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# Final Program

## Melbourne Convention and Exhibition Centre



<b>Societies</b>	4
<b>Program at a Glance</b>	14
<b>Scientific Program</b>	
Monday 1 May	17
Tuesday 2 May	43
Wednesday 3 May	71
Thursday 4 May	97
Friday 5 May	115
<b>Poster lists</b>	
ISLS	134
AO Spine	152
AFSS	158
ASSI	164
JSSR	168
KSNS	170
NASS	172
SILACO	176
SIS	177
SMISS	178
SOSORT	182
SSA	184
General	188
<b>Meetings, Satellite Symposia &amp; Workshops</b>	
Monday 1 May	191
Tuesday 2 May	195
Wednesday 3 May	199
Friday 5 May	203
<b>Company Profiles</b>	207



## AOSPINE

AO Spine is the leading global academic spine community, creating, disseminating, and exchanging knowledge to promote excellence in patient care and outcomes. It is the only truly multinational spine society in the world. AO Spine's global member community consists of 6,000 spine surgeons and researchers in 120 countries.

Every year, AO Spine stages over 200 educational events worldwide for over 12,000 participants. The education activities cover all spine pathologies and the spine surgeon's entire career. AO Spine also invests heavily in long- and short-term fellowship programs and observation opportunities.

AO Spine is the premier knowledge provider in the field of spinal surgery and at the forefront of preclinical and clinical research. It conducts its research independent of the industry. The clinical research is driven by the AO Spine Knowledge Forums. The five key opinion leader driven working groups generate knowledge in the spinal pathologies of tumor, deformity, spinal cord injury (SCI), trauma, and degenerative disease. They aim to spark expertise by way of clinical studies and evidence-based recommendations. The results are published and disseminated in the most influential journals and at conferences all over the world.

AO Spine is committed to developing new and innovative ways to develop spinal care across the globe. In 2020, two new important initiatives will be launched: the AO Spine Global Diploma Exam and the Clinical Expert Forums. AO Spine's official scientific journal, the Global Spine Journal, has been accepted to the Clarivate Analytics Journal Citation's Report (JCR) Science Edition and will receive an Impact Factor in June 2020.

The Global Spine Congress (GSC), the official annual congress of AO Spine, is one of the biggest gatherings for spine surgeons from all over the world.



## ASIA PACIFIC SPINE SOCIETY

The Asia Pacific Spine Society (APSS) is the Spine Section of the Asia Pacific Orthopaedic Association (APOA), a regional organization of spine surgeons mainly from the Asia Pacific region. This society started with the Western Pacific Orthopaedic Association - Spine Section in 1979.

The Society aims to advance spine care in the Asia Pacific region through education, research, and collaboration. The society aims to promote the highest standards of spine care by providing a platform for multidisciplinary professionals, including spine surgeons, neurosurgeons, orthopaedic surgeons, pain management specialists, and rehabilitation professionals, to share their knowledge, expertise, and experience.

APSS organises various educational activities, including conferences, courses, outreach programmes and fellowship programmes, to enhance the skills and knowledge of spine care professionals. The society also supports research through grants, awards, and publications to improve the understanding of spine diseases and their treatment. In addition, APSS collaborates with other spine societies worldwide to promote international exchange and cooperation.

The Society currently has over 500 members from over 20 countries in the Asia Pacific region and beyond. By fostering collaboration and exchange among professionals and promoting high-quality spine care, APSS strives to improve the lives of patients with spine disorders in the Asia Pacific region and beyond.

For more information, visit the APSS website: <https://www.apssonline.org/>

## ASSOCIATION OF SPINE SURGEONS OF INDIA

# ASSI

Association of Spine Surgeons of India (ASSI) was started on 18th December 1985, with an aim to bring all the spine surgeons of the country together under one umbrella. It was envisaged that we would have national, regional, and local meetings, symposia, CMEs, workshops, and conferences to promote uniform scientific spine care, both surgical and non-surgical. At present the association has around 3900 members. With the Motto "If we are doing it, let us do it better", Association promotes any spine related scientific activity, anywhere in India.

ASSI is running a two-year fellowship program in affiliated centers across India and conducts various outreach programs across the country in tier 2/3 cities, a capacity development program, textbooks on spine surgery and monographs as part of its academics. The society has been a strong propagator of research and has its research grant awards, a Spine Registry and a mobile application App based case discussion forum. "Indian Spine Journal (ISJ)" is indexed now and soon will get indexing in the PubMed as well. We plan to come out with <http://assieleamspine.org/>, world's largest online information portal, which will have two versions – one for spine experts and the other for general public, with an aim to develop a web-based teaching and be an educational resource. We have come out with ASSI theater book in Spine Surgery, a first of its kind in the world which will be a guide for all Surgeons, Fellows, theater Personnel & industry to get inputs as per their requirements. The ASSI scoliosis Screening app first kind of online app in India, called "spinescolcheck.com" is already launched.

Website: [www.assi.in](http://www.assi.in)



## BIO SPINE

BioSpine started in Europe, 2002 and had a key role and strong reputation to facilitate active interaction between scientists, physicians, and surgeons for the development of innovative "BioSpine-Products". Aligned with this accomplishment of BioSpine, Prof. Yong Eun Cho and colleagues launched the 1st BioSpine AP in Seoul, 2018 as another step of BioSpine in the Asia Pacific region.

BioSpine AP aims to serve as a strong platform for the development of "BioSpine-Product" in the Asia Pacific region. As Asia Pacific has abundant young, competent researchers with diverse geographical and ethnic properties, biotechnological innovations for spinal treatment are undoubtedly successful in the Asia Pacific region.

BioTechnology is an always leading, creative solution which enables clinicians to overcome current clinical problems. To drive the clinical application of new biotechnologies and biomaterials in spine field, we require open discussion with Asian and Worldwide spine surgeons, researchers, scientists, veterinarians, government officers, and industries. We thus cordially invite you all to attend the BioSpine AP 2023 meeting.

We very much look forward to meeting you at the BioSpine AP 2023 meeting in SpineWeek 2023, Melbourne.



### ACA - AUSTRALIAN CHIROPRACTORS ASSOCIATION

With over 3,000 members, the ACA provides a strong, unified voice for all chiropractors.

Whether it's through leadership, advocacy, member service, research, public engagement or governance, the ACA is active on all fronts in supporting chiropractors and enhancing health. ACA continues to grow, evolve and adapt to build a better understanding of the value of chiropractic care and ensure that the profession reaches its full potential.



### BSS - SOCIEDAD IBERO LATINOAMERICANA DE COLUMNA AUSTRALIA

Founded on October 12, 1994, BSS is a scientific, non-profit organization whose main objective is to disseminate the specialty in an institutional way, developing, encouraging and improving studies and research in the area of Orthopedics and Neurosurgery, with emphasis on Spine, contributing to the technical and scientific growth of the professionals of the area.

Website: [www.columna.com.br](http://www.columna.com.br)



### CA - CHIROPRACTIC AUSTRALIA

Chiropractic Australia is the leading peak body promoting evidence-based practice representing chiropractors in Australia. Established in 1990, it is a not-for-profit, member-based organisation that works towards advancing the chiropractic profession and improving the health outcomes of Australians through education, advocacy, and research.

Chiropractic Australia aims to promote evidence-based chiropractic care that is safe, effective, and accessible to all Australians. It provides support and resources to its members, including continuing education programs, networking opportunities, and clinical guidelines. The organisation also advocates for the inclusion of chiropractic care in healthcare policies and funding, and collaborates with other healthcare organisations to improve the overall quality of healthcare in Australia.

Chiropractic Australia is committed to upholding the highest standards of professional practice, and requires its members to adhere to a strict code of ethics and conduct. It also works closely with government bodies and other health professionals to ensure that chiropractic care is appropriately regulated and integrated into the broader healthcare system.

Overall, Chiropractic Australia plays an important role in promoting the health and wellbeing of Australians through chiropractic care. Its dedication to evidence-based practice, advocacy, and professional standards make it a trusted and respected organisation in the healthcare community.

### EUROPEAN SPINE JOURNAL



The European Spine Journal, one of the leading spine journals internationally, has always been much more than just a European publication.

The journal has a strong presence all over the world, especially in the Asia Pacific region. Not only do we get many manuscript submissions originating from this area, but we also are proud to have a large number of reviewers in that part of the globe.

That is why the European Spine Journal is glad to see SpineWeek being held in Melbourne. The European Spine Journal will be organising workshops on how to write a paper to maximise the chances of being accepted and also on how to do reviews for a scientific journal.

The Editors of the European Spine Journal look forward to meeting all their authors, reviewers and readers during the SpineWeek meeting in 2023.



### THE INTERNATIONAL SOCIETY FOR THE STUDY OF THE LUMBAR SPINE

Welcome to ISSLS, the International Society for the Study of the Lumbar Spine, bringing together individuals from across the globe for the purpose of research and clinical study into the lumbar spine. ISSLS serves as a forum for the exchange of information of both an investigative and clinical nature relating to low-back pain and disability. Since its establishment in 1974, ISSLS has actively sought to advance the study of low-back pain and disability. ISSLS members, some 400 surgeons, physiotherapists, chiropractors, engineers, kinesiologists, epidemiologists and molecular and cellbiologists from around the world, are at the forefront of developments and advances. Together, the contributions, activities and dedication of these individuals, have led to breakthroughs in many areas of spine research.

ISSLS encourages and supports young researchers and clinicians via its Fellowships and Awards Program. We are grateful for the generous corporate donations that allow young researchers to attend ISSLS Annual Meetings, where they present their papers and posters, meet like-minded clinicians and researchers, and continue their valuable investigation into spine disease and disability. The ISSLS Fellowship Program ensures that important research continues to be undertaken across clinical, bio-engineering and basic sciences.

