

# Scoliosis Research Society 56<sup>th</sup> Annual Meeting

September 22-25, 2021  
St. Louis, Missouri, USA

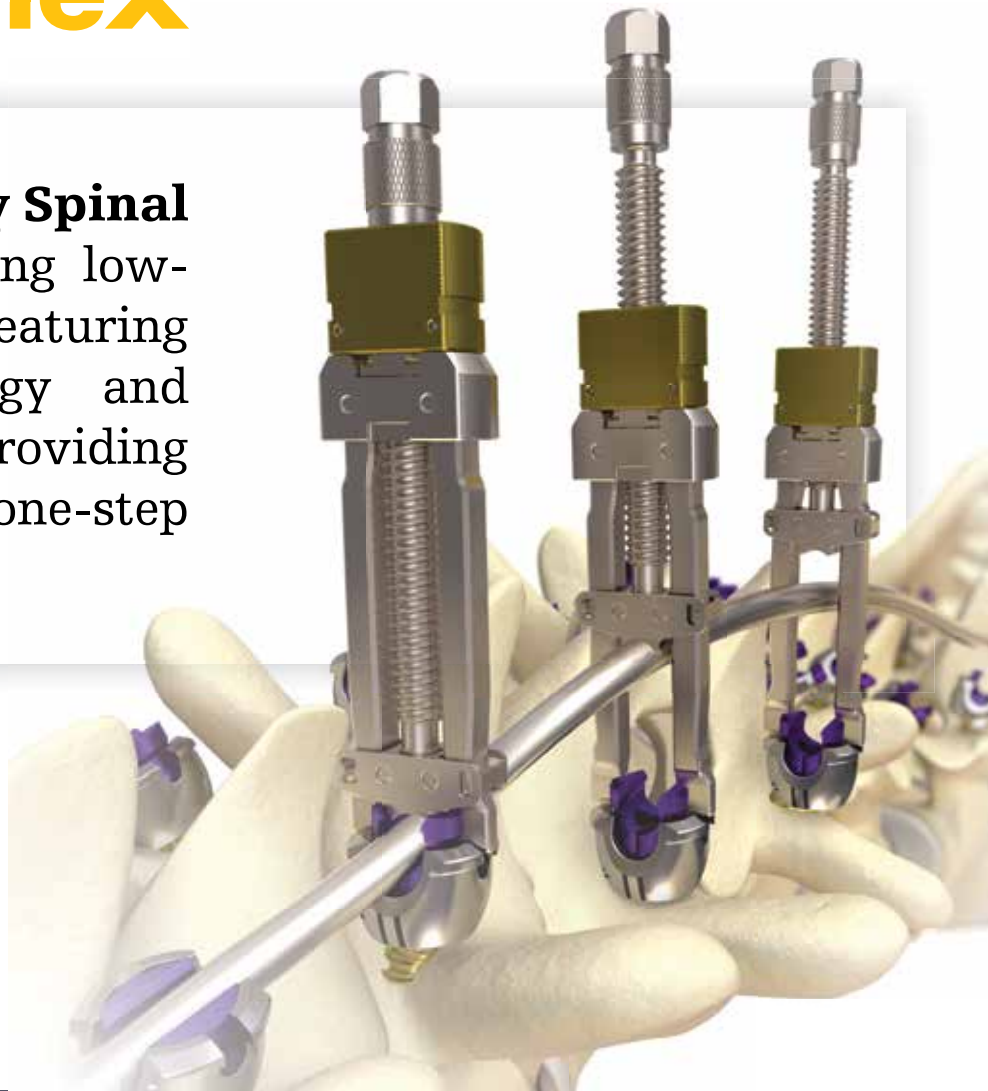
**PRELIMINARY  
PROGRAM**



[www.srs.org](http://www.srs.org)  
[www.srs.org/am21](http://www.srs.org/am21)

# Simplify the complex

The **Mesa 2 Deformity Spinal System** is a top-loading low-profile spinal system featuring Zero-Torque Technology and 60° range of motion, providing you with the ability to one-step final lock.



Learn more at [strykerspineexpo.com](http://strykerspineexpo.com)

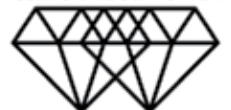
This document is intended solely for the use of healthcare professionals. A surgeon must always rely on his or her own professional clinical judgment when deciding whether to use a particular product when treating a particular patient. Stryker does not dispense medical advice and recommends that surgeons be trained in the use of any particular product before using it in surgery.

The information presented is intended to demonstrate the breadth of Stryker product offerings. A surgeon must always refer to the package insert, product label and/or instructions for use before using any Stryker product. The products depicted are CE marked according to either the Medical Device Directive 93/42/EEC or to Regulation (EU) 2017/745. Products may not be available in all markets because product availability is subject to the regulatory and/or medical practices in individual markets. Please contact your Stryker representative if you have questions about the availability of Stryker products in your area.

Stryker Corporation or its divisions or other corporate affiliated entities own, use or have applied for the following trademarks or service marks: K2M, Mesa, Stryker. All other trademarks are trademarks of their respective owners or holders.

Copyright © 2021 Stryker | K2M, Inc. | 600 Hope Parkway SE | Leesburg, VA 20175 | t: 571 919 2000 | [www.stryker.com](http://www.stryker.com)

SRS DOUBLE DIAMOND  
CORPORATE SUPPORTER



# Table of Contents

Annual Meeting Committees.....	4
Welcome Letter .....	5
Meeting Information .....	7
Guest Lectures .....	9
Award Recipients .....	10
Location Information .....	12
Registration Information .....	13
Housing Information.....	16
Meeting Outline <i>Subject to change</i> .....	18
Annual Meeting Program	
Tuesday, September 21 .....	20
Wednesday, September 22 .....	23
Thursday, September 23.....	30
Friday, September 24 .....	38
Self-Paced Program .....	49
SRS Board of Directors and Chairs.....	50
About SRS .....	51
2020 Research Grant Recipients .....	52
Corporate Partners.....	53

## DATES TO REMEMBER

Registration Opens for SRS Members and Meeting Speakers and Faculty

**May 20, 2021**

Housing Opens

**May 20, 2021**

Registration Opens for Non-Members

**July 1, 2021**

In-Person Registration & Housing Closes

**August 20, 2020**

Virtual Meeting Platform Opens

**September 20, 2021**

Live Meeting

**September 22-25, 2021**

Online Access Cut-Off Date

**December 31, 2021**

## ANNUAL MEETING VENUE

**Hyatt Regency St. Louis at The Arch**

315 Chestnut Street, St. Louis, Missouri, US, 63102

## VIRTUAL MEETING PLATFORM

<http://srs.brightspace.com>

## FUTURE EDUCATIONAL EVENTS

**Spine Deformity Solutions: A Hands-On Course**

October 27-29, 2021 | Nijmegen, the Netherlands

**Spine Deformity Solutions: A Hands-On Course**

November 18-20, 2021 | Singapore, Singapore

**29<sup>th</sup> IMAST**

April 6-9, 2022 | Miami, Florida, USA

**57<sup>th</sup> Annual Meeting**

September 20-23, 2022 | Sydney, Australia

*All information as of May 20, 2021.*



**SRS Executive Office** 555 East Wells Street, Suite 1100 Milwaukee, WI 53202  
P: 414.289.9107 F: 414.276.3349 [info@srs.org](mailto:info@srs.org) [www.srs.org](http://www.srs.org)

# Annual Meeting Committees

## SRS PRESIDENT

---

Muharrem Yazici, MD

## LOCAL HOST

---

Munish C. Gupta, MD

## SRS EDUCATION COUNCIL CHAIR

---

Suken A. Shah, MD

## PROGRAM COMMITTEE

---

Michael P. Kelly, MD, Chair  
Shay Bess, MD, Chair Elect  
Lindsay M. Andras, MD, Past Chair  
Michael C. Albert, MD  
Sébastien Charosky, MD  
Steven W. Hwang, MD  
Khaled M. Kebaish, MD  
David E. Lebel, MD, PhD  
Amy L. McIntosh, MD  
Joseph H. Perra, MD  
Sebastien Pesenti, MD  
Amer F. Samdani, MD  
Vidyadhar V. Upasani, MD

## EDUCATION COMMITTEE

---

Amer F. Samdani, MD, Chair  
Justin S. Smith, MD, PhD, Chair Elect  
Baron S. Lonner, MD, Past Chair  
Ahmet Alanay, MD  
Carlos Eduardo Barsotti, MD  
Mark A. Erickson, MD  
Arvinder Ghag, MD, FRCSC  
Munish C. Gupta, MD  
Christina K. Hardesty, MD  
Ali Humadi, MB, ChB, MS, FRACS  
Steven W. Hwang, MD  
Charles E. Johnston, MD  
Marissa M. Muccio, PT  
Luiz Müller Avila, MD  
Ibrahim Obeid, MD  
Stefan Parent, MD, PhD  
Nicolas Plais, MD  
Yong Qiu, MD

## PROGRAM REVIEWERS

---

Paloma Bas Hermida, MD  
Patrick J. Cahill, MD  
Michael S. Chang, MD  
Christopher J. DeWald, MD  
Charla R. Fischer, MD  
Sumeet Garg, MD  
Joseph P. Gjolaj, MD, FACS, FAOA  
Ryan C. Goodwin, MD, MBA  
Mari Louise Groves, MD  
Jeffrey L. Gum, MD  
Yong Hai, MD  
Darrell S. Hanson, MD  
David Lazarus, MD  
Darren R. Lebl, MD, MBA  
Charles Gerald T. Ledonio, MD  
Scott John Luhmann, MD  
Kamran Majid, MD  
Praveen V. Mummaneni, MD  
Ahmad Nassr, MD  
Stefano Negrini, MD  
Colin Nnadi, FRCS (Orth)  
Masayuki Ohashi, MD, PhD  
Bangping Qian, MD  
Yong Qiu, MD  
Juan Carlos Rodriguez-Olaverri, MD, PhD  
Byron F. Stephens, MD  
Fernando Techy, MD  
Khoi D. Than, MD  
ZeZhang Zhu, MD, PhD

# Welcome Letter

Dear Colleagues,

We would like to cordially invite you to St. Louis, Missouri for the 56<sup>th</sup> SRS Annual Meeting. This past year has been extremely difficult for everyone involved in healthcare, but we have persevered. We would like to celebrate your hard work and dedication to the field during the pandemic in St. Louis, my new home. This year's event will be a hybrid event allowing for a robust in-person program live from the Hyatt Regency St. Louis at The Arch in Missouri, USA as well as a virtual component where delegates are able to enjoy the Annual Meeting from the comfort of their home or office. Through the leadership of Dr. Muharrem Yazici, the Society has emerged stronger than ever. We are excited to discuss the latest improvements in spinal deformity care as well as to reminisce with old friends and the prospects of making new ones.

This year's educational program starts on Tuesday, September 21 with the Hibbs Society Meeting on *The Management of Spinal Infections*. Wednesday, September 22 begins with the Pre-Meeting Course, chaired by Drs. Amer Samdani, Justin Smith, and Michael Kelly titled, *Spine is Just the Tip of the Iceberg: Comprehensive Management of the Patient with Spine Deformity and Surgeon*. Following the Pre-Meeting Course are three concurrent lunchtime symposia, the start of the Scientific Program, three concurrent case discussion sessions, and the Opening Ceremonies and Welcome Reception on Wednesday evening. We are honored to feature our annual Howard Steel Lecturer, Tunç Findik, professional climber, motivational speaker, and world-renowned author. We also look forward to celebrating the Blount Humanitarian Award Winners for 2020 and 2021, and the 2020 Lifetime Achievement Award winner Introductions and Acceptance.

During the pandemic, spine surgeons have been highly productive in their academic work since their clinical activity was limited. The program committee chair, Dr. Michael Kelly and his team had the extremely difficult task of choosing which of the 933 abstract submissions from 29 countries to highlight. Diverse Lunchtime Symposia and Half-Day Courses complement these main scientific sessions, while Dr. Charles E. Johnston serves as this year's Harrington Lecturer, along with the Lifetime Achievement awards.

Meet us in St. Louis for Friday night's Farewell Reception. St. Louis has many attractions such as one of the largest public parks in the country, Forest Park. This park was home to the 1904 World's Fair and is a few miles away from the Annual Meeting venue. The St. Louis Arch museum has been completely renovated and is a must see. Being the gateway to the West, St. Louis has a lot of historical significance in American History.

We hope that these collective opportunities will make the 56<sup>th</sup> Annual Meeting an unforgettable experience for you. If I may be of service in any way, please do not hesitate to reach out!

Best Regards,



Munish C. Gupta, MD  
Local Host

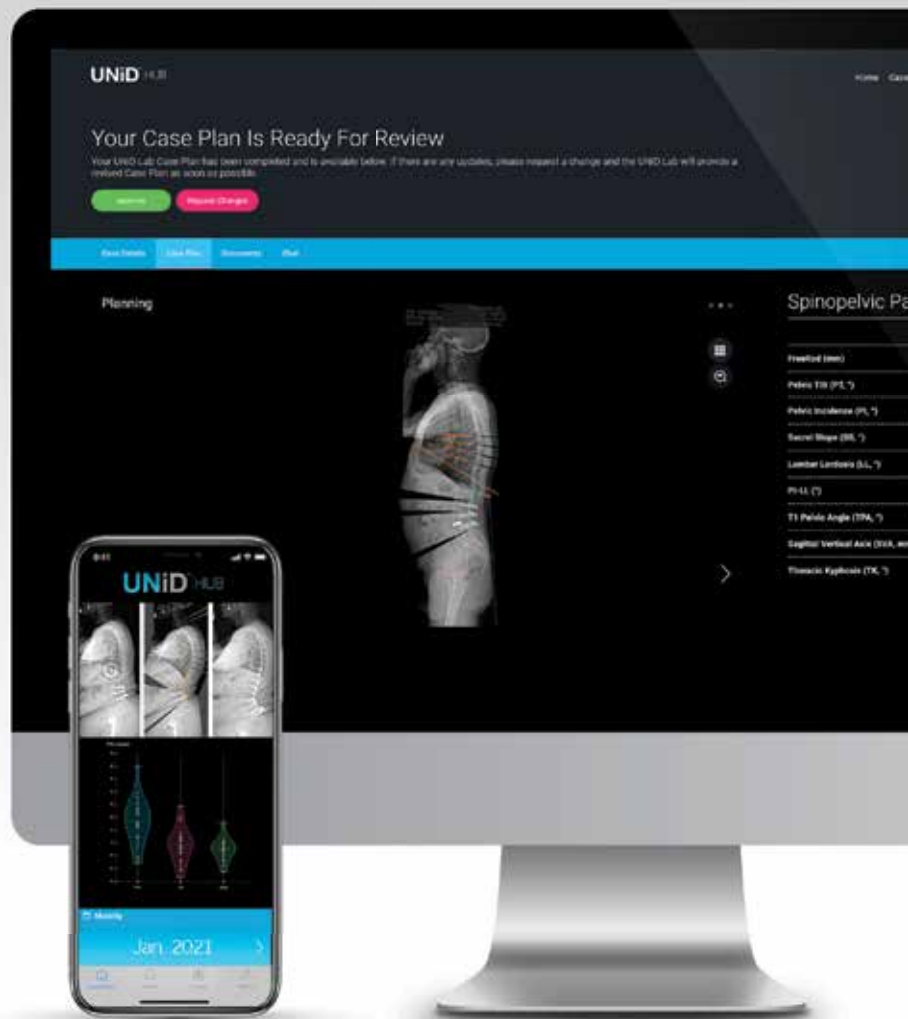
# PLAN. EXECUTE. ANALYZE.

## UNiD™ Adaptive Spine Intelligence

UNiD™ ASI uses artificial intelligence—backed by data science—to produce implants calculated to achieve optimal patient-specific spinal alignment. Powered by data aggregation of more than 7,000\* spinal procedures, the plan, execute, analyze process creates an iterative virtuous cycle that improves with each procedure. Choose the confidence of data and the convenience of custom alignment to your OR with UNiD™ ASI.



Contact your  
Medtronic sales rep  
or use the QR code  
to learn more.



\*Through Jan., 2021

### Indications

The UNiD™ Spine Analyzer is intended for assisting healthcare professionals in viewing and measuring images as well as planning orthopedic surgeries. The device allows surgeons and service providers to perform generic as well as spine related measurements on images, and to plan surgical procedures. The device also includes tools for measuring anatomical components for placement of surgical implants. Clinical judgment and experience are required to properly use the software.

### CONNECT WITH US.

Web  
Medtronic.com

LinkedIn  
Medtronic Brain  
and Spine Therapies

Twitter  
@Medtronic\_Spine

**Medtronic**  
Further, Together

# Meeting Information

## MEETING DESCRIPTION

The Scoliosis Research Society (SRS) Annual Meeting is a forum for the realization of the Society's mission and goals, the improvement of patient care for those with spinal deformities. Nine faculty-led instructional course lectures, case discussions, and 180 abstract papers will be presented on an array of topics, including adolescent idiopathic scoliosis, growing spine, kyphosis, adult deformity, minimally invasive surgery, machine learning, and mental health considerations.

## LEARNING OBJECTIVES

Upon completion of the Annual Meeting, participants should be able to:

- Analyze current research to inform best practices in clinical care.
- Request appropriate consultations to optimize management of comorbid conditions.
- Identify and support access to mental health resources for the patient and surgical team.
- Appraise and apply non-fusion technologies.
- Assess and critique artificial intelligence guidance.
- Incorporate best practice guidelines, sustainably, for pre-operative planning.
- Integrate approaches and techniques (MIS if applicable) to reduce complications.

## TARGET AUDIENCE

Spine surgeons (orthopaedic and neurological surgeons), residents, fellows, nurses, nurse practitioners, physician assistants, engineers, and company personnel.

## ACCREDITATION STATEMENT

The 56<sup>th</sup> Annual Meeting have been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the sponsorship of the Scoliosis Research Society (SRS). SRS is accredited by the ACCME to provide continuing medical education for physicians.

## CREDIT DESIGNATION

SRS designates this other (hybrid) activity, 56<sup>th</sup> SRS Annual Meeting, for a maximum of **37.25 AMA PRA Category 1 Credits™**. Physicians should claim only the credit commensurate with the extent of their participation in each activity.

## DISCLOSURE OF CONFLICT OF INTEREST

It is the policy of SRS to insure balance, independence, objectivity and scientific rigor in all of their educational activities. In accordance with this policy, SRS identifies conflicts of interest with instructors, content managers, and other individuals who are in a position to control the content of an activity. Conflicts are resolved by SRS to ensure that all scientific research referred to, reported, or used in a CME activity conforms to the generally accepted standards of experimental design, data collection and analysis. Complete faculty disclosures will be included in the final program.

## FDA STATEMENT (UNITED STATES)

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

## VIDEO RECORDING PROHIBITED

SRS does not allow personal video recording of the presentations of any kind. SRS holds the right to confiscate any and all recordings taken of any of the presentations. All session rooms will be recorded and will be available to delegates after the meeting on the Annual Meeting virtual platform.

## INSURANCE/LIABILITIES AND DISCLAIMER

SRS will not be held liable for personal injuries or for loss or damage to property incurred by participants or guests at the Annual Meeting including those participating in tours, social events or virtually. Participants and guests are encouraged to take out insurance to cover loss incurred in the event of cancellation, medical expenses or damage to or loss of personal effects when traveling outside of their own countries.

SRS cannot be held liable for any hindrance or disruption of the Annual Meeting proceedings arising from natural, political, social or economic events or other unforeseen incidents beyond its control. Registration of a participant or guest implies acceptance of this condition.

The materials presented at this Continuing Medical Education activity are made available for educational purposes only. The material is not intended to represent the only, nor necessarily best, methods or procedures appropriate for the medical situations discussed, but rather is intended to present an approach, view, statement, or opinion of the faculty that may be helpful to others who face similar situations.

SRS disclaims any and all liability for injury or other damages resulting to any individual attending a scientific meeting and for all claims that may arise out of the use of techniques demonstrated therein by such individuals, whether these claims shall be asserted by a physician or any other person.

## LANGUAGE

Presentations and meeting materials will be provided in English.

## NO SMOKING POLICY

Smoking is not permitted during any Annual Meeting activity or event.

## ATTIRE

Business (suits) or business casual attire (polo or dress shirt, sport coats) are appropriate for all Annual Meeting sessions; ties are not required.

## Meeting Information

### INDUSTRY WORKSHOPS

Delegates are encouraged to attend the industry workshops on Thursday, September 23 from 13:30-15:00. Each workshop is programmed by a single-supporting company and features presentations on topics and technologies selected by the company. Boxed lunches will be available during the workshops. CME credits are not available for workshops.

### MEMBERS BUSINESS MEETING

All SRS members are invited to the Member Business Meeting on Friday, September 24 from 12:30-14:15. Agendas will include reports from the various SRS committees, updates on SRS activities and programs, and voting.

# SRS Membership

Apply Today: [www.srs.org/membership](http://www.srs.org/membership)





# Guest Lectures

## WEDNESDAY, SEPTEMBER 22

### Howard Steel Lecture



#### **K2 the Mountain Of Mountains**

*Tunç Findik*

Born in Ankara, Turkey in 1972, Tunç Findik is a graduate of Ankara Bilkent University Faculty of English Language and Literature. Tunç is a professional climber, climbing instructor, motivational speaker and writer.

