The 2023 Spine Summit is jointly provided by the American Association of Neurological Surgeons and the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves.

MARCH 16–19, 2023
MIAMI BEACH

Excellence Requires Change
Mastery Vision Purpose

The 39th Annual Meeting of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves

#2023SPINESUMMIT

The 2023 Spine Summit is jointly provided by the American Association of Neurological Surgeons and the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves.
GET CONNECTED
2023 Spine Summit

Manage your schedule, peruse program content and stay in touch throughout the meeting.

Select 2023 Spine Summit from the Upcoming Events list.

Complimentary WiFi is available to all attendees throughout the Fontainebleau meeting space.

NETWORK NAME: Spine Summit
PASSWORD: 2023spine
On behalf of the AANS/CNS Joint Section on Disorders of the Spine and Peripheral Nerves (DSPN) Executive Committee, welcome to the 2023 Spine Summit! This year’s meeting promises to be uniquely engaging as we explore the theme “Excellence Requires Change: Mastery, Vision and Purpose.”

You will notice our theme embedded in the scientific sessions, awards and special events throughout the meeting. You will also notice new presentation formats, stylistic changes, visionary speakers, legendary athletes and orators. We received a record number abstract submissions this year — nearly 1,000 — signifying the trust you have in the DSPN to deliver cutting-edge science and innovative ideas. The onus was on us to respond and provide a modern program that engages, inspires, motivates and challenges our membership. We believe we have done just that!

We begin at the Opening Reception on Thursday night at the Fontainebleau’s Ocean Lawn, where L.A.vation: The World’s Greatest Tribute to U2, sets the backdrop for networking and socializing with new and old colleagues and friends. We opened the gates to our academic and community allies, neuro and ortho, including advanced practitioners, as we encourage collective involvement and participation throughout the meeting.

Celebrate our MVPs at our inaugural Sport & Spine Session as pro football Hall of Famer and Super Bowl champion Ronnie Lott of the San Francisco 49ers discusses being an MVP on the gridiron and in life, as he takes the stage with former teammate and friend, Jeff Fuller, who sustained a career-ending spinal cord injury on the field.

Visionary speakers will kick off every Plenary Session with TEDx style talks and each will be capped off with an impartial take on the session’s theme by tech leaders. We are going to be educated from all facets, from all specialties and from all viewpoints. Join us in honoring our distinctive guests Praveen Mummaneni, Allan Belzberg and David Polly. Our courses have been revamped, our debates and controversies reinvigorated and our scientific sessions reimagined.

Thank you for taking time out of your busy schedules to join us on this endeavor to provide an educational, energetic and enlightening experience for all!

Spine Summit 2023 will be like no meeting you have seen before!

Adam Kanter, MD, FAANS
AANS/CNS Section on Disorders of the Spine & Peripheral Nerves Chair

Scott Meyer, MD, FAANS
Annual Meeting Chair

Charles Sansur, MD, FAANS
Scientific Program Chair
Adam Kanter, MD, FAANS
AANS/CNS Section on Disorders of the Spine & Peripheral Nerves Chair

Dr. Adam Kanter grew up in Brockton, Massachusetts, aptly named the “City of Champions” as it was home to boxing legends the Brockton Blockbuster Rocky Marciano and the Marvelous Marvin Hagler. Dr. Kanter attended the city’s high school, the largest in the United States, with more than 4,200 students, less admirably dubbed a case study in failure by the NY Times as one-third of students dropped out and less than a quarter passed state proficiency exams. He learned at a young age that grit was born and shaped through perseverance, fortitude and resilience. He brawled for a spot on the wrestling squad and embraced the key tenets — never quit and always strive to improve. Dr. Kanter carried these principles with him when he left Brockton to begin his climb up life’s steep ladder of success—and he’s still climbing.

Dr. Kanter graduated with cum laude honors from the University of Massachusetts in Amherst. He performed research for NASA while obtaining a master’s degree at Boston University and then on to medical school at the University of Vermont. He completed neurosurgery residency at the University of Virginia, including a year abroad in Auckland, New Zealand, followed by fellowship training in minimally invasive spine surgery at the University of California, San Francisco. He then joined the University of Pittsburgh Medical Center (UPMC) as director of the minimally invasive spine program. Dr. Kanter launched UPMC’s complex spine fellowship in 2012, was appointed chief of spine in 2014 and performed more than 6,000 operations as he ascended the ranks to tenured professor of neurological surgery. Dr. Kanter has authored more than 150 journal publications, numerous books and chapters, and given more than 200 lectures across the globe.

After 15 years in Pittsburgh, Dr. Kanter sought new adventures and leadership opportunity, relocating his family and practice to Newport Beach, California, where he joined the Hoag Specialty Clinic as chief of neurosurgery. He is actively obtaining his executive MBA from the University of California, Los Angeles, following which he will assume the executive directorship of the Hoag Neurosciences Institute.
### General Information

**Badges required for entry to all sessions.**
There is a $100 reprint fee for all lost or forgotten badges.

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<tr>
<th><strong>Exhibit Hall</strong></th>
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**Industry Breakfast/Lunch**  
Splash 15, 16, 17 and Flash Symposia

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**I-Presentations**  
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**No Smoking Policy**
Smoking is not permitted at any official 2023 Spine Summit event. The Fontainebleau Miami Beach is a non-smoking hotel. Smoking is permitted in designated smoking areas outside only.

**Attire**
Professional attire is appropriate for the meeting and Exhibit Hall. Miami Vice Theme or casual attire is encouraged for the Thursday night Opening Reception.
Accreditation and Designation Statement
This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the AANS and AANS/CNS Section on Disorders of the Spine and Peripheral Nerves. The AANS is accredited by the ACCME to provide continuing medical education for physicians.

The AANS designates this live activity for a maximum of 24.75 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Continuing Education for Advanced Practice Providers (APPs)
Nurses, nurse practitioners (NPs) and physician assistants (PAs) must self-report their credit in NeuroU after completion of the meeting. PAs may print a certificate that can be submitted to the American Academy of Physician Assistants (AAPA) for acceptance toward the Physician Assistant Category I (pre-approved) CME requirement.

Disclosure Statement
Before the program, anyone in control of the educational content of this activity will disclose the existence of any financial interest and/or the relationship they have with the manufacturer(s) of any commercial product(s) to be discussed during their presentation. Disclosures will be included in the meeting app.
Ronnie Lott
NFL Hall of Fame
Defensive Back
Considered by many to be the greatest defensive back to put on a uniform, Ronnie Lott’s influence reinvented how the position was played, and whose influence can still be seen on the field today. In 14 professional seasons and 192 career games, Lott had 63 interceptions, 1,146 tackles and five touchdowns. He is a 10-time Pro Bowler, made the All-Pro team six times, the All-NFC six times, the All-AFC once and was named to the NFL’s 75th anniversary team in 1994. In 2000, Lott was inducted into the Pro Football Hall of Fame in his first year of eligibility.

Jeffrey Fuller
NFL Wide Receiver
Jeffrey Fuller was recruited to Texas A&M in 1980 and was later drafted by the San Francisco 49ers in 1984 where he played in two Super Bowls and went on to win Super Bowls XIX and XXIII.

As the result of damage caused to Candlestick Stadium by the 1989 Loma Pierta earthquake, Fuller played his last professional game at Stanford Stadium on October 22, 1989. In the second play of the game, he was partially paralyzed after a helmet-to-helmet hit on New England running back John Stephens.
HONORED GUEST

Joseph C. Maroon, MD, FAANS(L), is a clinical professor and vice chairman of the Department of Neurosurgery and the Heindl Scholar in Neuroscience at the University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania. He completed his undergraduate work at Indiana University where he was a Scholastic All-American in football and received his medical education at Indiana (Bloomington), Oxford (England) and Georgetown Universities and the University of Vermont. Dr. Maroon has been the team neurosurgeon for the Pittsburgh Steelers for 35 years and the first neurosurgeon directly appointed in the NFL. In November 2016, he was appointed chairman of the Scientific Advisory Committee of the Chuck Noll Foundation. He is a senior member of the NFL Head, Neck and Spine Committee and also the medical director of the World Wrestling Entertainment Corporation.

MERITORIOUS AWARD

ORTHOPAEDIC

David W. Polly, Jr., MD, is a professor and chief of spine surgery at the Department of Orthopaedic Surgery at the University of Minnesota. He holds the James W. Ogilvie professorship and the Catherine Mills Davis endowed chair for biomechanical research. He is a professor (W) in the Department of Neurosurgery.

Dr. Polly graduated from the United States Military Academy at West Point, attended medical school at the Uniformed Services University of the Health Sciences, did an internship and residency at the Walter Reed Army Medical Center, spine fellowship at the University of Minnesota and was chief of spine surgery and then chair of the Department of Orthopaedic Surgery and Rehabilitation at Walter Reed Army Medical Center prior to his retirement from the Army after 24.5 years of service. At Walter Reed, he and Stephen Ondra, MD, FAANS (L), founded a combined neurosurgical orthopaedic surgical spine service in 1992.
Allan J. Belzberg, MD, FAANS, is the George J. Heuer professor of neurosurgery at Johns Hopkins School of Medicine. He is the director of peripheral nerve surgery at Johns Hopkins Hospital, All Children’s Hospital and the Kennedy Krieger Institute. As a member of the multi-disciplinary comprehensive Neurofibromatosis Clinic at Johns Hopkins, Dr. Belzberg treats patients suffering from a variety of benign and malignant tumors. His expertise in both spinal and peripheral nerve surgery allows him to remove the most challenging nerve tumors and reconstruct both the spine and peripheral nerves as required.

Dr. Belzberg is interested in neuropathic pain and is the co-director of the Neurosurgery Pain Research Institute at Johns Hopkins. He has a publication record concerning the pathophysiology of painful nerves including those related to NF and nerve injury.

Praveen V. Mummaneni, MD, MBA, completed his bachelor’s degree and medical degree in a six-year accelerated program at Boston University School of Medicine. He subsequently completed his neurosurgery residency at the University of California, San Francisco (UCSF) and a complex spine fellowship at Emory University. After completing his training, he joined the faculty at Emory University from 2002-2006 and later returned to UCSF in 2006. He is now the Joan O’Reilly endowed professor in spinal surgery and vice chair of the UCSF neurosurgery department. He received his MBA from Louisiana State University in 2020. In 2022, he became the lead surgeon for UCSF’s perioperative services and oversees all surgical specialties at the main campus.

Dr. Mummaneni specializes in complex spine surgery, with a focus on MIS techniques in cervical surgery, deformity surgery and tumor surgery. He serves as co-director of the UCSF Spine Center and directs the MIS and complex spine fellowship program.
SPINE SURGEONS WANTED

The Joint Spine Section Emerging Investigator Program is a two-year national neurosurgeon-investigator mentoring program for junior spine faculty. Accepted applicants receive individualized mentoring from senior spine investigators at the American Association of Neurological Surgery Annual Meeting, the AANS/CNS Joint Spine Section Meeting and the Congress of Neurological Surgeons over the course of two years.

Our goal is that the program will make accepted applicants competitive for federal funding and develop robust clinical trial expertise, depending of their research interests. Chief residents, fellows and junior faculty within their first five years of faculty appointment will be considered.

2023 Awardees

Jacob Greenberg, MD, MSCI
Complex Spine Surgery Fellow, Cleveland Clinic

Owoicho Adogwa, MD, MPH
Assistant Professor of Neurosurgery, University of Cincinnati

Ahilan Sivaganesan, MD
Assistant Professor of Neurosurgery, Thomas Jefferson University
**NETWORKING EVENTS**

**Opening Reception**  
Ocean Lawn  
**Thursday, March 16  6–9 pm**  
Enjoy a night of music under the stars with a live concert featuring L.A.vation, the World’s Greatest Tribute to U2! Channel your inner Miami Vice while indulging in a lavish array of food and beverages as you network with old friends and new colleagues at the Opening Reception. Each medical attendee and spouse/guest registered for the meeting will receive one complimentary ticket. A name badge and ticket will be required for entry to the reception. Miami Vice/Casual attire is recommended.

**Booth Crawl in the Exhibit Hall**  
Sparkle Ballroom (Upper Lobby Level)  
**Friday, March 17  6:15–7:30 pm**  
Enjoy complimentary beer, wine and soft drinks as you network and learn about the latest innovations from participating exhibitors.
**NETWORKING EVENTS**

**WINS Reception**  Splash 1-3 (Upper Lobby Level)

Saturday, March 18  5–6 pm
Reconnect with friends and colleagues from WINS and forge new connections during this hour-long reception and networking event.

**Young Spine Surgeon Reception & Dinner**  Flicker 1-2 (Fourth Floor)

Saturday, March 18  6:30–9 pm
All residents, fellows and young neurosurgeons are invited to enjoy an engaging reception and delicious dinner with the 2023 Spine Summit honored guests. Advanced registration is required as space is limited.
CONGRATULATIONS
TO THE 2023
AWARD RECIPIENTS

Batzdorf Scholar Award
Jacob Greenberg
Zachary Pennington

Benzel Research Award
Nishanth Krishnan

Fessler Award
Pravesh S. Gadjradj

Kline Peripheral Nerve Abstract Award
Stanley Bazarek

Larson Award
Logan Muzyka

Shaffrey International Fellow Award
Visagan Ravindran
Charles Kuntz IV Scholars
Awarded in memory of Charles Kuntz IV, MD, to support research presentations by residents and fellows at the Annual Meeting of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves.

Gustavo Anton
Tej Azad
Roxana Beladi
Steve Cho
Timothy Chryssikos
Michael Cloney
Rafael De la Garza Ramos
Joravar Dhalwal
Jeff Ehresman
Aladine Elsamadicy
Syed Faraz Kazim
Patrick Flanigan
Laureen Hachem
Mohammad Hassan Noureldine
Jacob Jasinski
Evan Joiner
Abdul Karim Ghaith
Syed Khalid
Hammad Khan
Edwin Kulubya

David Kurland
Katriel Lee
Joseph Linzey
Tarek Mansour
David Mazur-Hart
Steve Monk
James Mooney
Karim Nathani
Sean Neifert
Aria Nouri
Ken Porche
Elliot Pressman
Miguel Ruiz-Cardozo
Kavelin Rumalla
Sananthan Sivakanthan
Edvin Telemi
Pavlos Texakalidis
Joseph Withrow
Mark Zaki
James Zhou

Todd Albert Scholars
Awarded in honor of Todd J. Albert, MD, to support research presentations by orthopaedic surgery residents and fellows at the Annual Meeting of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves.

Jessica Albanese
Kasra Araghi
Arthur Bartolozzi
James Bernatz
Austin Carroll
Diana Douleh
Jerry Du
Ryan Finkel
Brad Gelfand
Matthew Godlewski
Takashi Hirase
Haroon Kisana
Nathan Lee
Hannah Levy

Gerard Marciano
Robert Merrill
Christopher Mikhail
Stephane Owusu-Saprong
Micheal Raad
Prashant Rajan
Djani Robertson
Jerry Robinson
Pratyush Shahi
Gurmit Singh
Stephen Stephan
Dylan Thomas
Patrick Young
THURSDAY

11 am–7:30 pm
Registration

12:30–1:15 pm
Industry Sponsored Lunch Symposia

1:30–5:30 pm
Tips & Pearls for Advanced Practice Providers

1:30–5:30 pm
SPECIAL COURSE 1
Persistent Symptoms After Surgery: Cased-Based Salvage Options

1:30–5:30 pm
SPECIAL COURSE 2
(Joint DSPN and AOSNA) Applying Modern Deformity Concepts into Practice: A Case-Based Approach

1:30–5:30 pm
SPECIAL COURSE 3
Outpatient Spine Surgery: How to Do It and Do It Well

1:30–5:30 pm
SPECIAL COURSE 4
Innovations in Spine

6–9 pm
OPENING RECEPTION
FRIDAY

6:30 am–6:30 pm
Registration

7–7:45 am
Industry Sponsored
Breakfast Symposium
Continental Breakfast

8–10:05 am
SCIENTIFIC
SESSION 1
Sports & Spine

9 am–4:30 pm
Exhibit Hall Open

10:30 am–12:15 pm
SCIENTIFIC
SESSION 2
Excellence Requires Change

12:30–1:15 pm
Industry Sponsored
Lunch Symposia
Lunch in the Exhibit Hall

1:15–2:30 pm
SCIENTIFIC
SESSION 3
Spine Confessions: Confronting the Elephant in the Room

3:10–4:40 pm
SCIENTIFIC
SESSION 4
The Art of Spine Surgery

4:40–6:15 pm
DEBATES
Millennial Mayhem

6:15–7:30 pm
Booth Crawl in the Exhibit Hall
6:30 am–5 pm
Registration

7–7:45 am
Industry Sponsored Breakfast Symposium
Continental Breakfast

7:45–9:15 am
• Award Winning Abstract Presentations
• Concurrent Session 1
• Concurrent Session 2
• MVP—Top Abstracts: Session 3
• Specialty Breakout 1: Minimally Invasive/ Motion Preservation/ General Spine Abstracts

9 am–2 pm
Exhibit Hall Open

9:15–10:30 am SCIENTIFIC SESSION 5
Beyond the Foramen: Peripheral Nerve Perplexities

11 am–12:20 pm CAHILL CONTROVERSIES
To Operate or Not to Operate? That is the Question!

9:15–2:30 pm
SCIENTIFIC SESSION 6
Leaders in Spine: Tales from the Crypt

2:30–5 pm
SPECIAL COURSE 5
Summit Grand Rounds: Difficult Cases—The Decision Making Dilemma

2:30–5 pm
SPECIAL COURSE 6
Starting Your Career: Practical Tips for Success

2:30–5 pm
SPECIAL COURSE 7
Practical Matters: Hands-on Operating Room Preparation for the APP

2:30–5 pm
SPECIAL COURSE 8
Treatment and Complication Avoidance in the Management of Spinal Tumors

5–6 pm
WINS Reception

6:30–9 pm
Young Spine Surgeon Reception & Dinner
SUNDAY

6:30–11:30 am
Registration

7–7:30 am
BREAKFAST CASE DISCUSSIONS
Challenging Peripheral Nerve Cases Submitted by You

7–7:45 am
Continental Breakfast

7:30–9:30 am
SPECIALTY BREAKOUT 2
Trauma/General Spine Abstracts

7:30–9:30 am
SPECIALTY BREAKOUT 3
Tumor/General Spine Abstracts

7:30–9:30 am
SPECIALTY BREAKOUT 4
Peripheral Nerve/Basic Science/General Spine Abstracts

7:30–9:30 am
SPECIALTY BREAKOUT 5
Spinal Deformity/General Spine Abstracts

9:30–11:15 am
SCIENTIFIC SESSION 7
Our Greater Purpose

11:15 am–12:10 pm
SPECIAL SESSION
Business Tips, Pearls & Tactics

12:10–12:35 pm
DSPN BUSINESS MEETING
SPECIAL COURSE 1
Persistent Symptoms After Surgery: Case-Based Salvage Options

1:30–5:30 pm

Location: Splash 9

Course Directors: John Caridi, Sanjay Dhall

Course Description: Patients who have persistent pain and or weakness after seemingly successful surgical intervention can be very challenging. This course offers a panel of experts who will discuss their experiences with this problem. The discussion will center around diagnosis and treatment for this population.

Learning Objectives:
• Describe the natural history of patients with persistent pain syndromes
• Offer a differential diagnosis to patients who have continued problems after surgery
• Discuss various treatment options with their patients to help solve these challenging problems
• Implement treatment plans to alleviate the continuing symptoms these patients experience

1:30–1:35 pm
Introduction

1:35–1:47 pm
Failed Back—What It Is and What You Can Do About It
Jeremy Steinberger

1:48–2 pm
Upper Extremity Radiculopathy After Arthroplasty
Erik Hayman

2:01–2:13 pm
Recurrent Versus Persistent CTS
Allan Belzberg

2:14–2:26 pm
Is It C8 or the Ulnar Nerve?
Justin Brown

2:27–2:37 pm
Question & Answer Session
2:38–2:50 pm
C5 Palsy—What Do You Tell the Patient and What Are the Real Odds?
Bryan Bollinger

2:51–3:03 pm
Persistent SI Joint Pain After SI Joint Fusion
Joshua Heller

3:04–3:16 pm
Spinal Cord, DRG and Peripheral Nerve Stimulation
Gurtej Singh

3:17–3:29 pm
Iatrogenic Spinal Deformity
Han Jo Kim

3:30–3:40 pm
Question and Answer Session

3:41–3:53 pm
Pseudoarthrosis—Fix It Now or Take Your Chances?
Pawel Jankowski

3:54–4:06 pm
Inadequate Decompression—Can We Ignore It?
Alp Ozpinar

4:07–4:21 pm
The Dreaded PJK—Here Are Your Options!
Joel Beckett

4:22–4:34 pm
Question & Answer Session

4:35–4:47 pm
Trauma on the Slopes Gets Fusion—Now He's Got Chronic Back Pain: What to Do
Jason McGowan

4:48–5 pm
Subsidence—How to Prevent and How to Treat
Nitin Agarwal

5:01–5:13 pm
MIS Isn't Supposed to Be Minimally Effective: Pain Persists—Now What?
Andrew Vivas

5:14–5:30 pm
Question and Answer Session
SPECIAL COURSE 2
Applying Modern Deformity Concepts Into Practice: A Case-Based Approach (Joint DSPN and AOSNA)

1:30–5:30 pm
Location: Splash 10
Course Directors: Dean Chou, Kai-Ming Fu
Course Description: This course focuses on spinal deformity principles and case-based discussions to apply to real-world clinical practice. Such concepts as when bigger surgeries are needed and when smaller surgeries suffice are discussed. In addition, principles of approaches to deformity and considerations of types of surgeries will be discussed.

Learning Objectives:
• Apply principles of spinal deformity to everyday clinical practice
• Differentiate the various treatment options in patients with scoliosis, from larger surgeries to intermediate surgeries to focal, targeted surgeries
• Outline limits and merits of different treatment types of surgeries
• Outline the risks and benefits of the various surgeries in treating patients with adult deformity

1:30–1:35 pm
Introduction

1:36–1:50 pm
Strategies to Avoid PJK/PJF
Kristen Jones

1:51–2:05 pm
Indications for MIS Versus Open Deformity Surgery
Michael Virk

2:06–2:20 pm
How to Approach Deformity in Young Adults
Rakesh Patel

2:21–2:35 pm
Sacro-Pelvic Considerations in Deformity Surgery
Peter Passias

2:36–2:50 pm
Question & Answer Session

2:51–3:05 pm
Tools for Lumbar Deformity Correction
John Dimar

3:06–3:20 pm
SI Joint Disease in the Deformity Patient: Do You Ignore It?
Christopher Shaffrey
3:21–3:35 pm  
Rod Fractures! What Do You Do to Avoid Them?  
Rod Oskouian

3:36–3:50 pm  
Custom Implants, Seriously? Industry Gimmick  
John Shin

3:51–4:05 pm  
Question & Answer Session

4:06–4:20 pm  
Enabling Technologies in Spinal Deformity Surgery  
Amit Jain

4:21–4:35 pm  
Complication Management in Open Adult Deformity  
Jang Yoon

4:36–4:50 pm  
PROMS in Deformity Surgery  
Andrew Chan

4:51–5:05 pm  
Modern Advances in MIS Spinal Deformity: Update on Techniques and Outcomes Data  
Praveen Mummaneni

5:06–5:30 pm  
Discussion: Participants Bring in Cases with Discussion  
Dean Chou

SPECIAL COURSE 3  
Outpatient Spine Surgery: How to Do It and Do It Well

1:30–5:30 pm  
Location: Splash 13-14

Course Directors: Kurt Eichholz, Karthik Madhavan

Course Description: The ambulatory Surgical Center is a potentially sustainable financial model in the setting of spine surgery. Several spine surgeons have been moving part of their practice to an ASC. This course provides an overview of the development and operations of an ASC, from early simple cases to more complex procedures. Spine surgery in the ASC setting continues to evolve, as more minimally invasive procedures are being developed. As more spine surgeons move towards ASC’s they need to have a better understanding of the ASC reimbursement system, recent trends in ASC surgeries and enabling technologies.

Learning Objectives:
- Define the pros and cons of working in ASC
- Differentiate nuances of ASC vs hospital-based practice
- Outline reimbursement patterns for ASC
- Discuss future trends in ASC utilization
1:30–1:35 pm
Introduction

1:36–1:50 pm
Understanding the ASC Model
Michael Steinmetz

1:52–2:07 pm
My First ASC Case and Where I am Now
Domagoj Coric

2:08–2:23 pm
Progression of Neurosurgical Cases from Inpatient to Outpatient
Richard G. Fessler

2:24–2:39 pm
Integrating an ASC into a Multispecialty Practice
Kevin Foley

2:40–2:55 pm
Question & Answer Session

2:56–3:11 pm
ASC Patient Finances: Why is My Copay Different?
Andrew Sama

3:12–3:27 pm
What NOT to Do in an ASC
Anand Veeravagu

3:28–3:43 pm
ASC Practice — Is This the Best Investment?
Kurt Eichholz

3:44–3:59 pm
The Hybrid Model
Eric Potts

4:00–4:15 pm
Question & Answer Session

4:16–4:31 pm
What Implants I Choose for ASC
Chris Yeung

4:32–4:47 pm
Robotics & Navigation in the ASC: Is It Feasible?