The Annual Meetings are held in different cities around the world and ISSLS has participated and supported SpineWeek since its inception in Porto, Portugal in 2004.

The highlights of our meetings are the ISSLS Prize presentations, the Presidential address and the Harry Farfan Presidential Guest Speaker's lecture. We invite all registrants from every society to join us for these sessions.



### JSSR - JAPANESE SOCIETY FOR SPINE SURGERY AND RELATED RESEARCH

The purpose of the Japanese Society for Spine Surgery and Related Research is to promote research on spine and spinal cord disorders and to encourage exchanges of information among researchers, and to contribute to the enhancement of human health by disclosing and spreading the results of our researches and knowledge to the general public.

The Society was established in 1974 as the Society for Research on Spine Surgery, and the first general meeting was held in April of the same year under the chairmanship of Prof. Tarao Iwahara of Keio University.

The Society subsequently evolved into the Japanese Spine Research Society in 1985, the Japan Spine Research Society in 1990, and the current Japanese Society for Spine Surgery and Related Research in 2001.



### KOREAN SPINAL NEUROSURGERY SOCIETY

The Korean Spinal Neurosurgery Society was founded on December 19, 1987, as the third research society of the Korean Neurosurgical Society, initially named the Korean Spinal Neurosurgery Research Society. The society was established to promote academic communication and social intimacy between its members, as well as to improve clinical and basic research in spinal neurosurgery.

The establishment committee, led by Professor Hwan Yung Chung of Hanyang University, submitted the application for establishment to the Korean Neurosurgical Society, which was approved on October 22, 1987, during a full meeting of the director boards. The inaugural meeting and the first academic meeting were held at the Hanyang University Medical Center on December 19, 1987, where Hwan Yung Chung was elected as the first president. In December 1999, the society was renamed the Korean Spinal Neurosurgery Society, following approval by the Korean Neurosurgical Society. The society currently comprises six research societies, each dedicated to the study of specific topics in spinal neurosurgery.

The society has been active in organizing academic meetings and training seminars, both nationally and internationally, since its establishment. The society also published a comprehensive textbook of the spine, and its official journal, Neurospine, has been an official journal of ASIA SPINE, Neurospinal Society of Japan and Taiwan Neurosurgical Spine Society.

The Korean Spinal Neurosurgery Society has been committed to promoting excellence in the field of spinal neurosurgery, and its activities have contributed to advancing the knowledge and practice of spinal neurosurgery in Korea and beyond.



### KOREAN SOCIETY OF SPINE SURGERY SPINE SOCIETY OF AUSTRALIA

The Korean Society of Spine Surgery is an organization that provides a forum for the exchange of ideas between health care professionals so as to promote research in spinal surgery.

The society was founded in 1984 and has since become the longest-running organization specializing in the spine in Korea, while the number of registered members and published papers are still growing steadily. It holds an annual meeting twice a year in spring and autumn and provides instructional courses for surgeons and related professionals on a yearly basis.

The organization publishes two journals in two languages, which are The Journal of the Korean Society of Spine Surgery written in Korean and the Asian Spine Journal written in English. The Korean Society of Spine Surgery endeavors to create optimal care for patients with spinal diseases through education for both professionals and patients as well as the support of research by its members in the name of advancing the academic field of spinal surgery.



### NORTH AMERICAN SPINE SOCIETY

NASS is a global multidisciplinary, medical organization dedicated to fostering the highest quality, ethical, value-based and evidence-based spine care through education, research and advocacy. Join more than 8,000 spine professionals worldwide by making NASS your professional home for everything spine!



### SIS - SPINE INTERVENTION SOCIETY

The Spine Intervention Society (SIS) is an international physician organization dedicated to the development and promotion of the highest standards for the practice of interventional pain procedures.

Over 3,800 physician members in 50 countries rely on SIS for its renowned advocacy, research, and educational programs designed to advance evidence-based practice and ensure patient access to quality care and appropriate interventional pain treatments. SIS membership is primarily composed of physicians who are board certified in anesthesiology, physical medicine and rehabilitation, radiology, neurology, orthopedic surgery, or neurosurgery.



### SILACO - SOCIEDADE BRASILEIRA DE COLUNA

SILACO as a scientific society, brings together professionals related to all spinal disorders: to promote, develop and encourage the study and dissemination of causes, treatments and prevention of spinal disorders. It is also the representation of specialists before other continental or regional organizations to establish scientific relations between these entities.



### SOCIETY FOR MINIMALLY INVASIVE SPINE SURGERY

The Society for Minimally Invasive Spine Surgery (SMISS) is an international community of spine surgeons, orthopedic surgeons and neurosurgeons who have chosen to specialise in minimally invasive spine surgery.

The SMISS Asia/Pacific section encourages innovation progress and research in the field of minimally invasive spine surgery throughout the Asia-Pacific region.

The society provides educational activities for the safe and efficacious application of minimally invasive spinal technologies and provides unbiased evidence-based information relevant to miss for all healthcare professionals and the public at large.



### SOSORT - INTERNATIONAL SOCIETY ON SCOLIOSIS ORTHOPAEDIC AND REHABILITATION TREATMENT

SOSORT is a non-profit organization whose mission is to advance the most appropriate care for individuals with scoliosis and spine structural changes with an emphasis on non-operative management. The organization consists of patients, researchers, and clinicians such as physicians, surgeons, nurse practitioners, physician assistants, orthotists, physiotherapists, occupational therapists, exercise scientists, and rehabilitation professionals.

The first formal meeting of SOSORT was held in Poznan, Poland in April 2006. However, the seeds for this new organization were planted two years prior when a group of almost 100 clinicians gathered in Barcelona, Spain to discuss approaches and standards for non-operative care for scoliosis patients. The number and enthusiasm of the participants demonstrated that an organization dedicated to non-operative care was needed. The official SOSORT journal, *Scoliosis and Spinal Disorders* was published between 2006 and 2019. The journal was home to a number of consensus papers and several updates to SOSORT guidelines to help clinicians practice high quality evidence-based care.

Membership is now at over 200 individuals and growing. SOSORT is a diverse and international society with a common vision to create a world where multidisciplinary collaboration among individuals living with scoliosis and spine structural changes, their families, healthcare professionals and scientists exist to ensure optimal outcomes. Please consider joining our society and visit us in the spine village and at [www.SOSORT.org](http://www.SOSORT.org) for more information.



### SPINE SOCIETY OF AUSTRALIA

The Spine Society of Australia (SSA) is the peak organisation for medical professionals specialising in spine surgery, care and research in Australia.

Founded in 1990, with Professor Robert Fraser as the inaugural President, the original aims of the SSA included the following:

- o To form an educational organisation dedicated to the exchange of ideas and dissemination of scientific and clinical knowledge concerning spinal disease and disorder.
- o To advance the quality of and encourage research into the management of spinal disease and disorder.
- o To improve the means of communication and support for young men and women involved in the medical and scientific study, investigation and treatment of spinal disease and disorder

Today the SSA facilitates the exchange of ideas, research and communication about spine health. The current membership consists of about 200 members with clinicians from both orthopaedic and neurosurgical backgrounds and an increasing number of basic scientists and researchers.

The Australian Spine Registry (ASR) is an initiative of the Spine Society of Australia aiming to improve the quality of care provided to individuals undergoing spine surgery in Australia.

Visit the SSA and ASR in the Societies Village to see how you can get involved.

Program of a glance

**Monday 1 May**

Goldfields Theatre	Sovereign Room (Level 1)	Eureka 1 + 2	Eureka 3	Courtyard Rooms	Hospitality Suite 6
SSA	ASSI	SOSORT	APSS	SOSORT	
		Break			
SSA	ASSI	SOSORT	APSS	SOSORT	GENERAL
		Lunch break + Industry workshops			
SSA	ASSI	SOSORT	APSS	NASS	GENERAL
		Break			
SSA	ASSI	SOSORT	APSS	NASS	GENERAL

**Tuesday 2 May**

Goldfields Theatre	Sovereign Room (Level 1)	Eureka 1 + 2	Eureka 3	Courtyard Rooms	Hospitality Suite 6
SSA	ASSI	SOSORT	APSS	KSSS	KSNS
		Break			
SSA	ASSI	SOSORT	APSS	KSSS	KSNS
		Lunch break + Industry workshops			
ISSLS	ASSI	SOSORT	APSS	SSA	KSNS
		Break			
ISSLS	ASSI	SOSORT	APSS	SSA	KSNS

**Wednesday 3 May**

Goldfields Theatre	Sovereign Room (Level 1)	Eureka 1 + 2	Eureka 3	Courtyard Rooms	Hospitality Suite 6
ISSLS	ASSI	SOSORT	APSS	BIOSPINE	SSA
		Break			
ISSLS	ASSI	SOSORT	APSS	BIOSPINE	SSA
		Lunch break + Industry workshops			
ISSLS	ESJ	JSSR	SIS	BIOSPINE	NASS
		Break			
ISSLS	ESJ	JSSR	SIS	BIOSPINE	NASS

Program of a glance

**Thursday 4 May**

Goldfields Theatre	Sovereign Room (Level 1)	Eureka 1 + 2	Eureka 3	Courtyard Rooms	Hospitality Suite 6
ISSLS	ACA/CA	AO		SIS	SMISS AP
		Break			
ISSLS	ACA/CA	AO		SIS	SMISS AP
		Lunch break + Industry workshops			
	ACA/CA	NASS	BSS SILACO	SIS	SMISS AP
		Break			
	ACA/CA	NASS		SIS	SMISS AP