Tunç is an overall alpinist with more than 500 new routes; first winter ascents and first ascents in Turkish mountains and abroad, with a total sum of more than 1000 summits and an uncountable number of short traditional rock climbs and frozen icefalls to his credit. Tunç is a member of the Turkish Alpine Club (TDF) as well as being a member of Zirve Alpine Club of Turkey, the local athlete for The North Face, and a member of Grivel team.

Tunç Findik is the first Turkish person to summit Mount Everest twice, from different routes. He is running his project of 14x8000, climbing all the summits above 8000-meter altitude on our planet. His 13 8000 meter summits include Everest 8850m, K2 8611m, Kanchenjunga 8586m, Makalu 8463m, Dhaulagiri 8167m, Cho Oyu 8205m, Lhotse 8516m, Shishapangma 8013m, Manaslu 8163m, Gasherbrum II 8035m, Annapurna 8091m, Gasherbrum I 8058m, and Broad Peak 8047m.

Tunç has climbed in Nepal, China, Pakistan, Kazakhstan, Kyrgyzstan, Tajikistan, Russia, France, Georgia, Switzerland, Italy, Bulgaria, England, Iran, Argentina, Tanzania, and Kenya.

He has translated books about climbing and mountains from English to the Turkish language. He is also the author of the only existing Turkish climbing guidebook to the Kackar range in northeastern Turkey *Kackar-Vercenik Guide* and the author of another detailed and unique guidebook to the Taurus mountain range, *Aladaglar Climbing Guide*. He wrote his own book about his ascent of Mount Everest in 2001 and other adventure books of his own Karakorum climbs, *80 Days in Karakorum, Altitude 8000, K2- The Mountain of Mountains*, along with his technical instruction book, *Winter Climbing- Technics and Tactics*.

For more information, please visit: [www.tuncfindik.com](http://www.tuncfindik.com).

Instagram: @tuncfindikclimber

## THURSDAY, SEPTEMBER 23

### Harrington Lecture



#### *Charles E. Johnston, MD*

Charles E. Johnston, MD (“Charlie”) is assistant chief of staff emeritus at Texas Scottish Rite Hospital for Children, where he has practiced continuously since 1985. A native Southern Californian with strong family ties to south Texas, he graduated from Yale University and Columbia University College

of Physicians and Surgeons, then did a surgical internship in San Antonio, eventually completing orthopedic surgery residency at the UVA Medical Center Charlottesville. He returned to Texas as a Harrington Fellow in Pediatric Orthopaedics and Scoliosis at Texas Scottish Rite Hospital for Children in Dallas 1981-2 (fellowship had no relationship to Dr. Paul R. Harrington).

Dr. Johnston is currently Professor in the Department of Orthopaedic Surgery at the University of Texas Southwestern Medical Center at Dallas. He is a reviewer for The Journal of Bone and Joint Surgery and the Journal of Children’s Orthopaedics. He is a fellow in the American Academy of Orthopaedic Surgeons and serves on the executive committee of the Pediatric Spine Study Group and Foundation. An active member of the SRS since 1987, and has served on and chaired several committees, most recently the Education and Growing Spine committees. He is also a member of the Pediatric Orthopedic Society of North America, receiving its Humanitarian Award in 2020; the European Pediatric Orthopaedic Society; and the Texas Orthopedic Association.

Dr. Johnston has published over 150 papers in peer-reviewed journals and approximately 30 books chapters. Most important, Charlie and Ellen have been married for 45 years; have two daughters and five grandchildren.

# Award Recipients

## SRS AWARDS

### Walter P. Blount Humanitarian Awards

Presented for outstanding service to those with spinal deformity and for generosity to the profession and Society.

#### 2020 Blount Humanitarian Award Recipient

**Francisco Javier Sánchez Pérez-Grueso Sr., MD**

*The 2020 Blount award will be presented on Wednesday, September 22.*

#### 2021 Blount Humanitarian Award Recipient

**Kenneth MC Cheung, MD**

*The 2021 Blount award will be presented on Wednesday, September 22.*

### Lifetime Achievement Awards

Presented to members who have exhibited long and distinguished service to SRS and to spinal deformity research and care.

#### 2020 Lifetime Achievement Award Recipients

**Jean Dubousset, MD**

**Stuart L. Weinstein, MD**

*The 2020 Lifetime Achievement awards will be presented on Wednesday, September 22.*

#### 2021 Lifetime Achievement Award Recipients

**Donald P. K. Chan, MD**

**Robert N. Hensinger, MD**

*The 2021 Lifetime Achievement awards will be presented on Thursday, September 23.*

## ANNUAL MEETING AWARDS

### Russell A. Hibbs Awards

Presented to the best basic science and clinical research papers at the Annual Meeting.

#### 2020 Hibbs Award for Best Basic Research Paper

**A Novel Imaging Study to Quantify Respiratory Function in Early Onset Scoliosis-Introducing Quantitative Dynamic Magnetic Resonance Imaging (QdMRI)**

*Yubing Tong, PhD; Jayaram K. Udupa, PhD; Joseph M. McDonough, MS; Caiyun Wu, MS; Catherine Qiu, MS; Carina Lott, MS; Nirupa Galagedera, BA; Jason B. Anari, MD; Drew A. Torigan, MA; Patrick J. Cahill, MD*

#### 2020 Hibbs Award for Best Clinical Research Paper

**Complications Following Posterior Surgical Treatment of Adolescent Idiopathic Scoliosis: Prospective 10-Year Follow-Up Study**

*Arun R. Hariharan, MD; Suken A. Shah, MD; Margaret Baldwin, MD; Joseph Petfield, MD; Burt Yaszay, MD; Peter O. Newton, MD; Baron Lonner, MD; Firoz Miyanji, MD; Paul D. Sponseller, MD, MBA; Amer F. Samdani, MD*

*The 2020 Hibbs awards will be presented on Wednesday, September 23.*

*The 2021 Hibbs Awards will be announced on Saturday, September 25.*

### John H. Moe and Louis A. Goldstein Awards

Presented to the best basic science and clinical research e-Posters at the Annual Meeting.

#### 2020 Moe Award for Best Basic Research Poster

**3D Classification of the Right Thoracic Scoliotic Spine by the Means of Two View Spinal Radiographs: A Validation Study**

*Saba Pasha, PhD; Keith Baldwin, MD; Jason B. Anari, MD; Victor Ho-Fung, MD*

#### 2020 Goldstein Award for Best Clinical Research Poster

**Definitive Fusions are Better than Growth Friendly Procedures for Juvenile Patients with Cerebral Palsy and Scoliosis: A Prospective Comparative Cohort Study**

*Arun R. Hariharan, MD; Suken A. Shah, MD; Joseph Petfield, MD; Margaret Baldwin, MD; Carlos Pargas, MD; Paul D. Sponseller, MD; Burt Yaszay, MD; Michael P. Glotzbecker, MD; Patrick J. Cahill, MD; Tracey P. Bastrom, MA; Geraldine I. Neiss, PhD; Harms Study Group; Pediatric Spine Study Group*

# NEUROMUSCULAR SCOLIOSIS SOLUTIONS



# Location Information

## ABOUT ST. LOUIS

St. Louis, founded in 1764 is the second largest city in Missouri, USA. The city is on the banks of the Mississippi and Missouri Rivers. Its iconic, 630-foot Gateway Arch, built in the 1960s, honors the early 19<sup>th</sup> century explorations of Lewis and Clark and America's westward expansion in general.

## ARRIVING IN ST. LOUIS

St. Louis Lambert International Airport (STL) is the largest and busiest airport in Missouri with over 259 peak daily departures to 74 nonstop domestic and international locations.

STL is located approximately 15 miles (20-minute drive) from the Hyatt Regency St. Louis at The Arch, meeting venue and headquarters hotel. Upon arrival to STL, various forms of transportation, including taxis and ride-share services are available.

## PASSPORTS AND VISAS

Most international travelers are required to obtain a visa from the U.S. Department of State. For more information, visit <https://travel.state.gov/content/travel/en/us-visas.html>.

## CLIMATE

In St. Louis, in September, the average high-temperature is 80.2°F (26.8°C), and the average low-temperature is 60.6°F (15.9°C). The average humidity in September is 71.6%.

## TIME ZONE

St. Louis will be in US Central Daylight Time (CDT) during the Annual Meeting, which is one (1) hour behind US Eastern Daylight Time (EDT) and five (5) hours behind Greenwich Mean Time, GMT-5. St. Louis utilizes Daylight Saving Time.

## ELECTRICITY

The United States operates on 120 volts, compared to the standard 220 volts in Europe and uses a Type A or B Electrical plugs.



## SPINE DEFORMITY SOLUTIONS: A HANDS-ON COURSE

FROM THE SCOLIOSIS RESEARCH SOCIETY

**NOVEMBER 18-20, 2021**

National University Hospital | Advanced Surgical Training Center  
Singapore, Singapore

Course Chairs: Ahmet Alanay, MD; Munish C. Gupta, MD; Gabriel KP Liu, FRCS(Orth), MSC



# Registration Information

## REGISTRATION WEBPAGE

---

[www.srs.org/am21/registration](http://www.srs.org/am21/registration)

## DATES TO REMEMBER

---

Registration Opens for SRS Members and Meeting Speakers and Faculty

**May 20, 2021**

Registration Opens for Non-Members

**July 1, 2021**

In-Person Registration Deadline

**August 20, 2021**

Online Meeting Platform Close Date

**December 31, 2021**

The 56<sup>th</sup> Annual Meeting is a hybrid event allowing for a robust in-person program live from the Hyatt Regency St. Louis at The Arch in Missouri, USA as well as a virtual component where delegates are able to enjoy the Annual Meeting from an offsite location.

## IN-PERSON REGISTRATION

---

In-person registration includes onsite access to the Annual Meeting in St. Louis, MO, USA and access to the virtual meeting platform. **Due to COVID-19 restrictions, there is a limited capacity at the meeting venue.** Registration will first open on May 20 for SRS Members and Annual Meeting Speakers and Faculty. In-person registration will be available for non-members beginning July 1. If in-person registration sells out before you are able to register, you can be added to the [in-person registration waiting list](#) by registering for the virtual-only registration option.

We strongly encourage anyone planning to attend the meeting in-person to review the in-person attendance considerations available on the Annual Meeting website, [www.srs.org/am21/registration/considerations](http://www.srs.org/am21/registration/considerations).

## VIRTUAL-ONLY REGISTRATION

---

Virtual-only registration includes access to the Annual Meeting online platform for live and on-demand viewing. Annual Meeting content will be streamed live from the meeting allowing virtual attendees to experience many of the meeting elements in real time. If you are not able to coordinate times with the live sessions in US Central Daylight Time, recordings of the sessions will be available on the virtual meeting platform after the event for all meeting delegates. The virtual meeting platform will close on December 31 at 23:59 US CST.

## REGISTRATION PROCEDURE

---

SRS encourages individuals to register online at [www.srs.org/am21/registration](http://www.srs.org/am21/registration). However, delegates may also register by completing and mailing or faxing the registration form at the back of this program to the SRS office. All registrations will be confirmed via email. If you do not receive an email confirmation within two weeks of submission, please contact SRS at +1-414-289-9107 or [meetings@srs.org](mailto:meetings@srs.org).

## IN-PERSON REGISTRATION WAITING LIST

---

If in-person registration sells out before you are able to register, you can be added to the in-person registration waiting list by registering for the virtual-only registration option and selecting to be included on the in-person registration wait list. If an in-person registration spot becomes available, SRS staff will contact you to change your registration. The in-person registration waitlist will be first come/first serve by date of registration. Registering for the virtual meeting is the only way to be added to the in-person registration waitlist. Virtual meeting registration cannot be cancelled/refunded if you do not receive an in-person registration spot.

# Registration Information

## PRICING

Registration Class	In-Person Registration <i>for participation at the meeting in St. Louis, USA</i>	Virtual-Only Registration <i>for participation via the online meeting platform</i>
SRS Member Physician	\$1,050	\$840
SRS Member Non-Physician	\$600	\$480
SRS Emeritus Member	\$600	\$480
Non-Member Physician	\$1,400	\$1,120
Non-Member Non-Physician	\$750	\$600
Resident/Fellow/Medical Student	\$550	\$440
Delegate from Reduced Rate Country*	\$550	\$440
Industry Representative	\$1,450	\$1,160

\*Visits [www.srs.org/am21/registration](http://www.srs.org/am21/registration) for a list of countries that qualify for reduced rate registration.

## WHAT IS INCLUDED?

### In-Person Registration

- Entrance to the pre-meeting course, half-day courses, lunchtime symposia, and scientific sessions
- Admission to the opening ceremonies and industry workshops
- Meeting materials (name badge, program book, meeting app, USB with abstracts)
- Lunch and refreshment breaks
- Certificate of attendance and CME credits
- Access to the virtual meeting platform for on-demand viewing through December 31, 2021

### Virtual-Only Registration

- Access to the Annual Meeting content streamed live from the meeting for real-time viewing
- Access to the virtual meeting platform for on-demand viewing through December 31, 2021
- Meeting app with ARS capabilities for an interactive virtual meeting experience
- Hard copy of the Final Program
- Certificate of attendance and CME credits

# Registration Information

## IN-PERSON SESSION ADD-ONS

Add-on session registration is available for in-person participation only.

### Hibbs Society Meeting

**Tuesday, September 21 | 13:00-17:00**

*Available to in-person meeting delegates for an additional fee of \$50.*

Over the years, the Russell A. Hibbs Society, formed in 1947 as an international travel club for continuing medical education and furthering orthopaedic knowledge, has held an educational meeting at the SRS Annual Meeting. These meetings address difficult and complex issues that do not lend themselves to the usual kind of scientific presentations. The meeting encourages interaction among international participants and new ideas, new concepts, and reports on personal experience.

### Opening Ceremonies and Welcome Reception

*The Welcome Reception is supported, in part, by NuVasive, Medtronic, and OrthoPediatrics.*

**Wednesday, September 22 | 17:30-19:30**

*Available, at no charge, to in-person meeting delegates.*

The Annual Meeting will officially begin with the Opening Ceremonies and this year's Howard Steel Lecturer. The evening will include an introduction of the SRS officers, presentation of the Walter P. Blount Humanitarian Awards, and highlights from 2020.

### Early Career Surgeon Session

*The Early Career Surgeon Session is supported, in part, by Globus Medical, Inc.; DePuy Synthes; Medtronic; NuVasive; and Zimmer Biomet.*

**Thursday, September 23 | 17:30-19:00**

*Available, at no charge to in-person meeting delegates.*

The Early Career Surgeon Session is a part of SRS's recently developed Early Career Surgeon Program. The session features tips and tricks for the early career surgeon and offers a unique opportunity for SRS members and non-members to interact closely with their early career peers and senior experts, through didactic case-based discussion.

*Immediately following the Early Career Surgeon Session is an Early Career Surgeon Social hosted by Medtronic.*

### Farewell Reception

**Friday, September 24 | 19:30-22:00**

*Available to in-person meeting delegates for an additional fee of \$50.*

The 56<sup>th</sup> Annual Meeting will culminate with a reception open to all in-person meeting delegates. Tickets to the reception are \$50 for each registered delegate and must be purchased in advance, at the time of registration. A limited number of tickets are available. Cocktail dress is appropriate for the Farewell Reception.

## INDUSTRY REGISTRATION

In-person registration will open for industry representatives on July 1, 2021 and will be first-come, first-serve based on availability, regardless of company. If a representative is unable to attend the meeting in-person in St. Louis, USA, industry representatives are able to purchase the "virtual-only" registration option, which will allow real-time access to the content being streamed from the meeting.

## GUEST REGISTRATION

There is no guest registration option this year; however, guests wishing to attend the Annual Meeting sessions can register as non-member, non-physicians utilizing the delegate registration form. Please email [meetings@srs.org](mailto:meetings@srs.org) with questions.

## WIRE TRANSFERS

Registrants may pay their Annual Meeting registration fees by wire transfer. If you wish to pay with a wire transfer, please email [meetings@srs.org](mailto:meetings@srs.org) for more information.

## INVITATION LETTERS

Invitation letters for visa requests are available for registered delegates. Please visit the Annual Meeting [Travel page, www.srs.org/am21/travel](http://www.srs.org/am21/travel) for more information on requesting a letter of invitation.

## ONSITE REGISTRATION

Onsite registration is not available for the 56<sup>th</sup> Annual Meeting. No exceptions will be made.

## CANCELLATION AND REFUND POLICY

Full refunds, less a 10% processing fee, will be granted for the cancellation of in-person or virtual-only meeting registration, if received in writing within 48-hours from the time of registration. After 48-hours, in-person registration may only be reduced to virtual-only registration and virtual-only registration is non-refundable and non-transferable. If you wish to change your in-person registration to virtual-only registration, SRS will grant a full refund, less the difference of the virtual-only registration rate. No refunds will be granted after August 20, 2021. Cancellation and refund requests should be sent in writing via email to [meetings@srs.org](mailto:meetings@srs.org) or faxed to 414-276-3349. Delegates will receive a confirmation and refund within 14 days of receipt of their cancellation notice. The full cancellation and refund policy is available here: [www.srs.org/am21/registration/cancellation](http://www.srs.org/am21/registration/cancellation).

# Housing Information

## HOUSING WEBPAGE

[www.srs.org/am21/housing](http://www.srs.org/am21/housing)

## DATES TO REMEMBER

Housing Opens	May 20, 2021
Housing Reservation Deadline	August 20, 2021

## HEADQUARTERS HOTEL

A block of rooms is being held, courtesy of the Scoliosis Research Society, at the headquarters hotel and meeting venue, **Hyatt Regency St. Louis at The Arch**, located at 315 Chestnut Street, St. Louis, Missouri, US 63102.

## ROOM RATES

Single/Double Room:	\$199.00
Additional Person:	\$25.00

## METHOD OF RESERVATION

Online Reservations: [www.srs.org/am21/housing](http://www.srs.org/am21/housing)  
Reservation Department: +1-877-803-7534

All reservations, cancellations, and changes to reservations should be made directly through the Hyatt Regency St. Louis at The Arch.

Meeting attendees are responsible for making their own hotel reservations. Reservations can be made online at the link provided or by calling the hotel's reservation department and mentioning the group name, Scoliosis Research Society. A credit card is required in order to guarantee your reservation.

Attendees are encouraged to book their hotel reservations at the SRS headquarters hotel. Staying at the headquarters hotel not only allows attendees to take advantage of discounted room rates, but also puts them in close proximity to all meeting events for maximum interaction with fellow attendees and faculty and a hassle-free experience. Additionally, booking in the block helps the Society avoid penalties for not filling its hotel block, which keeps meeting expenses lower and thus registration rates, and achieve a consistent hotel booking history that helps SRS to continue to negotiate the lowest room rates possible for future meetings.

## RESERVATION CANCELLATIONS

Reservation cancellations should be made directly with the hotel. Cancellations and refunds are at the discretion of the hotel.



## SPINE DEFORMITY SOLUTIONS: A HANDS-ON COURSE OCTOBER 27-29, 2021

Radboud University Medical Center • Nijmegen, the Netherlands

**Course Chairs:** Ahmet Alanay, MD; Munish Gupta, MD; Marinus de Kleuver, MD, PhD







# SAVE *the* DATE



SCOLIOSIS RESEARCH SOCIETY **57<sup>th</sup>** ANNUAL MEETING

SEPTEMBER 20-23, 2022 • SYDNEY • AUSTRALIA



**SRS**

Scoliosis Research Society

# Meeting Outline *Subject to change*

<b>MONDAY, SEPTEMBER 20, 2021</b>	
8:00-17:00	SRS Board of Directors Meeting*
<b>TUESDAY, SEPTEMBER 21, 2021</b>	
7:00-13:00	Council Meetings*
12:00-17:00	Registration Open*
13:00-17:00	Hibbs Society Meeting
14:00-17:00	SRS Board of Directors Meeting*
18:30-21:00	SRS Leadership Dinner* (by invitation only)
<b>WEDNESDAY, SEPTEMBER 22, 2021</b>	
6:30-18:00	Registration Open*
7:30-12:00	Pre-Meeting Course
12:00-12:30	Boxed-lunch Pick-up*
12:30-13:30	Lunchtime Symposia (3 Concurrent Sessions)
13:30-14:00	Break*
14:00-15:30	Abstract Session 1
15:30-16:00	Break*
16:00-17:00	Case Discussions (3 Concurrent Sessions)
17:00-17:30	Break*
17:30-19:30	Opening Ceremonies and Welcome Reception*
<b>THURSDAY, SEPTEMBER 23, 2021</b>	
7:00-19:00	Registration Open*
8:00-9:55	Abstract Session 2
9:50-10:25	Break*
10:25-12:45	Abstract Session 3 and Harrington Lecture
12:45-13:30	Boxed-lunch Pick-up*
13:30-15:00	Industry Workshops* (5 Concurrent Sessions)
15:00-15:30	Break*
15:30-17:30	Half-Day Courses (2 Concurrent Sessions)
17:30-19:00	Early Career Surgeon Session
	Early Career Surgeon Social, Hosted By Medtronic

All times are listed in US Central Time.