4:48–5:03 pm
Payor Issues in the ASC vs. Hospital Outpatient Department
Joseph Cheng

5:04–5:19 pm
Life-Cycle of Independent ASC’s
Luis Tumialan

5:20–5:30 pm
Question & Answer Session
SPECIAL COURSE 4
Innovations in Spine
Equipment provided by Alphatec Spine, Augmedics, Brainlab, DePuy Synthes, Globus, Joimax, Life Instruments, Medtronic, NuVasive and Stryker.

1:30–5:30 pm
Location: Splash 11–12
Courses Directors: Paul Park and Juan Uribe

Course Description: This course will cover technological, as well as operative and non-operative advances in the treatment of spinal disease. Topics will include novel non-fusion options for the treatment of back pain, regenerative technologies, artificial intelligence, surface technology, expandable cage technology, advanced application of navigation and robotics. Many of these innovations have the potential to improve surgical efficiency, safety and outcomes. Attendees will gain a better understanding of the basis for these technologies and techniques, its applications clinically, evidence for the technologies, outcomes and costs.

Learning Objectives: Upon completion of this course, participants will be able to:
• Explore regenerative spinal technology such as multifidus muscle stimulation for the treatment of low back pain
• Recognize novel non-fusion procedures such as basivertebral nerve ablation for the treatment of low back pain
• Discuss the potential of artificial intelligence to impact spinal treatment
• Outline the role of robotics and its integration into spinal surgery as well as understand new applications for spinal navigation

1:30–1:35 pm
Introduction

1:36–1:49 pm
Updates on Lumbar Disk Replacement
Rolando Garcia

1:49–2:03 pm
Multifidus Muscle Stimulation for Treatment of Low Back Pain
Juan Uribe

2:03–2:17 pm
Basi Vertebral Nerve Ablation for Treatment of Low Back Pain Syndrome
Jad Khalil

2:17–2:31 pm
Advantages of Robotic Surgery
Mohamad Bydon
2:31–2:45 pm
Question & Answer Session

2:45–2:59 pm
Single Position Lateral Surgery
Paul Park

2:59–3:13 pm
Robotic Assisted Deformity Surgery
Martin Pham

3:13–3:27 pm
Machine Learning and Spine Surgery
Hesham Zakaria

3:27–3:41 pm
Radiation Reduction Techniques
Jay Turner

3:41–3:49 pm
Question & Answer Session

3:50–4:01 pm
Augmented Reality
Jakub Godzik

4:11–4:22 pm
Update on Novel Cage Designs and Innovations
Victor Chang

4:23–4:37 pm
Personalized Implant Technologies
Darryl Lau

4:38–4:50 pm
Cage Surface Technology and Materials Treatments
David Okonkwo

4:51–4:58 pm
Endoscopic Spine Surgery Techniques
Christoph Hofstetter

4:59–5:06 pm
Impact of Navigation in Endoscopic Spine Surgery
Osama Kashlan

5:07–5:14 pm
CT and MRI vs DEXA for Assessment of Osteoporosis
Kevin Swong

5:15–5:22 pm
Update on Biologics: Costs and Effectiveness
Khoi Than

5:23–5:30 pm
Spinal Column Shortening for Tethered Cord Syndrome
Christopher Bonfield
SEMINAR FOR APPs
Tips & Pearls for Advanced Practice Providers

1:30–5:30 pm
Location: Flicker 1–2

Course Directors: Kenneth Crandall, Gina Duel, Sara McEvoy

Course Description: This course will cover pre-operative and post-operative education and management of patients with degenerative spine conditions. A special emphasis will be made on teamwork and communication to create a better patient and provider experience.

Learning Objectives:

• Identify the impact of comorbidities on patient outcomes
• Identify conservative treatment options during the initial spine evaluation
• Describe the impact of preoperative and postoperative patient communication and setting the expectation
• Identify the impact of a good team approach in treating patients

1:30–1:35 pm
Introduction

1:35–1:50 pm
Pre-Operative Education for Spine Surgery
Megan Bellman

1:50–2:05 pm
Early Diagnosis of Spondyloarthritis: Educating Your Patient
Vikas Majithia

2:05–2:20 pm
Managing Medical Co-Morbidities Prior to Spine Surgery
Sara McEvoy

2:20–2:35 pm
APP Utilization: Where and How We Can Help
Angela Jolivette

2:35–2:50 pm
Question & Answer Session

2:50–3:05 pm
Conservative Management of Spine Issues: Collaboration with PM&R Team
Marilou Oh

3:05–3:20 pm
Prehabilitation: Tips to Get Better Surgical Outcomes
Angela Petrosky

3:20–3:35 pm
Anatomic and Surgical Tips & Pearls Related to Lateral Access Surgery (LLIF)
Gina Duel
3:35–3:50 pm  
Chiropractic Treatment of Acute Neck/Back Pain: Indications and Contraindications  
Jeffrey King

3:50–4:05 pm  
Question & Answer Session

4:05–4:20 pm  
Essential Spine Anatomy: How to Be a Good Surgical Assist  
Gina Rizzo

4:20–4:35 pm  
Inpatient Issues After Spine Surgery & How to Deal with Them  
Kenneth Crandall

4:35–4:50 pm  
Outpatient Issues After Surgery, They Still Hurt! How Spinal Cord Stim Can Help  
Shawn Zardouz

4:50–5:05 pm
Building an Inpatient Neurosurgery APC Team  
Corey Ames

5:05–5:20 pm
20 Years of Managing the APP Team: How I’ve Survived & What I’ve Learned  
Edward Shaffer

5:20–5:30 pm
Wrap-Up & Closing  
Kenneth Crandall, Gina Duel, Sara McEvoy

OPENING RECEPTION  
Sponsored by DePuy, Globus, Medtronic, NuVasive and Stryker

6–9 pm
Location: Ocean Lawn
SCIENTIFIC SESSION 1
Sports & Spine
Educational grant support for Scientific Session 1 is provided by the National Football League.

8–10:05 am
Location: Glimmer Ballroom (Fourth Floor)
Moderators: Praveen Mummaneni, David Okonkwo
Learning Objectives:
1. Describe the interaction between spine surgery and athletics
2. Describe sports injuries that may result in the need for spine surgery
3. Describe tools to optimize player health and safety

8–8:05 am
Welcome to 2023 Spine Summit and the NEW Sports & Spine
Adam Kanter

8:05–8:15 am
From NFL to the OR: How Lessons From the Field Prepared Me for Neurosurgery
Myron Rolle

8:15–8:40 am
Leadership On & Off the Field

Ronnie Lott
NFL Hall of Fame Defensive Back
Considered by many to be the greatest defensive back to put on a uniform, Ronnie Lott’s influence reinvented how the position was played, and whose influence can still be seen on the field today. In 14 professional seasons and 192 career games, Lott had 63 interceptions, 1,146 tackles and five touchdowns. He is a 10-time Pro Bowler, made the All-Pro team six times, the All-NFC six times, the All-AFC once and was named to the NFL’s 75th anniversary team in 1994. In 2000, Lott was inducted into the Pro Football Hall of Fame in his first year of eligibility.
Jeffrey Fuller
NFL Wide Receiver

Jeffrey Fuller was recruited to Texas A&M in 1980 and was later drafted by the San Francisco 49ers in 1984 where he played in two Super Bowls and went on to win Super Bowls XIX and XXIII.

As the result of damage caused to Candlestick Stadium by the 1989 Loma Pierta earthquake, Fuller played his last professional game at Stanford Stadium on October 22, 1989. In the second play of the game, he was partially paralyzed after a helmet-to-helmet hit on New England running back John Stephens.

8:40–8:50 am
Question & Answer Session
David Okonkwo, Praveen Mummaneni

8:50–9:05 am
Neurosurgery Honored Guest: 40 Years of Caring for Elite Athletes
Joseph Maroon

9:05–9:15 am
How We Have and Will Continue to Improve Player Health and Safety
Jeff Miller

9:15–9:25 am
Why the Difference in How We Treat Spine Trauma in an Elite Athlete?
Nicholas Theodore

9:25–9:30 am
Question & Answer Session

9:30–9:40 am
Isthmic Spondy Direct Pars Repair in the Athlete
Rick Sasso

9:40–9:50 am
Is Arthroplasty an Option in Elite Athletes?
Scott Zuckerman

9:50–10 am
Leadership Lecture: The Future is Data, Connectivity and Emerging Technologies
Robert Cohen

10–10:05 am
Question & Answer Session

Beverage Break in the Exhibit Hall
10:05–10:30 am
SCIENTIFIC SESSION 2
Excellence Requires Change
10:30 am–12:15 pm
Location: Glimmer Ballroom (Fourth Floor)
Moderators: Adam Kanter, Charles Sansur
Learning Objectives:
1. Describe the evolution of spine surgery
2. Describe tools to enhance the performance of your practice
3. Recognize the role for physician leadership in health care

10:30–10:35 am
Welcome to Session & Introduction of Neurosurgery Meritorious Award Recipient
Adam Kanter

10:35–10:41 am
Neurosurgery Meritorious Award Recipient
Praveen Mummaneni

10:42–10:44 am
Introduction of Orthopaedic Meritorious Award Recipient
Kristen Jones

10:45–10:51 am
Orthopaedic Meritorious Award Recipient
David W. Polly, Jr.

10:52–10:54 am
Introduction of Peripheral Nerve Meritorious Award Recipient
Daniel Lubelski

10:55–11:01 am
Peripheral Nerve Meritorious Award Recipient
Allan Belzberg

11:02–11:12 am
Visionary Speaker: The Expanding Need for Physician Leadership In Health Care
Michael N. Brant-Zawadzki, MD, FACR
Michael N. Brant-Zawadzki, MD, FACR, is the senior physician executive at Hoag Hospital, facilitating business and strategic relationships with specialist clinicians, and overseeing a platform for programmatic care that integrates specialized services with population health. He also oversees the Hoag Center for Research and Education.

11:13–11:19 am
Introduction of DSPN Chair
David Okonkwo

11:20–11:35 am
DSPN Chair’s Address: Excellence Requires Change
Adam Kanter
11:36 am–12:05 pm  
Verbs and Vertebrae—Personal Branding for Spine Surgeons  
Sasha Strauss  
CEO & Founder, Innovation Protocol  
Sasha Strauss shares two decades of experience in brand development, building brands for corporations, philanthropies and universities while working at top advertising, PR, marketing and branding firms worldwide. His unique and proven perspective on how brands are built and communicated laid the foundation for his brand strategy consulting firm, Innovation Protocol.

12:05–12:15 pm  
Leadership Lecture: Bold Moves—Big Rewards  
Chris Barry

SCIENTIFIC SESSION 3  
Spine Confessions: Confronting the Elephant in the Room

1:15–2:30 pm  
Location: Glimmer Ballroom (Fourth Floor)  
Moderators: Srinivas Prasad, Daniel Hoh  
Learning Objectives:  
1. Outline the implications of complications in the world for healthcare litigation  
2. Distinguish the treatment and avoidance of various complications in spine and peripheral nerve surgery  
3. Identify better strategies for patient selection

1:15–1:25 pm  
Visionary Speaker: Disease or Unease?  
How to Identify & Avoid Operating on the Unease  
C. Philip O’Carroll, MD  
C. Philip O’Carroll, MD, is a native of Ireland and a graduate of University College Dublin Medical School. He completed a three-year residency in internal medicine in Canada, followed by a residency in neurology at Massachusetts General Hospital. Dr. O’Carroll completed a fellowship in neurophysiology at the Mayo Clinic in Rochester, Minnesota. He is a co-founder of the Pickup Neuroscience Institute at Hoag Hospital.

1:26–1:30 pm  
Introduction of THE CASE  
Srinivas Prasad
ThinKING THURSDAY

1:30–1:38 pm
Interrogation of Plaintiff’s Expert
Liam Duffy, Christopher Shaffrey

1:39–1:46 pm
Interrogation of Defendant’s Expert
Liam Duffy, James Harrop

1:46–1:56 pm
Lawyer Discussion of What Went Right and What Went Wrong
Liam Duffy

1:57–2:04 pm
My Worst MIS Mishap: Lessons Learned
Kevin Foley

2:05–2:12 pm
My Worst Deformity Debacle: Lessons Learned
Jens Chapman

2:13–2:20 pm
My Worst Peripheral Nerve Pandamonium: Lessons Learned
Mark Mahan

2:21–2:30 pm
Leadership Lecture: Does Cannabis Have a Role in Our Clinics?
Ziva Cooper

Beverage Break in the Exhibit Hall
2:30–3:10 pm

SCIENTIFIC SESSION 4
The Art of Spine Surgery

3:10–4:40 pm
Location: Glimmer Ballroom (Fourth Floor)
Moderators: Zoher Ghogawala, Burak Ozgur

Learning Objectives:
1. Distinguish technical nuances in complex spine conditions
2. Determine how surgeons need to evolve their techniques to stay current and provide optimal outcomes
3. Identify ways to reduce complications despite using latest technologies
3:12–3:30 pm
Visionary Address: Modic Changes: Fact, Fiction or Fallacy

Michael Modic, MD

Michael Modic, MD, joined Vanderbilt University Medical Center in 2018 as senior vice president, population health and professor of radiology and radiological sciences. He works with the population health team integrating clinical activities and establishing and enabling evidence-based clinical standards across diverse network-based ambulatory and inpatient settings.

3:31–3:40 pm
The Art in Scoliosis Surgery:
It’s Not All Just Measurements
Amer Samdani

3:41–3:50 pm
Endoscopic Awake TLIF: Is This Just Me or Is It Ever Going to Catch On?
Michael Wang

3:51–4 pm
Anterior Release from the Posterior Approach:
Really? Why?
Steven Ludwig

4:01–4:10 pm
Pushing the Limits in Arthroplasty: Just How Far Can We Expand Our Indications?
Ronald Lehman

4:11–4:20 pm
Prone Transpsoas Surgery: Is It as Safe as Lateral? Here’s the Data!
Juan Uribe

4:20–4:30 pm
Leadership Lecture: The Art of the Wright Way
Skip Kiil

4:30–4:40 pm
Question & Answer Session
**DEBATES**

**Millennial Mayhem**

4:40–6:15 pm
Location: Glimmer Ballroom
Moderator: Mohamad Bydon

**Learning Objectives:**

- Outline the difference between Orthopaedic and Neurosurgical Spine Training
- Recognize anterior and posterior treatment paradigms for addressing the sagittal imbalance
- Discuss treatment options for the use of robotics in spine surgery

**4:40–4:43 pm**

Topic 1: Machine Learning and AI in Spine Surgery

Nima Alan

**4:43–4:50 pm**

AI is the Future, Get On Board!

Christopher Ames

**4:50–4:57 pm**

AI Will Lead to Spine Armageddon!

Juan S. Uribe

**4:57–5:05 pm**

Vote: Expert Declares Winner & His Two Cents

Michael Y. Wang

**5:05–5:08 pm**

Topic 2: Social Media in Spine Surgery

Zachary J. Tempel

**5:08–5:15 pm**

Social Media is the Patient Recruitment Tool of Choice

Gregory Mundis

**5:15–5:22 pm**

Social Media Fills My Clinic With Non-Surgical Patients

Neal Anand

**5:22–5:30 pm**

Vote: Specialty Thoughts on Using Social Media To Promote Your Practice

Sasha Strauss

**5:30–5:33 pm**

Topic 3: Neuro & Ortho: Are We ONE Yet?

Kristen Jones

**5:40–5:48 pm**

What Unites Us Is More Compelling Than What Divides Us

David W. Polly Jr.
5:48–5:56 pm
Unless We Have A Spine Residency, We Will Always Be Split
Christopher Shaffrey

5:56–6:05 pm
Vote: Thoughts From Our Orthopaedic HYM Advocate
Todd Albert

6:05–6:15 pm
Leadership Lecture: Guiding Principles of Leadership
Russell Powers

BOOTH CRAWL IN THE EXHIBIT HALL
Sponsored by Depuy, Orthofix, Seaspine, Spineology and Stryker

6:15–7:30 pm
Location: Sparkle Ballroom (Upper Lobby Level)
Award Winning Abstract Presentations: Session 1
7:45–9:15 am
Location: Splash 9
Moderators: Yakov Gologorski, Nathan Pratt

7:48–7:50 am
111 What is the Effect of Fellowship Training on Navigated Robot-Assisted Spine Surgery?
Presenting Author: Gerard Marciano
Co-Authors: Nathan Lee, Paul Park, William Clifton, Varun Puvanesarajah, Kevin Kwan, Ian Buchanan, Alex Ha, Mena Kerolus, Scott Zuckerman, Joseph Lombardi, Ronald Lehman

7:52–7:54 am
125 Does the ACS-NSQIP risk calculator apply to adult deformity surgery? A single-center comparative study
Presenting Author: Robert Merrill
Co-Authors: Anthony Pajak, Justin Samuel, Izzet Akosman, John Clohisy, Jerry Du, Bo Zhang, Jonathan Elysee, Pratyush Shahi, David Kim, Yusef Jordan, Rachel Knopp, Francis Lovecchio, Han Jo Kim

7:54–7:56 am
132 Diabetes Adversely Affects Surgical Outcomes after Spine Surgery for Lumbar Spondylosis: A Matched Analysis of the QOD Dataset
Presenting Author: James Mooney
Co-Authors: Karim Nathani, Nitin Agarwal, Daniel Zeitouni, Giorgos Michalopoulos, Andrew Chan, Domagoj Coric, Dean Chou, Kevin Foley, Anthony Asher, Erica Bisson, Kai-Ming Fu, Steven Glassman, Jacob Goldberg, Oren Gottfried, Regis Haid, Ibrahim Hussain, John Knightly, Daniel Lu, Praveen Munmaneni, Paul Park, Eric Potts, Christopher Shaffrey, Mark Shaffrey, Brandon Sherrod, Jonathan Slotkin, Luis Tumialan, Cheerag Upadhyayaya, Michael Virk, Michael Wang, Mohamad Bydon
7:56–7:58 am

133 Are we getting better at treating adult cervical deformity? Complication Rate Trends Analysis in Adult Cervical Deformity Over 10 Years.

Presenting Author: Stephane Owusu-Saprong
Co-Authors: Tyler Williamson, Jamshaid Mir, Peter Tretiakov, Pooja Dave, Kimberly McFarland, Bassel Diebo, Nina Fisher, Bailey Imbo, Rachel Joujon-Roche, Oscar Krol, Jordan Lebovic, Shaleen Vira, Peter Passias

7:58–8 am

193 Geographic Distribution in Training and Practice of Academic Neurologic and Orthopaedic Spine Surgeons in The United States

Presenting Author: Logan Muzyka
Co-Authors: Raj Lavadi, Sangami Pugazenthi, Darsh Shah, Arpan Patel, Taiyeb Rangwalla, Galal Elsayed, Nitin Agarwal

8–8:02 am

190 Does Laminectomy for Cervical Intradural Tumor Resection Require Fusion?

Presenting Author: Nishanth Krishnan
Co-Authors: Timothy Chryssikos, Enrique Vargas, Sanjay Dhall, Aaron Clark, Dean Chou, Praveen Mummanen

8:02–8:04 am

101 A machine learning approach to predicting surgical intervention in patients with vertebral osteomyelitis and discitis (VOD)

Presenting Author: Miguel Ruiz-Cardozo
Co-Authors: Jennifer Lee, Raj Lavadi, J.D Peiffer, Michelle Santacatterina, Brenton Pennicooke

8:04–8:06 am

102 Transforaminal versus lateral interbody fusions for treatment of adjacent segment disease in the lumbar spine

Presenting Author: Prashant V. Rajan
Co-Authors: Mark Megerian, Ansh Desai, Penelope Halkiadakis, Nicholas Rabah, James Showery, Zachary Grabel, Dominic Pelle, Jason Savage

8:06–8:08 am

103 Carbon-Fiber Reinforced PEEK Spinal Implants for Primary and Metastatic Spine Tumors: Systematic Review on Implant Complications and Radiotherapy Benefits

Presenting Author: Hammad Khan
Co-Authors: Roee Ber, Sean Neifert, David Kurland, Ilya Laufer, Douglas Kondziolka, Arpit Chhabra, Anthony Frempong-Boadu, Darryl Lau

8:08–8:10 am

104 Preoperative spinal injections within thirty days of lumbar decompression are associated with a three-fold increase in readmissions: A matched institutional study

Presenting Author: Patrick Flanigan
Co-Authors: Karim Nathani, Selby Chen, Maziyar Kalani, Mohamad Bydon
8:10–8:12 am
105 En Bloc Fixation/Correction is Associated with a Lower Rate of Pseudoarthrosis after Three Column Osteotomies in Adult Spinal Deformity Surgery
Presenting Author: Micheal Raad
Co-Authors: Amy Xu, Kevin Mo, Brian Neuman, David Cohen, Lee Riley, Hamid Hassanzadeh, Khaled Kebaish

8:12–8:14 am
106 Predicting post-operative spinal alignment using intraoperative stitched x-rays
Presenting Author: James Zhou
Co-Authors: Steve Cho, Jeffrey Ehresman, Harrison Farber, Charuta Furey, Tim Gooldy, Kumar Kakarla, Luke O’Neill, Jay Turner, Juan Uribe

8:14–8:16 am
107 Minimally Invasive Transforaminal Lumbar Interbody Fusion in the ambulatory Surgery Center Versus Inpatient Setting: A One-Year Comparative Effectiveness Analysis
Presenting Author: Steve Monk
Co-Authors: Ummey Hani, Deborah Pförtmiller, Tim Adamson, Michael Bohl, Byron Branch, Paul Kim, Mark Smith, Christopher Holland, Matthew McGirt

8:16–8:18 am
108 Characterizing Neck Injuries in the National Football League: A Descriptive Epidemiology Study
Presenting Author: Takashi Hirase
Co-Authors: Bobby Dow, Dakota Doucet, Venkat Boddapati, Rex Marco

8:18–8:20 am
109 Preoperative Frailty and 30-day Mortality After Surgery for Type II Odontoid Fractures: A Multi-Center Analysis of 474 Patients
Presenting Author: Kavelin Rumalla
Co-Authors: Syed Faraz Kazim, Priyanka Jain, Rohini McKee, Meic Schmidt, Christian Bowers

8:20–8:22 am
110 Harnessing the endogenous regenerative potential of the injured spinal cord
Presenting Author: Laureen Hachem
Co-Authors: James Hong, Alexander Velumian, Andrea Mothe, Charles Tator, Michael Fehlings

8:22–8:24 am
112 Screening for Degenerative Cervical Myelopathy (SCREEN-DCM) in Patients Based on Signs, Symptoms and Known Risk Factors: Preliminary Results of an Ongoing Prospective Multicenter Study
Presenting Author: Aria Nouri
Co-Authors: Granit Molliqaj, Alexandre Lavé, Gianpaolo Jannelli, Benjamin Davies, Mark Kotter, Allan Martin, Justin Virojanapa, Joseph Cheng, Teresa Somma, Paolo Cappabianca, Carmen Vleggeert-Lankamp, Valerie ter Wengel, Karl Schaller, Enrico Ressitore
8:24–8:26 am
113 Surgery Decreases Nonunion, Myelopathy, and Mortality for Patients with Traumatic Odontoid Fractures: A Propensity Score Matched Analysis
Presenting Author: Michael Cloney
Co-Authors: Hooman Azad, Anastasious Roumeliotis, Vineeth Thirunavu, Nathan Shlobin, Kevin Swong, Najib El Tecle, Nader Dahdaleh

8:26–8:28 am
115 Outcomes Following Anterior Odontoid Screw versus Posterior C1-C2 Arthrodensis for Odontoid Fractures: A Systematic Review and Meta-analysis
Presenting Author: Pavlos Texakalidis
Co-Authors: Stavros Matsoukas, Constantine Karras, Hyman Frankel, Kevin Swong, Geoffrey Stricsek, Nader Dahdaleh

8:28–8:30 am
116 Inpatient versus Outpatient Lateral Lumbar Interbody Fusion: A Single-institution Review of Patient and Surgical Factors for Patient Selection
Presenting Author: Katriel Lee
Co-Authors: Nima Alan, Juan Pablo Leal Isaza, Juan Pedro Giraldo, Robert Dugan, James Zhou, Harrison Farber, Luke O-Neil, Juan Unbe

8:30–8:32 am
117 Harrington Rod Constructs in Adult Spinal Deformity Patients: Do Their Outcomes Improve Following Revision Surgery?
Presenting Author: Stephen Stephan
Co-Authors: Fthimnir Hassan, Christopher Mikhail, Andrew Platt, Nathan Lee, Zeeshan Sardar, Joseph Lombardi, Ronald Lehman, Lawrence Lenke