**Friday 5 May**

Goldfields Theatre	Sovereign Room (Level 1)	Eureka 1 + 2	Eureka 3	Courtyard Rooms	Hospitality Suite 6
ISSLS	ACA/CA	AO	BSS SILACO	SIS	SMISS AP
		Break			
ISSLS	ACA/CA	AO	BSS SILACO	SIS	SMISS AP
		Lunch break + Industry workshops			
ISSLS	ACA/CA	AO			SMISS AP
		Break			
ISSLS	ACA/CA	AO			SMISS AP



# Monday 1 May Scientific Program

	Goldfields Theatre	Sovereign Room (Level 1)	Eureka 1 + 2	Eureka 3	Courtyard Rooms	Hospitality Suite 6
08:00	SSA	ASSI	SOSORT	APSS	SOSORI	
10:00			Break			
10:30	SSA	ASSI	SOSORT	APSS	SOSORI	<b>GENERAL</b>
12:30			Lunch break + Industry workshops			
14:00	SSA	ASSI	SOSORT	APSS	NASS	<b>GENERAL</b>
16:00			Break			
16:30	SSA	ASSI	SOSORT	APSS	NASS	<b>GENERAL</b>



## SPINE SOCIETY OF AUSTRALIA

**Free Paper Session 1A: New technology**

Chairs: Wilke H.J. (DE) &amp; Russo M. (AU)

08.00		Short Welcome and Introduction Costi J. (AU)
08.05	O1	Assessing changes in spine biomechanics for progressive AIS: A method using MRI and artificial intelligence Little P. (AU)
08.15	O2	Refinements of a parametric virtual workflow to design spinal orthoses for adolescent idiopathic scoliosis Chalmers R. (AU)
08.25	O3	Risk factors for errors in pedicle screw placement in minimal invasive computer assisted spine surgery Hubbe U. (DE)
08.35	O4	Machine learning algorithms can accurately distinguish pathological gait patterns in patients with lumbar spine conditions and Parkinson's disease when compared to normative controls Fernando P.V. (AU)
08.45	O5	Viscoelastic lumbar disc prosthesis and monosegmental ALIF: What is the impact on the centers of rotation of the adjacent segment? Lazennec J.Y. (FR)
08.55		<b>Short break</b>
		<b>Free Paper Session 1B: Basic science &amp; biomechanics I</b>
		Chairs: Costi J. (AU), Suresh S. (AU)
09.00	O6	New findings pave the way: Structure-function characterization of the transition zone in the intervertebral disc Tavakoli J. (AU)
09.10	O7	Is graft material still necessary in 3D titanium interbody fusions? A preclinical evaluation in sheep Vizesi F. (US)
09.20	O8	Engineering the perfect mattress: The influence of age and anthropometry on lying biomechanics Rayward L. (AU)
09.30	O9	Intra-thecal pressure, spinal cord compression and oedema in a pig model of contusion spinal cord injury Jones C.F. (AU)
09.40	O10	Spinal cerebrospinal fluid flow following traumatic spinal cord injury: An investigation using phase-contrast magnetic resonance imaging in the pig Bessen M. (AU)
09.50	O11	What do surgeons hear and feel when breaching cortical walls? Biomechanical investigation of acoustic and torsional biomarkers for cortical wall perforations Lange T. (AU)
10.00		<b>Coffee Break</b>



## SPINE SOCIETY OF AUSTRALIA

Opening Welcome to SSA2023  
Kuru R. (AU) - SSA President & Costi J. (AU) - SSA Scientific Secretary

**Symposium 1**

Chair: Scott-Young M. (AU)

10.30		Spine Biomechanics - Current Challenges and What the Future Holds Oakland T. (CA)
11.00		Discussion
11.05		What drives CSF flow in the spine? Bilston L. (AU)
11.30		Discussion
11.35		Riluzole in acute spinal cord injury trial: a major international study, results and Australian perspective Stanford R. (AU)
12.00		Discussion
12.05		Panel Discussion
12.30		<b>Lunch Break &amp; Industry Workshops</b>
		<b>Free Paper Session 2: Outcomes I</b>
		Chairs: Diwan A. (AU) & Davis M. (AU)
14.00	O12	Development of the Paediatric Australian Spine Registry (pASR) Ho S.W.K. (AU)
14.10	O13	Safety and efficacy of continuous epidural analgesia after posterior instrumented fusion for adolescent idiopathic scoliosis Jamali M. (AU)
14.20	O14	The clinical and radiographic degenerative spondylolisthesis classification and its predictive value Baecker H. (NZ)
14.30	O15	Outcomes of the direct lateral and anterolateral approach in spinal surgery: Results from the British Spinal Registry Pun A. (AU)
14.40		<b>Short break</b>
		<b>Society Session</b>
		Chair: Lundine K. (AU)
14.45		Future direction and challenges in Australian health care delivery David R. (AU)
15.10		Update on the Australian Spine Registry Johnson M. (AU)
15.35		SSA Medico-legal update Kuru R. (AU)
16.00		<b>Coffee Break</b>

## SPINE SOCIETY OF AUSTRALIA

**Free Paper Session 3A: Spinal deformity I & tumour**

Chairs: Seex K. (AU) &amp; Duncombe P. (AU)

- 16.30 O16 Risk factors for distal construct failure in posterior spinal instrumented fusion for adolescent idiopathic scoliosis – A retrospective cohort study  
Ise C.B. (NZ)
- 16.40 O17 Two year outcomes of the Nemost growth rod for early onset scoliosis  
Kimami M.B. (AU)
- 16.50 O18 Effect of Non-fusion Anterior Scoliosis Correction (NFASC) on thoracic and lumbar sagittal parameters in Adolescent Idiopathic scoliosis (AIS) patients? Is it detrimental  
Akbari K. (IN)
- 17.00 O19 Surgical management and denosumab for aneurysmal bone cysts of the spine in an Australian tertiary paediatric centre  
Tsinas D. (CH)
- 17.10 O20 A novel approach for thoracic wall reconstruction using a 3D-printed prosthesis with hinged fixation to the vertebral column  
Tsinas D. (CH)
- 17.20 **Short Break**

## SPINE SOCIETY OF AUSTRALIA

**Free Paper Session 3B: Basic science & biomechanics II**

Chairs: Little P. (AU) &amp; Rayward L. (AU)

- 17.30 O21 The effect of head-end constraint on cervical spine kinematics, facet mechanics, and failure mode, during axial loading  
Quarrelling R. (AU)
- 17.40 O22 Estimating canal occlusion with specimen-specific computer models of subaxial cervical spine kinematics  
Quarrelling R. (AU)
- 17.50 O23 A dynamic experimental model of cervical facet dislocation  
Thompson-Bagshaw D. (AU)
- 18.00 O24 Anatomic viability of C2 translaminar screw fixation is variable between ethnicity and sex: European anatomy  
Baker J. (NZ)
- 18.10 O25 Interbody fusion using controlled release of E-Cell derived rhBMP-2 in skeletally mature ovine model  
Walsh W. (AU)
- 18.20 O26 Bone on the back table: Effects of autograft handling on spinal fusion  
Vizesi F. (US)

08.00	<b>Symposium: Planning surgery for severe (&gt;90°) rigid thoracic curves</b> Chairs: Jayaswal A. (IN) & Krishnan A. (IN)
08.07	Risk stratification & preoperative optimization of patients with severe deformity Sudhir G. (IN)
08.10	Discussion
08.10	<b>Preoperative halo-gravity traction - Pearls &amp; pitfalls</b> Basu S. (IN)
08.17	Discussion
08.20	<b>Debate: Surgical approach for severe (&gt;90°) rigid thoracic curves</b> Pro: Anterior release + posterior correction Kandwal P. (IN)
08.27	Con: Posterior release + posterior correction Garg B. (IN)
08.34	Discussion
08.40	<b>Debate: Implant density (&gt;90°) in severe rigid thoracic curves</b> Pro: I instrument all levels in severe rigid curves Sonawane D. (IN)
08.47	Con: Instrumenting strategic vertebrae gives the same result Dhillon C. (IN)
08.54	Discussion
09.00	Pulmonary considerations in patients with severe spinal deformities Das G. (IN)
09.07	Discussion
09.10	<b>Robots/Navigation in surgery for correction of severe deformity: Gimmick or useful tool??</b> Sheehy A. (IN)
09.17	Discussion
09.20	<b>Responding to IONM alerts during surgeries for correction of severe spinal deformity</b> Unnikrishnan R. (IN)
09.27	Discussion
09.30	<b>Free Paper Session I</b> Chairs: Das G. (IN) & Mohapatra B. (IN)
09.30	O27 Do 3D printed templates improve the accuracy and safety of pedicle screw insertion in complex spinal kypho-scoliotic deformities? A comparative cohort study Achary S. (IN)
09.35	O28 <b>Effect of non fusion anterior scoliosis correction surgery on pulmonary function in Lenke type 1 Adolescent Idiopathic Scoliosis patients treated with mini open thoracotomy approach</b> Akbar K. (IN)
09.40	O29 <b>Does trunical balance restoration in idiopathic scoliosis depend on choice of lowest instrumented vertebra and Cobb correction?</b> Tahasilakar N. (IN)
09.45	O30 <b>Posterior-only two-stage vertebral column resection in severe and rigid scoliosis</b> Sheeth S. (IN)
09.50	Q&A Session
10.00	<b>Coffee Break</b>