\*Denotes Non-CME Session

# Meeting Outline *Subject to change*

<b>FRIDAY, SEPTEMBER 24, 2021</b>	
6:30-7:30	Past President's Breakfast*
7:00-17:00	Registration Open*
8:00-9:50	Abstract Session 4: Hibbs Award-Nominated Papers
9:50-10:20	Break*
10:20-12:00	Abstract Session 5 and Presidential Address
12:00-12:30	Boxed-lunch Pick-up*
12:30-14:15	Member Business Meeting and Lunch*
12:30-14:00	Lunchtime Symposium: A SRS-AANS Collaboration
14:15-14:45	Break*
14:45-16:10	Abstract Sessions 6 and 7 (2 Concurrent Sessions)
16:10-16:40	Break*
16:40-18:05	Abstract Sessions 8 and 9 (2 Concurrent Sessions)
18:30-19:30	Presidents Reception* (by invitation only)
19:30-22:00	Farewell Reception* (tickets required)
<b>SATURDAY, SEPTEMBER 25, 2021</b>	
7:30-10:00	Registration Open*
8:00-10:05	Abstract Session 10
10:05-10:35	Break*
10:35-12:35	Abstract Session 11
13:00-17:00	SRS Board of Directors Meeting*

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

## 12:00-17:00

### Registration Open

## 13:00-17:00

### Hibbs Society Meeting

Available to in-person meeting delegates for an additional fee of \$50.

The mission of the Hibbs Society is to foster communication and camaraderie amongst surgeons who travel and/or facilitate the Traveling Fellowship programs of the Scoliosis Research Society. The Society facilitates communication and camaraderie by the thoughtful exchange of innovative ideas, concepts, and treatment philosophies concerning spinal disorders that are based in careful clinical and basic science research.

### Management of Spinal Infections

Chairs: John M. Caridi, MD; Addisu Mesfin, MD; Gregory M. Mundis Jr., MD; George H. Thompson, MD

## 13:00-14:00

### Post Infectious Deformity

Moderators: John M. Caridi, MD & Addisu Mesfin, MD

13:00-13:05

#### Introduction

George H. Thompson, MD

13:05-13:15

#### Management of Osteomyelitis Associated Deformity

S. Rajasekaran, MD, FRCS, MCh, PhD

13:15-13:20

#### Case Discussion

Ajoy Prasad Shetty, MS Orth

13:20-13:30

#### Management of TB Associated Deformity in Pediatric Patients

Muharrem Yazici, MD

13:30-13:35

#### Case Discussion

Kwadwo Poku Yankey, MD

13:35-13:45

#### Management of TB Associated Adult Spinal Deformity

Oheneba Boachie-Adjei, MD, DSc

13:45-13:50

#### Case Discussion

Gokhan Demirkiran, MD

13:50-14:00

#### MRSA in Spine Surgery: Colonization, Infection and Prevention

John M. Caridi, MD

## 14:00-14:30

### Break

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

## 14:30-15:00

### Prevention of Infections in Neuromuscular Scoliosis and AIS

Moderators: Gregory M. Mundis Jr., MD & George H. Thompson, MD

- 14:30-14:40 **Prevalence of Infections in Pediatric Spine Patients**  
*Dror Ovadia MD*
- 14:40-14:45 **Case Discussion**
- 14:45-14:55 **Prevention Methods for Infections in Neuromuscular Scoliosis**  
*Muharrem Yazici, MD*
- 14:55-15:00 **Case Discussion**  
*Gokhan Demirkiran, MD*
- 15:00-15:10 **Management of the Patient with Delayed Infection After AIS Fusion**  
*Paul D. Sponseller, MD, MBA*
- 15:10-15:15 **Case Discussion**
- 15:15-15:25 **Prevention of Infections in Tethering Procedures**  
*Ahmet Alanay, MD*
- 15:25-15:30 **Case Discussion**  
*Caglar Yilgor, MD*

## 15:30-16:00

### Break

## 16:00-17:00

### Surgical Site Infections Following Adult Deformity and Spine Tumor Surgery

Moderators: John M. Caridi, MD & George H. Thompson, MD

- 16:00-16:10 **Role of P Acnes in Causing Degenerative Disc Disease**  
*S. Rajasekaran, MD, FRCS, MCh, PhD*
- 16:10-16:20 **Prevention Methods and Treatment of SSI in Adult Deformity**  
*Gregory M. Mundis Jr., MD*
- 16:20-16:25 **Case Discussion**  
*Hamid Hassanzadeh MD*
- 16:25-16:35 **Prevention and Management of Infections in Spine Tumor Surgery**  
*Addisu Mesfin, MD*
- 16:35-16:55 **Discussion**
- 16:55-17:00 **Conclusion**  
*George H. Thompson, MD*

## 6:30-18:00

### Registration Open

All times are listed in US Central Time.

\*Denotes Non-CME Session



Challenging what is possible  
in surgical spine technologies

On the **MOVE.**

[Orthofix.com](http://Orthofix.com)

OFS-2110.1 © Orthofix Medical Inc. 4/2021

 **ORTHOFIX**® | SPINE

Program (topics, timing, and faculty) are preliminary and subject to change.

## 7:30-12:00

### Pre-Meeting Course

The Pre-Meeting Course is supported, in part, by Globus Medical, Inc. and NuVasive.

#### Spine is Just the Tip of the Iceberg: Comprehensive Management of the Patient with Spine Deformity and Surgeon

Chair: Amer F. Samdani, MD Co-Chairs: Michael P. Kelly, MD & Justin S. Smith, MD, PhD

## 7:30-8:55

### Part 1: Challenges that Present in Childhood

Moderators: Meric Enercan, MD & Amer F. Samdani, MD; e-Moderator: Burt Yaszay, MD

- 7:30-7:35 **Course Welcome**  
*Amer F. Samdani, MD*
- 7:35-7:43 **Neurofibromatosis: Medical Considerations**  
*Stephanie M. Morris, MD*
- 7:43-7:49 **Neurofibromatosis: Surgical Considerations**  
*Steven W. Hwang, MD*
- 7:49-7:57 **Spinal Muscular Atrophy: Medical Considerations**  
*Craig M. Zaidman, MD*
- 7:57-8:03 **Spinal Muscular Atrophy: Surgical Considerations**  
*Michael G. Vitale, MD, MPH*
- 8:03-8:12 **Discussion**
- 8:12-8:20 **Cerebral Palsy: Medical Considerations**  
*Tony Pearson, MD*
- 8:20-8:26 **Cerebral Palsy: Surgical Considerations**  
*Selina C. Poon, MD*
- 8:26-8:34 **Osteogenesis Imperfecta: Medical Considerations**  
*Gary S. Gottesman, MD*
- 8:34-8:40 **Osteogenesis Imperfecta: Surgical Considerations**  
*Suken A. Shah, MD*
- 8:40-8:49 **Discussion**
- 8:49-8:55 **Summary Perspective: Pediatric**  
*Paul D. Sponseller, MD, MBA*

## 8:55-10:15

### Part 2: Adult Challenges

Moderators: Michael P. Kelly, MD & Justin S. Smith, MD, PhD; e-Moderator: Addisu Mesfin, MD

- 8:55-9:03 **Degenerative Scoliosis and Refractory Pain in the Octogenarian: Medical Considerations**  
*Mahshid Mohseni, MD*
- 9:03-9:09 **Degenerative Scoliosis and Refractory Pain in the Octogenarian: Surgical Considerations**  
*Christopher I. Shaffrey, MD*
- 9:09-9:17 **Global Sagittal and Coronal Malalignment in the Patient with Parkinson's: Medical Considerations**  
*James F. Alonso, MD*
- 9:17-9:23 **Global Sagittal and Coronal Malalignment in the Patient with Parkinson's: Surgical Considerations**  
*Heiko Koller, MD*
- 9:23-9:32 **Discussion**

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

- 9:32-9:40      **The Obese Diabetic Patient Who Smokes: Medical Considerations**  
*Devyani Hunt, MD*
- 9:40-9:46      **The Obese Diabetic Patient Who Smokes: Surgical Considerations**  
*Juan S. Uribe, MD*
- 9:46-9:54      **Other Comorbid Conditions: Renal and Cardiac: Medical Considerations**  
*Stephen H. Gregory, MD*
- 9:54-10:00     **Other Comorbid Conditions: Renal and Cardiac: Surgical Considerations**  
*Ferran Pellisé, MD, PhD*
- 10:00-10:09    **Discussion**
- 10:09-10:15    **Summary Perspective: Adult**  
*Lawrence G. Lenke, MD*

## 10:15-10:45

### Break

## 10:45-12:00

### Part 3: Mental Health Impact on the Patient and Provider

Moderators: *Baron S. Lonner, MD & David S. Marks, FRCS, FRCS(Orth)*; e-Moderator: *Jennifer M. Bauer, MD, MS*

- 10:45-10:55     **Management of the Adult Patient with Mental Health Challenges**  
*Munish C. Gupta, MD*
- 10:55-11:05     **The Psychological Burden of Early Onset Scoliosis**  
*Muharrem Yazici, MD*
- 11:05-11:15     **Discussion**
- 11:15-11:25     **Burnout, Substance Abuse and Suicide: Are We Any Better at Helping Ourselves?**  
*Todd J. Albert, MD*
- 11:25-11:35     **Strategies to Handle the Misery: Second Victim Syndrome**  
*Marinus de Kleuver, MD, PhD*
- 11:35-11:45     **Panel Discussion**
- 11:45-11:55     **Discussion**
- 11:55-12:00     **Closing Comments**  
*Amer F. Samdani, MD*

## 12:00-12:30

### Boxed Lunch Pick-Up

## 12:30-13:30

### Lunchtime Symposia (Three Concurrent Sessions)

The Lunchtime Symposia are supported, in part, by *Globus Medical, Inc.*; *NuVasive*; and *Zimmer Biomet*.



Program (topics, timing, and faculty) are preliminary and subject to change.

## 12:30-13:30

### LTS A. My Worst Complication and How I Dealt with It

Moderators: Michael P. Kelly, MD & Gregory M. Mundis Jr., MD

- 12:30-12:35 **Case Presentation: Permanent Neurologic Deficit**  
*Munish C. Gupta, MD*
- 12:35-12:45 **Dealing with Patients and Yourself Amidst a Chronic Condition You Induced**  
*Behrooz A. Akbarnia, MD*
- 12:45-12:50 **Case Presentation: Perioperative Death**  
*Michael P. Kelly, MD*
- 12:50-12:55 **Discussion**
- 12:55-13:15 **Does Death of a Patient Result in a Small Death of Ourselves: Lessons Learned from Cardiovascular Surgery**  
*G. Alexander Patterson, MD*
- 13:15-13:30 **How Should Surgeons Engage in Active Recovery from a Major Complication**  
*Washington University Helpline*

## 12:30-13:30

### LTS B. Artificial Intelligence and Computerized Decision Support Tools

Moderators: Christopher P. Ames, MD & Ferran Pellisé, MD, PhD

- 12:30-12:40 **Introduction: Use of Big Data for Risk and Outcome Prediction - Why is it Critical?**  
*Christopher P. Ames, MD*
- 12:40-12:50 **Current State of the Art in Adult Risk and Outcome Prediction Tools**  
*Ferran Pellisé, MD, PhD*
- 12:50-13:00 **Moving from Dashboards to AI for Quality Benchmarking in Complex Disease**  
*Shay Bess, MD*
- 13:00-13:05 **Discussion**
- 13:05-13:15 **Benchmarking in the AIS Population**  
*Michelle C. Marks, PT, MA*
- 13:15-13:25 **AI Predicting Scoliosis Progression and VBT Application**  
*Stefan Parent, MD, PhD*
- 13:25-13:30 **Discussion**

## 12:30-13:30

### LTS C. Vertebral Body Tethering: Topics for Debate and Discussion

Moderator: Amer F. Samdani, MD & Michelle C. Welborn, MD

- 12:30-12:31 **Introduction**  
*Michelle C. Welborn, MD*
- 12:31-12:36 **Tips on Doing Your First Tether**  
*Lawrence L. Haber, MD*

#### Debate 1

Moderator: Daniel G. Hoernschemeyer, MD

- 12:36-12:41 **Tethering is Only Indicated in Skeletally Immature Patients**  
*Michelle C. Welborn, MD*
- 12:41-12:46 **Tethering is Indicated in Select Skeletally Mature Patients**  
*Baron S. Lonner, MD*
- 12:46-12:51 **Discussion**  
*Moderator: Suken A. Shah, MD*

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

12:51-12:56 **Technical Tips: Level Selection and Tensioning**  
Firoz Miyanji, MD, FRCSC

12:56-13:01 **Reoperations: Incidence and Tips**  
Amer F. Samdani, MD

## Debate 2

Moderator: A. Noelle Larson, MD

13:01-13:06 **Thoracolumbar Curve: Fusion Remains the Gold Standard**  
Peter O. Newton, MD

13:06-13:11 **Thoracolumbar Curve: Tethering is the Best Treatment**  
Randal R. Betz, MD

13:11-13:16 **Discussion**  
Moderator: Amer F. Samdani, MD

13:16-13:30 **Panel Case Discussion**  
Randal R. Betz, MD; Lawrence L. Haber, MD; Baron S. Lonner, MD; Michelle C. Welborn, MD

## 13:30-14:00

### Break

## 14:00-15:30

### Abstract Session 1. Adolescent Idiopathic Scoliosis I

14:00-14:05 **Welcome**

14:05-14:09 **Paper #1: Retrospective Matched Comparison Study on Anterior Vertebral Body Tethering (AVBT) versus Posterior Spinal Fusion (PSF) for Primary Thoracic Curves**  
*Peter O. Newton, MD*; Firoz Miyanji, MD; Ahmet Alanay, MD; Dan Hoernschemeyer, MD; Stefan Parent, MD, PhD; Baron S. Lonner, MD; Kevin M. Neal, MD; Laurel C. Blakemore, MD; Tracey P. Bastrom, MA; Harms Non-Fusion Study Group

14:09-14:13 **Paper #2: Unsuccessful Vertebral Body Tethering: Incidence and Predictive Factors**  
*Amer F. Samdani, MD*; Joshua M. Pahys, MD; Solomon Samuel, D. Eng.; Alejandro Quinonez, BS; Erica Johnson, BS; Hannah Miravich, BS; Ross Chafetz, PhD; Steven W. Hwang, MD

14:13-14:17 **Paper #3: Does LIV Selection Affect Radiographic Outcomes in Vertebral Body Tethering? Analysis of a Prospective Case Series of 102 Patients from the PSSG Database**  
*Kenny Y. Kwan, MD*; Chris Yuk Kwan Tang, MBBS, FRCS; Stefan Parent, MD, PhD; Ron El-Hawary, MD; Firoz Miyanji, MD; Kenneth M. Cheung, MD, MBBS, FRCS

14:17-14:26 **Discussion**

14:26-14:30 **Paper #4: Predicting Overcorrection in AVBT: Can We Improve Patient Selection?**  
*Firoz Miyanji, MD*; Peter O. Newton, MD; Baron S. Lonner, MD; Ahmet Alanay, MD; Dan Hoernschemeyer, MD; Kevin M. Neal, MD; Amer F. Samdani, MD; Tracey P. Bastrom, MA; Harms Non-Fusion Study Group

14:30-14:34 **Paper #5: Operative Differences for PSF After VBT: Are We Fusing More Levels in the End?**  
*Dan Hoernschemeyer, MD*; Melanie Boeyer, PhD; Ahmet Alanay, MD; Kevin M. Neal, MD; A. Noelle Larson, MD; Stefan Parent, MD, PhD; Peter O. Newton, MD; Firoz Miyanji, MD; Lawrence L. Haber, MD; Harms Non-Fusion Study Group

14:34-14:38 **Paper #6: Results of Fusion after Failed Anterior Vertebral Body Tethering**  
*Amer F. Samdani, MD*; Joshua M. Pahys, MD; Solomon Samuel, D. Eng.; Taylor Blondell, BS; Alejandro Quinonez, BS; Erica Johnson, BS; Hannah Miravich, BS; Steven W. Hwang, MD

14:38-14:47 **Discussion**

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

- 14:47-14:51 **Paper #7: Estimating the Risk of Scoliosis Progression in Adolescent Idiopathic Scoliosis Based on Skeletal Maturity**  
 Mitchell A. Johnson, BS; Shivani Gohel, BS; John (Jack) M. Flynn, MD; Jason B. Anari, MD; Patrick J. Cahill, MD; Stuart L. Mitchell, MD; Jennifer J. Winell, MD; Keith Baldwin, MD, MPH, MSPT
- 14:51-14:55 **Paper #8: Could Have Tethered, Glad We Didn't: A Review of AIS Patients Meeting Anterior Vertebral Body Tethering Criteria While Bracing**  
Ryan Guzek, BS; Mitchell A. Johnson, BS; Arielle R. Krakow, BA; Lacey Magee, BA; Lori Jia, BS; Keith Baldwin, MD, MPH, MSPT; Jennifer J. Winell, MD; John (Jack) M. Flynn, MD
- 14:55-14:59 **Paper #9: 2 to 5-years Follow-up Results after Thoracoscopic VBT: A Single Surgeon's Experience**  
Ahmet Alanay, MD; Altug Yucekul, MD; Kadir Abul, MD; Ilkay Karaman, MD; Atahan Durbas ; Tais Zulemyan, MD; Gokhan Ergene, MD; Sahin Senay, MD; Sule Turgut Balci, MD; Pinar Yalinay Dikmen, MD; Yasemin Yavuz, PhD; Caglar Yilgor, MD
- 14:59-15:09 **Discussion**
- 15:09-15:13 **Paper #10: Thoracolumbar Curve Behavior after Selective Thoracic Anterior Vertebral Body Tethering in Lenke 1A vs Lenke 1C Curve Patterns**  
Michelle C. Welborn, MD; Laurel C. Blakemore, MD; Cameron Hanford, MD; Frank Rodgers, MD; Firoz Miyanji, MD; Ron El-Hawary, MD; Pediatric Spine Study Group; Stefan Parent, MD, PhD
- 15:13-15:17 **Paper #11: Sagittal Alignment after Vertebral Body Tethering: 2 Years Follow-up**  
Alice Baroncini, MD, PhD; Filippo Migliorini, MD; Per D. Trobisch, MD
- 15:17-15:21 **Paper #12: 10-year Follow-up of Lenke V Curves in Patients with Adolescent Idiopathic Scoliosis**  
Nicholas D. Fletcher, MD; Tracey P. Bastrom, MA; A. Noelle Larson, MD; Baron S. Lonner, MD; Burt Yaszay, MD; Mark A. Erickson, MD; Stefan Parent, MD, PhD; Harms Study Group
- 15:21-15:30 **Discussion**

## 15:30-16:00

Break

## 16:00-17:00

Case Discussions (Three Concurrent Sessions)

### 16:00-17:00

#### Case Discussion 1. Neurovascular Perioperative Complications

Moderators: Kariman Abelin Genevois, MD, PhD, Carol C. Hasler, MD & Gregory M. Mundis, MD

- 16:00-16:15 **1A. Hemodynamic Instability from Patient Positioning with Pectus Excavatum Leading to Procedural Discontinuance**  
Terry D. Amaral, MD; Sayyida Hasan, BS; Jesse Galina, BS; Aaron M. Atlas, BS; Vishal Sarwahi, MD, MBBS
- 16:15-16:30 **1B. The Use of D-Waves as a Prognostic Tool after Signal Loss in Complex Spinal Deformity Surgery**  
Gulsen Oztosun; Altug Yucekul, MD; Irem Havlucu; Tais Zulemyan, MD; Caglar Yilgor, MD; Elif Ilgaz Aydinlar, MD; Ahmet Alanay, MD; Pinar Yalinay Dikmen, MD
- 16:30-16:45 **1C. Delayed Post-operative Spinal Cord Ischemia after Posterior Spinal Fusion in a Pediatric Patient with Syrinx and Decompressed Chiari**  
Jennifer M. Bauer, MD; Sebastian E. Welling, BS
- 16:45-17:00 **1D. Delayed Presentation of Quadriplegia Due to Cervical Cord Ischaemia Following Posterior Scoliosis Correction and Thoracolumbar Spinal Instrumentation for Lenke Type 1AR Adolescent Idiopathic Scoliosis**  
Vigneshwara M. Badikillaya, MD; Keyur Akbari, MD; Muralidharan Venkatesan, MD; Pramod Sudarshan, MD; Sajjan K. Hegde, MD

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

## 16:00-17:00

### Case Discussion 2. Neuromuscular/Syndromic

Moderators: Lori A. Karol, MD, Firoz Miyanji, MD, FRCSC & Muharrem Yazici, MD

16:00-16:15 **2A. Surgical Management of Cervicothoracic Lordoscoliosis in an Emery-Dreifuss VI Muscular Dystrophy Patient: A Case Discussion**

*Brandon A. Ramo, MD*; Devan James Devkumar; Daniel J. Sucato, MD, MS

16:15-16:30 **2B. Vertebral Column Resection for Correction of Right Bronchus Occlusion from Thoracic Lordosis**

*Richard E. McCarthy, MD*; David B. Bumpass, MD

16:30-16:45 **2C. Don't Underestimate Preoperative Kyphosis in Cerebral Palsy**

*Margaret Baldwin, MD*; Julieanne P. Sees, MD; Suken A. Shah, MD

16:45-17:00 **2D. Shorter Fusion in Neuromuscular Scoliosis Patients Give Rise to Long-Term Problems**

*Vishal Sarwahi, MD, MBBS*; Sayyida Hasan, BS; Jesse Galina, BS; Aaron M. Atlas, BS; Terry D. Amaral, MD

## 16:00-17:00

### Case Discussion 3. Novel approaches to Instrumentation

Moderators: David L. Skaggs, MD, Ilkka Helenius, MD, PhD & Kristen Jones, MD

16:00-16:15 **3A. The First MCGR in the World: Lessons Learned Over the Past 10 years from Implantation to Graduation**

*Jason Pui Yin Cheung, MD, MBBS, MS, FRCS*; Teng Zhang, PhD; Kenneth Cheung, MD, MBBS, FRCS

16:15-16:30 **3B. The Iliac Kickstand Screw: A Novel Pelvic Screw for Correction of Coronal Spinal Imbalance**

*James D. Lin, MD*; Joseph M. Lombardi, MD; Jun Kim, MD; Joseph A. Osorio, MD, PhD; Meghan Cerpa; Melvin C. Makhni, MD; Lawrence G. Lenke, MD

16:30-16:45 **3C. Tether Breakage in a Mature Thoracolumbar Double Row Vertebral Body Tethering Patient**

*Altug Yucekul, MD*; Gokhan Ergene, MD; Ipek Ege Gurel; Atahan Durbas; Caglar Yilgor, MD; Irem Havlucu; Tais Zulemyan, MD; Pinar Yalinay Dikmen, MD; Binnaz Ay, MD; Sahin Senay, MD; Ahmet Alanay, MD

16:45-17:00 **3D. Management of AIS with Double Major Curves with Combination of Posterior Pedicle Screw Fixation-Fusion for Thoracic and Vertebral Body Tethering for Thoracolumbar/Lumbar Curves (Hybrid Technique)**

*Merik Enercan, MD*; Mustafa Eltayep, MD; Huseyin Ozturk, MD; Seray Gizem Gur, MD; Ayhan Mutlu, MD; Sinan Kahraman, MD; Tunay Sanli; Selhan Karadereler, MD; Azmi Hamzaoglu, MD

## 17:00-17:30

### Break

## 17:30-19:30

### Opening Ceremonies and Welcome Reception

The Welcome Reception is supported, in part, by NuVasive, Medtronic, and OrthoPediatrics.