8:32–8:34 am
118 Characterization of the Influence of Spinopelvic Parameters on Thoracolumbar Trauma in 514 patients
Presenting Author: Joseph Withrow
Co-Authors: Analisa Narro, Lauren Haley, Marco Martinez Cruz, Dallas Sheinberg, Bradley Budde, Zhouxuan Li, Wen Li, John Caridi, John Quinn

8:34–8:36 am
119 Pelvic Incidence Supine versus Upright in Adult Spine Patients
Presenting Author: Matthew Godlewski
Co-Authors: Jason Haselhuhn, Jacob Schaefer, Angela Bruzina, Christopher Martin, David W. Polly, Jr.
8:36–8:38 am
120 Implementation of a statewide Enhanced Recovery after Surgery (ERAS) paradigm for spine surgery: A Michigan Spine Surgery Improvement Collaborative Study
Presenting Author: Tarek Mansour
Co-Authors: Edvin Telemi, Travis Hamilton, Seokchun Lim, Jared Reese, Mohamed Macki, Obadeh Mohiddin, Anisse Chaker, Pranish Kantak, Lonni Schultz, Kylie Springer, David Nerenz, Ilyas Aleem, Richard Easton, Jad Kahlil, Kevin Taliaferro, Muwaffak Abdulhak, Paul Park, Mick Perez-Cruet, Jason Schwalb, Victor Chang

8:38–8:40 am
121 Clinical and radiographic outcomes after index anterior cervical discectomy and fusion with interbody spacer with integrated anchor fixation: A single-surgeon case series
Presenting Author: Jessica Albanese
Co-Authors: Vishal Venkatraman, Saif Zaidi, Muhammad Abd-El-Barr

8:40–8:42 am
122 Ultrasound in Human Spinal Cord Injury: From Bench to Operating Room
Presenting Author: Sananthan Sivakanthan
Co-Authors: Zin Khaing, Jonah Harmon, Matt Bruce, Christoph Hofstetter

8:42–8:44 am
123 Does Coronal Alignment Affect Patient Reported Outcomes for Adult Spinal Deformity Surgery? The Key may be Lower Extremity Compensation vs. Decompensation
Presenting Author: Nathan Lee
Co-Authors: Gerard Marciano, Michael Fields, Fthimnir Hassan, Joseph Lombardi, Zeeshan Sardar, Ronald Lehman, Lawrence Lenke

8:44–8:46 am
124 Outcomes following 2-level cervical interventions with cage-and-plate, zero-profile, or arthroplasty constructs
Presenting Author: Syed Khalid
Co-Authors: Pranav Mirpuri, Kyle Thomson, Elie Massad, Aladine Elsamadicy, John Shin, Ankit Mehta

8:46–8:48 am
126 Predictive Value of Seven Nutrition Biomarkers in Oncological Spine Surgery: A Performance Assessment for Prediction of 90-day and 12-month mortality
Presenting Author: Rafael De la Garza Ramos
Co-Authors: Jessica Ryvlin, Mousa Hamad, Justin Langro, Saikiran Murthy, Yaroslav Gelfand, John Shin, Reza Yassari
8:48–8:50 am  
127 Cervical Disc Arthroplasty Cost of Care Increased Disproportionately to Medicare Reimbursement as Payments to Surgeons Declined from 2009 to 2019  
Presenting Author: Jerry Du  
Co-Authors: Karim Shafi, Colin Blackburn, Han Jo Kim, Sravisht Iyer, Randall Marcus, Sheeraz Qureshi, Todd Albert

8:50–8:52 am  
128 Machine learning identified variables to predict significant improvement in low back pain following lumbar decompressive surgery  
Presenting Author: David Mazur-Hart  
Co-Authors: Brannan O’Neill, Joseph Nugent, Jamila Godil, Hanne Gehling, Brandi Pang, Christian Lopez Ramos, Arlene Godoy, James Obayashi, Travis Philipp, Clifford Lin, Jung Yoo, Christina Wright, James Wright, Donald Ross, Josiah Orina, Won Hyung Ryu

8:52–8:54 am  
129 Academic Pediatric Spinal Deformity: Who is driving the field?  
Presenting Author: Patrick Young  
Co-Authors: Richard Menger, Robert Rella

8:54–8:56 am  
130 Risk Analysis Index and its recalibrated version predict postoperative outcomes better than 5-factor modified frailty index in traumatic spinal injury  
Presenting Author: Syed Faraz Kazim  
Co-Authors: Matthew Conlon, Rachel Thommen, Alis Dicpinigaitis, Meic Schmidt, Christian Bowers

8:56 –8:58 am  
131 Fusing to the Sacrum or Stopping Just Short: Is there a Difference in Outcomes among AdIS Patients?  
Presenting Author: Christopher Mikhail  
Co-Authors: Fthimir Hassan, Stephen Stephan, Andrew Platt, Nathan Lee, Joseph Lombardi, Zeeshan Sardar, Ronald Lehman, Lawrence Lenke

8:58–9 am  
191 Long-term Effectiveness of Full-endoscopic Discectomy versus Microdiscectomy for Sciatica: Results of a Randomized Controlled Trial  
Presenting Author: Pravesh S. Gadjaradj

9–9:02 am  
194 Spinal Cord Tissue Oxygen Guided Treatment for Patients with Acute, Severe Traumatic Spinal Cord Injuries  
Presenting Author: Visagan Ravindran  
Co-Authors: Argyro Zoumprouli, Marios Papadopoulos, Samira Saadoun
7:45–9:15 am
Location: Splash 10
Moderators: Benjamin Elder, Mark Oppenlander

7:48–7:50 am
150 Stable Long-term Regional and Global Alignment in Patients Treated with Minimally Invasive Lateral Retropleural Thoracic Discectomy Without Fixation
Presenting Author: Steve Cho
Co-Authors: Samuel Farber, James Zhou, Nima Alan, Luke O’Neill, Juan Pedro, Laura Snyder, Jay Turner, Juan Uribe

7:50–7:52 am
151 The Surgical Evaluation and Management of Primary Spinal Epidural Lymphoma Presenting with Acute Onset Thoracic Myelopathy in a Young Adult
Presenting Author: Austin Carroll
Co-Authors: R. Adams Cowley, Kory Pasko, David Weiner

7:52–7:54 am
135 Postoperative Radiculitis in Patients with Preoperative Radicular Symptoms Following Single-Level Anterior Lumbar Interbody Fusion
Presenting Author: Kasra Araghi
Co-Authors: Mitchell Fourman, Robert Merrill, Omri Maayan, Eric Zhao, Anthony Pajak, David Kim, Tejas Subramanian, Robert Kamil, Pratyush Shahi, Jerry Du, John Clohisy, Bo Zhang, Evan Sheha, James Dowdell, Srisht Iyer, Sheeraz Qureshi

7:54–7:56 am
136 Preoperative Symptom Duration and Patient-Reported Outcomes Following Lumbar Fusion for Low-Grade Spondylolisthesis: Analyses from the Michigan Spine Surgery Improvement Collaborative (MSSIC)
Presenting Author: Jacob Jasinski
Co-Authors: Doris Tong, Elise Yoon, Clifford Houseman, Prashant Kelkar, Peter Bono, Victor Chang, Muwaffak Abdulhak, Paul Park, Boyd Richards, Teck Soo

7:56–7:58 am
137 Lumbar Degenerative Spondylolisthesis: Role of Sagittal Alignment
Presenting Author: Gurmit Singh
Co-Authors: Jonathan Sembrano, David Polly

7:58–8 am
138 Anterior Column Release and its Association with Proximal Junctional Kyphosis Compared to Traditional Three-Column Osteotomy in a Five-Year Cohort
Presenting Author: Ryan Screven
Co-Authors: Molly Monsour, Deborah Liaw, Kelly Gassie, Puya Alikhani, Elliot Pressman
8–8:02 am
139 Should Age-Adjusted Realignment Goals Vary Based on Patient Frailty Status in Adult Spinal Deformity
Presenting Author: Djani Robertson
Co-Authors: Pooja Dave, Kimberly McFarland, Jamshaid Mir, Peter Passias, Justin Smith, Peter Tretiakov, Tyler Williamson

8:02–8:04 am
Presenting Author: Sean Neifert
Co-Authors: David Kurland, Kimberly Ashayeri, Themistocles Protopsaltis, Anthony Frempong-Boadu, Ilya Laufer, Darryl Lau

8:04–8:06 am
141 Clinical Outcomes and Radiographic Results of Prone Transpsoas Lateral Lumbar Interbody Fusion: A Single Institution Case Series of 106 Cases and 173 Levels
Presenting Author: Jeff Ehresman
Co-Authors: Katriel Lee, Bryan Lee

8:06–8:08 am
142 Perioperative Hyperglycemia Increases Rates of Infection in Spine Surgery
Presenting Author: Ryan Finkel
Co-Authors: Evan Nigh, Daniel Farivar, Christopher Johnson, Kevin Rezzadeh, Sang Kim

8:08–8:10 am
143 Placental Mesenchymal Stromal/Stem Cells and Extracellular Vesicles Seeded on a Dural Graft Improved Motor Function Recovery After Acute Spinal Cord Injury
Presenting Author: Edwin Kulubya
Co-Authors: Samantha Avallone, Diana Farmer, Leora Goldbloom-Helzner, Priyadarshini Kumar, Zachary Paxton, Christopher Pivetti, Camille Reed, Aijun Wang, Mounika Bhaskara, Jordan Jackson, Sirjan Mor

8:10–8:12 am
144 Association of Inpatient Opioid Consumption on Postoperative Outcomes After Open Posterior Spinal Fusion for Adult Spine Deformity
Presenting Author: Aladine Elsamadicy
Co-Authors: Aladine Elsamadicy, Mani Ratnesh Sandhu, Benjamin Reeves, Isaac Freedman, Andrew Koo, Christina Jayaraj, Samuel Craft, Astrid Hengartner, John Havlik, Andrew Hersh, Zach Pennington, Sheng-Fu Larry Lo, John Shin, Ehud Mendel, Daniel Sciubba
8:12–8:14 am
145 Radiographic and Patient-Reported Outcomes in a Large Cohort of Patients undergoing ACDF using Hydroxyapatite Infused PEEK Interbody Spacers: Two Year Results
Presenting Author: Michael Kelly
Co-Authors: Seyed Kalantar, Brad Gelfand

8:14–8:16 am
146 Predictors of Blunt Cerebrovascular Injury in Patients with Cervical Spine Trauma
Presenting Author: Tej Azad
Co-Authors: Divyaansh Raj, Kowsar Ahmed, Kathleen Ran, Josh Materi, Joseph Dardick, Joshua Olexa, Farah Musharbash, Daniel Lubelski, Timothy Witham, Ali Bydon, Nicholas Theodore, James Byrne, Elliott Haut

8:16–8:18 am
147 The correlation between immunohistochemical markers and tumor progression following resection of spinal chordomas: A multi-center study.
Presenting Author: Abdul Karim Ghaith
Co-Authors: Oluwaseun Akinduro, Antonio Bon Nieves, Anshit Goyal, Michelle Clarke, Alfredo Quiñones-Hinojosa, Kingsley Abode-Iyamah, Jamie Van Gompel, Mohamad Bydon

8:18–8:20 am
148 Robotics Versus Navigation for Minimally Invasive Transforaminal Lumbar Interbody Fusion
Presenting Author: Pratyush Shahi
Co-Authors: Avani Vaishnav, Kasra Araghi, Evan Sheha, James Dowdell, Sravisht Iyer, Sheeraz Qureshi

8:20–8:22 am
149 Intraoperative electrical stimulation of the human dorsal spinal cord reveals a map of arm and hand muscle responses
Presenting Author: Evan Joiner
Co-Authors: James McIntosh, Jacob Goldberg, Lynda Murray, Phoebe Greenwald, Bushra Yasin, Anil Mendiratta, Steven Karceski, Earl Thuet, Oleg Modik, Evgeny Shelkov, Kelley Mcgowan, Nisha Patel, Joseph Lombardi, Zeeshan Sardar, Ronald Lehman, K Riew, Noam Harel, Christopher Mandigo, Michael Virk, Jason Carmel

8:22–8:24 am
188 Data-Driven Clustering to Define Novel Endophenotypes for Chiari Malformation Type 1
Presenting Author: Jacob Greenberg
Co-Authors: Ziqi Xu, Thanda Meehan, David Limbrick, Chenyang Lu
8:24–8:26 am
161 Lack of Agreement Between Surgeons Regarding State-of-the-Art Surgical Treatment Plans for Severe Pediatric Spinal Deformity
Presenting Author: Diana Douleh
Co-Authors: Patrick Carry, Munish Gupta, Lawrence Lenke, Sumeet Garg

8:26–8:28 am
192 Supinator to Posterior Interosseous Nerve Transfer for Recovery of Finger Extension following Cervical Spinal Cord Injury
Presenting Author: Stanley Bazarek
Co-Authors: Benjamin Johnston, Margaret Sten, Justin Brown

8:28–8:30 am
153 Prevalence of Total Joint Replacement in Adult Spinal Deformity Patients
Presenting Author: Dylan Thomas
Co-Author: David Polly

8:30–8:32 am
154 Comparison of Outcomes Between Single-staged and Multi-staged Lumbar 360 Fusion Surgery
Presenting Author: Edvin Telemi
Co-Authors: Tarek Mansour, Michael Melhem, Leticia Simo, Travis Hamilton, Seokchun Lim, Jacob Pawloski, Hassan Fadel, Mohamed Macki, Richard Easton, David Nerenz, Paul Park, Mick Perez-Cruet, Ilyas Aleem, Lonni Schultz, Jason Schwalb, Kylie Springer, Hsueh-Han Yeh, Muwaffak Abdulhak, Victor Chang

8:32–8:34 am
155 Selective Thoracolumbar Fusion in Adult Spinal Deformity (ASD) Double Curves with Circumferential Minimally Invasive Surgery (CMIS): 2-year Minimum Follow Up
Presenting Author: Jerry Robinson
Co-Authors: Neel Anand, Andrew Chung, David Gendelberg, Jose Jimenez, Sheila Kahwaty, Babak Khandehroo, Corey Walker

8:34–8:36 am
156 High-Frequency Sciatic Nerve Neurostimulation Decreases Nocifensive Behavior Following Acute Disc Herniation in a Rat Model
Presenting Author: Ken Porche
Co-Authors: Kyle Allen, Lauren Dewberry, Kevin Otto, Daniel Hoh
157 How Closely Are Outcome Questionnaires Correlated to Patient Satisfaction After Cervical Spine Surgery for Myelopathy?
Presenting Author: Mark Zaki
Co-Authors: Rushikesh Joshi, Joey Linzey, Yamaan Saadeh, Michael Strong, Timothy Yee, Cheerag Upadhyaya, Domagoj Coric, Eric Potts, Erica Bisson, Jay Turner, Jack Knightly, Kai-Ming Fu, Kevin Foley, Luis Turnialan, Mark Shaffrey, Mohamad Bydon, Praveen Mummaneni, Dean Chou, Andrew Chan, Scott Meyer, Anthony Asher, Christopher Shaffrey, Oren Gottfried, Khoi Than, Michael Wang, Regis Haid, John Slotkin, Steven Glassman, Paul Park

158 Timing & Outcomes in Kyphoplasty
Presenting Author: Haroon Kisana
Co-Authors: Ben Watzig, Monis Khan, Conner Clay, Ali Baaj, James Lawrence, Charles Reitman, John Glaser, Brandon Hirsch, Robert Ravinsky

159 Preoperative Education Decreases Postoperative Opioid Use and First Time to ambulation in Patients Undergoing Elective Spine Surgery: A Quality Improvement Project
Presenting Author: Gustavo Anton
Co-Authors: Gustavo Anton, Elise Yoon, James Dragonette, Natasha Lee, Daniel Carr, Boyd Richards, Teck Soo, Doris Tong

160 Pelvic Incidence as a Predictor of Proximal Junctional Failure in Patients Undergoing Anterior Column Realignment with Anterior Longitudinal Ligament Release in Adult Spinal Deformity
Presenting Author: Mohammad Hassan Noureldine
Co-Authors: Paul McBride, Puya Alikhani

162 What Are We Transfusing? A Prospective Trial Evaluating the Quality of Intraoperatively Salvaged Red Blood Cells in Spinal Deformity Surgery
Presenting Author: David Kurland
Co-Authors: Daniel Alber, Darryl Lau
8:48–8:50 am
163 Activated titanium cages promote higher rates of early fusion as compared to poly-ether-ether-ketone cages in adults undergoing 1-2 level transforaminal lumbar interbody procedures
Presenting Author: Joravar Dhaliwal
Co-Authors: Nathaniel Toop, David Gibbs, Alexander Keister, Connor Gifford, Shelby Miracle, Reza Forghani, Francis Farhadi, Andrew Grossbach

8:50–8:52 am
164 Patients undergoing lumbar canal decompression above L4 have more back pain associated with their stenosis than patients undergoing decompression at lower levels
Presenting Author: Arthur Bartolozzi
Co-Authors: Todd Alamin, Ivan Cheng, Jayme Koltssov, Owen Marecic

8:52–8:54 am
165 MIS vs. Open Lumbo-Pelvic Fixation: Is There a Difference in Distal Junctional Failure Rates? A Propensity Score-Matched Analysis
Presenting Author: Timothy Chryssikos
Co-Authors: Vardhaan ambati, Michael Tawil, Abraham Dada, Ryan Sadjadi, Alma Rechav Ben-Natan, Youssef Sibih, Mohamed Macki, Andrew Chan, Sigurd Berven, Dean Chou, Aaron Clark, Praveen Mummaneni

8:54–8:56 am
166 Radiofrequency ablation of basivertebral and sinuvertebral nerves for chronic discogenic low back pain: A systematic review and meta-analysis
Presenting Author: Maaria Abdel Moneim
Co-Authors: Giorgos Michalopoulos, Sufyan Ibrahim, Mohamad Bydon, Karim Nathani

8:56–8:58 am
167 Predictors of Performance in Spine Surgery Fellowship
Presenting Author: Hannah Levy
Co-Authors: Payton Boere, John Bodnar, John Paulik, Nicholas D’Antonio, I. David Kaye, Mark Kurd, Jeffrey Rihn, Christopher Kepler, Alexander Vaccaro, Arjun Sebastian, Alan Hilibrand, Brian Karamian

8:58–9 am
152 Local Control of Spinal Metastases Treated with Stereotactic Body Radiation Therapy: Does epidural disease make a difference?
Presenting Author: Joseph Linzey
Co-Authors: Michael Strong, Peyton Goethe, Lila Tudrick, Johan Lee, Arushi Tripathy, Sravanthi Koduri, Ayobami Ward, Oludotun Ogunsola, Mark Zaki, Rushikesh Joshi, William Jackson, Nicholas Szerlip
9–9:02 am
**134 Surgical and Clinical Efficacy of Minimally Invasive Sacroiliac Joint Fusion Surgery: A PROSPERO-registered Meta-Analysis**

**Presenting Author:** Roxana Beladi  
**Co-Authors:** Gustavo Anton, Roxana Beladi, Michael Lawless, Elise Yoon, Boyd Richards, Doris Tong, Teck Soo

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**MVP-Top Abstracts: Session 3**

7:45–9:15 am  
**Location:** Splash 11  
**Moderators:** Sanjay Dhall, Michele Johnson

### 7:48–7:52 am

**168 Are We Optimizing Surgery for High Risk Adult Cervical Deformity Patients Over Time?**

**Presenting Author:** Peter Passias  
**Co-Authors:** Peter Tretiakov, Tyler Williamson, Rachel Joujon-Roche, Bailey Imbo, Oscar Krol, Nitin Agarwal, Douglas Burton, Alan Daniels, Bassel Diebo, Robert Eastlack, Richard Fessler, Jeffrey Gum, Munish Gupta, D. Kojo Hamilton, Robert Hart, Richard Hostin, Khaled Kebaish, Han Jo Kim, Eric Klineberg, Renaud Lafage, Lawrence Lenke, Stephen Lewis, Breton Line, Gregory Mundis, Pierce Nunley, Themistocles Protopsaltis, Justin Scheer, Christopher Shaffrey, Justin Smith, Alex Soroceanu, Khoi Than, Vincent Traynelis, Frank Schwab, Shay Bess, Virginie Lafage, Christopher Ames

### 7:52–7:56 am

**169 Cervical Laminoplasty Versus Laminectomy and Posterior Spinal Fusion for Cervical Myelopathy: Propensity Matched Analysis of 24-Month Outcomes From the Quality Outcomes Database**

**Presenting Author:** Andrew Chan  
**Co-Authors:** Christopher Shaffrey, Christine Park, Oren Gottfried, Erica Bisson, Mohammad Bydon, Anthony Asher, Domagoj Coric, Eric Potts, Kevin Foley, Michael Wang, Kai-Ming Fu, Michael Virk, John Knightly, Scott Meyer, Paul Park, Cheerag Upadhyaya, Mark Shaffrey, Luis Tumialan, Jay Turner, Giorgos Michalopoulos, Brandon Sherrod, Nitin Agarwal, Dean Chou, Regis Haid, Praveen Mummaneni

### 7:56–8 am

**170 Clinical and Radiographic Outcomes Following 110 Prone Transpsoas (PTP) Surgeries at a Single Center**

**Presenting Author:** Antoine Tohmeh  
**Co-Authors:** Peyton Van Pevenage, Kelli Howell
8–8:04 am
171 Clinical and Radiographic Outcomes of Repair of Spondylitic Spondylolisthesis via Direct Pars Repair
Presenting Author: John Dimar
Co-Authors: Nolan Smith, Steven Glassman, Charles Crawford, Mladen Djurasovic, Leah Carreon

8:04–8:08 am
172 Comparing the Effectiveness of Fibrin Glue, Nylon, and Vicryl Sutures for Sciatic Nerve Grafts in Rats
Presenting Author: Amgad Hanna
Co-Authors: Ahmad Hussein, Ethan Mickelson, Pradeep Attaluri, Daniel Hellenbrand

8:08–8:12 am
173 Disparities Attributable to Gender Differences in 4000 Lumbar Fusion Outcomes
Presenting Author: Ryan Gallagher
Co-Authors: Daksh Chauhan, Austin Borja, Tara Collier, Jianbo Na, Scott McClintock, Neil Malhotra

8:12–8:16 am
174 Do Reported ICD-10 Codes Accurately Reflect Diagnosis for Lumbar Spinal Surgery: Early Experience from the American Spine Registry
Presenting Author: Steven Glassman
Co-Authors: Leah Carreon, Anthony Asher, Ayushmita De, Kyle Mullen, Kimberly Porter, Christopher Shaffrey, John Knightly, Kevin Foley, Todd Albert, Darrel Brodke, David Polly, Mohamad Bydon

8:16–8:20 am
175 Five-year Follow-up of a Prospective FDA IDE Trial Evaluating a PEEK-on-Ceramic Cervical Disc Replacement
Presenting Author: Donna Ohnmeiss
Co-Authors: Richard Guyer, Domagoj Coric, Pierce Nunley, Rick Sasso, Michael Musacchio, Hyun Bae, Donna Ohnmeiss

8:20–8:24 am
176 Is There a Correlation Between Degree of Facet Degeneration and Increase in Spinal Canal Volume after a Minimally Invasive Pre-psoas Interbody Fusion? A Minimum 2 year Follow up Study
Presenting Author: Neel Anand
Co-Authors: Robinson Jerry, Andrew Chung, David Gendelberg, Jose Jimenez-Almonte, Babak Khandehroo, Sheila Kahwaty

8:24–8:28 am
177 Methylprednisolone in Acute Traumatic Spinal Cord Injury; Case Matched Outcomes from the NASCIS2 and SYGEN Historical SCI Studies with Contemporary Statistical Analysis
Presenting Author: Jamie Wilson
Co-Authors: Ali Moghaddamjou, Michael Fehlings, Fred Geisler
8:28–8:32 am
178 Outpatient Minimally Invasive Transforaminal Lumbar Interbody Fusion Performed At A Single ambulatory Surgery Center
Presenting Author: Kevin Foley
Co-Author: Jeffrey Sorenson

8:32–8:36 am
179 Predictive algorithm for surgery recommendation in thoracolumbar burst fractures without neurological deficits
Presenting Author: Charlotte Dandurand
Co-Authors: Cumhur Oner, Sander Muijs, Klaus Schnake, Marcel Dvorak

8:36–8:40 am
180 Prognostic Factors Regarding the Return to Daily Activities and Sports Following Posterior Spinal Fusion for Adolescent Idiopathic Scoliosis (AIS): A single center experience of 194 cases.
Presenting Author: Tuna Pehlivanoglu
Co-Authors: Bahadir Gokcen, Tugay Yagci, Osman Eroglu, Cagatay Ozturk

8:40–8:44 am
181 Restorative Neurostimulation Effectiveness in Patients with Chronic Low Back Pain Associated with Multifidus Dysfunction - Four-Year Durability
Presenting Author: Steven Falowski
Co-Author: Chris Gilligan