10.30	<b>Symposium: Approach to Benign primary spine tumors</b> Chairs: Unnikrishnan R. (IN) & Sudhir G. (IN)
10.30	Interactive case-based panel discussion Patel D. (IN)
11.30	Panelists: Venkatesh K. (IN), Wallia B. (IN), Pillai S. (IN), Thomas A. (IN)
11.30	<b>Free Paper Session II</b> Chairs: Sharma A. (IN) & Farooque K. (IN)
11.35	O31 <b>Pediatric non-gliar intramedullary spinal cord lesions: Clinicoradiological profile, pathology and surgical outcome</b> Divakar G. (IN)
11.40	O32 Functional results following microsurgical resection of intradural extramedullary spinal tumors Munagan Y. (IN)
11.40	O33 <b>Management of aggressive vertebral haemangioma - A systematic review and a proposed management algorithm</b> Machhera Haribabu S. (IN)
11.45	O34 <b>Locally aggressive chondroblastoma of the dorsal spine mimicking parachordoma</b> Gala R. (IN)
11.50	Q&A Session
12.00	O35 <b>Minimally invasive posterior thoracolumbar corpectomy: Technical note and case series</b> Harr A. (IN)
12.05	O36 <b>Approach to soft tissue reconstruction for complex spinal wounds</b> Chauhan S. (IN)
12.10	O37 <b>Blood conservation in major spine surgeries: Role of high dose TXA. An institutional experience</b> Unnikrishnan R. (IN)
12.15	O38 <b>Complex revision surgeries: How to do it right!</b> Modi J.V. (IN)
12.20	Q&A Session
12.30	<b>Lunch Break &amp; Industry Workshops</b>
14.00	<b>Joint session of ASSI and APSS: Early onset scoliosis</b> Chairs: Acharya S. (IN) & Lui G. (SG)
14.00	Interactive case-based panel discussion Garg B. (IN)
14.25	Panelists: Jayaswal A. (IN), Chan C.Y.W. (IN), Lau L.L. (IN)
14.25	Treatment strategy for EOS: When and what?? Wong Y.W. (HK)
14.40	Discussion
14.45	Tethering for EOS - The Indian experience! Hegde S. (IN)
14.55	Discussion

## ASSOCIATION OF SPINE SURGEONS OF INDIA

15.00	O39	<b>Free Paper Session III</b> Chairs: Dhilon C. (IN) & Sonawane D. (IN)
		Clinical and radiological outcomes of high-grade developmental spondylolisthesis treated surgically - Does reduction matter? Acharya S. (IN)
15.05	O40	Effect of in-situ fusion in lumbar spondylolisthesis on clinical outcomes and spino-pelvic sagittal balancing - A case series of 138 patients Zawar A. (IN)
15.10	O41	Effects of posterior spinal fusion surgery on gait biomechanics in patients with Adolescent Idiopathic Scoliosis Gerg B. (IN)
15.15	O42	Do all adult spinal deformity (ASD) patients need complex deformity correction surgery? A propensity matched prospective comparative analysis of outcomes of operative versus non-operative treatment of adult spinal deformity in an Indian scenario Badrikalya V. (IN)
15.20		<b>Q&amp;A Session</b>
15.30	O43	Is thoracolumbar interfascial plane block better than local anaesthetic infiltration in lumbar fusion for postoperative pain management? A randomized controlled trial Prasad S. (IN)
15.35	O44	Minimally Invasive Surgery Transpedicular Intradisc Cage (MISTIC technique) for management of Kummell's disease Iffthikar S. (IN)
15.40	O45	Analysis of clinical and radiological outcome of percutaneous kyphoplasty for osteoporotic compression fractures - A single centre prospective study Kondety S.K.R. (IN)
15.45	O46	Assessment of efficacy and safety of nandrolone decanoate and alendronate alone in patients with osteoporosis Dave M. (IN)
15.50		<b>Q&amp;A Session</b>
16.00		<b>Coffee Break</b>
		<b>Symposium: Challenging cases/innovative solutions</b>
		Chairs: Jhala A. (IN) & Giridhar P. (IN)
16.30		Open wedge osteotomy incongenital scoliosis Rajasekaran S. (IN)
16.37		<b>Discussion</b>
16.40		A kyphoplasty gone awry! Gurugaj S. (IN)
16.47		<b>Discussion</b>
16.50		<b>Sarcopenia: Is it the beginning of the end??</b> Babu N. (IN)
16.57		<b>Discussion</b>
17.00		<b>Technique for percutaneous biopsy in subaxial cervical spine</b> Aithala J. (IN)
17.07		<b>Discussion</b>

## ASSOCIATIONS OF SPINE SURGEONS OF INDIA

17.10		<b>Video: Percutaneous transforaminal lumbar endoscopic discectomy for migrated lumbar disc herniation Why it scores over other forms of lumbar discectomy?</b> Sharma M. (IN)
17.17		<b>Discussion</b>
17.20		<b>Video: Endoscopic discectomy for recurrent lumbar disc herniation</b> Kaushal M. (IN)
17.27		<b>Discussion</b>
		<b>Free Paper Session IV</b> Chairs: Gurugaj S. (IN) & Iyengar R. (IN)
17.30	O47	Necessity of direct decompression for thoracolumbar junction burst fractures with neurological compromise Ankit R. (IN)
17.35	O48	The study of neurological and radiological outcome of short segment fixation without laminectomy for traumatic thoracolumbar spine fractures with neurologic deficit Mutha M.N. (IN)
17.40	O49	Thoracolumbar vertebral burst fractures treated by short segment fixation with index screw and transpedicular intracorporeal bone grafting: A clinico-radiological analysis pre-post interventional study Agarwal P. (IN)
17.45	O50	Comparison of radiological & functional outcome of thoracolumbar burst fractures treated by Short Segment Pedicle screw fixation (SSPF) with monopedicular index screw fixation & bipedicular index screw fixation Gade M.S.R. (IN)
17.50		<b>Q&amp;A Session</b>
18.00	O51	Dural breach is an indicator to prognosticate neurological recovery in traumatic dorsolumbar spine: Prospective analysis of 48 patients with cauda equina and conus injuries Patel P. (IN)
18.05	O52	Better late than never: Clinical outcomes of delayed fixation in thoracolumbar spinal trauma Rathod T. (IN)
18.10	O53	Outcomes of long segment posterior fusion in patients with ankylosing spondylitis with thoracolumbar fractures Shahi P. (NP)
18.15	O54	A perioperative predictive model of early mortality in acute cervical spine injury: A prospective cohort study Verma A. (IN)
18.20		<b>Q&amp;A Session</b>
18.30		<b>Adjourn</b>



SOSORT - INTERNATIONAL SOCIETY ON SCOLIOSIS ORTHOPAEDIC AND REHABILITATION TREATMENT

08.00	<b>Introduction</b> McAviney J. (AU) & Zaina F. (IT)
08.06	<b>Session 1: Bracing</b> Chairs: McAviney J. (AU) & Aulisa A.G. (IT) On-site clinician-led bracing algorithm with short clinical feedback loops lead to significant improvements in bracing outcomes Choong J. (GB)
08.13	O56 The effect of night-time bracing on the sagittal profile in adolescent idiopathic scoliosis Heegaard M. (DK)
08.20	O57 Nighttime compared to full-time bracing in adolescent idiopathic scoliosis: Evaluating clinical equipoise and feasibility for a multi-center clinical trial Truong W. (US)
08.27	O58 The short-term outcomes of the Boston brace 3D Program based on SOSORT and SRS study criteria Wynne J. (US)
08.34	O59 It is worth treating adolescent with idiopathic scoliosis when bone maturity passed US Risser 2: Bracing can improve curves and aesthetic Donzelli S. (IT)
08.41	Discussion
08.57	O60 The effect of Risser stage on the risk of curve progression in patients with adolescent idiopathic scoliosis treated with night-time bracing Heegaard M. (DK)
09.04	O61 Bracing interventions can help adolescents with idiopathic scoliosis with surgical indication: A systematic review Zaina F. (IT)
09.11	O62 Can an immediate increase of standing height, when wearing a corrective scoliosis brace, be predictive of in-brace skeletal correction? Choong J. (GB)
09.18	O63 Non-operative treatment for Adolescent Idiopathic Scoliosis (AIS) by a combination of Cheneau brace and Schroth - Physiotherapeutic Scoliosis Specific Exercises (PSSE), for curves at high risk of progression Karavides N. (GR)
09.25	O64 Secondary outcomes on spinal deformity, spinal appearance, health related quality of life, treatment adherence and adverse effects in a multicentre randomised controlled trial on Conservative Treatment for moderate-grade Adolescent Idiopathic Scoliosis (CONTRALS) Abbot A. (SE)
09.32	O65 Assessing the presentation of adolescents seeking bracing treatment in the UK, using SRS bracing guidelines Choong J. (GB)
09.39	Discussion
09.51	<b>Coffee Break and Poster Session I</b>