17:30-17:35 **Welcome to St. Louis**

*Munish C. Gupta, MD, Local Host*

17:35-17:40 **Presidential Welcome**

*Muharrem Yazici, MD*

17:40-17:45 **Presentation of the 2020 Hibbs Awards for Best Basic Science and Clinical Research Papers**

*Presentation by Lindsay M. Andras, MD*

17:45-18:05 **Presentation of the 2020 Lifetime Achievement Awards**

*Introductions by Muharrem Yazici, MD & Peter O. Newton, MD*

*Award Recipients: Jean Dubousset, MD & Stuart L. Weinstein, MD*

18:05-18:15 **Presentation of the 2020 and 2021 Walter P. Blount Humanitarian Awards**

*Presentation by Kenneth J. Paonessa, MD, Awards & Scholarships Committee Chair*

*2020 Award Recipient: Francisco Javier Sánchez Pérez-Gruesso Sr., MD*

*2021 Award Recipient: Kenneth MC Cheung, MD*

All times are listed in US Central Time.

\*Denotes Non-CME Session

*Program (topics, timing, and faculty) are preliminary and subject to change.*

- 18:15-18:30     **Corporate Partners Acknowledgement**  
*Presentation by Paul D. Sponseller, MD, MBA, Corporate Relations Committee Chair*
- 18:30-18:40     **Lori A. Karol, MD Recognition**  
*Paul D. Sponseller, MD, MBA*
- 18:40-18:55     **Celebrating Tressa Goulding**  
*Paul D. Sponseller, MD, MBA & Muharrem Yazici, MD*
- 18:55-19:00     **Introduction of the Howard Steel Lecturer**  
*Muharrem Yazici, MD*
- 19:00-19:25     **Howard Steel Lecture: K2 the Mountain Of Mountains**  
*Tunç Fındık*
- 19:25-19:30     **Closing Remarks**  
*Muharrem Yazici, MD*

*All times are listed in US Central Time.*

*\*Denotes Non-CME Session*

Program (topics, timing, and faculty) are preliminary and subject to change.

7:00-19:00

## Registration Open

8:00-9:50

## Abstract Session 2. Adult Deformity I

Moderators: Han Jo Kim, MD & Mitsuru Yagi, MD, PhD

- 8:00-8:04 **Welcome**
- 8:04-8:08 **Paper #13: Fixed Coronal Malalignment (CM) Independently Impacts Disability in Adult Spinal Deformity (ASD) Patients when Considering the Obeid-CM (O-CM) Classification**  
*Louis Boissiere, MD*; Anouar Bourghli, MD; Daniel Larrieu, PhD; Ahmet Alanay, MD; Frank S. Kleinstueck, MD; Ferran Pellisé, MD, PhD; Javier Pizones, MD, PhD; David C. Kieser, MD, PhD; Ibrahim Obeid, MD
- 8:08-8:12 **Paper #14: Postoperative Coronal Malalignment after Adult Spinal Deformity Surgery: Incidence, Risk Factors, and Impact on 2-year Outcomes**  
*Scott Zuckerman, MD*; Christopher Lai, BS; Yong Shen, BS; Meghan Cerpa, MPH; Ian A. Buchanan, MD; Mena G. Kerolus, MD; Nathan J. Lee, MD; Eric Leung, BS; Alex Ha, MD; Zeeshan M. Sardar, MD; Ronald A. Lehman, MD; Lawrence G. Lenke, MD
- 8:12-8:16 **Paper #15: Comparative Effectiveness of Ant-IF vs. Post-IF in ASD Surgery: A Propensity Score Based Analysis**  
*Susana Núñez Pereira, MD*; Alba Vila-Casademunt, MS; Maria Capdevila-Bayo, MS; Aleix Ruiz de Villa, PhD; Sleiman Haddad, MD, PhD, FRCS; Frank S. Kleinstueck, MD; Javier Pizones, MD, PhD; Manuel Ramirez Valencia, MD; Ibrahim Obeid, MD; Ahmet Alanay, MD; Anne F. Mannion, PhD; Ferran Pellisé, MD, PhD; European Spine Study Group
- 8:16-8:25 **Discussion**
- 8:25-8:29 **Paper #16: Fractional Curve Correction using TLIF vs. ALIF in Adult Scoliosis**  
*Thomas J. Buell, MD*; Christopher I. Shaffrey, MD; Shay Bess, MD; Han Jo Kim, MD; Eric O. Klineberg, MD; Virginie Lafage, PhD; Renaud Lafage, MS; Themistocles S. Protopsaltis, MD; Peter G. Passias, MD; Gregory M. Mundis, MD; Robert K. Eastlack, MD; Vedat Deviren, MD; Michael P. Kelly, MD; Alan H. Daniels, MD; Jeffrey L. Gum, MD; Alex Soroceanu, MPH; D. Kojo Hamilton, MD; Munish C. Gupta, MD; Douglas C. Burton, MD; Richard Hostin, MD; Khaled M. Kebaish, MD; Robert A. Hart, MD; Frank J. Schwab, MD; Christopher P. Ames, MD; Justin S. Smith, MD, PhD; International Spine Study Group
- 8:29-8:33 **Paper #17: Central Sacral Pelvic Line (CSPL) is a Useful Radiographic Parameter that Correlates with Clinical Outcomes of Coronal Alignment after Spine Deformity Surgery**  
*Alex Ha, MD*; Scott Zuckerman, MD; Josephine R. Coury, MD; Nathan J. Lee, MD; Xavier E. Ferrer, MD; Ian A. Buchanan, MD; Mena G. Kerolus, MD; Meghan Cerpa, MPH; Joseph M. Lombardi, MD; Marc D. Dyrszka, MD; Zeeshan M. Sardar, MD; Ronald A. Lehman, MD; Lawrence G. Lenke, MD
- 8:33-8:37 **Paper #18: Radiographic Malalignment Has a Far Greater Impact on Clinical Outcomes than Perioperative and Postoperative Complications in ASD Surgery**  
Oscar Krol, BS; *Peter G. Passias, MD*; Virginie Lafage, PhD; Renaud Lafage, MS; Justin S. Smith, MD, PhD; Breton G. Line, BS; Shaleen Vira, MD; Alan H. Daniels, MD; Bassel G. Diebo, MD; Jeffrey L. Gum, MD; Khaled M. Kebaish, MD; Paul Park, MD; Gregory M. Mundis, MD; Richard Hostin, MD; Munish C. Gupta, MD; Robert K. Eastlack, MD; Neel Anand, MD; Christopher P. Ames, MD; Robert A. Hart, MD; Douglas C. Burton, MD; Frank J. Schwab, MD; Christopher I. Shaffrey, MD; Eric O. Klineberg, MD; Shay Bess, MD; International Spine Study Group
- 8:37-8:46 **Discussion**
- 8:46-8:50 **Paper #19: Preoperative Paraspinal Fat Atrophy of the Upper Instrumented Vertebrae Musculature in Spine Deformity Surgery is a Risk Factor for Proximal Junctional Kyphosis and Sagittal Malalignment**  
*Alex Ha, MD*; Justin Mathew, MD; Xavier E. Ferrer, MD; Josephine R. Coury, MD; Luzzi J. Andrew, MD; Daniel Hong, MD; Scott Zuckerman, MD; Ian A. Buchanan, MD; Mena G. Kerolus, MD; Meghan Cerpa, MPH; Joseph M. Lombardi, MD; Marc D. Dyrszka, MD; Zeeshan M. Sardar, MD; Ronald A. Lehman, MD; Lawrence G. Lenke, MD
- 8:50-8:54 **Paper #20: Dynamic Assessment Sagittal Spinal Parameter after 10 minutes of Walking Predicts Mechanical Failure and Revision of PJK**  
*Junseok Bae, MD*; Sang-Ho Lee, MD, PhD

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

- 8:54-8:58 **Paper #21: C2 Pelvic Angle (C2PA) is a Useful Intraoperative Radiographic Parameter that Correlates with the Risk of Developing Proximal Junctional Kyphosis Postoperatively**  
*Alex Ha, MD*; Justin Mathew, MD; Xavier E. Ferrer, MD; Josephine R. Coury, MD; Luzzi J. Andrew, MD; Daniel Hong, MD; Gerard F. Marciano, MD; Scott Zuckerman, MD; Ian A. Buchanan, MD; Mena G. Kerolus, MD; Meghan Cerpa, MPH; Joseph M. Lombardi, MD; Marc D. Dyrszka, MD; Zeeshan M. Sardar, MD; Ronald A. Lehman, MD; Lawrence G. Lenke, MD
- 8:58-9:07 **Discussion**
- 9:07-9:11 **Paper #22: Using Normal to Find Normal: Identifying Individualized Lordosis Alignment Targets**  
*Jeffrey M. Hills, MD*; Zeeshan M. Sardar, MD; Jean-Charles Le Huec, MD; Stephane Bourret, PhD; Kazuhiro Hasegawa, MD, PhD; Hee-Kit Wong, FRCS; Gabriel KP Liu, MD; Hend Riahi, MD; Hwee Weng Dennis Hey, MD; Lawrence G. Lenke, MD; Michael P. Kelly, MD
- 9:11-9:15 **Paper #23: The Clinical Benefit of Addressing the Malalignment In Revision Surgery for Proximal Junctional Kyphosis Following ASD Surgery**  
*Peter G. Passias, MD*; Oscar Krol, BS; Virginie Lafage, PhD; Renaud Lafage, MS; Justin S. Smith, MD, PhD; Breton G. Line, BS; Shaina Lipa, MD; Themistocles S. Protosaltis, MD; Alan H. Daniels, MD; Bassel G. Diebo, MD; Shaleen Vira, MD; Robert K. Eastlack, MD; Gregory M. Mundis, MD; Richard Hostin, MD; Munish C. Gupta, MD; Neel Anand, MD; Christopher P. Ames, MD; Robert A. Hart, MD; Douglas C. Burton, MD; Frank J. Schwab, MD; Christopher I. Shaffrey, MD; Eric O. Klineberg, MD; Han Jo Kim, MD; Shay Bess, MD; International Spine Study Group
- 9:15-9:19 **Paper #24: Correcting ASD Patients to Normative Alignment Results in No Functional Benefit but More PJK and PJF**  
*Themistocles S. Protosaltis, MD*; Alex Soroceanu, MPH; Renaud Lafage, MS; Han Jo Kim, MD; Eaman Balouch, MD, PhD; Zoe Norris, BFA; Justin S. Smith, MD, PhD; Alan H. Daniels, MD; Eric O. Klineberg, MD; Christopher P. Ames, MD; Robert A. Hart, MD; Shay Bess, MD; Christopher I. Shaffrey, MD; Frank J. Schwab, MD; Lawrence G. Lenke, MD; Virginie Lafage, PhD; Munish C. Gupta, MD; International Spine Study Group
- 9:19-9:28 **Discussion**
- 9:28-9:32 **Paper #25: Comparison of Sagittal Vertical Axis Correction after L4 vs. L3 Pedicle Subtraction Osteotomies**  
Joshua Rivera ; Praveen V. Mummaneni, MD; Jeremy Guinn, BS; Hao-Hua Wu, MD; Minghao Wang, MD, PhD; Pingguo Duan, MD; Zhuo Xi, MD; Justin Lee, MD; Burooj Mahmood, MD; Parishkrita Srivastava ; Rafael Guizar III ; Xiao Tan, BS; Jeremy Huang, BS; John K. Yue, MD; Vivian Le, MPH; Shane Burch, MD; Sigurd H. Berven, MD; *Dean Chou, MD*
- 9:32-9:36 **Paper #26: Delayed Staging during Same Hospitalization Increases Complication Risk following Adult Spinal Deformity Surgery**  
*Brian J. Neuman, MD*; Kevin Y. Wang, BS; Emmanuel McNeely, MS; Eric O. Klineberg, MD; Justin S. Smith, MD, PhD; Shay Bess, MD; Virginie Lafage, PhD; Peter G. Passias, MD; Themistocles S. Protosaltis, MD; Jeffrey L. Gum, MD; Christopher P. Ames, MD; Christopher I. Shaffrey, MD; Khaled M. Kebaish, MD; International Spine Study Group
- 9:36-9:40 **Paper #27: Pelvic Fixation Using the S2AI Technique in ASD Surgery: Ten-year Clinical and Radiographic Follow-up**  
*Varun Puvanesarajah, MD*; Kevin Y. Wang, BS; Micheal Raad, MD; Floreana N. Kebaish, MD; Paul D. Sponseller, MD; Khaled M. Kebaish, MD
- 9:40-9:50 **Discussion**

9:50-10:25

Break

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

10:25-12:45

### Abstract Session 3. Early Onset Scoliosis/Kyphosis

Moderators: Brice Ilharreborde, MD, PhD & Scott John Luhmann, MD

- 10:25-10:29 **Paper #28: The Basic Science Supporting Rib Fixation Rather than Spinal for Early Onset Hyperkyphotic Deformity**  
Daniel Bonthius, BS; Mohammed Alshareef, MD; Zeke J. Walton, MD; Alison Smith, DVM; Richard H. Gross, MD; Hai Yao, PhD
- 10:29-10:33 **Paper #29: The Effect of Apical Vertebra Position on Growing Rod Treatment: A Clinical and Finite Element Study**  
Gokay Dursun, MD; Riza Mert Cetik, MD; Dilek Guzel, BS; Gokhan H. Demirkiran, MD; Ercan Gurses, BS; Muharrem Yazici, MD
- 10:33-10:36 **Paper #30: Sagittal Alignment Changes During Childhood: Results of a National Cohort Analysis of 1078 Healthy Children**  
Sebastien Pesenti, MD, PhD; Brice Ilharreborde, MD, PhD; Federico Solla, MD; Benjamin Blondel, MD, PhD; Solène Prost, MD; Erik-André Sauleau, MD, PhD; Yann Philippe Charles, MD, PhD
- 10:36-10:45 **Discussion**
- 10:45-10:49 **Paper #31: Salvaging of Magnetically Controlled Growing Rods in Deep Wound Infections Does Not Lead to Increased Rates of Recurrent Infection in Early Onset Scoliosis**  
Krishna Vangipuram Suresh, BS; Majd Marrache, MD; Paul D. Sponseller, MD; Pediatric Spine Study Group
- 10:49-10:53 **Paper #32: Matched Comparison of Growing Rods versus Primary Posterior Spinal Fusion in “Tweeners” with Early Onset Scoliosis**  
Lukas G. Keil, MD; Alysa B. Nash, MD; Til Stürmer, MPH; Yvonne M. Golightly, PT; Feng-Chang Lin, PhD; Joseph D. Stone, MD; James O. Sanders, MD; Craig R. Louer, MD
- 10:53-10:57 **Paper #33: Lung Parenchymal Characterization via Thoracic Dynamic MRI (dMRI) in Pediatric Patients with Early Onset Scoliosis (EOS): A Novel Approach**  
Yubing Tong, PhD; Jayaram K. Udupa, PhD; Joseph M. McDonough, MS; Chamith Rajapakse, PhD; Caiyun Wu, MS; Carina Lott, MS; Robert H. Carson, BSRT; Jason B. Anari, MD; Drew A. Torigian, MA; Patrick J. Cahill, MD
- 10:57-11:06 **Discussion**
- 11:06-11:10 **Paper #34: Upper Instrumented Vertebra (UIV) Selection Matters: Increased Risk of Proximal Junctional Kyphosis When UIV Is Closer to the Apex in Scheuermann’s Kyphosis**  
Adam N. Fano, BS; Hiroko Matsumoto, PhD; Benjamin D. Roye, MD; Lawrence G. Lenke, MD; Elizabeth Herman, BA; Afrain Z. Bobby, MS, BS; Luzzi J. Andrew, MD; Peter O. Newton, MD; Baron S. Lonner, MD; Michael G. Vitale, MPH; Harms Study Group
- 11:10-11:14 **Paper #35: To Prevent PJK in Scheuermann’s Kyphosis, Restore Kyphosis to Patient’s PI Value and Choose Proximal UIV**  
Vishal Sarwahi, MD, MBBS; Jesse Galina, BS; Sayyida Hasan, BS; Aaron M. Atlas, BS; Stephen F. Wendolowski, BS; Jeffrey Goldstein, MD; Thomas J. Dowling III, MD; Jordan Fakhoury, DO; Sean Molloy, MBBS; Adam Benton, MBBS; Sara Khoyratty, MBBS; Yungtai Lo, PhD; Terry D. Amaral, MD; Darren F. Lui, FRCS
- 11:14-11:18 **Paper #36: A Normal PI-LL Relationship Is Associated with Pain Improvement following Posterior Spinal Fusion for Scheuermann’s Kyphosis**  
Elizabeth Herman, BA; Hiroko Matsumoto, PhD; Adam N. Fano, BS; Benjamin D. Roye, MD; Peter O. Newton, MD; Michael Fields, BS; Afrain Z. Bobby, MS, BS; Lawrence G. Lenke, MD; Baron S Lonner, MD; Michael G. Vitale, MPH; Harms Study Group
- 11:18-11:27 **Discussion**
- 11:27-11:31 **Paper #37: Characterization of the Different Spino-pelvic Profiles of Walking Diplegic Cerebral Palsy Patients**  
Kariman Abelin Genevois, MD; Carole Vernez, MD; Emmanuelle Chaleat Valayer, MD, PhD

All times are listed in US Central Time.

\*Denotes Non-CME Session



Program (topics, timing, and faculty) are preliminary and subject to change.

- 11:31-11:35 **Paper #38: Concurrent Scoliosis and Hip Dysplasia in Children with Cerebral Palsy: Should We Fix the Spine or Hip First?**  
M. Wade Shrader, MD; Ali Asma, MD; armagan C. ulusaloglu, MD; Kenneth J. Rogers, PhD; Freeman Miller, MD; Jason J. Howard, MD; Mutlu Cobanoglu, MD; *Suken A. Shah, MD*
- 11:35-11:39 **Paper #39: When is Pelvic Fixation Necessary in Children with Hypotonic Neuromuscular Scoliosis (NMS) Treated with Growing Instrumentation?**  
Arya Ahmady, MD; Bianca Parker, MS; Joel Gagnier, PhD; Jaysson T. Brooks, MD; Patrick J. Cahill, MD; Ryan Fitzgerald, MD; John (Jack) M. Flynn, MD; Peter F. Sturm, MD; Michael G. Vitale, MPH; *G.Ying Li, MD*; Pediatric Spine Study Group
- 11:39-11:48 **Discussion**
- 11:48-11:53 **Harrington Lecture Introduction**  
*Muharrem Yazici, MD*
- 11:53-12:15 **Harrington Lecture**  
*Charles E. Johnston, MD*
- 12:15-12:45 **Presentation of the 2021 Lifetime Achievement Awards**  
*Introductions by Christopher I. Shaffrey Sr., MD & Paul D. Sponseller, MD, MBA*  
*Award Recipients: Donald P. K. Chan, MD & Robert N. Hensinger, MD*

## 12:45-13:30

### Lunch Pick-Up

## 13:30-15:00

### Industry Workshops\* (Five Concurrent Sessions)

Workshops from DePuy Synthes; Globus Medical, Inc.; Medtronic; NuVasive; and Stryker.