8:44–8:48 am
182 Risk of Peritoneal Violation During Lateral Lumbar Interbody Fusion (LLIF) Approach
Presenting Author: Luiz Pimenta
Co-Authors: Kelli Howell, Jack Miles, Jeffrey Moore, Samuel Moore, Gabriel Pokorny

8:52–8:56 am
184 Single-level cervical disc arthroplasty associated with a higher rate of subsequent cervical spine surgery when compared to anterior cervical discectomy and fusion.
Presenting Author: Alexander Tuchman
Co-Authors: Ida Chen, Corey Walker, Hyun Bae, David Skaggs

8:56–9 am
185 The influence of Schwann cells and exosomes on functional recovery after repair of long-segmental peripheral nerve defect in the rat
Presenting Author: Stephen Burks
Co-Authors: Emily Errante, Meredith Costello, Andrew Kloehn, Taylor Smartz, Krisna Maddy, Joseph Yunga Tigre, Allan Levi
9–9:04 am
186 Two Year Follow-up Data From a Pilot Study on a Lumbar Total Joint Replacement
Presenting Author: Alex Sielatycki
Co-Authors: Alex Sielatycki, Marissa Koscielski, Ahilan Sivaganesan, Brady Riesgraf, Jeffrey Goldstein, Scott Hodges

9:04–9:08 am
187 Zero-Profile Stand-Alone Cage with Integrated Instrumentation for ACDF: Comparison with Traditional Plate-Cage System and Stand-Alone Implants; a review of 8 years of experience.
Presenting Author: Burak Ozgur
Co-Authors: Kareem Khalifeh, Janneinne Le

Specialty Breakout 1:
Minimally Invasive/Motion Preservation/General Spine Abstracts
7:45–9:15 am
Location: Splash 13–14
Moderators: Eduardo Bertolini, Marcus Mazur

7:48–7:50 am
201 7-year progression and 10-year prediction of adjacent-level degeneration and disease after lumbar total disc replacement: A post hoc analysis of a prospective clinical trial with 7-year follow-up
Presenting Author: Ernest Braxton
Co-Authors: Jack Zigler, Domagoj Coric, Anton Jorgensen, Peter Derman, Kris Radcliff, Glenn Buttermann, Aaron Situ, Nicole Ferko, Kyle Brena

7:50–7:52 am
Presenting Author: Peter Tretiakov
Co-Authors: Pooja Dave, Bassel Diebo, Bailey Imbo, Rachel Joujon-Roche, Oscar Krof, Renaud Lafage, Virginie Lafage, Jordan Lebovic, Kimberly McFarland, Jamshaid Mir, Shaleen Vira, Tyler Williamson, Peter Passias

7:52–7:54 am
203 Assessment of Surgeons’ Attitude towards Awake Spine Surgery under Spinal Anesthesia
Presenting Author: Gaetano De Biase
Co-Authors: Selby Chen, Elird Bojaxhi, Rickey Carter, Alfredo Quinones-Hinojosa, Kingsley Abode-Iyamah
7:54–7:56 am  
204 Augmented reality enhances tubular minimally invasive transforaminal lumbar interbody fusion  
Presenting Author: Richard Price

7:56–7:58 am  
205 Bilateral interlaminar contralateral approach saving stabilizing structure for spinal stenosis in degenerative spondylolisthesis using unilateral biportal endoscopy (UBE)  
Presenting Author: Dong Hyun Lee  
Co-Authors: Dong-Geun Lee, Jae-Won Jang, Jin Sub Hwang, Choon Keun Park

7:58–8 am  
206 Causes of readmission following minimally invasive transforaminal lumbar interbody fusion  
Presenting Author: S. Harrison Farber  
Co-Authors: Nolan Weinsten, Shashvat Desai, Frederick Marcian, Luis Tumialan

8–8:02 am  
207 Comparative analysis of kyphotic deformity correction and implant failure in Thoracolumbar Fractures management with Percutaneous Long-Segment versus Short-Segment Pedicle Screws Fixation  
Presenting Author: Muhammad Jehanzeb  
Co-Authors: Ahmad Faizan, Asif Bashir

8:02–8:04 am  
208 Comparing Finite element analysis with Mechanical Compression Testing of a Novel Cervical Disc Arthroplasty  
Presenting Author: Samuel Brehm  

8:04–8:06 am  
209 Conventional Fluoroscopy (C-arm) versus Three-Dimensional Stereotactic Navigated (O-arm) Minimally Invasive Sacroiliac Joint Fusion  
Presenting Author: Dallas Kramer  
Co-Authors: Daniel Myers, Gersham Ranoine, Chen Xu
8:08–8:10 am
211 Endoscopic and non-endoscopic approaches to single-level lumbar spine decompression: propensity score matched comparative analysis and frailty driven predictive model
Presenting Author: Alex Kassicieh
Co-Authors: Kavelin Rumalla, Aaron Segura, Syed Faraz Kazim, John Vellek, Peter Shin, Meic Schmidt, Christian Bowers

8:10–8:12 am
212 Endoscopic Extreme Transforaminal Lumbar Interbody Fusion with Large Spacer (OLIF Cage): A Technical Note and Preliminary Report
Presenting Author: Jin Hwa
Co-Author: Alhareth Ma’aya

8:12–8:14 am
213 Feasibility of the Prone Transpsoas (PTP) Approach in the Obese and Morbidly Obese: A Comparison Study
Presenting Author: M. Craig McMains
Co-Authors: Antoine Tohmeh, Tyler Smith, Lee Bryan, Isaac Moss, Gene Massey, Kelli Howell

8:14–8:16 am
214 Five-year Follow-up of a Prospective FDA IDE Trial Evaluating a PEEK-on-Ceramic Cervical Disc Replacement
Presenting Author: Richard Guyer
Co-Authors: Domagoj Coric, Pierce Nunley, Rick Sasso, Michael Musacchio, Hyun Bae, Donna Ohnmeiss

8:16–8:18 am
215 Foraminal and Extraforaminal Lumbar Disc Herniations: Endoscopic discectomy or fusion?
Presenting Author: Adam Leibold
Co-Authors: Eric Tecce, Matthew O’Leary, Daniyal Mansoor, James Harrop, Joshua Heller, Jack Jallo, Srin Prasad, Ahilan Sivaganesan

8:18–8:20 am
216 Hovering Technique with Direct Visualization and Dynamic Retraction in the Lateral Lumbar Spine
Presenting Author: Shahed Elhamdani
Co-Authors: Dallas Kramer, Dan Myers, Cody Woodhouse, Chen Xu, Alexander Yu

8:20–8:22 am
217 Impact of Preoperative Sagittal Imbalance on Outcomes Following Minimally Invasive TLIF for Degenerative Spondylolisthesis
Presenting Author: Omri Maayan
Co-Authors: Andre Samuel, Pratyush Shahi, Tejas Subramaniam, Avani Vaishnav, Kasra Araghi, Nishtha Singh, Eric Zhao, Anthony Pajak, Max Korsun, Sheeraz Qureshi
8:22–8:24 am
218 Incidental Durotomy and Re-operation Rate in Tubular Lumbar Microdiscectomies
Presenting Author: Cody Woodhouse
Co-Authors: Shahed Elhamdani, Dallas Kramer, Lara Massie, Edward McClain, Daniel Myers, Chen Xu, Alexander Yu

8:24–8:26 am
219 Learning Curve of Mini-Open Correction and Fusion for Adolescent Idiopathic Scoliosis (AIS) Correction: A Single Surgeon’s 12 Years’ Experience
Presenting Author: Devender Singh
Co-Authors: Matthew Geck, Ashley Duncan, John Stokes, Eric Truumees

8:26–8:28 am
220 Low posterior electromyography threshold is not associated with poor functional outcomes following L4-5 lateral lumbar interbody fusion
Presenting Author: Robert Rudy
Co-Authors: Nima Alan, S Harrison Farber, Juan Giraldo, Luke O’Neill, Jay Turner, Juan Uribe, James Zhou

8:28–8:30 am
221 Matching cervical segmental and device biomechanics: toward optimizing disk arthroplasty selection
Presenting Author: TJ Florence
Co-Authors: Ryan Lowder, Joel Beckett, Andrew Vivas

8:30–8:32 am
222 Microscopic Lumbar Discectomy in ambulatory Surgery Center versus Inpatient Setting: A One-Year Cost Utility and Cost Benefit Analysis
Presenting Author: Ummey Hani
Co-Authors: Steve Monk, Deborah Pfortmiller, Mark Smith, Tim Adamson, Michael Bohl, Paul Kim, Christopher Holland, Matthew McGirt

8:32–8:34 am
223 Minimally invasive Transforaminal lumbar interbody fusion (MI-TLIF) in 607 patients. Clinical outcomes and long-term follow-up
Presenting Author: Lee Chieng
Co-Authors: Mick Perez-Cruet, Aaron Rapp

8:34–8:36 am
224 Minimally Invasive Versus Open Transforaminal Lumbar Interbody Fusion for Grade 1 Lumbar Spondylolisthesis: 60-Month Follow-Up from the QOD Multi-Center Prospective Registry
Presenting Author: Andrew Chan
Co-Authors: Erica Bisson, Mohamad Bydon, Steven Glassman, Kevin Foley, Christopher Shaffrey, Eric Potts, Mark Shaffrey, Domagoj Coric, John Knightly, Paul Park, Michael Wang, Kai-Ming Fu, Jonathan Slotkin, Anthony Asher, Michael Virk, Giorgos Michalopoulos, Regis Haid, Nitin Agarwal, Christine Park, Dean Chou, Praveen Mummaneni
8:36–8:38 am
225 Older Age Is Associated with Lack of Sustained Symptomatic Improvement After Endoscopic Discectomy
Presenting Author: Vignesh Kumar
Co-Authors: Sarah Wang, Prateek Gupta, Gregory Basil

8:38–8:40 am
226 Optimal Implant Sizing via Machine Learning is Associated with Increased Range of Motion Following Cervical Disc Arthroplasty
Presenting Author: Nikita Lakomkin
Co-Authors: Zachary Pennington, Archis Bhandarkar, Anthony Mikula, Georgios Michalopoulos, Selby Chen, Jamal McClendon, Mohamad Bydon

8:40–8:42 am
227 Outcomes in Patients with Non-Segmental versus Segmental Instrumentation in Minimally Invasive Transforaminal Lumbar Interbody Fusion: A Retrospective Cohort Study
Presenting Author: Elise Yoon
Co-Authors: Chad Claus, Bryce Sarcar, Daniel Carr, Clifford Houseman, Prashant Kelkar, Peter Bono, Boyd Richards, Doris Tong, Teck Soo, Gustavo Anton

8:42–8:44 am
228 Pilot Study Outcomes on a Lumbar Total Joint Replacement: Return to Work
Presenting Author: Jeffrey Goldstein
Co-Authors: Marissa Koscielski, Alex Sielatycki, Brady Riesgraf, Tyler Metcalf, Scott Hodges

8:44–8:46 am
229 Preoperative Robotics Planning Facilitates Complex Construct Design in Robot-Assisted Minimally Invasive Adult Spinal Deformity Surgery
Presenting Author: Martin Pham
Co-Authors: Lauren Stone, Nicholas Hernandez

8:46–8:48 am
230 Radiomics to Predict Distal Failure for Correction of Deformities with Sparing of the Lumbosacral Junction
Presenting Author: Joseph DiDomenico

8:48–8:50 am
231 Single Position Corpectomies for different clinical scenarios: a multicentric case series
Presenting Author: Jahangir Asghar
Co-Authors: Michael Galgano, Cristiano Menezes, Ashish Patel, Michael Rogers, Justin Seale, Alex Thomas, Alfredo Guiroy
8:50–8:52 am
232 SPINEHealthie: A Smartphone App for Virtual Post-Operative Care and Collection of PROMs for Patients Undergoing Endoscopic Spine Surgery
Presenting Author: James Pan
Co-Authors: Natalie Yap, Tobias Prasse, Christoph Hofstetter

8:52–8:54 am
233 The Posterior Cervical Transdural Approach for Cysts at the Craniovertebral Junction
Presenting Author: Aria Jamshidi
Co-Author: Allan Levi

8:54–8:56 am
234 Title: Does the Severity of Facet Arthropathy Limit the Sagittal Re-alignment in Circumferential Minimally invasive Surgical (CMIS) Correction of Adult Spinal Deformity (ASD)?
Presenting Author: Neel Anand
Co-Authors: Jerry Robinson, Chung Andrew, David Gendelberg, Jiménez-Almonte Jose, Khandehroo Babak, Kahwaty Kahwaty

8:56–8:58 am
Presenting Author: Nelson Sofoluke
Co-Authors: Sean Barber, Taylor Reardon, Albert Telfeian, Sanjay Konakondla

8:58–9 am
236 Trivergent: The Next Evolutionary Step in Lumbar Posterior Fixation
Presenting Author: Richard D. Fessler
Co-Authors: Richard G. Fessler

9–9:02 am
237 Two Level Full Endoscopic Posterior Cervical Foraminotomy: Short Term Results and Comparison with Open Surgery
Presenting Author: Masahiko Akiyama
Co-Authors: Hisashi Koga, MD, PhD

9:02–9:04 am
238 Two-Year Clinical and Radiographic Outcomes for Percutaneous Lumbar Interbody Fusion with an Expandable Titanium Cage Through Kambin’s Triangle without Facetectomy
Presenting Author: Troy Tabarestani
Co-Authors: Timothy Wang, David Sykes, Vikram Mehta, Christopher Shaffrey, Walter Wiggins, John Chi, Muhammad Abd-El-Barr
9:04–9:06 am
239 Unilateral Biportal Endoscopic Lumbar Discectomy: Experience in the First 10 Cases
Presenting Author: Jin Hwa Eum
Co-Authors: Alhareth Maaya

9:06–9:08 am
240 What Matters Most to Anterior Cervical Discectomy and Fusion Patients: A Digital Analysis of Patient Perception via Social Media
Presenting Author: Avi Gajjar
Co-Authors: Sidra Hasan, Jonathan Huang, Neo Hou, Anthony Le, Mohamed Salem, Brian Jankowitz, Jan-Karl Burkhardt

SCIENTIFIC SESSION 5
Beyond the Foramen: Peripheral Nerve Perplexities

9:15–10:30 am
Location: Glimmer Ballroom (Fourth Floor)
Moderators: Line Jacques, Mark Mahan
Learning Objectives:
1. Describe a systematic approach to patients with a wide range of peripheral nerve disorders
2. Develop a non-operative or operative management strategy for these conditions
3. Discuss advantages and disadvantages and expected outcomes of various surgical approaches

9:15–9:20 am
Honoring & Intro of the Lynda Yang PN Lectureship
Paul Park

9:21–9:30 am
Inaugural Lynda Yang Lecture: Why is the Sky Blue?
Robert Spinner

9:31–9:37 am
Peripheral Nerve Surgery for the Spinal Cord Injury Patient
Wilson Ray

9:38–9:44 am
When to Refer a Patient with C5 Palsy to a Peripheral Nerve Surgeon
Allan Belzberg

9:45–9:50 am
Question & Answer Session

9:50–9:52 am
Kline Peripheral Nerve Research Award-The Role of Exercise and Neuroinflammation in Regeneration of the Injured Peripheral Nerve
Megan Jack
10:01–10:07 am
Treatment of Foot Drop
Amgad Hanna

10:08–10:15 am
Pyriformis Syndrome (Is It Real?) A Peripheral Nerve Perspective
Aaron Filler

10:16–10:23 am
Double Crush Syndrome: What Do You Treat First?
Line Jacques

10:24–10:30 am
Question & Answer Session

Beverage Break in the Exhibit Hall
10:30–11am

CAHILL CONTROVERSIES
To Operate or Not to Operate? That is the Question!
11 am–12:20 pm
Location: Glimmer Ballroom (Fourth Floor)
Moderators: Kristen Jones, Wilson Ray
Learning Objectives:
• Discuss patient selection criteria for complex spine surgery
• Differentiate current non-operative treatment strategies for various spine conditions
• Describe underlying conditions and indications for controversial spine surgeries.

11:01–11:03 am
Incidentally Found SEVERE Cervical Cord Compression
Luis Tumialan

11:03–11:10 am
Decompress the Spinal Cord or Suffer from Stupidity!
Rick Sasso

11:10–11:17 am
Asymptomatic! Don’t Fix It if It Ain’t Broke!
R. John Hurlbert

11:17–11:20 am
Vote and Questions

11:21–11:23 am
75 Year Old Osteoporotic Deformity Patient
John Chi

11:23–11:30 am
Grandma is Miserable, Help Her!
Alexander Vaccaro
11:30–11:37 am
Septogenerian w/Osteoporosis: Sometimes You Just Have to Say No!
Mohamad Bydon

11:37–11:40 am
Vote and Questions

11:41–11:43 am
35 Year Old Collapsed L5/S1 with Intolerable Back Pain x 3 years—Conservative Measures Failed!
Christopher M. Holland

11:43–11:50 am
To Cut is to Cure!
Richard G. Fessler

11:50–11:57 am
No Evidence = No Cut!
Serena Hu

11:57 am–12 pm
Vote and Questions

12:01–12:03 pm
Large L4/5 HNP, 4 Months Out, Pain Resolved Last Month But Persistent Foot Drop
Robert Whitmore

12:03–12:10 pm
Surgery Worth a Shot!
Frank Phillips

12:10–12:17 pm
Try an AFO And Let Nature Play Out!
Eric Potts

12:17–12:20 pm
Vote and Questions

SCIENTIFIC SESSION 6
Leaders in Spine Surgery: Tales from the Crypt

1:15–2:30 pm
Location: Glimmer Ballroom (Fourth Floor)
Moderators: Irene Say, Juan Uribe
Learning Objectives:
1. Recognize social and economic challenges in spine surgery
2. Discuss methods to improve efficiency in practice
3. Review advanced spine technologies

1:15–1:20 pm
Introduction

1:20–1:32 pm
After a Decade of Arthroplasty: The Real Data on Revision and Conversion to Fusion
Domagoj Coric
1:33–1:45 pm
ERAS: This Is Why My ASC Works!
Michael Wang

1:46–1:57 pm
Socio-Economic Challenges in Spine Surgery: What Is Our Future?
Deborah Benzil

1:58–2:10 pm
The Importance of Diversity & Equity in Spine Programs
Ann Stroink

2:11–2:22 pm
How to Balance Advancing Technology with Advancing Costs
Regis Haid

2:23–2:30 pm
Question & Answer Session

SPECIAL COURSE 5
Spine Summit Grand Rounds: Difficult Cases—The Decision-Making Dilemma

2:30–5 pm
Location: Splash 9
Course Directors: Christopher Maulucci, Eve Tsai
Course Description: This course with a focus on Spine Section member participation. Spine Section members are encouraged to submit their cases through the Spine Section portal. Intended for audience members to bring difficult cases they have managed or are currently managing.

Learning Objectives:
• Discuss a variety of decision-making approaches in the complex case.
• Demonstrate complication management techniques in cervical and lumbar operations.
• Discuss complication avoidance strategies for management of complex lumbar and cervical conditions.

2:30–2:32 pm
Introduction

2:32–2:40 pm
Cervical Deformity Case
Tyler Koski

2:41–2:49 pm
Difficult Osteomyelitis Case
Rod Oskouian

2:50–2:58 pm
Challenging TL Trauma Case
Daniel Cavanaugh
2:59–3:07 pm
Complex TL Deformity Case
Hesham Soliman

3:08–3:11 pm
Question & Answer Session

3:12–3:20 pm
The Dumbell Schwannoma: Technical Pearls
Ashok Asthagiri

3:21–3:29 pm
Atlanto-Occipital Dislocation case
Sanjay Dhall

3:30–3:38 pm
Persistent CSF Leak Case, and Pathway to Its Solution
Asdrubal Falavigna

3:39–3:47 pm
Hangman’s Fracture Case
Jerônimo Milano

3:48–3:52 pm
Question & Answer Session

3:53–4:01 pm
Difficult TL Deformity Case
Harry Mushlin

4:02–4:10 pm
Lumbar ALIF Revision Case
Steven Ludwig

4:11–4:19 pm
Spondyloptosis Case
Cheerag Upadhyaya

4:20–4:28 pm
Vertebral Column Resection Case
Julius Ebinu

4:29–4:37 pm
Cervical Fracture Dislocation
W.H. Andrew Ryu

4:38–4:40 pm
Question & Answer Session

4:40–5 pm
Submitted Cases Discussion
SPECIAL COURSE 6
Starting Your Career: Practical Tips for Success
2:30–5 pm
Location: Splash 10
Course Directors: Owoicho Adogwa, Laura Snyder
Course Description: This course addresses neurosurgery and neuroscience research across the continuum of scientific inquiry: clinical research, translational research, comparative effectiveness research and bench/basic science research. In this comprehensive course, you will hear from scientific leaders in neurosurgery/neuroscience research, about surgeon- and institutional-level factors that enhance your success as an early career investigator. The course will be beneficial to neurosurgery residents and junior faculty interested in pursuing careers as surgeon-scientists/researcher.
Learning Objectives:
• Successfully negotiate your first contract as a surgeon-researcher
• Outline the different types of research methodologies and keys to success
• Discuss the progression from hypothesis generation to a fundable project
• Align clinical and research interest for success as an early career investigator
• Develop a strategy for success on the ABNS oral board examination

2:31–2:38 pm
Introduction

2:39–2:50 pm
Negotiating Your First Job: Components of Academic Spine Surgeon Contract
Philip Weinstein

2:51–3:02 pm
What I Should Have Known Before Signing My First Contract
Scott Meyer

3:03–3:14 pm
Thinking Ahead, Structuring Your First Five Years for Success
John Knightly

3:15–3:22 pm
Question & Answer Session

3:23–3:35 pm
ABNS Oral Boards: Structure and Important Timelines Why Should You Care?
Russell Lonser

3:36–3:47 pm
Tips for Success on the ABNS Oral Boards
Alexander Ropper
3:48–4 pm
From Ideas to Fundable Projects
Wilson Ray

4:01–4:09 pm
Question & Answer Session

4:10–5 pm
Survival Guide to Your First Year in Practice
Michael Bohl, Byron Branch, Laura Snyder

SPECIAL COURSE 7
Practical Matters: Hands-On Operating Room Preparation for the APP

*Equipment provided by Stryker Spine.*

2:30–5 pm
Location: Splash 11-12

Course Directors: Corinna Zygourakis, Nicole LeFevre

Course Description: This course will teach the must-have knowledge and skills to ensure success in the operating room for every Advanced Practice Provider.