SOSORT - INTERNATIONAL SOCIETY ON SCOLIOSIS ORTHOPAEDIC AND REHABILITATION TREATMENT

10.30	O66 <b>Session 2: Quality of life</b> Chairs: Parent E. (CA) & Abbott A. (SE) Combined Subjective and Objective health related Quality of life (SO-QOL™) score, and usefulness in a spine population for pre and post intervention assessment Mobbs R.J. (AU)
10.37	O67 Patient and parent expectations to scoliosis treatment Simony A. (DK)
10.44	O68 The psychological impact of children spinal deformities on their parents: How to measure with a Rasch consistent unidimensional questionnaire Zaina F. (IT)
10.51	Discussion
11.09	O69 Investigating the relationship between objective measurements and patient perception in non-treated AIS. Study 1: How much radiologic measurements affect the SRS-22 and the TAPS Aristegui G. (ES)
11.16	O70 Sources of emotional support for scoliosis patients Castille M.G. (US)
11.23	O71 Cross-cultural adaptation and psychometric properties of the traditional Chinese version of the Italian Spine Youth Quality of life (SYQOL) questionnaire Wong A.Y.L. (HK)
11.30	O72 What's sore about scoliosis? A prospective cohort study correlating PROM's, radiographic measurements, and surface topography with pain Grobiser B. (US)
11.37	Discussion
11.50	O73 Differences in LBP in adults with and without scoliosis: Results of a systematic review Marchese R. (AU)
11.57	O74 Don't hang up the cleats yet: Predicting physical activity levels in scoliosis patients with surface topography Grobiser B. (US)
12.04	O75 Is thoracic hyper-kypnosis deformity relevant to pain, autonomic nervous system function, disability, and cervical sensorimotor control in patients with chronic nonspecific neck pain? Harrison D. (US)
12.11	Discussion
12.30	<b>Lunch Break &amp; Industry Workshops</b>



**SOSORT - INTERNATIONAL SOCIETY ON SCOLIOSIS ORTHOPAEDIC AND REHABILITATION TREATMENT**

**Session 3: Exercise**

**Chairs: Romano M. (IT) & Aristegui G. (ES)**

- 14.00 O76 Adherence to physiotherapeutic scoliosis specific exercises during adolescence: Voices from patients and their families - A qualitative content analysis  
Donzelli S. (IT)
- 14.07 O77 The effect of scoliosis-specific exercises on quality of life in adolescents idiopathic scoliosis vary with program duration and baseline curve severity: A meta-regression  
Parent E. (CA)
- 14.14 O78 The effect of scoliosis-specific exercises on curve severity in adolescents idiopathic scoliosis vary with program duration and baseline curve severity: A meta-regression  
Parent E. (CA)
- 14.21 Discussion
- 14.41 O79 The effects of physiotherapy scoliosis specific exercise on truncal shift in idiopathic scoliosis: A 12-month follow-up  
Maude E. (GB)
- 14.48 O80 Factors that influence how Schroth therapists world-wide implement Schroth for adolescents with idiopathic scoliosis: A qualitative study  
Marchese R. (AU)
- 14.55 O81 Trunk shift over correction is related to generalised hypermobility  
Beits T. (GB)
- 15.02 Discussion



**SOSORT - INTERNATIONAL SOCIETY ON SCOLIOSIS ORTHOPAEDIC AND REHABILITATION TREATMENT**

**Session 4: Miscellaneous**

**Chairs: Harding R. (AU) & Maude E. (GB)**

- 15.12 O82 The development of United Kingdom National Guidelines for the post operative treatment of AIS - A consensus-based approach from a new multidisciplinary special interest group  
Beits T. (GB)
- 15.19 O83 Possible implications of pediatric chest wall surgeries on the risk of development of spinal deformities  
White R. (US) & Ginzburg M. (US)
- 15.26 O84 Bracing and physiotherapy in the conservative management of adolescent idiopathic scoliosis during growth: A survey of current practices across the UK and Ireland  
Dunstan E. (GB)
- 15.33 O85 Effect of muscle fatigue of the thoracic erector spinae on neuromuscular control in people with adolescent idiopathic scoliosis  
Tsang S.M.H. (HK)
- 15.40 Discussion
- 16.00 **Coffee Break and Poster Session II**
- 16.30 **Invited Lecture**  
Introduction by Zaina F. (IT)
- 17.00 **Basic biomechanics of the spine – What have we learned in 25 years?**  
Oxland T. (CA)
- 17.10 **Discussion**
- 17.10 **Invited Lecture**  
Introduction by Zaina F. (IT)
- 17.25 **Biomechanical considerations in examining spinal stiffness**  
Colloca C. (US)
- 17.25 **Discussion**
- 17.35 **Invited Lecture**  
Introduction by Cohen L. (AU)
- 17.35 **Riding the curve: My experience with scoliosis and unicycling for a cause**  
McKabb R. (AU)
- 17.50 **Discussion**
- 18.00 **Adjourn**



### ASIA PACIFIC SPINE SOCIETY

#### APSS Opening Ceremony

07.30	Program Introduction <i>Liu G. (SG)</i>
07.35	Welcome remarks & APSS history by the President <i>Rajasekaran S. (IN)</i>
07.50	Acknowledgement to APSS Central Sponsors
07.53	Introduction to ASJ
	<b>Free Paper Session I: Trauma</b> Chairs: Islam S.S. (BD) & Kundnani V. (IN)
08.00	Introduction
08.01	O86 Efficacy, safety and reliability of single posterior approach for unstable thoracolumbar burst fracture treated with anterior reconstruction & posterior instrumentation <i>Jonayed S.A. (BD)</i>
08.04	O87 Comparison of three different instrumentation constructs in a prospective cohort of thoracolumbar burst fractures - Does interbody fusion offer any advantage over fractured level instrumentation? <i>Sarkar B. (IN)</i>
08.07	O88 Effects of feriparatide alone versus percutaneous vertebroplasty on pain control and radiographic outcomes after osteoporotic vertebral compression fracture: A matched cohort study <i>Chen P.A. (TW)</i>
08.10	O89 Non-surgical management of flexion distraction type of spinal column injuries, institutional preview <i>Bhat S.A. (IN)</i>
08.13	Q&A Session
08.23	O90 Epidemiological characteristics and factors of early mortality for traumatic cervical spinal cord injury with radiographic abnormality: A multicenter nationwide cohort study <i>Kitagawa K. (JP)</i>
08.26	O91 Treatment of spinal cord injury, is there any hope? <i>Saleem M.J. (PK)</i>
08.29	O92 Predictors of neurological outcome of acute traumatic central cord syndrome: Outcome of a treatment algorithm <i>Verma V. (IN)</i>
08.32	O93 Assessment of biomechanical advantages in combined anterior-posterior cervical spine surgery by radiologic outcomes: Pedicle screw over lateral mass screw <i>Kim S.H. (KR)</i>
08.35	Q&A Session



### ASIA PACIFIC SPINE SOCIETY

	<b>Plenary Session</b> Chair: Sivananthan K.S. (MY)
09.00	Introduction
09.01	Severe rigid spinal deformity management <i>Hai Y. (JCN)</i>
09.16	Degenerative cervical myelopathy presenting as subjective lower limbs weakness could be a trap towards misdiagnosis <i>Niu C.C. (TW)</i>
09.31	Surgical pearls for spinal cord abnormalities in congenital spinal deformity <i>Tao H. (CN)</i>
09.46	Q&A Session
10.00	<b>Coffee Break</b>
	<b>Free Paper Session II: Cervical myelopathy</b> Chairs: Niu C.C. (TW) & Islam A. (BD) & Tangente R. (PH)
10.30	Introduction
10.31	O94 Surgical complications and incomplete canal widening of the vertebral body sliding osteotomy to treat cervical myelopathy <i>Cho S.T. (KR)</i>
10.34	O95 Retrospective comparative study of anterior cervical decompression and fusion and muscle-preserving selective laminectomy in patients with degenerative cervical myelopathy <i>Kitamura K. (JP)</i>
10.37	O96 The surgical results of on-stage of laminoplasty and anterior cervical fusion for the patients with multilevel cervical spondylotic myelopathy - Postoperative 8 year-follow-up <i>Wu W.T. (TW)</i>
10.40	O97 Predictive factors for the aggravation of cervical alignment after posterior cervical foraminotomy <i>Cho S.T. (KR)</i>
10.43	O98 Change in physical and mental well-being between the short- and mid-term periods after cervical surgery for myelopathy: A retrospective cohort study with minimum 5 years follow-up <i>Tamari K. (JP)</i>
10.46	O99 Do intra-operative neurophysiological changes predict functional outcome following decompressive surgery for cervical myelodysplasia? A prospective study <i>Alkbari K. (IN)</i>
10.49	Q&A Session





## ASIA PACIFIC SPINE SOCIETY

**Symposium 1: Controversies surround thoracolumbar and lumbar spinal fracture**

Chairs: Shetty A.P. (IN) &amp; Islam S.S. (BD) &amp; Dhakal G.R. (NP)

11.00	Introduction
11.01	Anterior vs. posterior vs. combined surgery Jonayed S.A. (BD)
11.09	When should we consider spinal decompression or fusion? Zamzouf Z. (MY)
11.17	Special technical consideration for osteoporotic fracture fixation and instrumentation Tamai K. (JP)
11.25	Should we correct the spinal deformity in ankylosing spine fracture? Kim Y.C. (KR)
11.33	Is the treatment strategy different in metastatic spine fracture? Chiu C.K. (MY)
11.41	Q&A Session
11.51	Case Discussion
12.30	Lunch Break & Industry Workshops
14.00	<b>Free Paper Session III: Degenerative, infection &amp; spinal metastasis</b> (concurrent: Combined APSS-ASSI Paediatric Deformity Forum)
	Chairs: Islam A. (BD) & U.Y.H. (SG) & Chiu C.K. (MY)
14.00	Introduction
14.01	Male patients with longer disease duration of axial spondyloarthritis have less severe disc degeneration Cheung J.P.Y. (HK)
14.04	High grade spondylolisthesis: Reduction versus in situ fusion for adult Khan M.M.R. (BD)
14.07	Does platelet rich plasma enhance fusion in transforaminal lumbar interbody fusion? A prospective clinico-radiological comparative study Sudhir G. (IN)
14.10	How paraspinal atrophy affects pain and function in degenerative spinal conditions? An analytical study on degenerative disc disease without instability and in spondylolisthesis Prasad S. (IN)
14.13	Q&A Session
14.23	Total en-bloc spondylectomy versus stereotactic ablative body radiotherapy in patients with single spinal metastasis Kang D.H. (KR)
14.26	The analysis of treatment failure candidate after preoperative radiotherapy for metastatic spinal tumor Seok S.Y. (KR)
14.29	A comparative factor analysis and new MRI scoring system for differentiating pyogenic versus tuberculous spondylodiscitis Pomsapanakom P. (TH)