## 15:00-15:30

### Break

## 15:30-17:30

### Half-Day Courses (Two Concurrent Sessions)

The Half-Day Courses are supported, in part, by NuVasive.

## 15:30-17:30

### HDC A. Preoperative Planning for Adult Deformity

Moderators: Ahmet Alanay, MD & Ferran Pellisé, MD, PhD

#### Part 1: Optimal Patient Selection and When to Say No

- 15:30-15:33 **Case Presentation**  
*Christopher I. Shaffrey, MD*
- 15:33-15:38 **Optimal Patient Selection and Timing of Surgery**  
*Justin S. Smith, MD, PhD*
- 15:38-15:43 **Role of Multidisciplinary Team Approach**  
*Rajiv K. Sethi, MD*
- 15:43-15:48 **Role of AI-Based Predictive Models**  
*Christopher P. Ames, MD*
- 15:48-16:00 **Case Resolution & Discussion**

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

## Part 2: Optimal Technique Selection, Pearls & Pitfalls

- 16:00-16:03 **Case Presentation**  
*Michael P. Kelly, MD*
- 16:03-16:11 **Osteoporosis & Blood Management**  
*David W. Polly, Jr., MD*
- 16:11-16:18 **Decompression Only vs Short Fusion vs Long Fusion**  
*Gregory M. Mundis, Jr., MD*
- 16:18-16:25 **When and How to Go to Pelvis**  
*Munish C. Gupta, MD*
- 16:25-16:33 **Role of MIS Surgery**  
*Juan S. Uribe, MD*
- 16:33-16:45 **Case Resolution & Discussion**

## Part 3: Preoperative Deformity Correction Planning

- 16:45-16:48 **Case Presentation**  
*Javier Pizones, MD, PhD*
- 16:48-16:53 **Coronal Plane Planning**  
*Ibrahim Obeid, MD*
- 16:53-17:03 **Sagittal Plane Planning According to Schwab Classification, Roussouly Types and GAP Score**  
*Yukihiro Matsuyama, MD, PhD*
- 17:03-17:08 **How to Account for Alignment Goals Through the Ages**  
*Michael P. Kelly, MD*
- 17:08-17:13 **How to Assure Intraoperatively that Preoperative Planning Targets are Reached**  
*Lawrence G. Lenke, MD*
- 17:13-17:18 **Intraoperative and Postoperative Preventive Measures to Avoid Mechanical Complications if Planning Targets Are Not Reached**  
*Christopher I. Shaffrey, MD*
- 17:18-17:30 **Case Resolution & Discussion**

## 15:30-17:30

### HDC B. When New Technology in Pediatric Deformity Grows Up: Lessons Learned

Co-Chairs: Sumeet Garg, MD; Baron S. Lonner, MD; Firoz Miyajji, MD, FRCSC & Amer F. Samdani, MD

#### Part 1: Magnetically Controlled Growing Rods

Moderator: TBD

- 15:30-15:35 **MCGR: Optimal Indications and When It Can Fail**  
*David L. Skaggs, MD, MMM*
- 15:35-15:40 **Best Surgical Technique Practices for MCGR Insertion**  
*Ozgur Dede, MD*
- 15:40-15:45 **Discussion**
- 15:45-15:50 **Tips on Running an Expansion Clinic**  
*Colin Nnadi, FRCS (Orth)*
- 15:50-15:55 **Mechanical Complications and Metallosis**  
*Jwalant S. Mehta, FRCS (Orth)*
- 15:55-16:00 **MCGR-HRQoL: Are We Making a Difference?**  
*Muharrem Yazici, MD*
- 16:00-16:05 **Discussion**

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

16:05-16:30 **MCGR Case Discussion Panel**  
 Moderator: Suken A. Shah, MD  
 Panelists: Jennifer M. Bauer, MD, MS; Kenny Kwan, BMBCh(Oxon), FRCSEd; Lawrence L. Haber, MD; G. Ying Li, MD; Burt Yaszay, MD

## Part 2: Vertebral Body Tethering

Moderator: Amer F. Samdani, MD

16:30-16:35 **Optimal Indications and When It Can Fail**  
 Stefan Parent, MD, PhD

16:35-16:40 **Thoracic Tethering: Peals and Complications**  
 Firoz Miyanji, MD, FRCSC

16:40-16:45 **Lumbar and Double Tethers: Peals and Complications**  
 Per D. Trobisch, MD

16:45-16:50 **Discussion**

16:50-16:55 **Pushing the Limits of aVBT**  
 Baron S. Lonner, MD

16:55-17:00 **Dealing with VBT Revisions**  
 Caglar Yilgor, MD

17:00-17:05 **Discussion**

17:05-17:30 **VBT Case Discussion Panel**  
 Moderator: Peter O. Newton, MD  
 Panelists: Robert H. Cho, MD; Daniel G. Hoernschemeyer, MD; A. Noelle Larson, MD; Daniel J. Sucato, MD, MS; Caglar Yilgor, MD

## 17:30-19:00

### Express Yourself: An Early Career Surgeon Session

The Early Career Surgeon Session is presented by the SRS Early Career Task Force and is supported, in part, by Globus Medical, Inc.; DePuy Synthes; Medtronic; NuVasive; and Zimmer Biomet.

17:30-17:33 **Welcome: Early Career Surgeon Task Force Concept**  
 Kariman Abelin Genevois, MD, PhD; Kenny Kwan, BMBCh(Oxon), FRCSEd; & Caglar Yilgor, MD

17:33-17:36 **Early Career Surgeon Social Details**  
 The Early Career Surgeon Social is hosted by Medtronic.

17:36-17:39 **Launch of the SRS Mentorship Program**  
 Robert H. Cho, MD & Brian G. Smith, MD

### Part 1. My Most Challenging Case within the First 3 Years of Practice

Moderators: Kariman Abelin Genevois, MD, PhD; Jaysson T. Brooks, MD; & Caglar Yilgor, MD

17:39-17:44 **Pearls and Pitfalls of Pedicle Subtraction Osteotomy: A Young Surgeon's Perspective**  
 Owoicho Adogwa, MD, MPH

17:44-17:53 **Discussion**

17:53-17:58 **Too Big a Curve, Too Early: Challenging Idiopathic Scoliosis**  
 Kadir Abdul, MD

17:58-18:07 **Discussion**

18:07-18:12 **Congenital Kyphoscoliosis in the Young Adult**  
 Alekos A. Theologis, MD

18:12-18:21 **Discussion**

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

## Part 2. The Challenges in “Ordinary Cases”

Moderators: Santiago T. Bosio, MD; Kenny Kwan, BMBCh(Oxon), FRCSEd; & Jeffrey P. Mullin, MD, MBA

18:21-18:29 **How to Achieve Spine Fixation/Correction with Poor Bone Quality?**  
Jennifer M. Bauer, MD, MS

18:29-18:34 **Discussion**

18:34-18:42 **Adult Revision Surgery: How I Manage an Adjacent Segment**  
TBD

18:42-18:47 **Discussion**

18:47-18:55 **Ideal plan for Cervical Spine Deformity**  
Amer Sebaaly, MD, MSc

18:55-19:00 **Discussion**

An Early Career Surgeon Social, hosted by Medtronic is to follow the Early Career Surgeon Session.

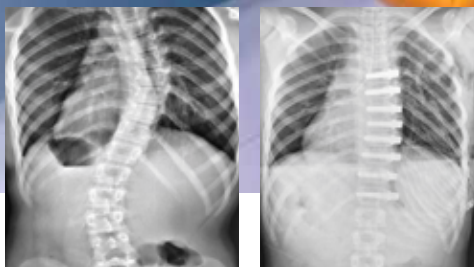
The banner features the SRS (Scoliosis Research Society) logo on the left, which includes a stylized spine and the text 'SRS Scoliosis Research Society'. To the right of the logo, the word 'iExperience' is written in a large, white, sans-serif font. Below this, the text 'Early Onset Scoliosis' is displayed in a smaller white font. The background is a dark blue globe with a grid pattern. Several inset images are arranged across the banner: a diagram of a spine with labels for 'Anatomical Plane of Motion', 'Flexion', 'Extension', and 'Tortic Collar'; a photograph of a man in a blue lab coat standing next to a presentation board; a photograph of a surgical team in an operating room; a photograph of a woman in a red jacket examining a child's back; and a photograph of a woman in a white lab coat standing next to a presentation board.

All times are listed in US Central Time.

\*Denotes Non-CME Session

# The Tether™

## Ahead of the Curve



Learn more about The Tether™ at [myscoliosis.com](http://myscoliosis.com)

#### HUMANITARIAN DEVICE

The Tether is FDA approved as a Humanitarian Device for skeletally immature patients that require surgical treatment to obtain and maintain correction of progressive idiopathic scoliosis, with a major Cobb angle of 30 to 65 degrees whose osseous structure is dimensionally adequate to accommodate screw fixation, as determined by radiographic imaging. Patients should have failed bracing and/or be intolerant to brace wear. There is probable benefit of the device, but its efficacy is still unproven.

#### RISKS

Common post-operative surgical risks include overcorrection of instrumented curve, cord breakage, nausea, vomiting, and bone screw migration.

#### CONTRAINDICATIONS

The Tether is not appropriate for patients who have reached skeletal maturity, have poor bone quality, or who have a systemic or local infection at the surgical site.

Not an actual patient. Results are not necessarily typical, indicative, or representative of all recipient patients. Results will vary due to health, weight, activity and other variables. Not all patients are candidates for this product and/or procedure. Only a medical professional can determine the treatment appropriate for your specific condition. Appropriate post-operative activities will differ from patient to patient. Talk to your surgeon about whether vertebral tethering is right for you and the risks of the procedure, including the risks of infection, implant wear, loosening, breakage or failure, any of which can require additional surgery. For additional information or to find a surgeon near you, visit [www.myscoliosis.com](http://www.myscoliosis.com).

All content herein is protected by copyright, trademarks and other intellectual property rights, as applicable, owned by or licensed to Zimmer Biomet or its affiliates unless otherwise indicated, and must not be redistributed, duplicated or disclosed, in whole or in part, without the express written consent of Zimmer Biomet. © 2021 Zimmer Biomet. 3315.3-GLBL-en-REV0221

Program (topics, timing, and faculty) are preliminary and subject to change.

7:00-17:00

## Registration Open

8:00-9:50

### Abstract Session 4. Hibbs Award-Nominated Papers for Best Basic/Translational and Clinical Research

Moderators: Kariman Abelin Genevois, MD, PhD & S. Rajasekaran, MD, FRCS, MCh, PhD

- 8:00-8:04 **Welcome**
- 8:04-8:08 **Paper #40: An Algorithm for Using Deep Learning Convolutional Neural Networks with Three Dimensional Depth Sensor Imaging in Scoliosis Detection†**  
*Terufumi Kokabu, MD; Noriaki Kawakami, DMSc; Koki Uno, MD, PhD; Toshiaki Kotani, MD, PhD; Teppei Suzuki, MD, PhD; Hiroyuki Tachi, MD; Yuichiro Abe, MD, PhD; Hideki Sudo, MD, PhD*
- 8:08-8:12 **Paper #41: Sanders Stage 7b: Using the Ulna Physis Improves Decision-making for Brace Weaning in Adolescent Idiopathic Scoliosis†**  
*Prudence Wing Hang Cheung, BSc (Hons); Jason Pui Yin Cheung, MD, MBBS, MS, FRCS*
- 8:12-8:16 **Paper #42: Outcomes of Magnetically Controlled Growing Rods (MCGR) in Severe Early Onset Scoliosis†**  
*Antti J. Saarinen, MD; Paul D. Sponseller, MD; Lindsay M. Andras, MD; David L. Skaggs, MD; John B. Emans, MD; George H. Thompson, MD; Pediatric Spine Study Group; Ilkka J. Helenius, MD, PhD*
- 8:16-8:31 **Discussion**
- 8:31-8:35 **Paper #43: Spinal Fusion Leads to Quality Adjusted Life Year Gains in Cerebral Palsy Patients Sustained up to 5 Years after Surgery†**  
*Krishna Vangipuram Suresh, BS; Paul D. Sponseller, MD; Suken A. Shah, MD; Firoz Miyanji, MD; Amer F. Samdani, MD; Burt Yazsay, MD; Peter O. Newton, MD; Amit Jain, MD; Harms Study Group*
- 8:35-8:39 **Paper #44: Mid-term Health-related Quality of Life and Caregiver Burden Following Spinal Fusion in Children with Cerebral Palsy†**  
*Rachel L. DiFazio, PhD, RN; Judith A. Vessey, PhD, RN; Patricia E. Miller, MS; Brian D. Snyder, MD, PhD; Benjamin J. Shore, MPH*
- 8:39-8:54 **Discussion**
- 8:54-8:58 **Paper #45: Adverse Events in Multilevel Surgery in Elderly Patients with Spinal Deformity: Report of the Prospective Evaluation of Elderly Deformity Surgery (PEEDS)†**  
*Sigurd H. Berven, MD; Lawrence G. Lenke, MD; Michael Venezia Venezia, DO; John T. Street, MD; Allan R. Martin, MD, PhD, FRCS(C); Justin S. Smith, MD, PhD; Eric O. Klineberg, MD; Michael P. Kelly, MD; Christopher I. Shaffrey, MD; Benny T. Dahl, DMSc; Marinus De Kleuver, MD; Maarten Spruit, MD; Ferran Pellisé, MD, PhD; Kenneth M. Cheung, MD, MBBS, FRCS; Ahmet Alanay, MD; David W. Polly, MD; Jonathan N. Sembrano, MD; Yukihiko Matsuyama, MD, PhD; Stephen J. Lewis, MD, FRCS(C)*
- 8:58-9:02 **Paper #46: Alterations of Gait Kinematics Depend on the Type of Deformity in ASD†**  
*Karl Semaan, BS; Eddy Saad, MS; Rami Rachkidi, MD, MS; Abir Massaad, PhD; Georges Kawkabani, MD, MS; Renee Maria Saliby, MD, MS; Mario Mekhael, MD, MS; Krystal Abi Karam, BS; Marc Fakhoury, BS; Elena Jaber, BS; Ismat Ghanem, MD; Khalil Kharrat, MD; gabi kreichati, MD; Wafa Skalli, PhD; Virginie Lafage, PhD; Ayman Assi, PhD*
- 9:02-9:06 **Paper #47: Kyphosis and Early Disc Degeneration Induced by Paraspinal Muscle Impairment in Female TSC1mKO Mice\***  
*Hwee Weng Dennis Hey, MD; Wing Moon Raymond Lam, PhD; Kimberly TAN, MBBS; Simon Cool, PhD; Wenhai Zhuo, MD; Elisa Marie Crombie, PhD; Shih-Yin Tsai, PhD*
- 9:06-9:21 **Discussion**

Key: † = Hibbs Award Nominee – Best Clinical Research Paper \* = Hibbs Award Nominee – Best Basic/Translational Paper

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

- 9:21-9:25 **Paper #48: Comparison of Patient Factors (Frailty) vs Surgical Factors (Invasiveness) for Optimization of 2-year Cost-utility: We Should Focus on the Patient Factors†**  
*Jeffrey L. Gum, MD*; Samrat Yeramaneni, PhD; Kevin Y. Wang, BS; Richard Hostin, MD; Khaled M. Kebaish, MD; Brian J. Neuman, MD; Amit Jain, MD; Michael P. Kelly, MD; Douglas C. Burton, MD; Christopher P. Ames, MD; Christopher I. Shaffrey, MD; Eric O. Klineberg, MD; Han Jo Kim, MD; Themistocles S. Protopsaltis, MD; Peter G. Passias, MD; Gregory M. Mundis, MD; Robert K. Eastlack, MD; Frank J. Schwab, MD; Robert A. Hart, MD; Munish C. Gupta, MD; Alan H. Daniels, MD; Justin S. Smith, MD, PhD; Virginie Lafage, PhD; Breton G. Line, BS; Shay Bess, MD; International Spine Study Group
- 9:25-9:29 **Paper #49: Genetic Age Determined by Telomere Length is Significantly Associated with Risk of Complications in Adult Deformity Surgery despite No Significant Difference in Chronological Age: Pilot Study of 43 Patients\***  
*Michael Safaee, MD*; Jue Lin, PhD; Christopher P. Ames, MD
- 9:29-9:33 **Paper #50: Cellular Immunophenotyping in Adult Spinal Deformity Surgery: Next Step in Personalized Medicine\***  
 Annie Hess, MD; Isaiah Turnbull, MD, PhD; Ayu Frazier, PhD; *Michael P. Kelly, MD*
- 9:33-9:49 **Discussion**  
**Audience Vote**

### 9:50-10:20

#### Break

### 10:20-12:00

#### Abstract Session 5. Adult Deformity II

Moderators: *Jeffrey Gum, MD & Bangping Qian, MD*

- 10:20-10:24 **Paper #51: Complications? Reoperations? Let's Do It Again: Decision Regret After Adult Spinal Deformity Surgery**  
 Daniel Rubio, MD; Christopher F. Dibble, MD, PhD; Ayu Frazier, PhD; Lawrence G. Lenke, MD; *Michael P. Kelly, MD*
- 10:24-10:28 **Paper #52: Would You Do It Again? Discrepancies Between Patient and Surgeon Willingness for Adult Spine Deformity Surgery**  
*Shay Bess, MD*; Breton G. Line, BS; Renaud Lafage, MS; Christopher P. Ames, MD; Robert K. Eastlack, MD; Gregory M. Mundis, MD; Virginie Lafage, PhD; Eric O. Klineberg, MD; Alan H. Daniels, MD; Munish C. Gupta, MD; Michael P. Kelly, MD; Lawrence G. Lenke, MD; Peter G. Passias, MD; Themistocles S. Protopsaltis, MD; Douglas C. Burton, MD; Khaled M. Kebaish, MD; Han Jo Kim, MD; Frank J. Schwab, MD; Christopher I. Shaffrey, MD; Justin S. Smith, MD, PhD; International Spine Study Group
- 10:28-10:32 **Paper #53: The Impact of Unplanned Reinterventions Following ASD Surgery**  
*Ferran Pellisé, MD, PhD*; Alba Vila-Casademunt, MS; Maria Capdevila-Bayo, MS; Susana Núñez Pereira, MD; Aleix Ruiz de Villa, PhD; Sleiman Haddad, MD, PhD, FRCS; Javier Pizones, MD, PhD; Manuel Ramirez Valencia, MD; Ibrahim Obeid, MD; Ahmet Alanay, MD; Frank S. Kleinstueck, MD; Anne F. Mannion, PhD; European Spine Study Group
- 10:32-10:48 **Discussion**
- 10:48-10:52 **Paper #54: Racial Disparities in Presenting Physical Functionality and Mental Distress Characteristics of Patients Undergoing Spine Surgery**  
 Sarthak Mohanty, BS; Jenna Harowitz, BS; Thaddeus Woodard, BS; Vincent Arlet, MD; David S. Casper, MD; *Comron Saifi, MD*
- 10:52-10:56 **Paper #55: Preoperative Opioid Use Poorly Correlates with Mental Health in Adult Spinal Deformity: Time to Rethink Foregone Conclusions**  
*Michael P. Kelly, MD*; Lawrence G. Lenke, MD; Breton G. Line, BS; Justin S. Smith, MD, PhD; Christopher I. Shaffrey, MD; Khaled M. Kebaish, MD; Eric O. Klineberg, MD; Han Jo Kim, MD; Frank J. Schwab, MD; Munish C. Gupta, MD; Virginie Lafage, PhD; Renaud Lafage, MS; Alan H. Daniels, MD; Peter G. Passias, MD; Themistocles S. Protopsaltis, MD; Douglas C. Burton, MD; Shay Bess, MD; International Spine Study Group

Key: † = Hibbs Award Nominee – Best Clinical Research Paper \* = Hibbs Award Nominee – Best Basic/Translational Paper

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

- 10:56-11:00 **Paper #56: Using Patient Reported Outcomes to Counsel Adult Symptomatic Lumbar Scoliosis Patients (ASLS)**  
*James Wondra, BS*; Michael P. Kelly, MD; Justin S. Smith, MD, PhD; Christopher I. Shaffrey, MD; Shay Bess, MD; Elizabeth L. Yanik, PhD; Frank J. Schwab, MD; Keith H. Bridwell, MD
- 11:00-11:04 **Paper #57: AO Adult Spine Deformity Patient Profile: A Paradigm Shift In Comprehensive Patient Evaluation In Order To Improve Patient Care**  
*J Naresh-Babu, MS*; Kenny Y. Kwan, MD; Yabin Wu, PhD; Caglar Yilgor, MD; Ahmet Alanay, MD; Kenneth M. Cheung, MD, MBBCh, FRCS; David W. Polly, MD; Jong-Beom Park, PhD; Manabu Ito, MD, PhD; Lawrence G. Lenke, MD; Miranda L. Van Hooff, PhD; Marinus De Kleuver, MD; AOSpine Knowledge Forum Deformity
- 11:04-11:23 **Discussion**
- 11:23-11:35 **2022 Meeting Previews: 57th Annual Meeting, 29th IMAST, Global Education on Spine Deformity**
- 11:35-11:40 **Introduction of the President**  
*Christopher I. Shaffrey Sr., MD*
- 11:40-12:00 **Presidential Address**  
*Muharrem Yazici, MD*

## 12:00-12:30

### Lunch Pick-Up

## 12:30-14:15

### Member Business Meeting and Lunch\*

## 12:30-14:00

### LTS D. Limits of MIS: A SRS-AANS Collaboration

Moderators: *Regis W. Haid, Jr., MD*; *Praveen V. Mummaneni, MD*; *Michael Y. Wang, MD, FACS*

- 12:30-12:35 **Case Presentation Using MISDEF 2 and MIISA Algorithms**  
*Kai-Ming Gregory Fu, MD, PhD*
- 12:35-12:45 **Panel Discussion: MIS Algorithm**  
*Panelists: Dean Chou, MD; Richard G. Fessler, MD, PhD; Paul Park, MD*
- Debate: How to Achieve 30 Degrees of Sagittal Balance Restoration**
- 12:45-12:50 **Debate Case Presentation**  
*Pierce D. Nunley, MD*
- 12:50-12:56 **MIS is Best**  
*Juan S. Uribe, MD*
- 12:56-13:02 **Open is Best**  
*David O. Okonkwo, MD, PhD*
- 13:02-13:10 **Rebuttals & Discussion**
- Debate: How to Prevent and Treat PJK**
- 13:10-13:15 **Debate Case Presentation**  
*Robert K. Eastlack, MD*
- 13:15-13:21 **MIS is the Best Way to Prevent PJK**  
*Neel Anand, MD*
- 13:21-13:27 **Open Techniques Work Fine to Prevent PJK**  
*Justin S. Smith, MD, PhD*
- 13:27-13:35 **Rebuttals & Discussion**

All times are listed in US Central Time.