Learning Objectives:
• Recognize basic anatomy and screw placement from the occiput to the ilium
• Discuss procedure-specific patient positioning
• Demonstrate operative techniques including suturing, drilling, and placing screws

2:30–2:35 pm
Introduction
Corinna Zygourakis

2:36–2:50 pm
Proper Technique for Lumbar Punctures, Lumbar Drain Insertion, EVD Placement
Salazar Jones

2:51–3:01 pm
Positioning Palsies
Courtney Pendleton

3:02–3:15 pm
Spine Surgery Anatomy
Anand Veeravagu

3:16–3:28 pm
Basics of Screw Placement
Corinna Zygourakis

3:29–3:32 pm
Question & Answer Session

3:33–3:50 pm
Suturing Tips and Tricks
Karl Bruckman
3:50–4:40 pm
Hands-On Rotations

4:40–5 pm
Question & Answer Session

SPECIAL COURSE 8
Treatment and Complication Avoidance in the Management of Spinal Tumors

2:30–5 pm
Location: Splash 13-14
Course Directors: John Shin, Ilya Laufer
Course Description: This course will review and highlight the multi-disciplinary management of spinal tumors for the practicing surgeon. Practical tips for managing common tumors and clinical scenarios with an emphasis on complications avoidance and surgical planning will be emphasized. Participants are encouraged to prepare and present cases for discussion.
Learning Objectives:
• Analyze various surgical treatment approaches to address spine tumor pathologies
• Outline applications of new technologies in spine tumor surgery
• Discuss complications avoidance strategies in tumor surgery

2:30–2:32 pm
Introduction

2:33–2:41 pm
Practical Tips for Treating Epidural Cord Compression—Decompression Indications, Timing and Techniques
Nicolas Dea

2:42–2:50 pm
When Do Metastatic Spine Tumor Patients Require Stabilization? Is Decompression Only an Option?
Hesham Soliman

2:51–2:59 pm
Patient Selection Considerations: When Is En Bloc Resection Indicated and Feasible?
Sheng-Fu Lo

3–3:08 pm
Definitive Radiotherapy for Chordoma: State-of-the-Art
Yen-Lin Chen

3:09–3:17 pm
Management of Benign Bone Tumors in the Spine
Michael Galgano

3:18–3:26 pm
Management of Intradural Tumors
Scott Zuckerman
3:26–3:30 pm
Break

3:31–3:39 pm
Minimally Invasive Approaches to Spine Tumors
John O’Toole

3:40–3:48 pm
Frailty and Pre-Operative Optimization Strategies
Raphaele Charest-Morin

3:49–3:57 pm
Soft-Tissue Reconstruction After Spinal Surgery

3:58–4:06 pm
Complications and How I Deal with Them
C. Rory Goodwin

4:07–4:15 pm
New Technologies in Surgery: Robotics, Endoscopy
Ori Barzilai

4:16–4:23 pm
New Technologies in Surgery: 3D Printing, Augmented/Virtual Reality
Jereme Larouche

4:24 pm–4:31 pm
Use of Vertebroplasty in Spine Oncology
Ehud Mendel

4:32–5 pm
Discussion with the Masters
Mark Bilsky, Dean Chou, Ziya Gokaslan, Larry Rhines, Dan Sciubba

**WINS RECEPTION**
Sponsored by DePuy, Globus, Medtronic, Nuvasive, Stryker
5–6 pm
Location: Splash 1–3
(Upper Lobby Level)

**YOUNG SPINE SURGEON RECEPTION & DINNER**
6:30–9 pm
Location: Flicker 1–2
(Fourth Floor)
Specialty Breakout 2: Trauma/General Spine Abstracts
7:30–9:30 am
Location: Splash 9
Moderators: Eve Tsai, Alecio Barcelos, Erik Hayman

7:32–7:34 am
301 A 12-year Retrospective Analysis of 366 Complications from Dural Grafts Reported by the Food and Drug Administration's Manufacturer and User Facility Device Experience Database
Presenting Author: Arjun Menta
Co-Authors: Daniel Davidar, Andrew Hersh, Denis Routkevitch, Carly Weber-Levine, Meghan Bhimreddy, Kelly Jiang, Safwan Alomari, Brendan Judy, Daniel Lubelski, Jon Weingart, Nicholas Theodore

7:36–7:38 am
303 Automated Detection of Cervical Spine Fractures in CT imaging: Lessons Learned from our submission to the 2022 RSNA Kaggle Challenge
Presenting Author: Tyler Steed
Co-Authors: Zach Zaiman, Chima Okechukwu, Judy Gichoya

7:38–7:40 am
304 Biomechanical Analysis of Two Versus Four Rods Across the Cervico-Thoracic Junction – an in vitro Human Cadaveric Model
Presenting Author: Gnel Pivazyan
Co-Authors: Daina Brooks, Carlynn Winters, Faheem Sandhu, Bryan Cunningham

7:40–7:42 am
305 Biomechanical Assessment of a Novel Sharp-Tip Screw for One Step Minimally Invasive Pedicle Screw Placement Under Navigation: Pullout Study
Presenting Author: Anna Sawa
Co-Authors: Bernardo DeAndrada, Luke O’Neill, Brian Kelly, Jay Turner, Juan Uribe

7:42–7:44 am
306 Blast versus direct penetrating injury to the spine: a retrospective review of gunshot wounds to the spine at a single institution
Presenting Author: Liesl Close
Co-Authors: Margaret Riordan, Sun Ik Lee
7:44–7:46 am  
**307** Build-A-Spine software (BASs): Validation of a Novel Semi-Automated Tool For Measurement of Spinopelvic Parameters in 250 Patients  
**Presenting Author:** Joseph Withrow  
**Co-Authors:** Christopher Conner, Analisa Narro, Lauren Haley, Marco Martinez Cruz, Dallas Sheinberg, Michael Monterey, Bradley Budde, Phillip Choi, John Quinn, John Caridi

7:46–7:48 am  
**308** Cannabis Use is Associated with a Two-fold Increased Risk of Pseudarthrosis Following TLIF Procedures: A Propensity Matched Study  
**Presenting Author:** Abhijith Matur  
**Co-Authors:** Syed Khalid, Rebecca Garner, Xu Tao, Geet Shukla, Phillip Vorster, Andrew Wu, Louisa Onyewadume, Benjamin Motley, Joseph Cheng, Owoicho Adogwa

7:48–7:50 am  
**309** Cannabis Use is Associated with Poor Outcomes among Traumatic Spinal Cord Injury Patients: A National Trauma Registry Analysis  
**Presenting Author:** Sung Huang Laurent Tsai  
**Co-Authors:** Abdel Karim Gaith, Sally El Sammak, Chi-Ya Yang, Yagiz Yolcu, Mohamad Bydon

7:50–7:52 am  
**310** Cauda Equina Syndrome Presenting to Emergency Departments Nationwide: An Analysis of Racial and Socioeconomic Factors Affecting Patient Outcomes and Hospital Resource Utilization  
**Presenting Author:** Thomas Johnstone  
**Co-Authors:** Vaibhavi Shah, Ghani Haider, Martin Stienen, Anand Veeravagu

7:52–7:54 am  
**311** Central Cord and Non-Central Cord Injured Patients Have No Difference in Peri-operative Outcomes Following Early Surgery: A TRACK-SCI Study  
**Presenting Author:** Austin Lui  
**Co-Authors:** Nikos Kyritsis, Timothy Chryssikos, Abel Torres-Espin, Xuan Duong-Fernandez, Rajiv Saigal, Jacob Blitstein, Jason Talbott, Jonathan Pan, Debra Hemmerle, Adam Ferguson, William Whetstone, Vineeta Singh, Philip Weinstein, Sanjay Dhall, Praveen Mummaneni, J Hui, Lisa Pascual, Geoff Manley, Jacqueline Bresnahan, Michael Beattie, Anthony DiGiorgio

7:54–7:56 am  
**312** Conservative Treatment of Type 2 Odontoid Fractures in Elderly Adults: Outcome Measures in a Series of 55 Patients  
**Presenting Author:** Paul Arnold  
**Co-Authors:** David Weisbaum, Tarika Patel, Annabelle Shaffer
7:56–7:58 am
313 Demographics of Patients Presenting to the Emergency Department with C1 and C2 Fractures
Presenting Author: Lauren Ladehoff
Co-Authors: Michael Diaz, Kevin Root, Kamil Taneja, Karan Patel, Marco Foreman, Brandon Lucke-Wold

7:58–8 am
314 Differences in Bowel and Bladder Function Following Spinal Cord Injury at the Cervical Versus Thoracic Level
Presenting Author: John Francis
Co-Authors: Grigory Manyak, Benjamin Whiting, John Como, Mary Roach, Michael Kelly

8–8:02 am
315 Disruption of the Blood-Spinal Cord Barrier using Low-Intensity Focused Ultrasound in a Rat Model
Presenting Author: Andrew Hersh
Co-Authors: Denis Routkevitch, Ali Mohammadabadi, Arjun Menta, Kelly Jiang, Carly Weber-Levine, Daniel Davidar, Joshua Punnose, Kelley Kempski Leadingham, Betty Tyler, Nicholas Theodore, Amir Manbachi, Meghana Bhimreddy

8:02–8:04 am
316 Effects of the 2016 CDC Opioid Prescription Guidelines on Worker Compensation Opioid Use and Case Length
Presenting Author: Harel Deutsch
Co-Author: Ethan Chung

8:04–8:06 am
317 Epidemiology, management, and outcome of traumatic spinal cord injury at two hospitals in the south-west region of Cameroon: a five-year retrospective review
Presenting Author: Berjo Dongmo Takoutsing
Co-Authors: Alain Chichom Mefire, Ignatius Esene

8:06–8:08 am
318 Factors Associated with Increased Surgical Drain Output After Spinal Deformity Correction in Adults
Presenting Author: Devender Singh
Co-Authors: Matthew Geck, John Stokes, Eeric Truumees, Ashley Duncan

8:08–8:10 am
319 Frailty and Short-Term Outcomes following Acute Spinal Cord Injury Surgery
Presenting Author: Evan Courville
Co-Authors: Kranti Rumalla, Kavelin Rumalla, Syed Kazim, Rohini McKee, Meic Schmidt, Christian Bowers
8:10–8:12 am
320 Human Spinal Cord Stem Cells Exhibit Reduced Potential for Oligodendrogenesis Compared to Rodent Stem Cells
Co-Authors: Ahmad Galuta, Abdul Mounnem Yassin Kassab, Diana Ghinda, Jason Kwan, Eve Tsai

8:12–8:14 am
321 Impact of Social Deprivation on the Outcomes of Cervical Spinal Cord Injury
Presenting Author: Saad Javeed
Co-Authors: Justin Zhang, Jacob Greenberg, Christopher Dibble, Wilson Ray

8:14–8:16 am
322 Intraoperative Stereotactic Arteriography in Complex Cervical Spine Surgery
Presenting Author: Andrew Fanous

8:16–8:18 am
Presenting Author: Ibrahim Hussain
Co-Authors: François Waterkeyn, Hiten Solanki, Rahel Mwavika, Arthur Okembo, Julieth Joseph, Consolata Shayo, Susan Stolla, Stephanie Van Hoppe, Julie Woodfield, Halinder Mangat, Hamisi Shabani, Roger Härtl, Chibuikem Ikwegbuenyi

8:18–8:20 am
324 Management of lower cervical spine fracture-dislocation associated with severe traumatic brain injury: case report of surgical treatment for an uncommon lesion association
Presenting Author: Ghassen Gader
Co-Authors: Mohamed amine Gharbi, Khelil Ezzaouia, Ihsen Zammel

8:20–8:22 am
325 Management of Mild Degenerative Cervical Myelopathy and Asymptomatic Spinal Cord Compression: An International Survey
Presenting Author: Jamie Brannigan
Co-Authors: Benjamin Davies, Oliver Mowforth, Joost Dejaegher, Granit Molliqaj, Rory Murphy, Guy Wynne-Jones, Juan Zamorano, Aria Nouri

8:22–8:24 am
326 Mesenchymal stem cell transplantation mitigates spinal cord inflammation but not gut dysbiosis acutely following rat spinal cord injury
Presenting Author: Richard D. Fessler
Co-Authors: Quan Shen, Yarazleth Lopez-Ramirez, Dominique Tucker, Brian David, Kristen Raue
8:24–8:26 am  
327 Microfluidic Model of Innervated Vasculature for Nociception Using Human Dorsal Root Ganglia from Spine Patients  
Presenting Author: Annee Nguyen  
Co-Authors: Cesar Baeta, Harrison Hockenberry, Vardhman Kumar, David Kingsley, Sajeeshkumar Perikamana, Shyni Varghese, C. Rory Goodwin  

8:26–8:28 am  
328 Minimally Invasive Techniques in the Surgical Management of Chance Fractures in Young Children  
Presenting Author: Jose Castillo  
Co-Authors: Edwin Kulubya, Julius Ebinu  

8:28–8:30 am  
329 Minority status and low socioeconomic status are associated with unfavorable outcomes following cervical spinal cord injury: an analysis of the National Inpatient Sample Database.  
Presenting Author: Cody Heskett  
Co-Authors: Jean-Luc Kabangu, Frank DeStefano, Ifije Ohiorhenuan  

8:30–8:32 am  
330 Modified frailty index and risk stratification in patients undergoing surgery for traumatic spinal cord injury: a nationwide cohort analysis of 4,069 patients  
Presenting Author: Rahul Sastry  
Co-Authors: Nathan Pertsch, Owen Leary, Jared Fridley, Matthew Hagan  

8:34–8:36 am  
331 Navigation-assisted Minimally Invasive Lateral Corpectomy for the Management of Traumatic Thoracolumbar Fractures: An Illustrative Case Series and a Decision Tree for Clinical Management  
Presenting Author: Thomas Wozny  
Co-Authors: John Andrews, John Yue, Mohamed Macki, Doris Wang, David Gendelberg, Ashraf El Naga, Praveen Mummaneni, Anthony DiGiorgio  

8:36–8:38 am  
332 Novel Wireless Battery-free Fully Passive Flexible Implant platform for neuromodulation of the Spine through Epidural/Transdural Stimulation  
Presenting Author: Diogo Moniz Garcia  
Co-Authors: Daniel Gulick, Ahmed Benbuk, Shiyi Liu, Hamid Esmaeli, Medhi Nikkhah, Jennifer Christen, Alfredo Quinones-Hinojosa  

8:38–8:40 am  
333 Occult Tight Filum Terminale Syndrome in Adults: Surgical Outcomes in 57 Patients  
Presenting Author: Ahmed Awad  
Co-Authors: Jessica Zhou, Carol Bergner, Lisa Haney, Dan Heffez
8:40–8:42 am  
334 Opportunistic CT-Based Hounsfield Units Demonstrate a Strong Correlation with Biomechanical CT Measurements of Vertebral Strength and Trabecular Bone Mineral Density in the Thoracolumbar Spine  
Presenting Author: Michael Martini  
Co-Authors: Anthony Mikula, Nikita Lakomkin, Zach Pennington, Megan Everson, Ahmad Nassr, Brett Freedman, Arjun Sebastian, Kurt Kennel, Francis Baffour, Mohamad Bydon, Jeremy Fogelson, Benjamin Elder

8:42–8:44 am  
335 Optimizing Health Prior to Adult Spinal Deformity Surgery: Are Costs Outweighed by Perioperative Benefits?  
Presenting Author: Pooja Dave  
Co-Authors: Rachel Joujon-Roche, Kimberly Mcfarland, Jamshaid Mir, Peter Tretiakov, Jordan Lebovic, Peter Passias

8:44–8:46 am  
336 Patient-Reported Outcomes in the Preventive and Curative Surgeries for Neuromas of the Hand  
Presenting Author: Sufyan Ibrahim  
Co-Authors: Ashwath Acharya, Anil Bhat

8:46–8:48 am  
337 Polypharmacy in spinal cord injury: matched cohort analysis comparing drug classes, medical complications, and healthcare utilization metrics with 24 month follow up  
Presenting Author: Nicholas Dietz  
Co-Authors: Nitin Agarwal, Martin Bjurstrom, Maxwell Boakye, Doniel Drazin

8:48–8:50 am  
338 Predictive Analysis of a Comparative Cohort of Consultations for Cauda Equina Syndrome  
Presenting Author: Irene Say  
Co-Authors: Gautham Chitturu, Fahim Choudhury, Saharsh Mehta, Brittany Owusu-Adjei, Michael Stauff

8:50–8:52 am  
339 Predictors of Blunt Cerebrovascular Injury, Stroke, and Mortality in Patients with Cervical Spine Trauma  
Presenting Author: Divyaansh Raj  
Co-Authors: Divyaansh Raj, Tej Azad, Kowsar Ahmed, Ali Bydon, Joseph Dardic, Daniel Lubelski, James Byrne, Joshua Materi, Farah Musharbash, Joshua Olexa, Kathleen Ran, Nicholas Theodore, Timothy Witham, Elliot Haut

8:52–8:54 am  
340 Predictors of construct failure after ACDF for traumatic cervical spine injury  
Presenting Author: Victor Gabriel El-Hajj  
Co-Authors: Erik Edström, Adrian Elmi-Terander
8:54–8:56 am  
**341** Pre-injury mobility and cognitive function predict one-year mortality in older adults with mild traumatic spine fractures  
**Presenting Author:** Daryl Fields  
**Co-Authors:** Gregory Varga, Ali Alattar, Shawn Eagle, James Eubanks, William Gibson, David Hamilton, David Okonkwo, Adam Kanter, Debra Weiner

8:56–8:58 am  
**342** Principal Strains Across the Intact L4-5 Disc During In Vitro Loading using 3D Digital Image Correlation (DIC)  
**Presenting Author:** Anna Sawa  
**Co-Authors:** Bernardo DeAndrada, Jake Godzik, Jay Turner, Brian Kelly

8:58–9 am  
**343** Robotic-assisted minimally invasive spinopelvic fixation for traumatic sacral fractures: an early single-institution experience  
**Presenting Author:** Christopher Dibble  
**Co-Authors:** Andrew Hardigan, Eli Johnson, Troy Tabarestani, Timothy Wang, Isaac Karikari, C Rory Goodwin, Malcolm DeBaun, Muhammad Abd-El-Barr

9–9:02 am  
**344** Sciatica: Are patient demographics associated with increasing hospital cost?  
**Presenting Author:** Aditya Joshi  
**Co-Authors:** Karan Patel, Kamil Taneja, Michael Diaz, Steven Yocom, James Siegler

9:02–9:04 am  
**345** Single institution retrospective analysis of odontoid screws  
**Presenting Author:** Andrew Abumoussa  
**Co-Authors:** Elias Mohammad, Aaron Gelinne, Deb Bhowmick

9:04–9:06 am  
**346** Spinal cord and brain concentrations of riluzole after oral and intrathecal administration: a potential new treatment for spinal cord injury.  
**Presenting Author:** Juanmarco Gutierrez  
**Co-Authors:** Orion Keifer, Thais Buchman, Alexandre Betourne, Nicholas Boulis

9:06–9:08 am  
**347** Spinal Cord Stimulation following Spinal Cord Injury exhibits clinical improvements in pain, spasticity, autonomic dysfunction, and motor deficits: A Systematic Review and Meta-analysis  
**Presenting Author:** Gabriel Urreola  
**Co-Authors:** Jose Castillo, Arsash Ghafrari-Rafi, Venina Kalistratova, Khadija Soufi, Gunnar Lee, Julius Ebinu
9:08–9:10 am
348 Spinal Emergencies Secondary to Tumor, Trauma, and Infection During Pregnancy. A systematic review
Presenting Author: Amna Hussein
Co-Authors: Esteban Quiceno, Ebtesam Abdulla, Kristin Nosova, Naushaba Khan, Izzi Bauer, Monis Khan, Alexandros Moniakis, Annie Pico, Micheal Prim, Ali Baaj

9:12–9:14 am
Presenting Author: Ahmed Elbayomy
Co-Authors: Ahmed Albayar, Azam Ahmed

9:14–9:16 am
351 The Future of miRNA Therapeutics for Neuronal Repair in Spinal Cord Injury: A Systematic Review
Presenting Author: Nikita Das

9:16–9:18 am
352 The Learning Curve for Pedicle Screw Selection in Robotic-assisted and Intra-operative Navigation guided Minimally Invasive Transforaminal Lumbar Interbody Fusion (MI-TLIF)
Presenting Author: Avani Vaishnav
Co-Authors: Praytush Shahi, Hikari Urakawa, Junho Song, Daniel Shinn, Kasra Araghi, Sheeraz Qureshi

9:18–9:20 am
353 Thoracolumbar Injury Classification System: Validation and Shortcomings
Presenting Author: Michael Monterey
Co-Authors: Joseph Withrow, Brad Budde, Dallas Sheinberg, Pedram Honarpisheh, Lauren Haley, Marco Martinez Cruz, Analisa Narro, Zhouxuan Li, Wen Li, John Caridi, John Quinn

9:20–9:22 am
354 Transforaminal lumbar interbody fusion with placement of steerable banana cage: A single-center retrospective analysis of radiographic parameters
Presenting Author: Adam Levy
Co-Authors: Krisna Maddy, Anna Murray, Danny John, Vignessh Kumar, Timur Urakov

9:22–9:24 am
355 Transient quadriparesis in adolescent athletes: a retrospective case-series
Presenting Author: Jacob Jo
Co-Authors: Trevor Anesi, Haley Vance, Allen Sills, Scott Zuckerman, Christopher Bonfield
9:24–9:26 am
Presenting Author: Sharath Kumar Anand
Co-Authors: Daryl Fields, Ava Puccio, Allison Agnone, Andrew Legarreta, Joseph Hudson, Hansen Deng, Brian Kwon, David Okonkwo

9:26–9:28 am
357 Twelve-year retrospective analysis of commercially available corpectomy devices from the Food and Drug Administration's Manufacturer and User Facility Device Experience Database
Presenting Author: Daniel Davidar
Co-Authors: Meghana Bhimreddy, Andrew Hersh, Kelly Jiang, Arjun Menta, Denis Routkevitch, Nicholas Theodore, Carly Weber-Levine

9:28–9:30 am
358 Use of headless compression screws for direct osteosynthesis of traumatic type II odontoid fractures in high anesthesia risk patients.
Presenting Author: Elias Mohammad
Co-Authors: Andrew Abomussa, Aaron Gelinne, Deb Bhowmick

Specialty Breakout 3:
Tumor/General Spine Abstracts
7:30–9:30 am
Location: Splash 10
Moderators: Oren Gottfried, Patricia Zadnik

7:32–7:34 am
401 17-year Experience of Operative Management of Intradural Extramedullary (IDEM) Tumors: Clinical Outcomes from a Low—and Middle-Income Country
Presenting Author: Ahmad Ozair
Co-Authors: Vinay Suresh, Suresh H. S., Himanshu Jindal, Bharath Raju, Robert Wood, Manmeet Ahluwali

7:34–7:36 am
402 A Comparison of Palliative Care Perceptions Across Metastatic Spine Patients and the General Population
Presenting Author: Harrison Hockenberry
Co-Authors: Rory Goodwin, Brandon Bishop, Antoinette Charles, Tara Dalton, Margaret Johnson, Edwin Owolo, Meghan Price, Jacob Sperber
7:36–7:38 am
403 American Spinal Injury Association (ASIA) Impairment Scale (AIS) conversion underestimates neurological recovery following traumatic spinal cord injury
Presenting Author: Winward Choy
Co-Authors: Adam Ferguson, Xuan Duong-Fernandez, Nikos Kyritsis, Michael Beattie, Jacqueline Bresnahan, Anthony DiGiorgio, Rajiv Saigal

7:38–7:40 am
404 Assessing the Utilization of Inpatient and Outpatient Palliative Care at End of Life for Patients with Spine Metastases
Presenting Author: Antoinette Charles
Co-Authors: Edwin Owolo, Meghan Price, Isabel Prado, Tara Dalton, Jacob Sperber, Brandon Bishop, Emily Luo, Melissa Erickson, Margaret Johnson, Anthony Galanos, Elizabeth Fricklas, Arif Kamal, Christopher Jones, C. Rory Goodwin

7:40–7:42 am
405 Assessment of Triggered Electromyography for Pedicle Screw Placement Under Spinal Anesthesia
Presenting Author: Matthew Kanter
Co-Authors: Nicholas Hernandez, Michelle Olmos, Helen Karimi, Ron Riesenburger, James Kryzanski

7:42–7:44 am
406 Charting style affects the length of stay (LOS) index on a spinal surgery service line
Presenting Author: Rohaid Ali
Co-Authors: Ziya Gokaslan, Jill O'Brien, Adetokunbo Oyelese, G Dean Roye, Albert Telfeian

7:44–7:46 am
407 Clinical Insight into Spinal Drop Metastasis: A Systematic Review
Presenting Author: Ebtesam Abdulla
Co-Authors: Kristin Nosova, Monis Khan, Esteban Quiceno, amna Hussain, Alexandros Moniakis, Michael Prim, Izzi Bauer, Annie Pico, Ali A. Baaj

7:46–7:48 am
408 Delivering Comprehensive Spine Care in the United States: A Review of 221 Institutions
Presenting Author: Siegfried J Adelhoefer
Co-Authors: Julia Borowicz, Blake Boadi, Pravesh Gadjradj, Neel Mehta, Jaspal Singh, Roger Hartl

7:48–7:50 am
409 Development of a Personalized Machine Learning-based Prediction Model for Short Term Postoperative Outcomes Following Spinal Tumor Resection
Presenting Author: Mert Karabacak
Co-Authors: Konstantinos Margetis
7:50–7:52 am
410 Differences Across Various Ideal Lumbar Lordosis Measurement Formulas for Patient Specific Sagittal Alignment Goals
Presenting Author: David Polly
Co-Authors: Paul Brian Soriano, Jason Haselhuhn, Gurmit Singh, Kenneth Holton, Kristen Jones, Jonathan Sembrano

7:52–7:54 am
411 Differences in the Priorities and Expectations of Patients with Metastatic Spine Disease Before and After the Initiation of Treatment
Presenting Author: Tara Dalton
Co-Authors: Antoinette Charles, Jessica Albanese, Jacob Sperber, Edwin Owolo, Emily Luo, Dana Rowe, Harrison Hockenberry, Annee Nguyen, Melissa Erickson, Courtney Goodwin

7:54–7:56 am
412 Disparities in Elective Clinical Research Participation for Spine Tumor Patients Stratify by Neighborhood-Level Disadvantage: A 7-Year Single-Institution Analysis
Presenting Author: Owen Leary
Co-Authors: Oliver Tang, Joshua Feler, Arjun Ganga, Ankush Bajaj, Cameron Ayala, Krissia Rivera Perla, Silas Monje, Alexander Chernysh, Ki-Eun Chang, Deus Cielo, Adetokunbo Oyelese, Jared Fridley, Steven Toms, Ziya Gokaslan, Patricia Zadnik Sullivan

7:56–7:58 am
413 Evaluating Local Control in Patients with Spinal Metastatic Lung Cancer: Single-Institution Experience with a Multidisciplinary Spine Oncology Clinic
Presenting Author: Rushikesh Joshi
Co-Authors: Michael Strong, Joseph Linzey, Mark Zaki, Varun Kathawate, Peyton Goethe, Johan Lee, Sravanthi Koduri, Oludotun Ogunsola, Arushi Tripathy, Ayobami Ward, Lila Tudrick, William Jackson

7:58–8 am
414 Expected Motor Function Change Following Surgery for Spinal Metastatic Disease
Presenting Author: Bernard K. Okai
Co-Authors: Andrew Fabiano, Lindsay Lipinski