## ASIA PACIFIC SPINE SOCIETY

**Symposium 2: Spinal infection management and its controversies**

Chairs: Basu S. (IN) &amp; Lanang G. (ID) &amp; Jawad Saleem M. (PK)

14.32	Paradoxical worsening on imaging in the early treatment course of tuberculous spondylodiscitis: Should it be a concern? Naresh-Babu J. (IN)
14.35	Q&A Session
	<b>APSS/ASSI Joint Session</b>
15.00	Introduction
15.01	Surgical principles in managing TB spine in 2023 Alam S. (BD)
15.11	Treatment strategy for postoperative pyogenic infection of cervical spine Park J.B. (KR)
15.21	Controversies in the management of pyogenic spinal infections and when can we instrument? Wang S.T. (TW)
15.31	Q&A Session
15.41	Case Discussion
16.00	<b>Coffee Break</b>
	<b>Free paper session IV: MIS</b>
	Chairs: Lumawig J.M. (PH) & Zheng Z. (CN)
16.30	Introduction
16.31	Remodelling of facet joint after posterior endoscopic cervical foraminotomy: Computer tomographic facet dimension analysis and clinical evaluation with minimum one year follow-up Wu P.H. (SG)
16.34	Clinical and radiographic outcomes of late-onset cage subsidence after lateral lumbar interbody fusion Ju G.J. (KR)
16.37	Risk factors for conversion to open spinal surgery after percutaneous epidural neuroplasty Jang T.Y. (KR)
16.40	Minimally Invasive Spine Surgery (MISS): Techniques, technologies & indications for thoracolumbar spine fracture Jahan S. (BD)
16.43	What makes them stay? A study on effects of socioeconomic indicators on length of stay and post operative rehabilitation following Minimally Invasive Transforaminal Lumbar Interbody Fusion (MIS-TLIF) Mohan R. (SG)
16.46	Radiographic analysis of early changes in upper adjacent segments after fusion surgery: OUIF vs PLIF Lee J.Y. (KR)
16.49	Q&A Session



## ASIA PACIFIC SPINE SOCIETY

**Symposium 3: Degenerative lumbar spine: is MIS the future?**  
 Kumar D. (SG) & Pun A. (AU) & Tangente R. (PH)

17.00	Introduction
17.01	A) Prolapsed intervertebral disc or stenosis: Which technique is better? MIS tubular vs. endoscopic decompression Lumawig J.M. (PH)
17.09	Endoscopic interlaminar vs. transforaminal approach Sakthi Y.M. (ID)
17.17	Endoscopic biportal vs. uniportal approach Wu P.H. (SG)
17.25	B) Grade 1 spondylolisthesis: My favorite go to technique and why MIS TLIF Zheng Z. (CN)
17.33	MIS – LUIF Kwan K. (JP)
17.41	Endo-LIF Park H.J. (KR)
17.49	Do we still need open TLIF? Acharya S. (IN)
17.57	Q&A Session
18.07	Case Discussion



## ASIA PACIFIC SPINE SOCIETY

**Free Paper Session V: Lumbar Spine**  
 Chairs: Zakaria Z. (MY) & Dhakal G.R. (NP)

18.30	Introduction
18.31	O114 Effect of lumbar spinal stenosis on treatment of osteoporosis: Comparison of three oral bisphosphonate therapies Jung H.Y. (KR)
18.34	O115 A comparison between cortical bone trajectory screws and traditional pedicle screws in patients with single-level lumbar degenerative spondylolisthesis: 5 year results Choi S. (KR)
18.37	O116 Correlations between age, pain intensity, disability, and tactile acuity in patients with chronic low back pain Zheng K. (CN)
18.40	O117 Central sensitization is a significant risk factor for the chronic low back pain Hashizume H. (JP)
18.43	O118 Hip-spine syndrome: Which first and which last longer? Hsiung W. (TW)
18.46	Q&A Session



NORTH AMERICAN SPINE SOCIETY



NORTH AMERICAN SPINE SOCIETY

14.00		<b>Welcome</b> Finkenberg J. (US)
		<b>Paper Presentations I: Basic science &amp; biologics</b> Chair: Finkenberg J. (US)
14.05	O119	Aging intervertebral disc induces nociceptive signaling in mouse sensory system Dania C. (US)
14.11	O120	Biomechanical comparison of lumbar spine instrumented with stand-alone interbody fixation constructs versus interbody with supplemental fixation Kiapour A. (US)
14.17	O121	Effect of implant surface roughness and porosity on osteoblastic genes expression in bone marrow mesenchymal stem cells Hunt J. (US)
14.23	O122	Results of a biphasic calcium phosphate bone graft with submicron-sized needle-shaped surface topography as standalone alternative to autograft are favorable in a prospective, multi-center, randomized, intra-patient controlled trial Sage K. (US)
14.29	O123	Constrained pedicle screws constructs in thoracolumbar fusion and their influence in revision surgery incidence Noriega D.C. (ES)
14.35		Questions and Discussion
		<b>Paper Presentations II: Cervical and thoracolumbar surgery</b> Chair: Ghogawala Z. (US)
15.00	O124	What effect does T1 slope have on sagittal balance and the relationship with caudal end of three or more level posterior cervical fusions? Truumees E. (US)
15.06	O125	A randomized trial of cervical orthosis versus no orthosis following multilevel posterior cervical fusion Rodrigues Fernandes R.J. (CA)
15.12	O126	Comparison of 3D printed custom navigation jogs with freehand pedicle screw insertion for posterior spinal fusion in scoliosis Lui D. (GB)
15.18	O127	Prospective, randomized, blinded clinical trial comparing PEEK and allograft spacers in patients undergoing lumbar fusion surgeries Vilavicencio A. (US)
15.24	O128	Effect of interbody implant design on early clinical and radiographic outcomes in LLIF surgery Phillips F. (US)
15.30		Questions and Discussion
16.00		<b>Coffee break</b>

		<b>Symposium: Spine controversy updates</b> Chair: Finkenberg J. (US)
		<b>Introduction</b> Finkenberg J. (US)
16.30		
16.40		Navigation, robotics and Artificial Intelligence in spine care - Where do we go from here? Dohring E. (US)
17.00		Regenerative medicine - Are we ready to recommend utilization Finkenberg J. (US)
17.20		Facet mediated pain - Diagnosis and treatment O'Brien D. Jr. (US)
17.40		Decompression vs. decompression and fusion for degenerative spondylolisthesis Ghogawala Z. (US)
18.00		<b>Adjourn</b>

GENERAL SESSION

GENERAL SESSION

**Session 1**  
Chair: Zhou Y. (CN)

10:30	O130	<b>Comparative study of outcomes between allograft intervertebral disc transplantation and anterior cervical discectomy and fusion: a retrospective cohort study at least 5 years</b> Ruan D.K. (CN)	11:40	O136	<b>Cancelous and endplate bone mineral density of fusion level adjacent segments decreased after minimally invasive lateral fusion: A retrospective study of regional bone mineral density measurement using Phantomless-QCT</b> Lin J. (CN)
10:40	O131	<b>Finite element investigation on biomechanical response of novel porous cage based on bone quality analysis</b> Weng Y. (CN)	11:50	O137	<b>Can the full-percutaneous endoscopic lumbar discectomy in day surgery mode achieve better outcomes following enhanced recovery after surgery protocol? A retrospective comparative study</b> Weng Y. (CN)
10:50	O132	<b>Targeted fully endoscopic visualized laminar trepanning approach under local anesthesia for resection of highly migrated lumbar disc herniation</b> Weng Y. (CN)	12:00	O139	<b>Radiological and clinical outcomes of OIIF in the correction of spinal sagittal imbalance. A systematic review of literature</b> Ma C. (CN)
11:00	O133	<b>Effects of osteoporosis on biomechanics of various supplemental fixations for oblique lumbar interbody fusion (OIIF): A finite element analysis</b> Weng Y. (CN)	12:10	O140	<b>A modified endoscopic transforaminal lumbar interbody fusion technique: Preliminary clinical results of 96 cases</b> Zhou Y. (CN)
11:10	O134	<b>Unilateral bipolar endoscopic lumbar interbody fusion assisted by intraoperative O-arm total navigation for lumbar degenerative disease: A retrospective study</b> Zhou Y. (CN)	12:30		<b>Lunch Break &amp; Industry Workshops</b>