\*Denotes Non-CME Session



Program (topics, timing, and faculty) are preliminary and subject to change.

## Debate: Thoracolumbar Scoliosis in Skeletally Immature Patient - Is Anterior Vertebral Body Tethering the Best Option?

13:35-13:40 **Debate Case Presentation**

*Mari L. Groves, MD*

13:40-13:46 **Tethering is Best**

*Steven W. Hwang, MD*

13:46-13:52 **Posterior Approach is Best**

*Gregory M. Mundis, Jr., MD*

13:52-14:00 **Rebuttals & Discussion**

### 14:15-14:45

#### Break

### 14:45-16:10

#### Abstract Session 6. Miscellaneous (Runs concurrently to Session 7)

Moderators: *Meric Enercan, MD & Khoi D. Than, MD*

14:45-14:49 **Paper #58: FDA IDE Study of Decompression and Paraspinous Tension Band Stabilization vs TLIF for Degenerative Spondylolisthesis: 24-month Outcomes in 98 Patients**

*Rick C. Sasso, MD*; Barrett Boody, MD; William F. Lavelle, MD; Alan Villavicencio, MD; S. Tim Yoon, MD; Ravi S. Bains, MD; Calvin C. Kuo, MD; Kee D. Kim, MD; Jeffrey Fischgrund, MD; Khalid Sethi, MD; Elizabeth Yu, MD; Harvinder S Sandhu, MD; Michael P. Stauff, MD; W Z. Ray, MD; Dennis G. Crandall, MD; Todd Alamin, MD; Louis C. Fielding, MD

14:49-14:53 **Paper #59: The Longitudinal Impact of Intervertebral Disc Distraction on Disc Health : A Preliminary, In Vivo Study Using Magnetic Resonance Imaging In a Rabbit Model**

Hwee Weng Dennis Hey, MD; *Wing Moon Raymond Lam, PhD*; Kimberly TAN, MBBS; Wenhai Zhuo, MD; Kim Cheng Tan, MS; XiaFei Ren, MD, PhD; Hee Kit Wong, MBBS, FRCS

14:53-14:57 **Paper #60: Impact of the Flexibility of Coronal Deformities on Low Back Pain and Disc Degeneration in Adult Patients Nonoperatively Treated for Adolescent Idiopathic Scoliosis with Thoracolumbar/Lumbar Curves**

*Masayuki Ohashi, MD, PhD*; Kei Watanabe, MD, PhD; Toru Hirano, MD, PhD; Kazuhiro Hasegawa, MD, PhD

14:57-15:01 **Paper #61: Autograft Viability and Cellular Contribution to Fusion**

*Gregory M. Mundis, MD*; Jeremy Lombardo, PhD; Nick Russell, PhD; Jiawei He, PhD; Frank Vizesi, PhD

15:01-15:13 **Discussion**

15:13-15:17 **Paper #62: Perioperative Complications of Total En bloc Spondylectomy (TES) for Spinal Tumors**

*Satoru Demura, MD, PhD*; Satoshi Kato, PhD; Kazuya Shinmura, PhD; Noriaki Yokogawa, MD; Takaki Shimizu, MD; Makoto Handa, MD; Ryohei Annen, MD; Yohei Yamada, MD; Motoya Kobayashi, MD; Hiroyuki Tsuchiya, PhD

15:17-15:21 **Paper #63: Characteristics of Patients with Short-term versus Long-Term Readmission-free Survival After Metastatic Spine Tumor Surgery**

*Naresh Kumar, MBBS, FRCS*; Sirisha Madhu, M. Pharm.; Sridharan A. Ramakrishnan, MSc. (Mechanical Engineering); Andrew C. Thomas, MB Bch BAO

15:21-15:25 **Paper #64: Incidence of Post-spinal Surgery Pulmonary Emboli Over a 12-year Period in a Specialist Tertiary Referral Centre**

*Puneet Tailor, MBBS*; Hannah Norman, Medical student; Egidio Da Silva, MD; Jwalant S. Mehta, FRCS (Orth), MCh (Orth), MS (Orth), D Orth

15:25-15:29 **Paper #65: Early Postoperative Anticoagulation after Spinal Fracture Surgery Decreases Venous Thromboembolism Rates**

*Khaled Taghlabi, MBBS*; Douglas C. Burton, MD; Brandon B. Carlson, MD; Robert Sean Jackson, MD; Joshua Bunch, MD; Robert Winfield, FACS

15:29-15:41 **Discussion**

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

- 15:41-15:45 **Paper #66: Biomechanical Characterization of Common Thoracolumbar Adult Spinal Deformity Correction Constructs: An Implication for Proximal Junctional Kyphosis Risk Assessment**  
*Robert Koffie, MD, PhD*; Bernardo de Andrada, MD; Jennifer N. Lehrman, MS; Brian P. Kelly, PhD; Juan S. Uribe, MD; Jay D. Turner, MD
- 15:45-15:53 **Paper #67: Biomechanical Investigation of Long Spinal Fusion Model Using the Three-dimensional Finite Element Analysis**  
*Norihiro Oku, MD*; Satoru Demura, MD, PhD; Satoshi Kato, PhD; Kazuya Shinmura, PhD; Noriaki Yokogawa, MD; Hiroyuki Tsuchiya, PhD
- 15:53-15:57 **Paper #68: Telehealth: Comparison of Physical Exam between Telehealth Visits and In-person Visit for Patients with Spine Pathology**  
Hershil Patel, BS; Zoe Norris, BFA; Kimberly Ashayeri, MD; Nicole Mottole, BS; Eaman Balouch, MD, PhD; Ethan Sissman, MD; Constance Maglaras, PhD; Charla R. Fischer, MD; Themistocles S. Protopsaltis, MD; Aaron J. Buckland, MBBS, FRCSA; *Kola Jegede, MD*
- 15:57-16:10 **Discussion**

### 14:45-16:10

#### Abstract Session 7. Cervical Deformity (Runs concurrently to Session 6)

Moderators: *Serena Hu, MD & Caglar Yilgor, MD*

- 14:45-14:49 **Paper #69: Cervical Sagittal Alignment Parameters Across Ages**  
*Yann Philippe Charles, MD, PhD*; Sebastien Pesenti, MD, PhD; Benjamin Blondel, MD, PhD; Jean-Charles Le Huec, MD; Vincent Fiere, MD; Louis Boissiere, MD; Vincent Challier, MD; Aymeric Faure, MD; Erik-André Sauleau, MD, PhD; Brice Ilharreborde, MD, PhD
- 14:49-14:53 **Paper #70: Posterior Cervical Spinal Fusion in the Pediatric Population using Modern Adult Instrumentation: Clinical Outcome and Safety**  
*Alexander Spiessberger, MD*; Peter O. Newton, MD; William G. Mackenzie, MD; Amer F. Samdani, MD; Firoz Miyanji, MD; Joshua M. Pahys, MD; Suken A. Shah, MD; Paul D. Sponseller, MD; Mark Abel, MD; Jonathan H. H. Phillips, MD; Burt Yaszay, MD
- 14:53-14:57 **Paper #71: Interval for Repeat Pediatric Trisomy 21 Atlanto-Axial Instability Surveillance**  
*Jennifer M. Bauer, MD*; Virkamal Dhaliwal, BS; Walter F. Krengel III, MD
- 14:57-15:01 **Paper #72: Pediatric Cervical Spine Fusions: Opportunity for Improvement**  
Edward Compton, BS; Stephen Stephan, MD; Kenneth D. Illingworth, MD; David L. Skaggs, MD; *Lindsay M. Andras, MD*
- 15:01-15:17 **Discussion**
- 15:17-15:21 **Paper #73: Can Lateral Mass Screw Fixation be Improved with Supplemental Screws?**  
Muturi G. Muriuki, PhD; *Robert M. Havey, MS*; Suguna Pappu, MD; Nader Dahdaleh, MD; Kenneth R. Blank, PhD; Sarah Brownhill, PhD; Benjamin Johnston, BS; Sean Selover, MS; Shawn Harris, BS; Robert Carruth, MS; Avinash G. Patwardhan, PhD
- 15:21-15:25 **Paper #74: Medium and Long-term Sagittal Cervical Spine Alignment and Quality of Life in Adult Patients receiving Primary Surgery for Recent Cervical Subaxial Injury**  
*Panaqiotis Korovessis, MD*; Evangelia Mpountogianni, MD; Vasileios N. Syrimpeis, PhD; Ioannis Papaioannou, MD; Thomas Repantis, PhD; Maria Andriopoulou, Nurse; Alkis Korovesis, Electrical Engineer
- 15:25-15:29 **Paper #75: Outcomes Following Occipitocervical Fusion for Complex Spine Trauma; Optimal Fusion Angle and Construct Design Critical to Prevent Dysphagia and Revision Surgery**  
*Daniel C. Kim, MD, MS*; Richard P. Menger, MD; Anthony Martino, MD; George Rusyniak, MD
- 15:29-15:45 **Discussion**

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

- 15:45-15:49 **Paper #76: Surgical and Radiographic Outcomes in Patients with High T1 and C2 Slopes**  
Zoe Norris, BFA; Themistocles S. Protopsaltis, MD; Eaman Balouch, MD, PhD; Alex Soroceanu, MPH; Renaud Lafage, MS; Justin S. Smith, MD, PhD; D. Kojo Hamilton, MD; Eric O. Klineberg, MD; Peter G. Passias, MD; Robert A. Hart, MD; Shay Bess, MD; Christopher I. Shaffrey, MD; Frank J. Schwab, MD; Virginie Lafage, PhD; Christopher P. Ames, MD; International Spine Study Group
- 15:49-15:53 **Paper #77: Evolution of Adult Cervical Deformity (ACD) Surgery Clinical and Radiographic Outcomes Based on a Multicenter Prospective Study: Are Behaviors and Outcomes Changing with Experience?**  
Peter G. Passias, MD; Oscar Krol, BS; Virginie Lafage, PhD; Renaud Lafage, MS; Han Jo Kim, MD; Alan H. Daniels, MD; Bassel G. Diebo, MD; Themistocles S. Protopsaltis, MD; Gregory M. Mundis, MD; Khaled M. Kebaish, MD; Alex Soroceanu, MPH; Justin K. Scheer, MD; D. Kojo Hamilton, MD; Eric O. Klineberg, MD; Breton G. Line, BS; Robert A. Hart, MD; Douglas C. Burton, MD; Frank J. Schwab, MD; Christopher I. Shaffrey, MD; Shay Bess, MD; Justin S. Smith, MD, PhD; Christopher P. Ames, MD; International Spine Study Group
- 15:53-16:10 **Discussion**
- 16:10-16:40**
- Break**
- 16:40-18:05**
- Abstract Session 8. Adolescent Idiopathic Scoliosis II (Runs concurrently to Session 9)**  
Moderators: *Tenner Guillaume, MD & Michelle Welborn, MD*
- 16:40-16:44 **Paper #78: A Randomized Control Trial of Schroth-based Therapy Fails to Demonstrate a Positive Influence on Curve Progression in Skeletally Immature AIS**  
Karina Zapata, DPT; Rebecca J. Dieckmann, BS; Steven D. Glassman, MD; Michael T. Hresko, MD; Brian G. Smith, MD; Paul D. Sponseller, MD; Michael G. Vitale, MPH; Daniel J. Sucato, MD, MS
- 16:44-16:48 **Paper #79: Cost-utility Analysis of Bracing vs. Observation for Adolescent Idiopathic Scoliosis**  
Ijezie A. Ikwuezunma, BS; Kevin Y. Wang, BS; Paul D. Sponseller, MD; Amit Jain, MD
- 16:48-16:52 **Paper #80: Brace Treatment for Scoliosis Associated with Chiari Malformation Type 1 or Syringomyelia without Neurosurgical Intervention: A Matched Comparison with Idiopathic Scoliosis**  
Hongda Bao, MD; Shubin Shu, PhD; Benlong Shi, PhD; Xu Sun, MD; Bin Wang, MD; Bangping Qian, MD; Yong Qiu, MD; Zezhang Zhu, MD
- 16:52-17:01 **Discussion**
- 17:01-17:05 **Paper #81: A Modified Enhanced Recovery After Surgery (ERAS) Protocol Reduces Length of Stay and Opioid Consumption in Adolescents after Idiopathic Scoliosis Surgery**  
David E. Lebel, MD, PhD; Masayoshi Machida, MD; Fiona Campbell, MD; Natasha Bath, RN; Lisa Isaac, FRCP(C); Martin Koyle, MD, FRCS(C); Danielle Ruskin, CPsych; David Levin, MD, FRCS(C); Jennifer Stinson, PhD, RN
- 17:05-17:09 **Paper #82: AIS Post-Operative Rapid Recovery Program: Liposomal Bupivacaine (Exparel) vs. Epidural**  
Amy L. McIntosh, MD; Christopher B. McLeod, MD
- 17:09-17:13 **Paper #83: Short-term Outcomes of 23 Hour Observation Discharge Pathway after Posterior Spine Fusion in Adolescent Patients**  
Timothy Oswald, MD; Gilbert Chan, MD; Tonia Dry, PA-C
- 17:13-17:22 **Discussion**
- 17:22-17:26 **Paper #84: Complications after Major Pediatric Surgeries: Comparison With Our Peers**  
Shalin Patel, MD; Munish C. Gupta, MD; Peter O. Newton, MD; Daniel J. Sucato, MD, MS; Oheneba Boachie-Adjei, MD; Suken A. Shah, MD; David B. Bumpass, MD; Mark A. Erickson, MD; Patrick J. Cahill, MD; Paul D. Sponseller, MD; Richard E. McCarthy, MD; Fox Pediatric Spinal Deformity Study ; Michael P. Kelly, MD
- 17:26-17:30 **Paper #85: Complications and Additional Procedures after Anterior Vertebral Tethering (AVT) for AIS: A Ten-year Experience**  
John T. Braun, MD; Brian E. Grottkau, MD; David F. Lawlor, MD

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

- 17:30-17:34 **Paper #86: Improved Surgical Preparedness with Preoperative Psychology Evaluation Prior to AIS Surgery**  
Heather M. Richard, PsyD; Shelby P. Cerza, MA; Kiley F. Poppino, BS; Daniel J. Sucato, MD, MS
- 17:34-17:43 **Discussion**
- 17:43-17:47 **Paper #87: Changing Hand Position on EOS Spinal X-rays Does Not Impact Sagittal and Coronal Parameters**  
Vishal Sarwahi, MD, MBBS; Sayyida Hasan, BS; Jesse Galina, BS; Yungtai Lo, PhD; Terry D. Amaral, MD
- 17:47-17:51 **Paper #88: An “Ultra” Low-Dose O-Arm Protocol Further Reduces Pediatric Radiation Exposure without Compromising Imaging Quality**  
Derrick A. Henry, MD; Richard E. McCarthy, MD; David B. Bumpass, MD
- 17:51-17:55 **Paper #89: A Modified Position for Optimized Skeletal Maturity Assessment of AIS Patients with Low-Dose Stereoradiography: Results of a Randomized Study on Image Quality and Dosage**  
Victoria Blouin ; Victor Jullien ; Olivier Chémaly, MD; Sylvain Deschenes, PhD; Marjolaine Roy-Beaudry, MSc; Soraya Barchi, BSc; John (Jack) M. Flynn, MD; Stefan Parent, MD, PhD
- 17:55-18:05 **Discussion**
- 16:40-18:05**
- Abstract Session 9. Pediatric Deformity/Miscellaneous (Runs concurrently to Session 8)**  
Moderators: David E. Lebel, MD, PhD & Biraghi Leitaf Olavo, MD, PhD
- 16:40-16:44 **Paper #90: Does Vertebral Body Tethering Cause Disc and Facet Joint Degeneration? An MRI Study with Minimum 2-years Follow-up**  
Altug Yucekul, MD; Burcu Akpunarli, MD; Atahan Durbas ; Tais Zulemyan, MD; Irem Havlucu ; Gokhan Ergene, MD; Sahin Senay, MD; Pinar Yalinay Dikmen, MD; Sule Turgut Balci, MD; Ercan Karaarslan, MD; Yasemin Yavuz, PhD; Caglar Yilgor, MD; Ahmet Alanay, MD
- 16:44-16:48 **Paper #91: Tether-based Modulation of Scoliosis Reflects IVD Deformation: Development of Growing Pig Model**  
Benjamin Sinder, PhD; Alessandra Fusco, DVM; Jason B. Anari, MD; Edward Vresilovic, MD; Vincent Ruggieri, BS; Sriram Balasubramanian, PhD; Thomas P. Schaer, VMD; Patrick J. Cahill, MD; Brian D. Snyder, MD, PhD
- 16:48-16:52 **Paper #92: Pulmonary Function in Idiopathic Scoliosis after Fusion and Non-fusion Surgeries: A Matched Cohort Analysis**  
Caglar Yilgor, MD; Baron S. Lonner, MD; Burt Yaszay, MD; Dan Hoernschemeyer, MD; Stefan Parent, MD, PhD; Peter O. Newton, MD; Ahmet Alanay, MD; Harms Non-Fusion Study Group
- 16:52-17:01 **Discussion**
- 17:01-17:05 **Paper #93: Quantifying Spine Surgery among Patients With Morquio’s Disease: A Report of 12 Consecutive Cases**  
Juan S. Uribe, MD; Fernando Rios, MD; Oscar Castro, MD; Gregory M. Mundis, MD
- 17:05-17:09 **Paper #94: Spinal Fusion for Spine Deformity in Children with Arthrogyryposis Multiplex Congenita**  
Dietrich Riepen, MD; Brian Wahlig, BS; Karl E. Rathjen, MD; Kiley F. Poppino, BS
- 17:09-17:13 **Paper #95: Complications of the Magnetically Controlled Growing Rod versus the Spring Distraction System in the Treatment of Early Onset Scoliosis**  
Justin V. Lemans, MD; Casper S. Tabeling, MD; René M. Castelein, MD, PhD; Moyo C. Kruyt, MD, PhD
- 17:13-17:22 **Discussion**
- 17:22-17:26 **Paper #96: Increased Age-adjusted Body Mass Index (BMI) is Associated with Higher Risk of Postoperative Complications in Neuromuscular Scoliosis (NMS) Surgery**  
Chun Wai Hung, MD; Lorenzo Deveza, MD, PhD; Dallas Vanorny, MD, PhD; Frank T. Gerow, MD; William A. Phillips, MD; Benny T. Dahl, DMSc
- 17:26-17:30 **Paper #97: The Influence of Viral Respiratory Season on Perioperative Outcomes in Children Undergoing Spinal Fusion Surgery for Neuromuscular Scoliosis**  
Nicholas P. Gannon, MD; Zachary A. Quanbeck, MD; Daniel J. Miller, MD

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

- 17:30-17:34 **Paper #98: Intrusion of the Spine into the Chest Causes Airway Narrowing and Impaired Lung Function in AIS**  
James A. Farrell, PhD; Enrique Garrido, MD; Ludvig Vavruch, MD, PhD; Tom P. Schlösser, MD, PhD
- 17:34-17:43 **Discussion**
- 17:43-17:47 **Paper #99: Impact of Low vs. High Implant Density on Perioperative Parameters and Estimated Surgical Cost for Lenke 1A AIS Patients**  
A. Noelle Larson, MD; David W. Polly, MD; Paul D. Sponseller, MD; B. Stephens Richards, MD; Sumeet Garg, MD; Stefan Parent, MD, PhD; Suken A. Shah, MD; Stuart L. Weinstein, MD; Charles H. Crawford III, MD; James O. Sanders, MD; Michael P. Kelly, MD; Laurel C. Blakemore, MD; Matthew E. Oetgen, MD; Nicholas D. Fletcher, MD; Ann M. Brearley, PhD; Carl-Eric Aubin, PhD; Daniel J. Sucato, MD, MS; Hubert Labelle, MD; Mark A. Erickson, MD; Minimize Implants Maximize Outcomes Study Group, Study Group
- 17:47-17:51 **Paper #100: Adolescent Athletes Return to Sports Rapidly After Posterior Spine Fusion (PSF) for Idiopathic Scoliosis (AIS)**  
Tyler Tetreault, MD; Hannah Darland, BA; Angela Vu, BS; Patrick Carry, MS; Sumeet Garg, MD
- 17:51-17:55 **Paper #101: Pregnancy and Childbirth after Adolescent Idiopathic Scoliosis Surgery: A Study of 80 Pregnancies**  
Léonard Chatelain, MD; Laura Marie-Hardy, MD; Marc Khalifé, MD; Glorion Christophe, PhD; Christian Garreau de Loubresse, MD, PhD; Pierre Guigui, MD; Emmanuelle Ferrero, MD, PhD
- 17:55-18:05 **Discussion**

## 19:30-22:00

### Farewell Reception

The 56<sup>th</sup> Annual Meeting will culminate with a reception open to all in-person meeting delegates. Tickets to the reception are \$50 for each registered delegate and must be purchased in advance, at the time of registration.