8–8:02 am
415 Genomic analysis of spinal meningiomas: Correlation with histopathologic grade
Presenting Author: Joseph Driver
Co-Authors: John Chi
8:02–8:04 am
416 Hounsfield Units but not Vertebral Bone Quality Predict Time to Pathologic Fracture in Mobile Spine Metastases Treated with Radiotherapy
Presenting Author: Zach Pennington

8:04–8:06 am
417 Implementation of a Spine Triage Program and Its Effect on Outpatient Health Resource Radiology Utilization
Presenting Author: Yagiz Yolcu
Co-Authors: Emma Ryan, Tasneem Zaihra, Susan Christopher, Melissa Dunbar, Robert Whitmore, Zoher Ghogawala

8:06–8:08 am
418 Improving Quality Metrics in Neurosurgery: A Spinal Surgery Three Year Case Review
Presenting Author: Christina Feller
Co-Authors: Erin Bodenbach, Julie Kolinski, Grant Sinson

8:08–8:10 am
419 In-depth Gender Analysis of a Decade of Authorship at the AANS/CNS Spine Summit
Presenting Author: Samantha Palma
Co-Authors: William Blocher, Caren Stuebe, Natasha Frontera, Sergio Nuñez Báez, Rosemary Behmer-Hansen, Angela Richardson

8:10–8:12 am
420 Influence of Instrumentation Type on Outcomes after Surgical Management of Spondylodiscitis: A Systematic Review and Meta-Analysis
Presenting Author: Krisna Maddy
Co-Authors: Joseph Yunga Tigre, Meredith Costello, Emily Errante, Shelby Burks, Allan Levi

8:12–8:14 am
421 Isolated Metastatic Disease of the Vertebral Body: A Single Center Multidisciplinary Experience in Treatment and Quality of Life
Presenting Author: Ayobami Ward
Co-Authors: Joseph Linzey, Michael Strong, Peyton Goethe, Rushikesh Joshi, Varun Kawathe, Sravanthi Koduri, Arushi Tripathy, Mark Zaki, Nicholas Szerlip

8:14–8:16 am
422 Laminectomy versus laminectomy and fixation for multilevel degenerative cervical myelopathy: factors influencing surgical decision making amongst surgeons in the United Kingdom
Presenting Author: Alexandru Budu
Co-Authors: Benjamin Davies, Stefan Yordanov, Mark Kotter
8:16–8:18 am
423 Laser Induced Endogenous Fluorescence Spectroscopy Produces Distinct Spectral Signatures in Pathology Prepared Tumor Samples
Presenting Author: Jacob Sperber
Co-Authors: Tanner Zachem, Ravi Prakash, Gregory Chamberlain, Thomas Cummings, Annee Nguyen, Harrison Hockenberry, Wes Ross, Patrick Codd, C. Rory Goodwin

8:18–8:20 am
424 Late operative start time increases risk of surgical site infection in adult spinal surgery
Presenting Author: Jessica Ryvlin
Co-Authors: Isabella Pecorari, Kurt Widmaier, Mousa Hamad, Rafael De La Garza Ramos, Saikiran Murthy, Reza Yassari, Yaroslav Gelfand

8:20–8:22 am
425 Local Control in Patients with Spinal Metastatic Renal Cell Carcinoma: The Experience of an Institution with a Multidisciplinary Spine Oncology Clinic
Presenting Author: Johan Lee
Co-Authors: Joseph Linzey, Michael Strong, Varun Kathawate, Peyton Goethe, Lila Tudrick, Arushi Tripathy, Sravanthi Koduri, Ayobami Ward, Oludotun Ogunsola, Mark Zaki, Rushikesh Joshi, William Jackson, Nicholas Szerlip

8:22–8:24 am
426 Lumbar Surgical Techniques with the Greatest Improvements in Clinical Outcomes
Presenting Author: Monis Khan
Co-Authors: Kristin Nosova, Esteban Quiceno, Ebtesam Abdulla, Michael Prim, amna Hussein, Alexandros Moniakis, Isabel Bauer, Annie Pico, Robert Ravinsky, Ali Baaj

8:24–8:26 am
427 Management of Intramedullary Spinal Cord Tumors: A Modified Delphi Study
Presenting Author: Andrew Hersh
Co-Authors: Daniel Lubelski, Zachary Pennington, Rory Goodwin, Nicolas Dea, Desai, Wesley Hsu, Ajit Krishnaney, Ankit Mehta, Hesham Soliman, Ali Ozturk, Ilya Laufer, John Shin, Sheng-Fu Lo, Ziya Gokaslan, George Jallo, Daniel Sciubba

8:26–8:28 am
428 Metastatic Sarcoma to the Spine: Experiential Analysis at a Tertiary Care Center
Presenting Author: Arushi Tripathy
Co-Authors: Joseph Linzey, Michael Strong, Varun Kathawate, Peyton Goethe, Lila Tudrick, Johan Lee, Sravanthi Koduri, Ayobami Ward, Oludotun Ogunsola, Mark Zaki, Rushikesh Joshi, William Jackson, Nicholas Szerlip
8:28–8:30 am  
429 Neighborhood Disadvantage Prognosticates Postoperative Outcomes and Survival Following Spine Tumor Surgery  
Presenting Author: Cameron Ayala  
Co-Authors: Oliver Tang, Owen Leary, Joshua Feler, Arjun Ganga, Ankush Bajaj, Krissia Rivera Perla, Silas Monje, Alexander Chernysh, Ki-Eun Chang, Deus Cielo, Adetokunbo Oyelese, Jared Fridley, Steven Toms, Ziya Gokaslan, Patricia Zadnik Sullivan

8:30–8:32 am  
430 Normative Bone Mineral Density Measured on CT Scan in Children and Adolescents  
Presenting Author: John Dimar  
Co-Authors: Kosei Nagata, Leah Carreon, Grant Schimdt, Morgan Brown, Christy Daniels, Steven Glassman

8:32–8:34 am  
431 Novel Objective-Subjective Pain Assessment Score Results in Decreased Opioid Prescription After Elective Spine Surgery  
Presenting Author: Dia Halalmah  
Co-Authors: Ashra Mirza, Josko Silobrcic, Hazem Eltahawy

8:34–8:36 am  
432 Novel standalone motion-sparing pelvic fixation prevents insufficiency fractures following mid-sacrectomies without sacrificing normal, mobile lumbar segments traditionally used for stabilization.  
Presenting Author: Thomas Pieters  
Co-Authors: Andrew Hersh, Elsamadicy Aladine, Ross Green, Zach Pennington, Daniel Sciubba, Sheng-Fu Larry Lo

8:36–8:38 am  
433 Optimizing surgical efficiency using preoperative virtual reality planning: a systematic review  
Presenting Author: Nicholas Laskay  
Co-Authors: Matthew Parr, Laquanda Knowlin, Todd Chang, Jake Godzik

8:38–8:40 am  
434 Patient characteristics associated with the trajectory of neurological recovery after surgery for degenerative cervical myelopathy  
Presenting Author: Aditya Vedantam  
Co-Authors: Anjishnu Banerjee, Marjorie Wang

8:40–8:42 am  
435 Predicting Outcomes and Postoperative ambulatory Status following Transpedicular decompression and Fusion for Metastatic Epidural Spinal Cord Compression using Preoperative Bilsky Grade  
Presenting Author: Rohit Mauria  
Co-Authors: Pranav Gupta, Adel Azghadi, Collin Labak, Eric Herring, Mohit Patel, Arunit Chugh, Manish Kasliwal
8:42–8:44 am  
436 Prolonged Hospital Stay and Incidence of Postop Neck or Back Pain, Radiculopathy, and Physical Quality Outcomes in Primary Intradural Spinal Cord Patients with Unhealthy Baseline Metabolic Status 
Presenting Author: Neil Al-Saidi  
Co-Authors: Nicholas Van Halm-Lutterodt, MD, PhD

8:44–8:46 am  
437 Provider- and Patient-Level Factors Influence Socioeconomic Disparities in Spinal Fusion Post-Surgical Outcomes 
Presenting Author: Gavin Touponse  
Co-Authors: Karen Malacon, Guan Li, Ezra Yoseph, Janet Wu, Corinna Zygourakis

8:46–8:48 am  
438 Recommendation for Prehabilitation in Elective Spine Surgery: A Systematic Review 
Presenting Author: Paulomi Gohel  
Co-Authors: Raj Lavadi, Lior Elkiam, Vinay Jaikumar, Nima Alan, David Kojo Hamilton, Nitin Agarwal

8:48–8:50 am  
439 Reduced Radiation Exposure Through Utilization of Robotic Modalities in Comparison to Navigation in Minimally Invasive Lumbar Fusion Surgery 
Presenting Author: Anthony Pajak  
Co-Authors: Shane Pathania, Olivia Tuma, Max Korsun, Philip Louie, Pratyush Shahi, Han Jo Kim, James Dowdell, Sravisht Iyer, Todd Albert, Sheeraz Qureshi

8:50–8:52 am  
440 Regional Differences in Autofusion and Segmental Deformity in the Natural History of Pyogenic Vertebral Osteomyelitis: Our Institution’s 18-year Experience 
Presenting Author: Alexander Keister  
Co-Authors: Stephanus Viljoen, Samuel Ammerman, Justin Baum, Joshua Vignolles-Jeong, Noah Mallory, David Gibbs, Nathaniel Toop, David Xu, Andrew Grossbach

8:52–8:54 am  
441 Reliability and Predictors of Intraoperative Neuromonitoring Changes During Intramedullary Tumor Resection: Mayo Clinic Multicenter Experience 
Presenting Author: Andrea Otamendi-Lopez  
Co-Authors: Oluwaseun O. Akinduro, Abdul Karim Ghaith, Gaetano De Biase, Chase McKeivitt, Kingsley Abode-Iyamah, Mohamad Bydon, Alfredo Quinones-Hinojosa

8:54–8:56 am  
442 Risk of Mechanical Failure After Spinal Metastases Surgery In Women With Breast Cancer Receiving Aromatase Inhibitors 
Presenting Author: Elie Massaad  
Co-Authors: Paramesh Karandikar, Christine Park, Syed Khalid, Julia Duvall, Grant Rigney, Shahaan Razak, Mitchell Forman, Ali Kiapour, Theresa Williamson, John Shin
8:56–8:58 am
443 Risk of Noise Induced Hearing Loss in the Spine Surgeon
Presenting Author: Matt Meaede
Co-Authors: Stephanie Kwan, Mark Michael, Nicholas Minissale, Jeffrey Gleimer, Barrett Woods, Christopher Kepler

8:58–9 am
444 Sacral Fracture Risk in Single Dose Spinal Stereotactic Radiosurgery: A Retrospective Review
Presenting Author: Eric Goethe
Co-Authors: Laurence Rhines, Claudio Tatsui, Christopher Alvarez-Breckenridge, Amol Ghia, Robert North

9–9:02 am
445 Significantly Increased Postoperative Pain and Patient Dissatisfaction Rates in Primary Intradural Extramedullary Spinal Cord Tumor Patients with Baseline Depressive Status.
Presenting Author: Kristina Ghanem
Co-Author: Nicholas V

9:02–9:04 am
446 Single-Session Palliative Treatment of Atlas Spinal Metastatic Disease with Cranial Stereotactic Radiosurgery Unit
Presenting Author: Andrew Fabiano
Co-Authors: Bernard Okai, Matthew Podgorsak, Dheerendra Prasad

9:06–9:08 am
448 Sleep Dysfunction and Factors Associated with Improved Sleep in Patients Undergoing Surgery for Degenerative Spondylolisthesis: A Quality Outcomes Database Study
Presenting Author: Alexander Aabedi
Co-Authors: Stefan Mitrasinovic, Andrew Chan, Nitin Agarwal, Erica Bisson, Mohamad Bydon, Steven Glassman, Kevin Foley, Christopher Shaffrey, Eric Potts, Mark Shaffrey, Domagoj Coric, John Knightly, Paul Park, Michael Wang, Kai-Ming Fu, Jonathan Slotkin, Anthony Asher, Michael Virk, Regis Haid, Dean Chou, Praveen Mummaneni

9:08–9:10 am
449 Smartphone Activity Data Correlates with Patient-Reported Outcome Measures After Lumbar Spine Surgery
Presenting Author: Yohannes Ghenbot
Co-Authors: Hasan Ahmad, Robert Subtirelu, Sneha Sai Mannam, Ryan Turlip, Yohannes Ghenbot, Andrew Yang, Michael Wang, Gregory Basil, Zarina Ali, Jang Yoon
9:10–9:12 am
450 Social Risk Factors Associated with Decreased Patient Portal Utilization in Patients Undergoing Spine Surgery
Presenting Author: Edwin Owolo
Co-Authors: César Baêta, Antoinette Charles, Zoey Petitt, Jacob Sperber, Brandon Bishop, Harrison Hockenberry, Seeley Yoo, Emily Poehlein, Cindy Green, Chad Cook, C. Rory Goodwin, Melissa Erickson

9:12–9:14 am
451 Socioeconomic and Demographic Changes in U.S. Patients Undergoing Cervical Fusion Through the COVID-19 Pandemic, 2004-2021
Presenting Author: Janet Wu
Co-Authors: Gavin Touponse, Marinos Theologitis, Corinna Zygourakis

9:14–9:16 am
452 Spinal Metastatic Disease with Epidural Extension without Significant Neural Element Compression (Bilksy 1)
Presenting Author: Sravanthi Koduri
Co-Authors: Joseph Linzey, Michael Strong, Peyton Goethe, Varun Kathawate, Lila Tudrick, Ayobami Ward, Arushi Tripathy, Oludotun Ogunsola, Mark Zaki, Rushikesh Joshi, Johan Lee, William Jackson, Nicholas Szerlip

9:16–9:18 am
453 Spondylodiscitis Treatment “Success”: Normalization of Inflammatory Markers
Presenting Author: John Paul Kolcun
Co-Authors: Daniel Wolfson, Nicholas Kosinski, Nathan Pertsch, Shahjehan Ahmad, Ricardo Fontes

9:18–9:20 am
454 Surgical adverse events for primary tumors of the spine and their impact on outcomes: a PTRON study
Presenting Author: Mathieu Laflamme
Co-Author: Nicolas Dea

9:20–9:22 am
455 The ACGME Case Minimums in Spine Surgery May Not Adequately Reflect the Minimums Needed for Autonomy– A Single-Institution Analysis Using the Surgical Autonomy Program
Presenting Author: Vishal Venkatraman
Co-Authors: Alexander Suarez, Troy Tabarestani, Elayna Kirsch, Rajeev Dharmapurikar, Katherine McDaniel, Muhammad Abd-El-Barr, Shivanand Lad, Michael Haglund

9:22–9:24 am
456 The Effect of Surgery on Pain in Degenerative Cervical Myelopathy: A Pooled Trajectory-based Analysis of 1047 Patients from CSM-NA, CSM-I, and CSM-Protect Trials
Presenting Author: Alex Bak
Co-Authors: Ali Moghaddamjou, Paul Arnold, James Harrop, Michael Fehlings
9:24–9:26 am
457 The role of immunohistochemistry markers in predicting long-term recurrence following spinal chordoma resection: a multicenter study
Presenting Author: Mohamad Bydon

9:26–9:28 am
458 The Use of Carbon Fiber-Reinforced Instrumentation in patients with Spinal Oncologic Tumors: A Systematic Review of Literature and Future Directions
Presenting Author: Malek Bashti
Co-Authors: Efosa Amadasu, James Boddu, Jean-Paul Bryant, Joseph Gyedu, Roberto Perez-Roman, Michael Wang

9:28–9:30 am
459 Utilizing First-Order Derivatives and Smartphone-Based Accelerometry to Phenotype Degenerative Lumbar Spine Disease
Presenting Author: Sneha Sai Mannam
Co-Authors: Hasan Ahmad, Robert Subtirelu, Ali Hamade, Yohannes Ghenbot, Andrew Yang, Gregory Basil, Michael Wang, Jang Yoon, Daksh Chauhan

Specialty Breakout 4: Peripheral Nerve/Basic Science/General Spine Abstracts
7:30–9:30 am
Location: Splash 11
Moderators: Alexander Ropper, Suzanne Tharin

7:32–7:34 am
501 Age as a Predictor for Patient-Reported Outcomes in Anterior Cervical Discectomy and Fusion: Analysis from the Michigan Spine Surgery Improvement Collaborative
Presenting Author: Michael Lawless
Co-Authors: Chad Claus, Doris Tong, Chenxi Li, Clifford Houseman, Prashant Kelkar, Boyd Richards, Daniel Carr, Muwaffak Abdulhak, Victor Chang, Paul Park, Teck Soo
7:34–7:36 am
502 Are there differences in outcome between anterior and posterior cervical surgery for myelopathy? A QOD analysis
Presenting Author: Christine Park
Co-Authors: Christopher Shaffrey, Khoi Than, Giorgos Michalopoulos, Sally El Sammak, Erica Bisson, Anthony Asher, Domagoj Coric, Eric Potts, Avery Buchholz, Nitin Agarwal, Andrew Chan, Nauman Chaudhry, Dean Chou, Kevin Foley, Kai-Ming Fu, Regis Haid, John Knightly, Scott Meyer, Paul Park, Mark Shaffrey, Brandon Sherrod, Luis Tumialan, Jay Turner, Cheerag Upadhyaya, Michael Virk, Michael Wang, Praveen Mummaneni, Mohamad Bydon, Oren Gottfried

7:36–7:38 am
503 Automatic Segmentation of Carpal Tunnel Tissue Domains Using Optically-Derived Strain Measurement
Presenting Author: Sachin Govind
Co-Author: Kevin Swong

7:38–7:40 am
504 Biomechanical Comparison of Lumbar Spine Instrumented with Stand-Alone Interbody Fixation Constructs versus Interbody with Supplemental Fixation
Presenting Author: Ali Kiapour
Co-Authors: Ian Connolly, Elie Massaad, John Shin

7:40–7:42 am
505 Can Preoperative Hematocrit Levels Predict Complications and Healthcare Utilization in Patients Undergoing Brachial Plexus Neuroplasty?
Presenting Author: Anitesh Bajaj
Co-Authors: Rushmin Khazanchi, Rohan Shah, Joshua Weissman, Arun Gosain

7:42–7:44 am
506 Cervical Spondylotic Myelopathy and Driving Abilities: Prevalence and Long-Term Postoperative Outcomes: A QOD Study
Presenting Author: Nitin Agarwal
Co-Authors: Giorgos Michalopoulos, Mohamad Bydon, Erica Bisson, Andrew Chan, Saman Shabani, Vijay Letchuman, Sally Sammak, Daniel Lu, Michael Wang, Raj Lavadi, Regis Haid, John Knightly, Brandon Sherrod, Oren Gottfried, Christopher Shaffrey, Jacob Goldberg, Michael Virk, Ibrahim Hussain, Steven Glassman, Mark Shaffrey, Paul Park, Kevin Foley, Brenton Pennicooke, Domagoj Coric, Jonathan Slotkin, Cheerag Upadhyaya, Eric Potts, Luis Tumialan, Dean Chou, Kai-Ming Fu, Anthony Asher, Praveen Mummaneni
507 Change in Spinal Bone Mineral Density as estimated by Hounsfield Units following Osteoporosis Treatment with Romosozumab, Teriparatide, Denosumab, and Alendronate: An Analysis of 307 Patients
Presenting Author: Anthony Mikula
Co-Authors: Anthony Mikula, Nikita Lakomkin, Abdelrahman Hamouda, Megan Everson, Zach Pennington, Rahul Kumar, Zachariah Pinter, Michael Martini, Kurt Kennel, Francis Baffour, Ahmad Nassr, Brett Freedman, Arjun Sebastian, Kingsley Abode-Iyamah, Mohammad Bydon, Paul Anderson, Jeremy Fogelson, Benjamin Elder

508 Characteristics and Effects of Psychiatric Illness on Short-Term Outcomes after Spine Surgery: A National Readmissions Database Study
Presenting Author: Kranti Rumalla
Co-Authors: Kavelin Rumalla, Syed Faraz Kazim, Meic Schmidt, Christian Bowers

509 Characteristics of patients who return to work after undergoing surgery for cervical spondylotic myelopathy: a Quality Outcomes Database study
Presenting Author: Giorgos Michalopoulos
Co-Authors: Christopher Shaffrey, Oren Gottfried, Eli Johnson, Erica Bisson, Michael Wang, John Knightly, Michael Virk, Luis Tumialan, Jay Turner, Cheerag Upadhyaya, Mark Shaffrey, Paul Park, Kevin Foley, Coric Domagoj, Jonathan Slotkin, Eric Potts, Dean Chou, Kai-Ming Fu, Regis Haid, Anthony Asher, Mohammad Bydon, Praveen Mummaneni, Khoi Than, Stephen Bergin

510 Characterization of Adeno-Associated Virus Tropism for Dorsal Root Ganglion Tissue
Presenting Author: Kate Salotto
Co-Author: Jennifer Hong

511 Comparative Study on the Effects of Different Lumbar Surgeries for Back Pain on Patient Quality of Life and Functional Status: A Pan-Canadian CSORN Study
Presenting Author: Rakan Bokhari
Co-Authors: Justin-Pierre Lorange, Mina Aziz, Peter Jarzem

512 Computed tomography versus MRI-based synthetic computed tomography for robotic-assisted placement of pedicle screws
Presenting Author: Brendan Judy
Co-Authors: Daniel Davidar, Andrew Hersh, Carly Weber-Levine, Salwan Alomari, Meghana Bhimreddy, Neil Crawford, Gary Gong, Mir Hussain, Kelly Jiang, Majid Khan, Arjun Menta, Connor Pratt, Tijl van der Velden, Nicholas Theodore
7:56–7:58 am  
513 Concave and Convex Growth Do Not Differ over Tethered Vertebral Segments, Even with Open Tri-Radiate Cartilage  
Presenting Author: Daniel Farivar  
Co-Authors: Michael Heffernan, Ron El-Hawary, A Noelle Larson, Firoz Miyanji, Stefan Parent, Lindsay Andras, David Skaggs

7:58–8 am  
514 Correlation of skeletal muscle biomarkers and frailty in a mouse model of intervertebral disc lesioning; a feasibility study  
Presenting Author: Alan Wang  
Co-Authors: Dulce Maroni, Jill Skorupa, Gunjan Purohit, Oleh Khalimonchuk, Jamie Wilson

8–8:02 am  
515 Deterioration After Surgery for Degenerative Cervical Myelopathy: An Observational Study from the Canadian Spine Outcomes and Research Network  
Presenting Author: Nicolas Dea  

8:02–8:04 am  
516 Development of Predictive Algorithms to Predict Adverse Postoperative Outcomes Following Carpal Tunnel Decompression  
Presenting Author: Rushmin Khazanchi  
Co-Authors: Rohan Shah, Anitesh Bajaj, Jennifer Wolf

8:04–8:06 am  
517 Diffusion Basis Spectrum Imaging Identifies Clinically Relevant Disease Phenotypes of Cervical Spondylotic Myelopathy  
Presenting Author: Justin Zhang  
Co-Authors: Saad Javeed, Jacob Greenberg, Christopher Dibble, Sheng-Kwei Song, Wilson Ray

8:06–8:08 am  
518 Do flare-ups in systemic Disease Activity correlate to cervical deformity in patients with Rheumatoid Arthritis?  
Presenting Author: Anna Baukje Lebouille-Veldman  
Co-Authors: Dylan Spenkelink, C.F. Allaart, Carmen L.A. Vleggeert-Lankamp

8:08–8:10 am  
519 Does hinge sidedness really matter after open-door expansile cervical laminoplasty?  
Presenting Author: David Levi  
Co-Authors: Gregory Damian Brusko, Allan Levi, Michael Wang
8:10–8:12 am
520 Does Postoperative L4-S1 Lordosis Influence Outcomes after 1-2 Level Lower Lumbar Fusion?
Presenting Author: Jonathan Sembrano
Co-Authors: Paul Brian Soriano, Ronin Joshua Cosiquien, Kenneth Holton, Jason Haselhuhn

8:12–8:14 am
521 Frailty Measured by Risk Analysis Index and Adverse Discharge Outcomes After Adult Spine Deformity Surgery: Analysis of 3104 Patients from a Prospective Surgical Registry (2011-2020)
Presenting Author: Michael Covell
Co-Authors: Kavelin Rumalla, Alexander Kassicieh, Aaron Segura, Syed Kazim, Meic Schmidt, Christian Bowers

8:14–8:16 am
522 Hounsfield Unit as a Predictor of Adjacent-Level Disease in Lumbar Interbody Fusion Surgery
Presenting Author: Frank De Stefano
Co-Authors: Tyler Warner, Turki Elarjani, Jose Lopez, Sumedh Shah, Gregory Basil, Timur Urakov

8:16–8:18 am
523 How Do the True Intraoperative Costs of Laminoplasty Compare to Posterior Cervical Decompression and Fusion?
Presenting Author: Daniyal Mansoor Ali
Co-Authors: Sara Thalheimer, Adam Leibold, James Harrop, Alexander Vaccaro, Jack Jallo, Srinivas Prasad, Joshua Heller, Ahilan Sivaganesan