## GENERAL SESSION

Session 2		Chairs: Ouma J. (ZA) & Vincent J.A. (IN)	
14.00	0141	Minimally invasive posterior lumbar interbody fusion without operating microscope – How effective is it?	Munagan Y. (IN)
14.07	0142	Current physiotherapy assessment and treatment practices for low back pain in Nigeria: A national survey	Hahne A. (AU)
14.14	0143	Intraoperative anterior migration of expandable interbody fusion cage into peritoneum during MIS-TLIF	Sharma A. (IN)
14.21	0144	Assessment of clinico-radiological outcome of empirical antimicrobial therapy in spinal infections with negative microbiological diagnosis	Ghosh S.D. (IN)
14.28	0145	Black African scoliosis: Epidemiological, clinical, and therapeutic aspects about 78 cases observed over 12 years	Ibrahim F. (CM)
14.35	0146	Presentation and management of delayed uni and bifacet cervical dislocations	Ouma J. (ZA)
14.42	0147	Is anterior surgery necessary for TB spine? A series of 30 cases of tuberculosis of spine managed by all-posterior approach	Thomas A. (IN)
14.49	0148	Use of frailty score in predicting mortality and morbidity in elderly patients undergoing spine surgery for tubercular spondylodiscitis	Patel P. (IN)
14.56		Discussion	
15.10	0149	Results of mortality audit of elderly patients with tubercular spondylodiscitis undergoing spine surgery	Patel P. (IN)
15.17	0150	Traction radiograph: A dark horse in assessing flexibility in adolescent idiopathic scoliosis patients undergoing non fusion anterior scoliosis correction surgery	Akbari K. (IN)
15.24	0151	Clinical outcome of single-stage decompression and posterior stabilization in thoracolumbar spinal tuberculosis	Nayak B. (IN)
15.31	0152	Prospective outcome study of lumbar microdiscectomy based on MSU classification: Does MSU classification helps in better patient selection and decrease morbidity?	Chahal R.S. (IN)
15.38	0153	Lumbar disc prolapse mimicker – Our experience	Munagan Y. (IN)
15.45	0154	Screw-rod malalignment as cause of persistent pain after thoracolumbar fusion	Ardura F. (ES)
15.52	0155	Non-surgical management of extruded disc herniations - Clinical and radiological results	Ardura F. (ES)
16.00		Coffee Break	

## GENERAL SESSION

Session 3		Chair: van der Horst A. (NA)	
16.30	0156	Brucellosis of the spine – A global public health problem - An analysis of 37 patients from a 'high risk' region	Vincent J.A. (IN)
16.37	0157	Morphometric analysis of lumbar pedicles in Saudi Arabian population – A computed tomography-based study on 1500 vertebrae. Are there inter-continental and regional variations?	Vincent J.A. (IN)
16.44	0158	Chronosis spine: Operative results of this very rare spinal manifestation	Patel H.R. (IN)
16.51	0159	Progressive dysphagia & dysphonia secondary to DISH-related anterior cervical osteophytes: A case report	Shahi P. (NP)
16.59	0160	Does posterior-alone approach suffices for C2 vertebral body lesions?	Madhivanan K. (IN)
17.06	0161	Cervical tethered cord - Not so rare entity	Muthukumar N. (IN)
17.13	0162	Comparative study between conservative and early kyphoplasty treatment for Osteoporotic Vertebral Compression Fractures (OVCF) in elderly patients	Ardura F. (ES)
17.20	0163	Treatment of spinal metastasis in the 21st century: A matched pair analysis	Bank M.N. (DE)
17.27	0164	Clinical outcome in patients >75 years undergoing spine surgery for lumbar degenerative spine disease: Impact of increasing age and modified frailty index on surgical morbidity	Akbari K. (IN)
17.34	0165	Managing cervical trauma in a resource constrained environment. What the first world should not forget	van der Horst A. (NA)
17.41		Discussion	
17.48	0166	Educational potency of newly-developed high-fidelity spine model in spinal surgery	Ueda H. (JP)
17.55	0167	Prospective cohort study with 2 years follow up of clinical results, fusion rate and muscle bulk for unilateral full endoscopic posterolateral transforaminal lumbar interbody fusion	Wu P.H. (SG)
18.02	0168	Differential diagnosis in tumoral lesions of the sacrum: Osteoblastoma case report - Treatment update	Ardura F. (ES)
18.09	0169	Sacrifice of involved nerve root during surgical resection of foraminal and/or dumbbell spinal neurinomas	Barrey C. (CH)
18.16	0170	Transpedicular bone grafting with pedicle screw fixation- an effective treatment for pseudoarthrosis following osteoporotic thoracolumbar fractures – A retrospective study with 2 year follow up	Thomas A. (IN)

# Tuesday 2 May Scientific Program

	Goldfields Theatre	Sovereign Room (Level 1)	Eureka 1 + 2	Eureka 3	Courtyard Rooms	Hospitality Suite 6
08:00	SSA	ASSI	SOSORT	APSS	KSSS	KSNS
10:00			Break			
10:30	SSA	ASSI	SOSORT	APSS	KSSS	KSNS
12:30			Lunch break + Industry workshops			
14:00	ISSLS	ASSI	SOSORT	APSS	SSA	KSNS
16:00			Break			
16:30	ISSLS	ASSI	SOSORT	APSS	SSA	KSNS



## SPINE SOCIETY OF AUSTRALIA

**Free Paper Session 4: Lumbar spine I**

Chairs: Woodland P. (AU) &amp; Marcelo A. (AU)

- 08.00 O171 Longer wait times between referral and lumbar decompression surgery may contribute to poorer patient reported outcomes  
Cunningham G. (AU)
- 08.10 O172 The clinical and cost-effectiveness of lumbar fusion surgery compared to best conservative care for patients with persistent, severe low back pain: FusiOn verSus bEst coNServative Care (the FORENSIC-AUS trial protocol)  
FosterNE, (AU)
- 08.20 O173 10-year prediction of adjacent-level degeneration and disease after lumbar total disc replacement and fusion - A post-hoc analysis of 7-year data from a prospective clinical trial  
Zigler J. (US)
- 08.30 O174 Long-term outcomes following lumbar total disc replacement with M6-L  
Faulks C. (AU)
- 08.40 O175 Lumbopelvic kinematic findings in patients having ReActiv8 therapy for Chronic low back pain  
Lijo C. (AU)
- 08.50 O176 Four-year durability of restorative neurostimulation effectiveness in patients with chronic low back pain and impaired neuromuscular control of lumbar spine stability  
Phillips F. (US)

**Short Break**

## SPINE SOCIETY OF AUSTRALIA

**President Session**

Chair: Kuru R. (AU)

- 09.05 Introduction and presentation of SSA life membership  
Gunzburg R. (BE)
- 09.15 Spinal surgery: A personal journey  
Fraser R. (AU)
- 10.00 **Coffee Break**
- Symposium 2**  
Chair: Oxlund T. (CA)
- 10.30 Against nucleus pulposus replacement - From a biomechanical point of view  
Wilke J.H. (DE)
- 10.55 Q&A Session
- 11.10 Replacement of the damaged and disorganised disc (DDD) nucleus - A clinician's perspective  
Diwan A. (AU)
- 11.35 Q&A Session
- 11.50 Debate: Nucleus pulposus replacement strategies  
Pro: Diwan A. (AU)  
Con: Wilke J.H. (DE)
- 12.30 **Lunch Break & Industry Workshops**


**THE INTERNATIONAL SOCIETY FOR THE STUDY OF THE LUMBAR SPINE**

14.00	<b>Welcome</b> Local hosts
14.05	<b>Report from the Program Chairman</b> Hodges P. (AU)
14.15	<b>O177</b> Machine learning based image analysis tool for hybrid visualization of macroscopic-microscopic degenerative changes in intervertebral disc Lama P. (IN)
14.22	<b>O178</b> Molecular characterisation of human IVD degeneration for informed biomedical device development Joyce K. (IE)
14.29	<b>O179</b> Untargeted metabolomics reveals the metabolic alterations and significance of fatty acid metabolism in intervertebral disc degeneration Rajasekaran S. (IN)
14.36	<b>Discussion</b>
14.45	<b>O180</b> Gender difference on high mTORC1 induced myopathy, IVD degeneration and kyphosis: TSC1mKO model study Lam W.M.R. (SG)
14.52	<b>O181</b> Development of treatment for intervertebral disc degeneration by the selective interference of the mTOR signaling pathway using the CRISPR-Cas9 system Ryu M. (JP)
14.59	<b>O182</b> Biological significance of fragmented SLRP's, aggrecan and fibronectin in overloaded intervertebral disc Lama P. (IN)
15.06	<b>Discussion</b>


**THE INTERNATIONAL SOCIETY FOR THE STUDY OF THE LUMBAR SPINE**

15.15	<b>O183</b> <b>Session II: Surgery 1 - Complications and safety of surgery</b> Chairs: Ilicina P. (AU) & Cheung J. (HK) Safety and efficacy of a proposed dose of intrathecal morphine in single level lumbar spinal fusion surgery Vlok A.J. (ZA)
15.22	<b>O184</b> Comparative analysis of fusion rates between conventional open and minimally invasive scoliosis surgery for adolescent idiopathic scoliosis Chang D.G. (KR)
15.29	<b>O185</b> The incidence of complications in split tubular, endoscopic and robotic-assisted endoscopic TLIFs Buser Z. (US)
15.36	<b>O186</b> Risk factors for poor prognosis in patients with dural tear in surgical treatment of lumbar degenerative diseases: A multicenter database study Takenaka T. (JP)
15.43	<b>O187</b> Lateral lumbar interbody fusion adjacent to pediclesubtraction osteotomy reduces mechanical complications requiring revision surgery Ahn J. (KR)
15.48	<b>Discussion</b>
16.00	<b>Coffee Break</b>
16.30	<b>Invited Lecture 1</b> Introduction by Hodges P. (AU)
17.30	<b>Embedding innovation in clinical trials in back pain and spine research</b> Foster N. (AU) First Business Meeting (members only)



## ASSOCIATION OF SPINE SURGEONS OF INDIA

**Free Paper Session V**

Chairs: Thomas A. (IN) &amp; Srivastava A. (IN)

08.00 O188 A whole spine MRI based ambispective cohort study of the prevalence and clinico-radiological association of lumbosacral transitional vertebra with degenerative disc disease  
Anand S.V. (IN)

08.05 O189 Clinical and radiological outcomes of minimally invasive transforaminal lumbar interbody fusion: A study of 345 patients  
Kulkarni S. (IN)