**SCOLIOSIS  
DIALOGUES**

**An SRS Podcast**

Listen on **Apple Podcasts** Listen on **Google Podcasts**

[www.srs.org/podcast](http://www.srs.org/podcast)

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

### 7:30-10:00

#### Registration Open

### 8:00-10:05

#### Abstract Session 10. Adolescent Idiopathic Scoliosis III

Moderators: Amy L. McIntosh, MD & Vidyadhar V. Upasani, MD

- 8:00-8:04 **Paper #102: Validation of Patient-reported Outcomes Measurement Information System (PROMIS) Computerized Adaptive Testing (CATs) for Children with AIS**  
*Stuart L. Mitchell, MD*; Kevin McLaughlin, PT, DPT; Keith Bachmann, MD; Reider Lisa, PhD; Paul D. Sponseller, MD
- 8:04-8:08 **Paper #103: Shorter and Sweeter: the 16-item Version of the SRS Questionnaire Shows Better Structural Validity than the 20-item Version in Young Patients With Spinal Deformity**  
*Anne F. Mannion, PhD*; Achim Elfering, PhD; Tamas Fulop Fekete, MD; Ian J. Harding, MD, FRCS; Marco Monticone, MD; Peter M. Obid, MD; Thomas Niemeyer, MD; Alba Vila-Casademunt, MS; Francisco Javier S. Perez-Grueso, MD; Javier Pizones, MD, PhD; Ferran Pellisé, MD, PhD; Sarah Richner-Wunderlin, MS; Laura Zimmerman, BS; Frank S. Kleinstueck, MD; Ibrahim Obeid, MD; Ahmet Alanay, MD; Juan Bago, MD, PhD
- 8:08-8:12 **Paper #104: Actual Condition and Characteristics of Back Pain in Non-operative Patients with Adolescent Idiopathic Scoliosis**  
*Kei Watanabe, MD, PhD*; Masayuki Ohashi, MD, PhD; Toru Hirano, MD, PhD; Kazuhiro Hasegawa, MD, PhD
- 8:12-8:21 **Discussion**
- 8:21-8:25 **Paper #105: Patient Specific Rods for AIS Surgery Prevent Junctional Decompenation**  
*Kariman Abelin Genevois, MD*; davide sassi, MD; Thomas Chevillotte, MD; Pierre Grobost, MD
- 8:25-8:29 **Paper #106: Lowest Instrumented Vertebral Discordance in Adolescent Idiopathic Scoliosis: When Coronal and Sagittal Parameters Conflict**  
Dale Segal, MD; Jacob Ball, BS; Eric Yoon, BS; Tracey P. Bastrom, MA; Michael G. Vitale, MPH; Harms Study Group; *Nicholas D. Fletcher, MD*
- 8:29-8:33 **Paper #107: Can Placement of Hook at the Upper Instrumented Level Decrease the Proximal Junctional Kyphosis Risk in Adolescent Idiopathic Scoliosis?**  
*Mehmet Erkilinc, MD*; Melanie Coathup, PhD; Michael G. Liska, MD Candidate; John Lovejoy, MD
- 8:33-8:42 **Discussion**
- 8:42-8:46 **Paper #108: Is Quality of Life Affected by Concomitant Isthmic Spondylolisthesis when Undergoing Surgery for Adolescent Idiopathic Scoliosis and Non-Surgical Management of The Spondylolisthesis?**  
Matias Pereira Duarte, MD; Julie Joncas, RN; Stefan Parent, MD, PhD; Hubert Labelle, MD; Soraya Barchi, BSc; *Jean-Marc Mac-Thiong, MD, PhD*
- 8:46-8:50 **Paper #109: Surgical Strategies and Outcomes of Posterior Lumbar Hemivertebra Resection and Short Fusion in Patients with Lumbosacral Deformity Due to Severe Sacral Tilt**  
*Shengru Wang, MD*; Jianguo Zhang, MD
- 8:50-8:54 **Paper #110: Long-term Outcome after Surgical Treatment of Scheuermann Kyphosis (SK): Minimum of 10-year Follow-up**  
*Ujjwal Kanti K. Debnath, MD, FRCS*; Nasir A. Quraishi, PhD, FRCS
- 8:54-9:03 **Discussion**
- 9:03-9:07 **Paper #111: Distal Adding-on in AIS Results in Diminished Patient Reported Outcomes at 10 Years**  
*Benjamin D. Roye, MD*; Hiroko Matsumoto, PhD; Adam N. Fano, BS; Gerard F. Marciano, MD; Rajiv Iyer, MD; Afrain Z. Bobby, MS, BS; Lawrence G. Lenke, MD; Peter O. Newton, MD; Michael G. Vitale, MPH; Harms Study Group
- 9:07-9:11 **Paper #112: Loss of Lumbar Lordosis Below the LIV Occurs Due to an Increased Instrumented Lumbar Lordosis Following Posterior Fusion and Instrumentation for Double Major AIS**  
Sai Susheel Chilakapati, MS; Kiley F. Poppino, BS; *Daniel J. Sucato, MD, MS*
- 9:11-9:15 **Paper #113: National Trends in Performing Osteotomies for AIS in North America: Greater Incidence Is Associated with Significant Complications and Greater Cost**  
Kiley F. Poppino, BS; Chan-Hee Jo, PhD; *Daniel J. Sucato, MD, MS*

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

- 9:15-9:24 **Discussion**
- 9:24-9:28 **Paper #114: Does intraoperative Vancomycin Powder affect Postoperative Infections in Adolescent Idiopathic Scoliosis?**  
*Supriya Singh, MD*; Garshana Rajkumar ; Sachini Jayasinghe ; Arvinder Ghag, MD; Michael P. Glotzbecker, MD; Baron S. Lonner, MD; Amer F. Samdani, MD; Peter O. Newton, MD; Harms Study Group ; Firoz Miyanji, MD
- 9:28-9:32 **Paper #115: Prophylactic Use of Local Vancomycin Does Not Decrease Acute Surgical Site Infection in Adolescent Idiopathic Scoliosis**  
Stephen Stephan, MD; De-An Zhang, MD; Marilan Luong, MPH; Robert H. Cho, MD; *Selina C. Poon, MD*
- 9:32-9:36 **Paper #116: Intraoperative Navigation for Pedicle Screw Placement in Adolescent Idiopathic Scoliosis: No Clinical Benefit and Increased Cancer Risk**  
*Peter M. Obid, MD*; Sebastian Zahnreich, PhD; Thomas Niemeyer, MD; Georgi Wassilew, MD; Tamim Rahim, MD
- 9:36-9:46 **Discussion**
- 9:46-9:50 **Presentation of Award Winners**  
*Michael P. Kelly, MD*
- 9:50-10:05 **Transfer of the Presidency**  
*Muharrem Yazici, MD and Christopher I. Shaffrey Sr., MD*

## 10:05-10:35

### Break

## 10:35-12:30

### Abstract Session 11. Adult Deformity III

Moderators: *Stuart H. Hershman, MD & Byron F. Stephens, MD*

- 10:35-10:39 **Paper #117: Comparison of Degenerative Lumbar Scoliosis Correction and Risk for Mechanical Failure Using Posterior 2-rod Instrumentation Versus 4-rod Instrumentation and Interbody Fusion**  
*Yann Philippe Charles, MD, PhD*; Vincent Lamas, MD; Jean-Paul Steib, MD, PhD
- 10:39-10:43 **Paper #118: Rod Failures Continue to Plague the Surgical Treatment of Adult Spinal Deformity (ASD)**  
*Munish C. Gupta, MD*; Renaud Lafage, MS; Sachin Gupta, MD; Alan H. Daniels, MD; Alex Soroceanu, MPH; Robert K. Eastlack, MD; Khaled M. Kebaish, MD; Christopher I. Shaffrey, MD; Han Jo Kim, MD; Eric O. Klineberg, MD; Virginie Lafage, PhD; Themistocles S. Protopsaltis, MD; Peter G. Passias, MD; Gregory M. Mundis, MD; D. Kojo Hamilton, MD; Michael P. Kelly, MD; Douglas C. Burton, MD; Richard Hostin, MD; Robert A. Hart, MD; Frank J. Schwab, MD; Shay Bess, MD; Christopher P. Ames, MD; Justin S. Smith, MD, PhD; International Spine Study Group
- 10:43-10:47 **Paper #119: Multiple Rod Constructs and use of BMP2 Results in Lower Rod Fracture Rates in Adult Spine Deformity Patients Who Undergo Lumbar Pedicle Subtraction Osteotomy: Series of 141 Patients with 2-year Follow-up**  
*Darryl Lau, MD*; Qiunan Lyu, MD; Vedat Deviren, MD; Alexander Haddad, BS; Christopher P. Ames, MD
- 10:47-10:56 **Discussion**
- 10:56-11:00 **Paper #120: Assessing Pain as a Primary Factor in the Surgical Treatment of Adult Spinal Deformity Surgery in Patients over 60 years of Age**  
*Colby Oitment, MD, FRCS(C)*; Stephen J. Lewis, MD, FRCS(C); Anna Rienmüller, MD, MS; Thorsten Jentzsch, MD, MS; Hananel Shear-Yashuv, MD; Allan R. Martin, MD, PhD, FRCS(C); Christopher J. Nielsen, MD; Sigurd H. Berven, MD
- 11:00-11:04 **Paper #121: Comparing the Modified 5-item Frailty Index versus Chronological Age in Predicting Perioperative Complications and Discharge Disposition for Patients undergoing Adult Spinal Deformity Surgery**  
Rahul Sachdev, BS; Kevin Y. Wang, BS; Richard L. Skolasky, PhD; Khaled M. Kebaish, MD; *Brian J. Neuman, MD*

All times are listed in US Central Time.

\*Denotes Non-CME Session

Program (topics, timing, and faculty) are preliminary and subject to change.

- 11:04-11:08 **Paper #122: Matched Analysis Demonstrates Acute Rehabilitation or Skilled Nursing Facility Care Does Not Reduce Readmissions, Return to Surgery or Improve Outcomes Compared to Home Discharge Following Adult Spine Deformity Surgery**  
*Shay Bess, MD*; Breton G. Line, BS; Renaud Lafage, MS; Pierce D. Nunley, MD; Christopher P. Ames, MD; Robert K. Eastlack, MD; Gregory M. Mundis, MD; Virginie Lafage, PhD; Eric O. Klineberg, MD; Munish C. Gupta, MD; Michael P. Kelly, MD; Robert A. Hart, MD; Peter G. Passias, MD; Themistocles S. Protopsaltis, MD; Douglas C. Burton, MD; Khaled M. Kebaish, MD; Han Jo Kim, MD; Frank J. Schwab, MD; Christopher I. Shaffrey, MD; Justin S. Smith, MD, PhD; International Spine Study Group
- 11:08-11:17 **Discussion**
- 11:17-11:21 **Paper #123: Adults with Scoliosis, Curve Progression is Faster after Age 50: Results from a Longitudinal Collection of Radiographical Data**  
*Sabrina Donzelli, MD*; Fabio Zaina, MD; Giulia A. Rebagliati, MD; Massimiliano Vanossi, PhysiOtherapist; Greta Jurenaite, MD; Stefano Negrini, MD
- 11:21-11:25 **Paper #124: Adult Spinal Deformity Surgery Is Associated with Increased Productivity and Decreased Absenteeism from Work and School**  
*Wesley M. Durand, BS*; Jacob Babu, MD; D. Kojo Hamilton, MD; Peter G. Passias, MD; Han Jo Kim, MD; Themistocles S. Protopsaltis, MD; Virginie Lafage, PhD; Renaud Lafage, MS; Justin S. Smith, MD, PhD; Christopher I. Shaffrey, MD; Munish C. Gupta, MD; Michael P. Kelly, MD; Eric O. Klineberg, MD; Frank J. Schwab, MD; Jeffrey L. Gum, MD; Gregory M. Mundis, MD; Robert K. Eastlack, MD; Khaled M. Kebaish, MD; Alex Soroceanu, MPH; Richard Hostin, MD; Douglas C. Burton, MD; Shay Bess, MD; Christopher P. Ames, MD; Robert A. Hart, MD; Alan H. Daniels, MD; International Spine Study Group
- 11:25-11:29 **Paper #125: Gain in HRQL after ASD Surgery is Maintained between 2 and 5 years' Follow-up**  
*Ferran Pellisé, MD, PhD*; Alba Vila-Casademunt, MS; Maria Capdevila-Bayo, MS; Susana Núñez Pereira, MD; Aleix Ruiz de Villa, PhD; Sleiman Haddad, MD, PhD, FRCS; Frank S. Kleinstueck, MD; Javier Pizones, MD, PhD; Manuel Ramirez Valencia, MD; Ibrahim Obeid, MD; Ahmet Alanay, MD; Anne F. Mannion, PhD; European Spine Study Group
- 11:29-11:38 **Discussion**
- 11:38-11:42 **Paper #126: Neurologic Complications after Adult Spinal Deformity Surgery**  
 Karnmanee Srisanguan, BS; Michael Dinizo, MD; Thomas J. Errico, MD; *Tina Raman, MD*
- 11:42-11:46 **Paper #127: Assessing Key Functional Outcomes after Multilevel Fusion for Adult Spinal Deformity in Patients Over Sixty Years of Age: A Prospective, Observational, Multicenter Study with 2-year Follow-up**  
*Hananel Shear-Yashuv, MD*; Stephen J. Lewis, MD, FRCS(C); Thorsten Jentzsch, MD, MS; Colby Oitment, MD, FRCS(C); Anna Rienmüller, MD, MS; Allan R. Martin, MD, PhD, FRCS(C); Christopher J. Nielsen, MD; Marinus De Kleuver, MD; Yong Qiu, MD; Yukihiro Matsuyama, MD, PhD; Lawrence G. Lenke, MD; Ahmet Alanay, MD; Ferran Pellisé, MD, PhD; Kenneth M. Cheung, MD, MBBS, FRCS; Maarten Spruit, MD; David W. Polly, MD; Jonathan N. Sembrano, MD; Christopher I. Shaffrey, MD; Justin S. Smith, MD, PhD; Michael P. Kelly, MD; Benny T. Dahl, DMSc; Sigurd H. Berven, MD
- 11:46-11:55 **Paper #128: Complication Rates with MIS Deformity Surgery Depend More on Number of Posterior Levels Fused than Number of Interbody Grafts**  
 Juan S. Uribe, MD; *Shashank V. Gandhi, MD*; Michael Y. Wang, MD; Gregory M. Mundis, MD; Adam S. Kanter, MD; Robert K. Eastlack, MD; Neel Anand, MD; Paul Park, MD; Justin S. Smith, MD, PhD; Douglas C. Burton, MD; Michael P. Kelly, MD; Han Jo Kim, MD; Shay Bess, MD; Christopher I. Shaffrey, MD; Frank J. Schwab, MD; Lawrence G. Lenke, MD; Virginie Lafage, PhD; Praveen V. Mummaneni, MD; International Spine Study Group
- 11:55-12:05 **Discussion**
- 12:05-12:30 **56<sup>th</sup> Annual Meeting Highlights Summary**
- 12:30 **Adjournment**

All times are listed in US Central Time.

\*Denotes Non-CME Session



The self-paced program includes additional abstracts, e-posters, and recordings of the live sessions.

## Abstract Session 12. COVID-19 Impact on Spine Deformity

Moderators: Jeffrey Gum, MD & Michael P. Kelly, MD

### Paper #129: COVID-19 Significantly Impacted Hospital Length of Stay and Discharge Patterns for ASD Surgery

*Kevin Y Wang*; Emmanuel McNeely; Suraj Dhanjani; Micheal Raad; Varun Puvanesarajah; Brian J Neuman; Jay Khanna; Floreana N Kebaish; Hamid Hassanzadeh; Khaled M Kebaish

### Paper #130: The Lessons Learned from the COVID Pandemic will Improve the Patient Experience in the Outpatient Setting

Kiley F Poppino; Charu Sharma; Lindsay Phillips; *Daniel J. Sucato*

### Paper #131: Effect of COVID-19 on Spine Deformity Care and Patient-reported Outcome Measures

*Suken A Shah*; Michelle Claire Marks; Maty Petcharaporn; Petya Yorgova; Irene Li

### Paper #132: Are AIS patients Good Candidates for Telemedicine Consultation?: A Comparison of Satisfaction Scores between AIS and non-AIS Patients during the COVID-19 Pandemic

*Gabriel KP Liu*; Jun Hao Tan; Leok-Lim Lau; Hee-Kit Wong

### Paper #133: Impact of COVID-19 on Pediatric Spine Patients: Post Traumatic Stress and Coping Responses

*Emily Gale*; Whitney M Herge; Emily Stapleton; Kiley F Poppino; Shelby P Cerza; Daniel J. Sucato

### Paper #134: A Dangerous Curve: Impact of the COVID-19 Pandemic on Brace Treatment in Idiopathic Scoliosis

Matias Pereira Duarte; Julie Joncas; Stefan Parent; Olivier Chémaly; Felix L Brassard; Jean-Marc Mac-Thiong; Soraya Barchi; *Hubert Labelle*

## Abstract Session 13. Machine Learning and Advanced Analysis

Moderators: Marinus de Kleuver, MD, PhD & Zeeshan M. Sardar, MD

### Paper #135: Identification of Anterior Cervical Spinal Instrumentation Using a Smartphone Application Powered by Machine Learning

John Schwartz; Aly A Valliani; Brian H Cho; Varun Arvind; Eric Geng; Samuel K Cho; *Jun S Kim*

### Paper #136: The Utility of Surgeon-directed DICOM Manipulation Software as a Preoperative Surgical Planning Tool in Pediatric Craniovertebral Anomalies

*Kshitij Chaudhary*; Arjun Dhawale; Avi P Shah; Abhay Nene

### Paper #137: Automated clustering of Early Onset Scoliosis patients using Pre-operative Clinical Indices

*Girish Viraraghavan*; Patrick J Cahill; Jason B Anari; Sriram Balasubramanian

### Paper #138: Development and Validation of a Model to Predict X-ray Progression at a Follow-up Visit Based on Ultrasound and Clinical Parameters for Adolescent Idiopathic Scoliosis (AIS)

Mahdieh Khodaei; Eric C Parent; Lawrence H Le; Sarah Southon; Doug L Hill; Kyle Stampe; Eric M Huang; *Edmond H. Lou*

### Paper #139: Automatic Measurement of Cobb Angle Based on Artificial Intelligence Key Point Detection Technology

*Xianglong Meng*; Yaozhong Xing; Yu Sun; Zian Zhao

### Paper #140: Cluster Analysis to Identify Deformity and Disability Patterns in ASD Patients: A Step Toward a Clinically Relevant ASD Classification

*Renaud Lafage*; Justin S Smith; Shay Bess; Christopher I Shaffrey; Han Jo Kim; Khaled M Kebaish; Douglas C. Burton; Richard Hostin; Peter G Passias; Themistocles S Protopsaltis; Alan H Daniels; Eric O. Klineberg; Munish C Gupta; Michael P. Kelly; Lawrence G. Lenke; Frank J Schwab; Virginie Lafage; International Spine Study Group

### Paper #141: The Use of Predictive Modeling to Determine Post-operative Thoracic Kyphosis and Pelvic Tilt in Adult Spinal Deformity Surgery

*Mellissa R Delcont*; David C Ou-Yang; Evalina L Burger; Vikas V Patel; Nolan M Wessell; Christopher J Kleck

### Paper #142: Can Machine Learning Improve Our Ability to Predict Reoperations in Adult Spinal Deformity Surgery: A Leap Forward in Predictive Modeling

*Joseph M. Lombardi*; Scott Zuckerman; Meghan Cerpa; Zeeshan M Sardar; Ronald A Lehman; Lawrence G. Lenke

### Paper #143: Predicting Readmission Following Fusion for Scoliosis in Pediatric Patients: A Machine Learning Approach

*Alan H Daniels*; Ashwin Veeramani

## E-Posters

E-posters are available on the virtual meeting platform for self-paced viewing through December 31, 2021.