8:18–8:20 am
524 Impact of Interbody Implant Material on Early Outcomes in a Prospective Multicenter Study of Lumbar Interbody Fusion
Presenting Author: Clifford Crutcher
Co-Authors: Justin Smith, Khoi Than, Adam Shimer, Kojo Hamilton, Tyler Jenkins

8:20–8:22 am
525 Impact of Preoperative Mental Health State on Perioperative Surgical Outcomes After Lumbar Spine Fusions: A Retrospective Cohort Analysis
Presenting Author: Mohamed Soliman
Co-Authors: Alexander Aguirre, Mohamed Soliman, Cathleen Kuo, Marissa Kruk, Joseph Iskander, Hannon Levy, Asham Khan, Moleca Ghannam, Patrick Jowdy, John Pollina, Jeffrey Mullin

8:22–8:24 am
526 Impact of Unplanned Readmissions on 12-month Patient Reported Outcomes After Lumbar Spine Surgery
Presenting Author: Hani Chanbour
Co-Authors: Jacquelyn Pennings, Alicia Hymel, Inamullah Khan, Anthony Asher, Mohamad Bydon, Raymond Garocki, Kristin Archer, Byron Stephens, Scott Zuckerman, Amir Abtahi, Andrew Croft
527 Independent Predictors of Subsidence in ACDF and Its Effect on Delayed Cervical Alignment
Presenting Author: Yaroslav Gelfand
Co-Authors: Brianna Smith, Jinu Kim, Elie Salloum, Omid Azimaraghi, Matthias Eikermann, Reza Yassari, Saikiran Murthy, Rebecca Della Croce

528 Is Surgical Management of Brachial Plexus Schwannomas Safe and Effective: A Review of Clinical Experience
Presenting Author: Andrew Hersh
Co-Authors: Arjun Menta, Arinze Ochuba, Jaishri Blakeley, Luke MacLean, Theodore, Allan Belzberg, Daniel Lubelski, Abdel-Hameed Al-Mistarehi

529 Is the Spinopelvic Alignment Achieved in a Short Segment Lumbar Fusion at 3 Months After Surgery Maintained at 24 months?
Presenting Author: Devon LeFever
Co-Authors: Cari Drolet, Jean-Christophe Leveque, Philip Louie, Venu Nemani, Rajiv Sethi

530 Length of stay and readmission rates after single-level posterior cervical foraminotomy versus ACDF for radiculopathy
Presenting Author: Gabrielle Santangelo

531 Long-Term Clinical Outcomes with Compressive Lag Integrated Interbody Cervical Fusion in One- and Two-level Constructs
Presenting Author: Jason Garber

532 Multidimensional Assessments of Physical Function Improve Predictions of Postoperative Complications after Lumbar Spine Surgery
Presenting Author: Jacob Greenberg
Co-Authors: Ziqi Xu, Jingwen Zhang, Madelyn Frumkin, Justin Zhang, Saad Javeed, Zihan Cao, Kathleen Botterbush, Braeden Benedict, Camilo Molina, Brenton Pennicooke, Nitin Agarwal, Daniel Hafez, Paul Santiago, Matthew Goodwin, Nicholas Pallotta, Munish Gupta, Jacob Buchowski, Brian Neuman, Michael Steinmetz, Zohr Ghogawala, Michael Kelly, Bruce Hall, Jay Piccirillo, Thomas Rodebaugh, Chenyang Lu, Wilson Ray
8:36–8:38 am  
**533 Multilevel Laminoplasty for CSM: Is C3 Laminectomy Better Than C3 Laminoplasty at the Superior Vertebra?**  
Presenting Author: Michael Tawil  
Co-Authors: Timothy Chryssikos, Seth Tigchelaar, Alysha Jamieson, Alex Aabedi, Vijay Letchuman, Vardhaan Ambati, Nishanth Krishnan, Joshua Rivera, Arushi Lahiri, Casey Nguyen, Katie Park, Andrew Chan, Vivian Le, Lee Tan, Dean Chou, Praveen Mummaneni, Mohamed Macki

8:38–8:40 am  
**534 Opioid Utilization Following Anterior Cervical Discectomy and Fusion in the Veteran Population: A Retrospective National Study**  
Presenting Author: Paymon Rezaii  
Co-Authors: Matthew Cole, Sean Clark, Olivia Lee, Matthew Cyriac, Aaron Dumont, William Sherman

8:40–8:42 am  
**535 Outcomes and Predictors of Subsidence After Expandable Cage in Minimally Invasive Transforaminal Lumbar Interbody Fusion**  
Presenting Author: Praytush Shahi  
Co-Authors: Tejas Subramanian, Robert Merrill, Omri Maayan, Shane Pathania, Daniel Shinn, Yeo Eun Ashley Kim, Eric Zhao, Kasra Araghi, Michael Steinhaus, Avani Vaishnav, Andre Samuel, Francis Lovecchio, John Clohisy, Bo Zhang, Jerry Du, Evan Sheha, Sravisht Iyer, Sheeraz Qureshi

8:42–8:44 am  
**536 Pain After Vertebral Body Tether Surgery: Incidence, Risk Factors, and Timing**  
Presenting Author: Brandon Toll  
Co-Authors: Michael Yang, Samdani, Joshua Pahys, Alejandro Quinonez, Maureen McGarry, Harsh Grewal, Steven Hwang

8:44–8:46 am  
**537 Perception of Frailty in Spinal Metastatic Disease: International Survey of the AO Spine Community**  
Presenting Author: Raphaele Charest-Morin  
538 Percutaneous Vertebroplasty and Upper Instrumented Vertebra Cement Augmentation Reducing Proximal Junctional Kyphosis and Failure Rate in Adult Spinal Deformity: Case Series and Literature Review
Presenting Author: Kelly Gassie
Co-Authors: Angel Vicente, Elliot Pressman, Gabriel Flores-Milan, Jonah Gordon, Adam Alayli, Gavin Lockard, Puya Alikhani

539 Predictors for Inpatient Admission among Patients with a Primary Diagnosis of Spondylolisthesis: A Nationwide Database Analysis from 2015-2019
Presenting Author: Andrew Nguyen
Co-Authors: Reid Colliander, Michael Diaz, Karan Patel, Kamil Taneja, Aditya Joshi, Manisha Koneru, Sai Batchu, Brandon Lucke-Wold

540 Predictors of Dysphagia Following Anterior Cervical Discectomy and Fusion
Presenting Author: Yaroslav Gelfand
Co-Authors: Rebecca Della Croce, Elie Salloum, Jinu Kim, Omid Azimaraghi, Matthias Eikermann, Reza Yassari, Saikiran Murthy, Brianna Smith

541 Preoperative depression is associated with a two-fold increase in readmission rates following lumbar spine surgery: A multi-center institutional study
Presenting Author: Hannah Gilder
Co-Authors: Karim Nathani, Selby Chen, Mohamad Bydon

542 Prevalence and Prognosis of Gait Dysfunction in Patients Operated for Cervical Spondylotic Myelopathy
Presenting Author: Phoebe Greenwald
Co-Authors: Andrew Chan, Christopher Shaffrey, Christine Park, Oren Gottfried, Erica Bisson, Mohamad Bydon, Anthony Asher, Domagoj Coric, Eric Potts, Kevin Foley, Michael Wang, Kai-Ming Fu, Michael Virk, John Knightly, Scott Meyer, Paul Park, Cheerag Upadhyaya, Mark Shaffrey, Luis Tumialan, Jay Turner, Brandon Sherrod, Nitin Agarwal, Dean Chou, Steven Glassman, Regis Haid, Praveen Mummaneni

543 Reduced Cost after Elective Spine Surgery with An Enhanced Recovery After Surgery Pathway: A Quality Improvement MSSIC Study
Presenting Author: Kristin Knickerbocker
Co-Authors: Gustavo Anton, Nachiket Deshpande, Ammar Alsalahi, Daniel Carr, Doris Tong, Teck Soo, Elise Yoon
8:58–9 am
544 Remote Therapeutic Monitoring (RTM) in the Management of Spine Disease: A Pilot Project Using Fitbit Wearable Technology
Presenting Author: Alan Balu
Co-Authors: Ryan Gensler, Jiaqi Liu, Vinay Deshmukh

9–9:02 am
545 Role of Body Mass Index on Cervical Spine Surgery: An analysis of the Quality Outcomes Database
Presenting Author: Anant Naik
Co-Author: Paul Arnold

9:02–9:04 am
546 Statin Usage Decreases the Likelihood of Pseudarthrosis following Posterior Lumbar Fusion
Presenting Author: Monish Lavu
Co-Authors: David Kaelber, Jason Savage, Dominic Pelle

9:04–9:06 am
547 Surgical Management of Lumbosacral Plexus Tumors
Presenting Author: Sauson Soldozy
Co-Authors: Tyler Warner, Joseph Tigre, Bianca Marquez, S. Shelby Burks, Allan Levi

9:06–9:08 am
548 The association of prolonged biceps denervation with the development of elbow flexion contracture in neonatal brachial plexus palsy
Presenting Author: Whitney Muhlestein
Co-Authors: Brandon Smith, Kate Chang, Denise Justice, Virginia Nelson

9:08–9:10 am
549 The Degenerative Cervical Myelopathy Subjective and Objective Score (DCM-SOS): A Novel Outcome Measure
Presenting Author: Khadija Soufi
Co-Authors: Tess Perez, Patricia Balatbat, Allan Martin

9:10–9:12 am
550 The Impact of Foraminal Osteophytes on PROMs Following L5S1 ALIF and TLIF
Presenting Author: Eric Zhao
Co-Authors: Andrew Kim, Jerry Du, Mitchell Fourman, Sravisht Iyer, Sheeraz Qureshi

9:12–9:14 am
551 The Impact of Coexisting Substance Use Disorder on Perioperative Outcomes in Patients Undergoing Lumbar Spinal Fusion
Presenting Author: Mohamed Soliman
Co-Authors: Cathleen Kuo, Mohamed Soliman, Alexander Aguirre, Joseph Iskander, Justin Im, Hannon Levy, Asham Khan, Moleca Ghannam, Patrick Jowdy, John Pollina, Jeffrey Mullin
9:14–9:16 am
552 The Impact of Sarcopenic Obesity on Perioperative Morbidity and Mechanical Complications Following Lumbar Fusion
Presenting Author: Nora Kim
Co-Authors: Mason Blacker, Christopher Livia, Karl Sangwon, Girish Fatterpekar, Darryl Lau

9:16–9:18 am
553 Transcutaneous electrical nerve stimulation for treatment of acute post-operative pain following spine surgery—a review
Presenting Author: Jaes Jones
Co-Authors: Johan Lee, Haley Talbot-Stetsko, Noor Alesawy, Carina Jones, Jacob Joseph

9:18–9:20 am
554 Traumatic Vertebral Artery Injury – Denver Grade, Bilaterality & Stroke Risk: A Systematic Review & Meta-Analysis
Presenting Author: Giorgos Michalopoulos
Co-Authors: Zach Pennington, Peter Bambakidis, A. Yohan Alexander, Nikita Lakomkin, Charalampos Charalampous, Sally El Sammak, Fredric Meyer, Mohamad Bydon

9:20–9:22 am
555 Trends, Payments, and Costs Associated with BMP Use in Medicare Beneficiaries Undergoing Spinal Fusion
Presenting Author: Janet Wu
Co-Authors: Karen Malacon, Christopher Ames, John Ratliff, Corinna Zygourakis, Harsh Wadhwa

9:22–9:24 am
556 Utilizing Modified Frailty to Predict Perioperative Complications Following Transforaminal Lumbar Interbody Fusion: a Michigan Spine Surgery Improvement Collaborative (MSSIC) Registry Study
Presenting Author: Ascher Kaufmann
Co-Authors: Doris Tong, Kevin Brooks, Ling Wang, Ann Annis, James Dragonette, Chad Claus, Peter Bono, Clifford Houseman, Paul Park, Boyd Richards, Teck Mun Soo

9:24–9:26 am
557 Vertebral Bone Quality Score Independently Predicts Cage Subsidence Following Transforaminal Lumbar Interbody Fusion
Presenting Author: John Pollina
Co-Authors: Mohamed Soliman, Alexander Aguirre, Cathleen Kuo, Nicco Ruggiero, Shady Azmy, Neil Almeida, Moleca Ghannam, Asham Khan, Patrick Jowdy, Jeffrey Mullin, John Pollina
9:26–9:28 am
558 What is the Early Fate of Adjacent Segmental Lordosis Compensation at L3-4 and L5-S1 Following a Lateral versus Transforaminal Lumbar Interbody Fusion at L4-5?
Presenting Author: Jean-Christophe Leveque
Co-Authors: Mary Kim, Caroline Drolet, Thomas Hanks, Karissa Yamaguchi, Katie Krause, Venu Nemani, Rajiv Sethi, Philip Louie

9:28–9:30 am
559 Which is Better: Percutaneous or Open Robot-Assisted Spine Surgery? Prospective, Multicenter Study of 2,524 Screws in 336 patients
Presenting Author: Lindsay Orosz
Co-Authors: Nathan Lee, Jeffrey Gum, Gregory Poulter, Ehsan Jazini, Colin Haines, Christopher Good, Ronald Lehman

Specialty Breakout 5: Spinal Deformity/General Spine Abstracts
7:30–9:30 am
Location: Splash 13–14
Moderators: Darryl Lau, Harry Mushlin

7:32–7:34 am
601 A Biomechanical and Histologic Analysis of Cellular Mechanotransduction in Spinal Pseudoarthrosis
Presenting Author: Duy Phan
Co-Authors: Duy Phan, Ryan Burns, Hao Le, Ali Kiapour, Kris Kahle, Muhamed Hadzipasic, John Shin, Ganesh Shankar

7:34–7:36 am
602 A Hybrid Construct May Be Sufficient to Relieve Hypermobility in Adjacent Lumbar Segments: Comparison of 2-Level (L4-S1) Motion Preservation and Hybrid Construct
Presenting Author: Avinash Patwardhan
Co-Authors: Robert Havey, J. Alex Sielatycki, Marissa Koscielski, Scott Hodges, S. Craig Humphreys, Muturi Muriuki

7:36–7:38 am
603 A Multidisciplinary Approach Does not Discriminate Based on Socioeconomic Factors for Patients with Adult Spinal Deformity
Presenting Author: Caroline Drolet
Co-Authors: Jesse Shen, Venu Nemani, Jean-Christophe Leveque, Rajiv Sethi, Philip Louie

7:38–7:40 am
604 Already Elevated Risk of Venous Thromboembolism in Adult Spinal Deformity Surgery Further Elevated in Anterior Lumbar Fusions
Presenting Author: Molly Monsour
Co-Authors: Elliot Pressman, Deborah Liaw, Kelly Gassie, Puya Alikhani
7:40–7:42 am
605 Anterior Cervical Discectomy and Fusion Improves Clinical Outcomes Regardless of the Degree of Neuroforaminal Compression in Cervical Stenosis
Presenting Author: Tariq Issa
Co-Authors: Mark Lambrechts, Yunsoo Lee, Khoa Tran, Tristan Fried, Caroline Purtill, Erin Kim, Samuel Oh, Jose Canseco, Alan Hilibrand, Christopher Kepler, Alexander Vaccaro, Michael Smith, Gregory Schroeder

7:42–7:44 am
606 Anterior column realignment with ALL sectioning (ACR) vs. Pedicle subtraction osteotomy (PSO): A propensity-matched analysis comparing spinopelvic parameters and clinical outcomes
Presenting Author: G. Damian Brusko
Co-Authors: Robert Eastlack, Juan Uribe, Adam Kanter, Neel Anand, David Okonkwo, Peter Passias, Shay Bess, Christopher Shaffrey, Vivian Le, Virginie Lafage, Michael Wang, Praveen Mummaneni, Dean Chou, Paul Park, Pierce Nunley, Richard Fessler, Kai-Ming Fu, Gregory Mundis

7:44–7:46 am
607 At What Point Does Degenerative Become Deformity: When Sagittal Correction Influences Clinical Improvement Adult Cervical Deformity Surgery
Presenting Author: Jamshaid Mir
Co-Authors: Tyler Williamson, Jamshaid Mir, Peter Tretiakov, Kimberly McFarland, Pooja Dave, Bassel Diebo, Bailey Imbo, Rachel Joujon-Roche, Oscar Krol, Shaleen Vira, Peter Passias

7:46–7:48 am
608 Basilar Impression: A Systematic Review of Clinical Features, Operative Management and Critical Summary of Currently Available Evidence
Presenting Author: Faraaz Azam
Co-Authors: Jonathan Tao, Umaru Barrie, Benjamin Rail, Emmanuella Odoguwa, Anant Naik, Claudia Reimer, Mahmoud Elgindy, Yves Kenfack, James Caruso, Kristen Hall, Mazin Al Tamimi, Salah Aoun

7:48–7:50 am
609 C2 vs C3/C4 as the upper instrumented vertebra for long cervical fusions: a systematic review and Meta-analysis.
Presenting Author: Esteban Quiceno Restrepo
Co-Authors: Amna Hussein, Annie Pico, Izzii Bauer, Kristin Nosova, Ebtesam Abdulla, Monis A. Khan, Alexandros Moniakis, Michael Prim, Ali Baaj
7:50–7:52 am
610 Cervical Alignment and Patient-Reported Outcomes in Posterior Cervical Fusion: A Longitudinal Comparative Cohort Study with a 2-year Follow-up
Presenting Author: Daniel Griepp
Co-Authors: Mike Lawless, Doris Tong, Gustavo Anton, Jake Jasinski, Noah Elagamy, Austin Smith, Clifford Houseman, Daniel Carr, Boyd Richards, Teck Soo

7:52–7:54 am
611 Characterization of Lumbar Disc Herniation Prognosis Predictors Using Magnetic Resonance Imaging
Presenting Author: Maria Astudillo Potes
Co-Authors: Maryam Tilton, Areonna Schreiber, Harrison Gottlich, Paige Cummings, Anthony Mikula, Ajay Madhavan, Adriana Gregory, Timothy Kline, Benjamin Elder, Lichun Lu

7:54–7:56 am
612 Comparative Measurement of Lumbar Lordosis in Anterior Lumbar Interbody Fusion Followed by Posterior Spine Fusion
Presenting Author: Sina Sadeghzadeh
Co-Authors: Ghani Haider, Anand Veeravagu

7:56–7:58 am
613 Comparison of surgical techniques in direct repair of pars interarticularis in lumbar spondylolysis: a systematic review and meta-analysis
Presenting Author: Jallow Ousman
Co-Authors: Farhan Babur, Mohamad Bydon, Patrick Flanigan, Konstantinos Katsos, Giorgos Michalopoulos, Laurent Tsai

7:58–8 am
614 Continuous Erector Spinae Plane Block for Perioperative Pain Management in Spine Deformity Surgery
Presenting Author: Bradley Kolb
Co-Authors: Jesus Verela, John Paul Kolcun, Neal Mehta, DeWald, Ricardo Fontes

8–8:02 am
615 Defining Cervical Sagittal Plane Deformity—When Are Major Sagittal Plane Realignment Procedures Necessary In Patients Who Present Primarily With Radiculopathy and Myelopathy?
Presenting Author: Philip Louie
Co-Authors: Caroline Drolet, John Rhee, Venu Nemani
616 Differences in the Rate of Distal Junctional Pathology Between L3 and L4 Pedicle Subtraction Osteotomy (PSO): Minimum One Year Follow-up for 117 Patients
Presenting Author: Vardhaan Ambati
Co-Authors: Saman Shabani, Timothy Chryssikos, Alma Rechev Ben Natan, Jeremy Huang, Alysha Jamieson, Mohamed Macki, Nitin Agarwal, Michael Tawil, Jeremy Guinn, Hao-Hua Wu, Minghao Wang, Pingguo Duan, Joshua Rivera, Parishkrita Srivastava, Shane Burch, Sigurd Berven, Praveen Mummaneni, Dean Chou, Lee Tan

617 Does Routine Post-Operative Use of Drainage in Minimally Invasive Lumbar Spine Surgery Offer Better Results?
Presenting Author: Amna Hussein
Co-Authors: Esteban Quiceno, Michael Prim, Ebtesam Abdulla, Monis Khan, Kristin Nosova, Izzie Bauer, Annie Pico, Ali Baaj, Alexandros Moniakis

618 Epidemiology of Primary Non-Malignant Spine Tumors across Urbanicity
Presenting Author: Brandon Bishop
Co-Authors: Cesar Baeta, Antoinette Charles, Rory Goodwin, Harrison Hockenberry, Carol Kruchko, Quinn Ostrom, Edwin Owolo, Mackenzie Price, Camryn Sciubba, Jacob Sperber

619 Evaluation of Pre- and Post-operative Global Alignment and Proportion (GAP) Score in Circumferential Minimally Invasive Spine Surgery for Adult Spinal Deformity
Presenting Author: Nima Alan
Co-Authors: Lauren Puccio, Vivian Le, Juan Uribe, Praveen Mummaneni, Robert Eastlack, Jay Turner, Paul Park, Michael Wang, Dean Chou, Richard Fessler, Gregory Mundis, Neel Anand, Kai-Ming Fu, Pierce Nunley, Peter Passias, Shay Bess, Christopher Shaffrey, Justin Smith, Renaud Lafage, Virginie Lafage, Munish Gupta, Thomas Buell, D. Kojo Hamilton, Adam Kanter, David Okonkwo

620 Fusing the Foundation: Incidence and Risk Factors of Non-Union at L5-S1 in 152 patients with Iliac Fixation in Adult Spinal Deformity Surgery.
Presenting Author: Ryan Screven
Co-Authors: Deborah Liaw, Molly Monsour, Puya Alikhani

621 Iliac screw fixation as part of adult thoracolumbar deformity correction: long term follow up and reoperation rate
Presenting Author: Andrew Erwood
Co-Authors: Tyler Kosci, Mykhaylo Krushelnitsky
8:14–8:16 am
622 Impact of Obesity on Complications and Surgical Outcomes After Adult Degenerative Scoliosis Spine Surgery
Presenting Author: Raghuram Reddy
Co-Authors: Umaru Barrie, Mahmoud Elguindy, Donald Detchou, Akbik, Corinne Fotso, Kristen Hall, Aoun, Carlos Bagley

8:16–8:18 am
623 Improvement in Sagittal Alignment and Mechanical Low Back Pain Following Deep Brain Stimulation for Parkinson's Disease: A Case Report and Review of the Literature
Presenting Author: Jaime Guerrero
Co-Authors: Lokeshwar Bhenderu, Khaled Taghlabi, Amir Faraji

8:18–8:20 am
624 Incidence of Major Complications in Lateral Lumbar Interbody Fusion (LLIF) Performed via the Prone Transpsoas (PTP) Technique: A Survey of the Complete Early Experience
Presenting Author: Luiz Pimenta
Co-Authors: Rodrigo Amaral, Kelli Howell, Fernando Marcelino, Weby Mizael, Rafael Moriguchi, Gabriel Pokorny, Jullyene Pokorny, Jessica Sanches, Marcelo Yozo

8:20–8:22 am
625 Institution of a Prospective Quantitative Blood Loss Protocol Reveals the Effect of Inaccurate Estimated Blood Loss on Need for Perioperative Resuscitation Following Adult Spinal Deformity Surgery
Presenting Author: Kimberly Ashayeri
Co-Authors: Donato Pacione, Haleigh Dennett, Samya Senan, Iris Foley, Ferdinand Datu, Sydney Vasach, Samantha Minikel, Kathleen Sheerin, Ilene Tisnovsky, David Kurland, Ilya Laufer, Anthony Frempong-Boadu, Darryl Lau

8:22–8:24 am
626 Long-Term (>2year) Complication Rates for Adult Spinal Deformity Surgery: An Analysis Focused on Patients without Early- or Mid-Term Complications
Presenting Author: Andrew Legarreta
Co-Authors: Eric Klineberg, Shay Bess, Renaud Lafage, Virginie Lafage, Lauren Puccio, David Okonkwo, D. Kojo Hamilton, International Spine Study Group ISSG, Thomas Buell

8:24–8:26 am
627 Machine learning models predict outcomes of hospital re-admission, prolonged length of stay and adverse discharge disposition after elective spinal fusion surgery
Presenting Author: Corey Walker
Co-Authors: Attri Ghosh, Phillip Freda, Hyunjun Choi, Nicholas Matsumoto, Tiffany Perry, Alexander Tuchman
8:26–8:28 am  
628 Medicrea UNiD Patient Specific Rods for Adult Spinal Deformity Paper  
Presenting Author: Bryce Picton  
Co-Authors: Sean Solomon, Jason Liang, Andrew Nguyen, Nolan Brown, Martin Pham

8:28–8:30 am  
629 Microendoscopic Posterior Laminoforaminotomy for C3 and C4 radiculopathy  
Presenting Author: Daniel Zeitouni  
Co-Authors: Vincent Rossi, Hunter Dyer, Mark Smith, Paul Kim, Domagoj Coric, Tim Adamson