# SRS Board of Directors and Chairs

## BOARD OF DIRECTORS

Muharrem Yazici, MD- President  
Christopher I. Shaffrey Sr., MD- President Elect  
Serena S. Hu, MD- Vice President, Treasurer  
Laurel C. Blakemore, MD- Secretary; Governance Council Chair  
Ferran Pellise, MD, PhD- Secretary Elect  
Paul D. Sponseller, MD, MBA- Past President I  
Peter O. Newton, MD- Past President II  
Benny T. Dahl, MD, PhD, DMSci MD- Director  
Ronald A. Lehman Jr., MD- Director  
Gregory M. Mundis Jr., MD- Director  
John T. Smith, MD- Director  
Justin S. Smith, MD, PhD- Director  
Hee-Kit Wong, MD- Director  
Suken A. Shah, MD- Education Council Chair  
Marinus de Kleuver, MD, PhD- Research Council Chair  
Douglas C. Burton, MD- Research Council Chair Elect

## COUNCIL CHAIRS

Education Council	Suken A. Shah, MD
Finance Council	Serena S. Hu, MD
Governance Council	Laurel C. Blakemore, MD
Research Council	Marinus de Kleuver, MD, PhD

## COMMITTEE & TASKFORCE CHAIRS

AANS/SRS Joint TF	Praveen Mummaneni, MD
Adult Deformity	Robert K. Eastlack, MD
Awards and Scholarship	Kenneth J. Paonessa, MD
Blended Learning TF	Lawrence Haber, MD
Bylaws and Policies	John M. Wattenbarger, MD
CME	Steven W. Hwang, MD
Current Concepts in Spine	Kota Watanabe, MD, PhD
Deformity Courses	
Communications	Yan Wang, MD
Corporate Relations	Paul D. Sponseller, MD, MBA
Development	Khaled M. Kebaish, MD
Diversity, Equity, & Inclusion TF	Laurel C. Blakemore, MD & Serena S. Hu, MD
Early Career Surgeon TF	Kariman Abelin-Genevois, MD, PhD
Education	Amer F. Samdani, MD
Education Resource	Ron El-Hawary, MD
Ethics & Professionalism	Steven D. Glassman, MD
Fellowship	Jeffrey D. Coe, MD
Finance	Serena S. Hu, MD
Global Education on Spine	Ahmet Alanay, MD
Deformity	
Global Outreach	Kota Watanabe, MD, PhD
Growing Spine	Sumeet Garg, MD
Hands-On Courses	Munish C. Gupta, MD
Health Policy	Paul T. Rubery JR., MD
Historical	George H. Thompson, MD
IMAST	David L. Skaggs, MD, MMM
Long Range Planning	Paul D. Sponseller, MD, MBA
Morbidity & Mortality	G. Ying Li, MD
Needs Assessment TF	Haluk Berk, MD
Nominating	Paul D. Sponseller, MD, MBA
Non-Operative Management	Brian G. Smith, MD
Organizational Structure TF	Muharrem Yazici, MD & Christopher I. Shaffrey Sr., MD
Patient Education	Joseph P. Davey, MD
Patient Focus TF	Annalise Noelle Larson, MD
Pediatric Device TF	Patrick J. Cahill, MD
Platforms for Performance & Outcomes TF	Justin S. Smith, MD, PhD
Podcasts TF	Yan Wang, MD & Ron El-Hawary, MD
Program	Michael P. Kelly, MD
Research Grant	Virginie Lafage, PhD
Research Promotion & Oversight	René M. Castelein, MD, PhD
Safety & Value	Christopher P. Ames, MD
Spine Deformity Update TF	Michael P. Kelly, MD & Suken A. Shah, MD
Translation	Avraam Ploumis, MD, PhD
Website	Cristina Sacramento-Dominguez, MD, PhD
Worldwide Courses	Saumyajit Basu, MD

# About SRS

## OVERVIEW

---

Founded in 1966, the Scoliosis Research Society is an organization of medical professionals and researchers dedicated to improving care for patients with spinal deformities. Over the years, it has grown from a group of 37 orthopaedic surgeons to an international organization of more than 1,400 health care professionals.

## MISSION STATEMENT

---

The purpose of the Scoliosis Research Society is to foster the optimal care of all patients with spinal deformities.

## MEMBERSHIP

---

SRS is open to orthopaedic surgeons, neurosurgeons, researchers, and allied health professionals who have a practice that focuses on spinal deformity. Visit [www.srs.org/professionals/membership](http://www.srs.org/professionals/membership) for more information about membership with SRS and to apply online.

## PROGRAMS AND ACTIVITIES

---

SRS is focused primarily on education and research that include the Annual Meeting, the International Meeting on Advanced Spine Techniques (IMAST), Worldwide Courses, a Global Outreach Program, the Research Education Outreach (REO) Fund which provides grants for spine deformity research, and development of patient education materials.

## WEBSITE INFORMATION

---

For the latest information on SRS meetings, programs, activities, and membership please visit [www.srs.org](http://www.srs.org). The SRS Website Committee works to ensure that the website information is accurate, accessible, and tailored for target audiences. Site content is varied and frequently uses graphics to stimulate ideas and interest. Content categories include information for medical professionals, patients/public, and SRS members.

## SOCIETY OFFICE STAFF





---

Ashtin Neuschaefer, CAE- Executive Director  
Sinais Alvarado, MA- Education Manager  
Lily Atonio- Education and Instructional Design Manager  
Alysha Chapman, CNP- Membership and Development Manager  
Ann D'Arienzo, CMP- Senior Meetings Manager  
Jenifer Heller, DES- Meetings Manager  
Courtney Kissinger- Senior Education Manager  
Laura Pizur- Registration and Program Manager  
Michele Sewart, PMP – Senior Communication Manager  
Shawn Storey- Website and Program Manager

## SOCIAL MEDIA

---

Join the conversation surrounding the SRS Annual Meeting by including **#SRSAM21** in your social media posts.

 @srs\_org  
 @ScoliosisResearchSociety  
 @srs\_org  
 [linkedin.com/company/srs\\_org](https://www.linkedin.com/company/srs_org)

## SCOLIOSIS RESEARCH SOCIETY

---

555 East Wells Street, Suite 1100  
Milwaukee, WI 53202  
Phone: 414-289-9107  
Fax: 414-276-3349  
[www.srs.org](http://www.srs.org)

# 2020 Research Grant Recipients

## SRS RESEARCH PROGRAM OVERVIEW

The SRS Research funds are dedicated solely to research seeking improved treatments, the causes and possible prevention of spinal deformities. Since 1994, SRS has provided more than \$5.4 million for 178 spinal deformity research projects from the institutions all over the world, including the United States, Australia, Canada, China, France and Israel. These have included studies on improved spinal cord monitoring during surgery, brace treatment effectiveness, methods to improve fusion rates, and three large studies looking for the cause of idiopathic scoliosis.

In 2020, SRS received 72 grant applications, requesting a total of over \$2 million. The following 10 projects were selected for funding.

Title of Project	Primary Investigator/ Location	Grant Duration	Type of Grant	Amount Approved
Development and measurement properties of a patient-reported outcome measure of pulmonary function in patients with spinal deformity	Mrs. Miranda van Hooff MSc PhD/Nijmegen, The Netherlands	2 years	Standard Research	\$49,666
Effect of mixing dissimilar metals on serum metal ion levels and spinal implant performance in adolescent idiopathic scoliosis and neuromuscular scoliosis	Parham Rasoulinejad/ Ontario, Canada	4 years	Standard Research	\$50,000
Leveraging Embedded Haptic Sensor Technology for Force Vector Mapping in Orthoses for Adolescent Idiopathic Scoliosis	Carla Pugh MD, PhD, FACS/Stanford, USA	2 years	Standard Research	\$50,000
Self-perceived health status and healthcare consumption of operated AIS patients (minimum follow-up>25 years) compared with normal, age and gender, matched controls. How much do operated AIS patients differ from the general population?	Dr. Antonia Matamalas MD, PhD/Barcelona, Spain	2 years	New Investigator	\$30,000
Does Health Mindset predict Early Postoperative Outcomes after Posterior Spinal Fusion for Adolescent Idiopathic Scoliosis?	Dr. John Vorhies MD/ Stanford, USA	2 years	New Investigator	\$30,000
Postoperative pain control using local wound infiltration in adolescent idiopathic scoliosis surgery: a randomized control trial	Dr. Craig Birch MD/Boston, USA	2 years	New Investigator (pending approval)	\$29,594
Can Disease Related and Aged Related Inflammation Predict Disease Severity and Surgical Outcomes Following Adult Spinal Deformity Corrective Surgery?	Dr. Karan Patel MD/New York, USA	1 year	Resident/Fellow	\$10,000
The importance of restoring harmonious sagittal alignment in AIS surgery for clinical and radiological outcome as well as prevention of PJK- a new classification of sagittal alignment in AIS	Anna C. Rienmüller M.D. Dipl. Ing. C.O./Toronto, Canada	1 year	Resident/Fellow	\$10,000
Cerebrospinal fluid pressures at the Craniovertebral Junction in Patients with Chiari Malformation that develop Scoliosis	Dr. Asham Khan MD/ Buffalo, USA	1 year	Resident/Fellow	\$10,000
'Smart vest' as a measurement instrument for pulmonary function in adolescent idiopathic scoliosis; An exploratory study.	Mr. Niek Hennepe MD/ Nijmegen, The Netherlands	1 year	Exploratory Micro-Grant	\$2,500
Effect of posterior hemivertebra resection on spinal sagittal alignment of children with congenital scoliosis	Dr. Xu Fulong/Guangzhou, China	1 year	Exploratory Micro-Grant	\$2,400
Expanding Mechanistic Discoveries of IS Using a Hypomorphic kif7 Zebrafish Model	Dr. Nancy Hadley Miller MD/Colorado, USA	2 years	SRS-Cotrel Foundation Basic Science	\$50,000
Effectiveness of three-dimensional correction during bracing in adolescent idiopathic scoliosis: a prospective randomised clinical trial of Rigo Chêneau versus Boston-style orthoses	Dr. Kenny Kwan BMBCh FRCSEd(Orth) FHKCOS FHKAM(Orth)/Hong Kong	3 years	Biedermann Innovation Award	\$50,000

# Corporate Partners

We are pleased to acknowledge and thank those companies that provided financial support to SRS in 2021.

---

## DOUBLE DIAMOND LEVEL SUPPORT

DePuy Synthes  
Globus Medical, Inc. ★  
Medtronic ★  
NuVasive ★  
Stryker ★  
Zimmer Biomet

---

## GOLD LEVEL SUPPORT

OrthoPediatrics

---

## BRONZE LEVEL SUPPORT

ATEC Spine  
Biedermann Motech  
Orthofix  
Pacira BioSciences, Inc.

★ = ASLS II Supporter



THE 2021 ANNUAL MEETING WILL BE HELD AS A HYBRID MEETING which will allow people to join the in-person meeting in St. Louis, USA from September 22-25, 2021 and/or to participate virtually. **In-Person Registration Deadline: August 20, 2021** (or when capacity is reached). **Virtual Only Registration Deadline/Online Access Cut-Off Date: December 31, 2021**

## DELEGATE INFORMATION

SRS ID Number	First (Given) Name	Last (Family) Name	Suffix (Jr., III, etc.)	Degree (MD, PhD, etc.)
Email Address (All correspondence is done by email)				
Assistant/ Company Personnel Email Address				
Institution				
Mailing Address				
City (To appear on badge)		State	Zip/Postal Code	Country (To appear on badge)
Specialty: <input type="checkbox"/> Orthopaedic Surgeon <input type="checkbox"/> Neurosurgeon <input type="checkbox"/> Industry <input type="checkbox"/> Other:				

Registration Class	IN-PERSON REGISTRATION <i>for participation at the meeting in St. Louis, USA</i>	VIRTUAL ONLY REGISTRATION <i>for participation via the online meeting platform</i>	IN-PERSON ADD-ONS* <i>for participation at the meeting in St. Louis, USA</i>			
			CME Add-On		Non-CME Add-On	
			Hibbs Society Meeting Tues, Sept. 21	Early Career Session Thurs, Sept. 23	Opening Ceremonies & Welcome Reception Wed, Sept. 22	Farewell Reception Fri, Sept. 24
SRS Member Physician	<input type="checkbox"/> \$ 1,050	<input type="checkbox"/> \$ 840				
SRS Member - Non-Physician	<input type="checkbox"/> \$ 600	<input type="checkbox"/> \$ 480	<input type="checkbox"/> \$ 50	<input type="checkbox"/> \$ 0	<input type="checkbox"/> \$ 0	<input type="checkbox"/> \$ 50
SRS Emeritus Member	<input type="checkbox"/> \$ 600	<input type="checkbox"/> \$ 480	*Add-on session registration is required for onsite participation only.			
Non-Member Physician	<input type="checkbox"/> \$ 1,400	<input type="checkbox"/> \$ 1,120				
Non-Member Non-Physician	<input type="checkbox"/> \$ 750	<input type="checkbox"/> \$ 600				
Resident/Fellow/Medical Student	<input type="checkbox"/> \$ 550	<input type="checkbox"/> \$ 440				
Delegate from Reduced Rate Country*	<input type="checkbox"/> \$ 550	<input type="checkbox"/> \$ 440				
Industry Representative	<input type="checkbox"/> \$ 1,450	<input type="checkbox"/> \$ 1,160				

\*For countries that qualify for reduced rate registration, visit [www.srs.org/am21/registration](http://www.srs.org/am21/registration).

**In-Person Registration** includes admission to the pre-meeting course, half-day course, lunchtime symposia, scientific sessions, Opening Ceremonies and Welcome Reception, industry workshops at the meeting venue in St. Louis, and access to the online meeting platform.

**Virtual Only Registration** includes access to the Annual Meeting content streamed live from the meeting and access to the online meeting platform.

Total Fees \$ \_\_\_\_\_ USD

Include me on any published delegate list, including the list provided to corporate supporters so that they may send me information about their products, services, and involvement at the meeting.

Privacy policy: [www.srs.org/about-srs/contact-us/privacy-policy](http://www.srs.org/about-srs/contact-us/privacy-policy)

**Add me to the in-person registration waiting list.**

If in-person registration sells out before you are able to register, you can be added to the in-person registration waiting list by registering for the virtual only registration option and by selecting the in-person registration waiting list check box.

**Cancellation Policy:** Full refunds, less a 10% processing fee, will be granted for the cancellation of in-person or virtual only meeting registration, if received in writing within 48-hours from the time of registration. After 48-hours, in-person registration may only be reduced to virtual only registration and virtual only registration is non-refundable. If you wish to change your in-person registration to virtual only registration, SRS will grant a full refund, less the difference of the virtual only registration rate, if received in writing on or before August 20. No refunds will be granted after August 20, 2021.

**Waiver: Submission** of this registration form and payment of associated fee serves as agreement by the delegate to release the Scoliosis Research Society, the Hyatt Regency St. Louis at The Arch and their respective agents, servants, employees, representatives, successors, and assigns, from any and against all claims, demands, causes of action, damages, costs, and expenses, including attorneys' fees, for injury to person or damage to property arising out of attendance at the 56<sup>th</sup> Annual Meeting. In addition, the delegate hereby grants permission to use his/her likeness in a photograph or other digital reproduction in any and all of its publications, including website entries, without payment or any other consideration, agreeing that these materials will become the property of SRS which has the right to edit, alter, copy, exhibit, publish, or distribute this photo for purposes of publicizing its programs or for any other lawful purpose. Additionally, the delegate waives any right to royalties or other compensation arising or related to the use of the photograph.

SRS Tax ID #23-7181863

**Completed registration forms should be emailed, faxed, or mailed to the SRS Office.**

E: [meetings@srs.org](mailto:meetings@srs.org) • F: +1 414-276-3349 • Scoliosis Research Society, 555 E. Wells Street, Suite 1100, Milwaukee, WI, 53202, USA

## PAYMENT INFORMATION

**Checks (U.S. funds drawn on a U.S. bank only) may be made payable and mailed to:** Scoliosis Research Society • 555 E. Wells Street, Suite 1100 • Milwaukee, WI 53202

Check (U.S. funds drawn on a U.S. bank only)  
or provide credit card information:  Visa  MasterCard  American Express

Card Number

Security Code

Expiration Date

Name (As it appears on card)

Billing Address

City

State

Zip/Postal Code

Country

Signature (I agree to pay according to the credit card issuer agreement)









# SRS

Scoliosis Research Society

# Save the Date

## 29<sup>TH</sup> IMAST

INTERNATIONAL MEETING ON ADVANCED SPINE TECHNIQUES

April 6-9, 2022 | Miami, Florida, USA



# Power meets elegance

The right element to make a case, Reline is the most comprehensive fixation portfolio in spine, offering an easy-to-use yet powerful system. For degenerative through complex procedures, you need strength, versatility and speed. **Reline—where power meets elegance.**

Discover the elements of Reline  
at [nuvasive.com/Reline](https://www.nuvasive.com/Reline)



Scoliosis Research Society  
555 East Wells Street, Suite 1100  
Milwaukee, WI 53202

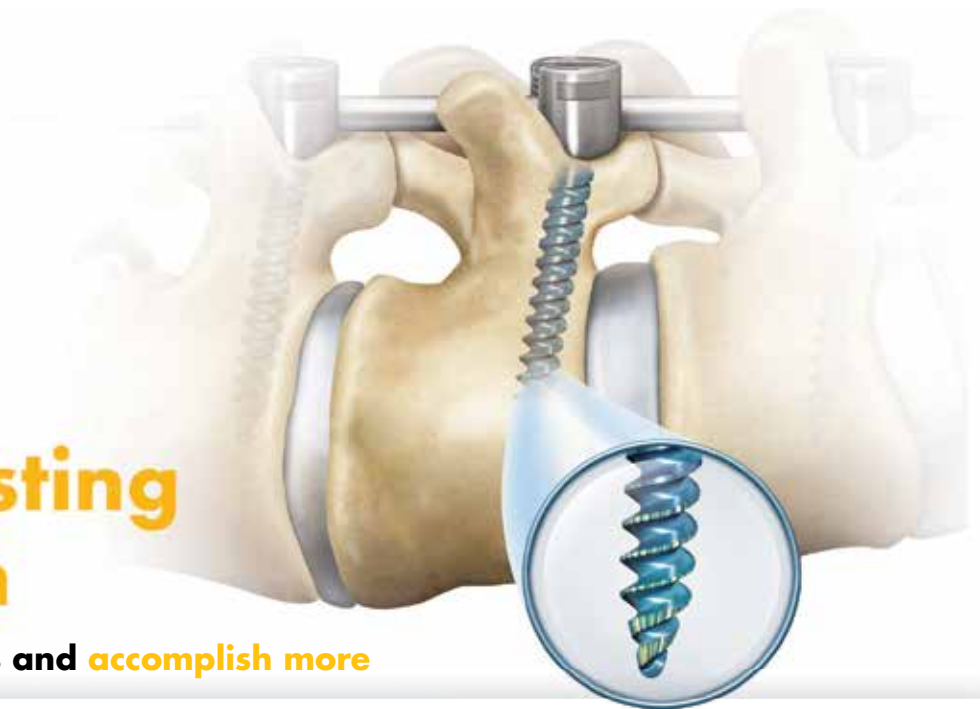
SRS-0521-189

stryker

Serrato®

# Leave a lasting impression

Allowing you to work less and accomplish more



Serrato pedicle screws feature **True-Tip™** geometry, a **dual-lead** cortical cancellous thread pattern, and market differentiating **serrations** that are designed to increase efficiency in your operating room.<sup>1</sup>



**Dual-lead cortical cancellous thread pattern**

- Shortened insertion time compared to similar implants with a single lead
- Designed to provide the right amount of work when you need it by decreasing torque during initial insertion, and gradually increasing torque as insertion is completed<sup>2,3</sup>

**Serrations**

Only available pedicle screw with serrations that are designed to reduce work by decreasing the amount of energy needed for screw insertion<sup>2,3</sup>

**True-Tip™**

35°-angled tip and extended thread profile allow for reliable insertion into and immediate engagement with bone<sup>1,3</sup>

Learn more at [strykerspineexpo.com](http://strykerspineexpo.com)

References: 1. PFC® 53783, 2. DHP 52538, 3. DHP 53892.

A surgeon must always rely on his or her own professional clinical judgment when deciding whether to use a particular product when treating a particular patient. Stryker does not dispense medical advice and recommends that surgeons be trained in the use of any particular product before using it in surgery. The information presented is intended to demonstrate the breadth of Stryker product offerings. A surgeon must always refer to the package insert, product label and/or instructions for use before using any Stryker product. The products depicted are CE marked according to the Medical Device Directive 93/42/EEC. Products may not be available in all markets because product availability is subject to the regulatory and/or medical practices in individual markets. Please contact your Stryker representative if you have questions about the availability of Stryker products in your area.

Stryker Corporation or its divisions or other corporate affiliated entities own, use or have applied for the following trademarks or service marks: Serrato, Stryker, True-Tip. All other trademarks are trademarks of their respective owners or holders.

SRS DOUBLE DIAMOND  
CORPORATE SUPPORTER