8:30–8:32 am  
630 Morbid obesity increases length of surgery in elective anterior cervical disectomy and fusion procedures but not readmission or reoperation rates: A cohort study  
Presenting Author: Evan Gross  
Co-Authors: Nicholas Laskay, James Mooney, Marshall McLeod, Travis Atchley, Dagoberto Estevez-Ordonez, Jakub Godzik

8:32–8:34 am  
631 Multi-center analysis of osteobiologic product use in lumbar spine fusion surgery  
Presenting Author: Christopher Talbot  
Co-Authors: Sruti Cheruvu, Daniel Valdivia, Elad Mashiach, Evgenii Belykh, Hai Sun

8:34–8:36 am  
632 Natural History of Thoracolumbar Kyphosis in Achondroplasia After Conservative Treatment  
Presenting Author: Chady Omara  
Co-Authors: Réne Castelein, Ralph Sakkers, Timothy Smith, Vleggeert-Lankamp

8:36–8:38 am  
633 Novel Spinal Parameters as Predictive Factors for Proximal Junctional Kyphosis  
Presenting Author: Asad Akhter  
Co-Authors: Samuel Ammerman, Joshua Wang, Ryan Eaton, Joravar Dhaliwal, Nathaniel Toop, Andrew Grossbach, Stephanus Viljoen

8:38–8:40 am  
634 Optimizing Modifiable Health Conditions Prior to Adult Cervical Deformity Surgery Associated with Fewer Complications  
Presenting Author: Kimberly McFarland  
Co-Authors: Pooja Dave, Peter Tretiakov, Jamshaid Mir, Jordan Lebovic, Renaud Lafage, Virginie Lafage, Peter Passias
8:40–8:42 am  
**635 Outcomes of Circumferential Minimally-Invasive Technique in Adult Spinal Deformity Surgery Patients with Severe Baseline Deformity**  
**Presenting Author:** Peter Passias  
**Co-Authors:** Peter Tretiakov, Pierce Nunley, Michael Wang, Paul Park, Adam Kanter, David Okonkwo, Robert Eastlack, Gregory Mundis, Dean Chou, Richard Fessler, Juan Uribe, Neel Anand, Kai-Ming Fu, Jay Turner, Vivian Le, Breton Line, Christopher Ames, Justin Smith, Christopher Shaffrey, Robert Hart, Douglas Burton, Renaud Lafage, Virginie Lafage, Shay Bess, Frank Schwab, Praveen Mummaneni

8:42–8:44 am  
**636 Patient Expectations Impact Patient-Reported Outcomes and Satisfaction After Lumbar Fusion**  
**Presenting Author:** Steven Glassman  
**Co-Authors:** Hanci Zhang, Erica Bisson, Eric Potts, Ehsan Jazini, Leah Carreon

8:44–8:46 am  
**637 Patient-specific Prefabricated Instrumentation: 12-month Follow-up Data from a Single Institution**  
**Presenting Author:** Jonathan Lee  
**Co-Authors:** Saeed Sadrameli, Paul Holman

8:46–8:48 am  
**638 Pelvic Tilt Non-Responders after Long Segment Thoracolumbar Fusion in the Obese Adult Deformity Patient Population**  
**Presenting Author:** Ryan Eaton  
**Co-Authors:** Samuel Ammerman, Matthieu Weber, Joravar Dhaliwal, Asad Akhter, Joshua Wang, Vikram Chakravarthy, David Xu, Stephanus Viljoen, Andrew Grossbach

8:48–8:50 am  
**639 Postoperative adjacent segment disease in minimally-invasive transforaminal lumbar interbody fusion with adjacent laminectomy for grade I-II spondylolisthesis and adjacent spinal stenosis**  
**Presenting Author:** Daniel Wolfson  
**Co-Authors:** Bradley Hunt, Julia Mueller, Bledi Brahimaj, Harel Deutsch, Richard Fessler, John O’Toole, Ricardo Fontes

8:50–8:52 am  
**640 Postoperative Outcomes and Complications after Corpectomy for Vertebral Osteomyelitis: Systematic Review and Meta-analysis**  
**Presenting Author:** Asimina Dominari  
**Co-Authors:** Giorgos Michalopoulos, Patrick Flanigan, Mohamad Bydon
8:52–8:54 am  
641 Race- and Intervention-Based Differences in Palliative Care Utilization for Patients with Spine Metastases  
Presenting Author: Dana Rowe  
Co-Authors: Meghan Price, Edwin Owolo, Isabel Prado, Tara Dalton, Jacob Sperber, Margaret Johnson, Arif Kamal, C. Rory Goodwin

8:54–8:56 am  
642 Radical Hemivertebra Resection (Grade 5 Osteotomy) for Congenital Scoliosis: A Comparison with Eggshell Hemivertebra resection  
Presenting Author: Pawel Grabala

8:56–8:58 am  
643 Rates of Instrumentation Failure in Long Posterior Spine Constructs with ALIF and DLIF for Adult Spinal Deformity  
Presenting Author: Karma Barot  
Co-Authors: Dana Adkins, Jovanna Tracz, Danxun Li

8:58–9 am  
644 Risk Factors for Adjacent Level Disease in Lateral Interbody Fusion  
Presenting Author: Cesar Carballo  
Co-Authors: Elliot Pressman, Puya Alikhani, Gabriel Flores Milan

9–9:02 am  
645 S-1 Alar Iliac Screw Fixation versus S-2 Alar Iliac Screw Fixation in Long Deformity Constructs: A Finite Element Analysis  
Presenting Author: Alan Stein  
Co-Authors: Wenhai Wang, Merritt Kinon, Jonathan Mahoney, Bridget Nolan, Kevin Clare, Brandon Bucklen, John Wainwright

9:02–9:04 am  
646 Single Level Lateral Lumbar Interbody Fusion using 3D porous titanium cages for Rod Fracture Without Loss of Global Alignment  
Presenting Author: Joseph Hudson  
Co-Authors: Andrew Legarreta, Alp Ozpinar, Hansen Deng, Nitin Agarwal, Sharath Anand, Nima Alan, Thomas Buell, David Hamilton, Adam Kanter, David Okonkwo

9:04–9:06 am  
647 Surgeon Experience Matters. A Propensity Matched Analysis of TLIF Outcomes Demonstrates No Difference in Surgical Outcomes Between Experienced Neurosurgeons and Orthopaedic Surgeons  
Presenting Author: Geet Shukla  
Co-Authors: Abhijith Matur, Syed Khalid, Xu Tao, Philip Vorster, Andrew Wu, Rebecca Garner, Louisa Onyewadume, Benjamin Motley, Joseph Cheng, Owoicho Adogwa
9:06–9:08 am  
648 Telemedical Support via Smartphones for Spine Surgery in Low- and Middle- Income Countries  
Presenting Author: Sertac Kirnaz  
Co-Authors: Francois Waterkeyn, Ibrahim Hussain, Rodrigo Navarro-Ramirez, Jacob Goldberg, Alaaeldin Ahmad, Massimo Balsano, Hamisi Shabani, Sam Haber, Vincent Sullivan, Amanda Ng, Pravesh Gadjradj, Roger Härtl, Fabian Sommer

9:08–9:10 am  
649 The Impact of Obesity on Long-Segment Spinal Fusion Radiographic and Patient-Reported Outcomes  
Presenting Author: Matthew Marquardt  
Co-Authors: David Gibbs, Alex Keister, Vikas Munjal, Stephanus Viljoen, Andrew Grossbach

9:10–9:12 am  
650 The Majority of Patients Undergoing Adult Deformity Surgery Exhibit a Clinically Significant Increase in Cognitive Ability: A Prospective Study with 12-Month Follow-Up  
Presenting Author: John Burke  
Co-Authors: Christopher ames, MD; Vedat Deviren, MD; Justin Lee, BS; Justin Scheer, MD

9:12–9:14 am  
651 The Role of Intraoperative Blood Loss and Perioperative Outcomes Following Three Column Osteotomy  
Presenting Author: Connor Wathen  
Co-Authors: Marcel Dagli, Gabrielle Santangelo, Dominick Macaluso, Ali Özturk

9:14–9:16 am  
652 Time to surgery in AIS patients in Latin america. How long does it takes? A multicentric study  
Presenting Author: Alfredo Guiroy  
Co-Authors: Gaston Camino-Willhuber, Charles Carazzo, Robert Meves

9:16–9:18 am  
653 Titanium implants result in higher fusion rates for anterior lumbar interbody fusion performed at the lumbosacral junction  
Presenting Author: Michael White  
Co-Authors: Kristina Chapple, Robert Dugan, Harrison Farber, Jacquelyn Ho, Nicolas Kuttner, Luke O’Neill, Kurt Shaffer, Jay Turner, Juan Uribe

9:18–9:20 am  
654 To Operate or Not to Operate: A Nationwide Analysis of Factors Influencing the Likelihood of Surgical Treatment in Patients with Lumbar or Lumbosacral Disc Disorders and Radiculopathy  
Presenting Author: Thomas Johnstone  
Co-Authors: Vaibhavi Shah, Ghani Haider, Anand Veeravagu
9:20–9:22 am
655 Tranexamic Acid Administration in Long Segment Thoracolumbar Fusion for Adult Spinal Deformity
Presenting Author: Mert Marcel Dagli

9:22 –9:24 am
656 Venous pathology based surgical treatment of hirayama disease: Case series and outcomes
Presenting Author: Deepak Sharma
Co-Author: Vamsi Krishna

9:24 am –9:26 am
657 Which Bone Mineral Density Measure Offers a More Reliable Prediction of Mechanical Complications in Adult Spinal Deformity Surgery: Hounsfield Units or DEXA Scan?
Presenting Author: Hani Chanbour
Co-Authors: Jeffrey Chen, Wilson Vaughan, Amir Abtahi, Raymond Gardocki, Byron Stephens, Scott Zuckerman

9:26–9:28 am
658 Why didn't you walk yesterday? Factors associated with slow early recovery after adult spinal deformity surgery
Presenting Author: Gregory Kazarian
Co-Authors: Francis Lovecchio, Robert Merrill, John Clohisy, Bo Zhang, Jerry Du, Yusef Jordan, Anthony Pajak, Rachel Knopp, David Kim, Justin Samuel, Jonathan Elysee, Izzet Akosman, Pratyush Shahi, Han Jo Kim

9:28–9:30 am
659 Women Demonstrate Significantly Greater Improvement in Neck Disability Index After Surgery for Cervical Myelopathy: an Analysis from the Quality Outcomes Database
Presenting Author: Arati Patel
Co-Authors: Sravani Kondapavulur, Vijay Letchuman, Andrew Chan, Dean Chou, Gray Umbach, Alysha Jamieson, Vivian Le, Erica Bisson, Mohamed Bydon, Anthony Asher, Domagoj Coric, Eric Potts, Kevin Foley, Michael Wang, Kai-Ming Fu, Michael Virk, John Knightly, Scott Meyer, Paul Park, Cheerag Upadhyaya, Mark Shaffrey, Luis Tumialan, Jay Turner, Oren Gottfried, Giorgos Michalopoulos, Brandon Sherrod, Christopher Shaffrey, Regis Haid, Praveen Murmaneni
SCIENTIFIC SESSION 7
Our Greater Purpose

9:30–11:15 am
Location: Glimmer Ballroom (Fourth Floor)
Moderators: Charles Sansur, Scott Meyer

Learning Objectives:
1. Analyze various surgical techniques to address spinal pathologies
2. Describe Applications of new technologies in spine surgery
3. Discuss complication avoidance strategies in spine surgery

9:30–9:31 am
Introduction

9:31–9:39 am
Visionary Speaker: Publications in Spinal Neurosurgery Science: History, Evolution and Future Directions
Douglas Kondziolka

9:40–9:47 am
Spine Gives Back: A Mission in Palestine
Burak Ozgur

9:48–9:56 am
Global Spine Surgery: How I Helped & You Can Too
Christopher Bonfield

9:57–10:05 am
Hot to Get a Real Knife
Laura Snyder

10:06–10:14 am
The Impact We Have on Patients
Eric Potts

10:15–10:23 am
Successful Reversal of Three-Week Incomplete Quadriplegia from Severe Basilar Invagination
Han Jo Kim

10:24–10:32 am
Can Augmented Reality Help Me in Spine Surgery?
Robert Louis

10:33–10:45 am
Question & Answer Session

10:46–10:51 am
Recognition of Kuntz & Albert Scholars and Introduction of J.A.N.E. and Mayfield Awards
Kai Ming Fu
10:52–10:58 am  
J.A.N.E. Award Presentation—Risk Factors for Sacral Fracture Following En Bloc Chordoma Resection  
Anthony Mikula

10:59–11:05 am  
Mayfield Clinical Award Presentation—Motorized Robotic Closed Cervical Traction: Preliminary Results from Cadaveric Testing  
Brandon Sherrod

11:06–11:15 am  
Question & Answer Session

SPECIAL SESSION  
Business Tips, Pearls & Tactics (co-brand with CSNS/CSNS faculty)

11:15 am–12:10 pm  
Location: Glimmer Ballroom  
Moderators: Kurt Eichholz, Yi Lu

Learning Objectives:
• Identify the changes in coding and reimbursement that impacts a neurosurgery spine practice.
• Manage cost and quality in spine surgery
• Discuss the importance of ortho and neuro collaboration to improve payor response strategies.

11:15–11:16 am  
Introduction

11:17–11:24 am  
Balance Between Cost and Quality  
Joseph Cheng

11:25–11:32 am  
Defending Our Codes: What Have We Won, and What Codes are At-Risk?  
Cheerag Upadhyaya

11:33–11:40 am  
Coding Strategies for Spine Surgeons: Ways to Optimize Reimbursement  
Justin Slavin

11:41–11:48 am  
Managing Conflict of Interest in Day-to-Day Practice  
Michael Steinmetz

11:49–11:56 am  
How to Teach Residents Without Compromising Efficiency  
Gregory Trost
11:57 am–12:04 pm
Payor Response Strategies, Opportunity for Ortho Neuro Collaboration
Luis M. Tumialan

12:05–12:10 pm
Panel Discussion

DSPN BUSINESS MEETING
12:10–12:35 pm
Location: Glimmer Ballroom

12:10–12:16 pm
Chair’s Report
Adam S. Kanter

12:17–12:20 pm
Treasurer’s Report
Juan S. Uribe

12:21–12:23 pm
Secretary’s Report
Luis M. Tumialan

12:24–12:26 pm
Nominating Committee Report
Domagoj Coric

12:27–12:29 pm
CNS Board Report
Elad I. Levy

12:30–12:32 pm
AANS Board Report
John Knightly

12:33–12:35 pm
Future Sites Committee Report
Joseph Cheng
Thursday March 16
12:30–1:15pm
Cross-Fire Debate: Strategies for Post-op Pain Management Following Spine Surgery
Description: This interactive discussion will discuss the role of ERAS in spine surgery novel approaches in the management of post-surgical pain following spine surgery. Faculty will present their individualized protocols along with techniques in administering EXPAREL via surgical infiltration versus a surgeon-administrated, ultrasound guided, ESP/TLIP block.
Speaker: Mohamad Bydon, Michael Wang
Location: Splash 15
Supported by: Pacira

Friday, March 17
7–7:45 am
Explore the Unseen with Spineology: The Future of Endoscopic Fusion
Speakers: Saqib Hasan, Michael Wang
Location: Splash 15
Supported by: Spineology

12:30–1:15pm
Carbon Fiber: Shifting the Tumor Care Paradigm
Description: Join us for an interactive discussion on the impact Carbon/PEEK implants are having on multidisciplinary care for spine tumor patients worldwide. Hear first-hand experiences from leading experts in the field and learn how they are improving patient outcomes by expanding treatment options and enabling safer care.
Speakers: Bernhard Meyer, Joshua Palmer, John Shin
Location: Flash
Supported by: icotec
The Future VUE of MIS Surgery Featuring the TELIGEN™ System

Description: Join our esteemed faculty to hear how they were able to see more and achieve more with The TELIGEN System, an integrated technology platform that delivers an advanced visualization experience in conjunction with the TELIGEN Vue procedural solution.

Speakers: Richard Fessler, Michael Wang
Location: Splash 15
Supported by: DePuy Synthes

Intelligence-Based Medicine: How AI and Enabling Technologies Are Changing The Way We Practice Spine Surgery

Description: Medtronic is integrating powerful complementary technologies: artificial intelligence-driven surgical planning, personalized spinal implants, navigation, and robotic assisted surgical delivery, which together advance standardization and reduced variability. This workshop will provide a unique opportunity to discover how spine surgeons are incorporating these integrated solutions into their practice, and how Medtronic is accelerating the transition to a new era of personalized medicine to deliver optimal patient care.

Speakers: Andrew Grossbach, Martin Pham
Location: Splash 16
Supported by: Medtronic

A Comprehensive Review of the Prone lateral Technique with Robotic Navigation

Description: This discussion will focus on Globus Medical’s comprehensive Prone Lateral surgical solution, including ExcelsiusGPS® for robotic navigation, Excelsius3D™ for intraoperative imaging, Expandable interbody spacer technology, and the NEW prone lateral patient positioner. The audience will gain a full understanding of this technique including setup, workflow and the patient selection process. The speaker will present benefits of the technology for this surgical application and share case reviews as well as workflow recommendations.

Speaker: Noojan Kazemi
Location: Splash 17
Supported by: Globus Medical
Saturday, March 18
7–7:45 am
Redefining Soft Tissue Visualization for Spinal Procedures with Intraoperative Ultrasound

**Description:** This in-depth discussion will remove the stigma of intraoperative ultrasound and introduce an innovative, essential technology that provides active imaging during a variety of spinal procedures. It will review the only soft tissue civilization platform that can be easily incorporated into the surgical workflow, where the surgeon can monitor spinal cord health, identify key anatomy and verify the extent of decompression.

**Speakers:** Timothy Chryssikos, Praveen Mummaneni, Saman Shabani

**Location:** Splash 15

**Supported by:** BK Medical

12:30–1:15 pm
PTP—The Evolution of the Lateral Approach

**Description:** PTP utilizes a maximally efficient prone position while providing a consistently reproducible approach, enabling the surgeon to achieve powerful alignment. PTP is the next step for lateral interbody fusion (LIF) bringing together the benefits of an MIS transpsoas approach with the advantages of an ergonomic prone position, facilitating an intuitively superior single-position surgery used to treat a wide range of patient pathologies.

**Speakers:** Gurvinder Deol, John Pollina

**Location:** Flash

**Supported by:** Atec

To Flip or Not to Flip? How UNLEASH™ Lateral, Prone Lateral & ATP Solutions Leverage Enabling Technologies & Innovations to Empower Your Decision

**Description:** Join our esteemed faculty for a moderated debate and discussion on which lateral approach they believe is the best way to access the spine. This session will showcase the UNLEASH Lateral and ATP Procedural Solutions, which leverage advanced techniques and enabling technologies to deliver patient-specific care while improving OR workflow and efficiently.

**Speakers:** Elias Dakwar, Adam Polifka, Jang Yoon

**Location:** Splash 15

**Supported by:** DePuy Synthes
Long-Term Evidence and Clinical Management of Cervical Disc Arthroplasty

**Description:** A panel of experts on both large joint and cervical spine arthroplasty will review available long-term outcomes and clinical management strategies following cervical spine arthroplasty.

**Speakers:** Frank Phillips, Avinash Patwardhan, Josh Jacobs, Jay Erturan, Armen Khachatrian

**Location:** Splash 16

**Supported by:** OrthoFix

Robotic Navigation: Benefits of Adding Automated Trajectory Alignment to your Navigation Workflow

**Description:** This panel discussion will focus on integrating Excelsius™ technology into a surgical workflow and specifically discuss the benefits this technology offers over freehand navigation techniques. The speaker will review the impact of adding automated alignment of surgeon-selected trajectories and the introduction of Excelsius3D to further facilitate workflow through a comprehensive ecosystem.

**Speaker:** Nicholas Theodore

**Location:** Splash 17

**Supported by:** Globus Medical

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SeaSpine
SI-BONE
Explore the latest spine and peripheral nerve technology in the Exhibit Hall. Enjoy one-on-one discussions and hands-on demonstrations with exhibitors. Learn about innovative devices and new technologies that can help to advance your practice.

Located in the Sparkle Ballroom.
Food & Beverage

Exhibit Hall Entrance

Sessions

Lounge

Presentation

Stage

Freeman

Conventus

ES #8

ES #7

Stryker

Cerapedics

Medtronic

OrthoFix

Depuy

Food & Beverage

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Food & Beverage

HOURS

Friday, March 17
9 am–4:30 pm

Saturday, March 18
9 am–2 pm
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HANDS-ON CADAVER SESSION

Attend this private session and receive hands-on training using the latest state-of-the-art devices and technology.

Thursday, March 15

Decreasing Blood Loss & Improving Efficiencies in MIS & complex spine cases with BoneScalpel and Biologics

1:30–5 pm
Location: Flicker 3
Supported: Bioventus
BEVERAGE BREAKS

Sparkle Ballroom (Upper Lobby Level)

Friday, March 17 10:05–10:30 am
Friday, March 17 2:30–3:10 pm
Saturday, March 18 10:30–11:00 am

Sponsored by

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BEVERAGE BREAKS

JOIN THE SPINE SECTION

The AANS/CNS Joint Section on Disorders of the Spine and Peripheral Nerves is dedicated to advancing spinal neurosurgery and related sciences through education, clinical research and improved patient care.

Enjoy the many benefits of membership, from advancing the field of neurosurgery, to networking with like-minded colleagues, to being involved in education and advocacy — there is something for everyone. Join this vibrant, diverse community in the ongoing pursuit of improving spinal neurosurgery.

Access spine specific content and resources.

- Education
- Guidelines
- Videos
- News
- Research
- Grants & Awards

SpineSection.org

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Join the Spine Section for the 2024 Spine Summit in Las Vegas.

SPINE SUMMIT
FEBRUARY 21–24, 2024
Las Vegas

NAVIGATING THE FUTURE
Embracing Technology and Innovation to Improve Patient Care

SpineSection.org
AANS/CNS Joint Section on Disorders of the Spine and Peripheral Nerves
WHAT’S NEW SESSIONS 
IN THE EXHIBIT HALL

Location: Exhibit Hall, Sparkle Ballroom

Friday, March 17

Is There a Better Alternative to the Surgical Microscope for Minimally Invasive Lumbar Spine Surgery? New Data on the Ergonomic Impact, Safety and Operating Room Efficiency of Viseon MaxView

9:30–9:40 am
Supported by: Viseon

When Fusion Is All You Want to See

9:45–9:55 am
Supported by: Spinal Elements

P-15 Peptide: A Game Changer in Spinal Fusion Surgery

10–10:10 am
Supported by: Cerapedics

HEDRON™: Benefits of 3D Printed Technology in Spine Surgery

10:15–10:25 am
Supported by: Globus Medical

Delivering Precision Medicine to the Interbody Space with aprevo® Patient Specific Devices

2:35–2:45 pm
Supported by: Carlsmed

iFuse Bedrock Granite—The Latest Evolution in Spinopelvic Fixation

2:50–3 pm
Supported by: Si-Bone

Saturday, March 18

The Science Behind MagnetOs and Early Experience at a Major Trauma Center

10:30–10:40 am
Supported by: Kuros Bioscience

Introducing the New Versatile Prone Lateral Patient Positioning System

10:45–10:55 am
Supported by: Globus Medical
The American Spine Registry is Accepting New Sites

The American Spine Registry (ASR), a collaborative effort of the American Association of Neurological Surgeons and the American Academy of Orthopaedic Surgeons, is a national quality improvement registry for spine care.

The ASR provides national benchmarks and multiple data reuse opportunities for physicians and practices to improve care quality and patient outcomes.

The ASR has developed new resources to support data submission and usability and continues to expand support for all spine surgeons to participate.

neuropoint.org/ASR

Stop by the ASR Booth, #324 to speak with a representative regarding enrollment.
Let NeuroU meet all of your Spine CME needs.
The Neurosurgery Research & Education Foundation (NREF) is dedicated to funding groundbreaking research, providing extraordinary educational opportunities and supporting studies that identify links between best practices and improved outcomes in patient care.

Since its inception, the NREF has invested more than $30 million in neurosurgery, and through careful stewardship, the NREF has utilized contributions to its highest potential with support for:

- **6** Director Residency Scholarships
- **10** Cerebrovascular Section Traveling Fellowships
- **93** Resident/Fellow Educational Courses
- **175** Clinical Fellowship Grants
- **284** Research Fellowship Grants & Young Clinician Investigator Awards
- **290** Medical Student Summer Research Fellowships
The leader in minimally invasive spine surgery now brings a modular screw system to the market.

The CD Horizon™ ModuLeX™ 5.5 spinal system offers a patented one-way secure locking mechanism, providing strength in the connection.

Combined with our industry leading StealthStation™ surgical navigation and Mazor™ robotic guidance, the CD Horizon™ ModuLeX™ 5.5 spinal system allows you to plan and execute your chosen procedure confidently, with procedural efficiency you can see.

Visit medtronic.com/modulex55 to learn more