08.10 O190 A pilot study on change in range of motion of adjacent segments following single level lumbar interbody fusion using disk angles  
Krishnan V. (IN)

08.15 O191 Alterations in biomechanics by finite element model analysis after lumbar spine fixation surgeries  
Faizan M. (IN)

08.20 **Q&A Session**

08.30 O192 O-arm navigated versus free hand pedicle screw placement in lumbar spine: An RCT- advancement or a mirage of an edge over convention?  
Garg B. (IN)

08.35 O193 Comparison of outcomes between robot assisted minimally invasive transforaminal lumbar interbody fusion and open freehand lumbar interbody fusion  
Sasidharan M.D. (IN)

08.40 O194 Is robot assisted TUF better than traditional TUF  
Reddy H.B. (IN)

08.45 O195 Novel mini-incision surgical fusion for single level lumbar degenerative spondylolisthesis - A pilot study comparing traditional PLIF  
Bataji B. (IN)

08.50 **Q&A Session**

**Invited guest oration**

Chairs: Acharya S. (IN) &amp; Rajasekaran S. (IN)

"The Surgeon Scientist"

Diwan A. (IN)

**ASSI Presidential Oration**

Chairs: Chahal R. (IN) &amp; Basu S. (IN)

09.30 Osteoporosis management – Experiences gathered over 25 years of spine practice  
Acharya S. (IN)

10.00 **Coffee Break**

## ASSOCIATION OF SPINE SURGEONS OF INDIA

**ASSI Awards**

Chairs: Acharya S. (IN) &amp; Garg B. (IN)

10.30 ASSI Basic Science Award

10.40 ASSI Clinical Science Award

10.50 ASSI Young Investigator Award

11.00 ASSI Publication Award

**VII Gold Medal Free Paper Session**

Chairs: Mullukutla R.D. (IN) &amp; Srivastava S.K. (IN)

11.10 O196 A modification in surgical technique - One of the ways to prevent Proximal junctional kyphosis in adolescent idiopathic scoliosis patients undergoing posterior instrumented correction - A poorly recognized modification  
Pillai S. (IN)

11.17 **Q&A Session**

11.20 O197 Comparison between relative efficacy of erector spinae plane block and caudal epidural block for early postoperative analgesia in lumbar spine fusion surgery  
Ramachandran K. (IN)

11.27 **Q&A Session**

11.30 O198 The comparative prospective study of the functional outcome of robotic-assisted rehabilitation versus conventional rehabilitation in patients with spinal cord injury  
Verma V. (IN)

11.37 **Q&A Session**

11.40 O199 Ossification of the ligamentum flavum- unknown facets of the disease  
Muthukumar N. (IN)

11.47 **Q&A Session**

11.50 O200 Degenerative Lumbar Spine Decision Making Score (DLDM5): A clinically applicable predictive score in single level lumbar degenerative disc disease for formulating a surgical plan  
Macherla Harbabu S. (IN)

11.57 **Q&A Session**

12.00 O201 Simultaneous single stage decompression surgery for triple tandem spinal stenosis - Safety and outcome analysis  
Patei P. (IN)

12.07 **Q&A Session**

12.10 O202 An obstetric and gynaecological insight to measure the gender specific issues including menstrual disorders in patients with scoliosis - A genuine step towards empowering women's inclusive health  
Garg B. (IN)

12.17 **Q&A Session**

12.20 O203 Disc below the fusion in adolescent idiopathic scoliosis – Long-term MRI follow up with clinical correlation  
Vellara J.F. (IN)

12.27 **Q&A Session**

12.30 **Lunch Break & Industry Workshops**

## ASSOCIATION OF SPINE SURGEONS OF INDIA

14.00	<b>Symposium: Spinal Tuberculosis</b> Chairs: Modi J.P. (IN) & Vellara J. (IN)
14.07	Endpoint of AKT: Still a controversy? Bhat S. (IN)
14.10	Discussion
14.17	Current drug options for Multidrug (MDR) and extreme drug resistant (XDR) tuberculosis Rafiqod T. (IN)
14.20	Discussion
14.27	Assessing instability in spinal tuberculosis Rajasekaran S. (IN)
14.30	Discussion
14.37	Rational decision making in tuberculosis involving the craniocervical junction Borkar S. (IN)
14.40	Discussion
14.47	<b>Debate: Surgery for D1-D2 tuberculosis</b> Anterior approach alone Krishnan A. (IN)
14.54	Posterior approach alone Shrivastava S.K. (IN)
15.00	Discussion
15.00	O204 Instrumentation in children aged up to 5 years with spinal tuberculosis Chaudhary R.K. (NP)
15.05	O205 Clinical & radiological outcome of minimally invasive decompression and interbody fusion in dorsal spondylodiscitis - 2 year follow-up Baid P.K. (IN)
15.10	O206 Functional outcome of the posterior only approach for decompression and fusion with or without interbody cage in thoracolumbar tuberculosis Bhat S.A. (IN)
15.15	O207 Outcome of all posterior VCR in healed rigid tubercular kyphosis in 20 patients of less than 10Y age - A single surgeon 5 year follow-up study Iyengar R. (IN)
15.20	Q&A Session
15.30	O208 Percutaneous pedicle screw fixation in caries spine - Does early MIS fixation has advantage over conservative? Agarwal V.K. (IN)

## ASSOCIATION OF SPINE SURGEONS OF INDIA

15.35	O209 Demystifying occipitocervical tuberculosis - A journey of three decades from the era of Minerva cast to minimal invasive procedures Marathe N.A. (IN)
15.40	O210 Concept of pedicle-vertebral angle (PVDA) - A morphometric analysis of the angle between cervical pedicle and vertebral body in subaxial cervical spine for safe insertion of pedicle screws Dave B. (IN)
15.45	O211 Clinico-radiological profile in spinal ligament ossification due to fluosis Aithala J. (IN)
15.50	Q&A Session
16.00	Coffee Break
16.30	<b>ASSI Focus Symposium: Safe spine surgery</b> Chairs: Babu N. (IN) & Bhat S. (IN)
16.37	Risk stratification in elderly patients undergoing spine surgery Shetty A. (IN)
16.40	Discussion
16.47	Potentially modifiable patient factors to minimize complications in spine surgery Mohapatra B. (IN)
16.50	Discussion
16.57	When should you hold off spine fusion because of osteoporosis? Role of bone optimization Shrivastava A. (IN)
17.00	Discussion
17.07	Positioning patients with an unstable spine: Tips & tricks Farooque K. (IN)
17.10	Discussion
17.17	Operating room essentials for safe spine surgery Dave B. (IN)
17.20	Discussion
17.27	Navigating the learning curve & overcoming obstacles for spinal endoscopic surgery Sharma A. (IN)
17.30	Discussion
17.30	ASSI General Body Meeting

SOSORT - INTERNATIONAL SOCIETY ON SCOLIOSIS ORTHOPAEDIC  
AND REHABILITATION TREATMENT



**Session 5: SOSORT Award and Papers**

Chairs: Cohen L. (AU) & Wynne J. (US)

08.00	O210	Introduction
08.06	O212	The effect of arm positions used during radiography on frontal and sagittal spinal parameters in adolescent idiopathic scoliosis populations Fehr B. (CA)
08.15	O213	Validation of an artificial intelligence based method to automate cobb angle measurement on spinal radiographs of children with adolescent idiopathic scoliosis Lou E. (CA)
08.24	O214	Assessing the mental health landscape and need for counseling in the scoliosis community Castille M.G. (US)
08.33	O215	Schroth – FSSE exercises can reduce the risk for progression during the peak of growth in curves Karavidas N. (GR)
08.42	O216	Effectiveness of night-time brace or scoliosis-specific exercise for preventing progression of moderate-grade adolescent idiopathic scoliosis: Primary outcomes of a multicenter randomized controlled trial (CONTRAS) Abbot A. (SE)
08.51	Discussion	
09.03	O217	Developing a new tool for scoliosis screening in a tertiary specialistic setting using artificial intelligence: A retrospective study on 10,813 patients Zaina F. (IT)
09.12	O218	Long-term outcome after brace treatment of Scheuermann's Kyphosis Aulisa A.G. (IT)
09.21	O219	A systematic review of machine learning models for predicting curve progression in teenagers with idiopathic scoliosis Chan W.Y. (HK)
09.30	O220	The impact of pregnancy on women with adolescent idiopathic scoliosis: A scoping review Theroux J. (AU)
09.39	O221	A systematic review comparing spinal alignment between standing positions in healthy adolescents or adolescents with idiopathic scoliosis Fehr B. (CA)
09.48	Discussion	
10.00		<b>Coffee Break and Poster Session III</b>
		Invited Lecture Introduction by Zaina F. (IT)
10.30		Changes in back muscle structure and function with spinal conditions Hodges P. (AU)
11.00		Discussion

SOSORT - INTERNATIONAL SOCIETY ON SCOLIOSIS ORTHOPAEDIC  
AND REHABILITATION TREATMENT



**Session 6: Evaluation**

Chairs: Karavidas N. (GR) & Lou E. (CE)

11.15	O222	The validity of surface topography and plumbline measurement of sagittal balance & lumbar lordosis in adults Cohen L. (AU)
11.23	O223	Correlation analysis of Cobb angle and linear spinous process angle in adolescent idiopathic scoliosis Ying X.M. (CN)
11.31	O224	Evaluation of apical vertebrae rotation of subjects with adolescent idiopathic scoliosis using 3D ultrasonography Lee T.T.Y. (HK)
11.39	O225	Correlation between the Angle of Trunk Rotation (ATR) measured with a scoliometer and the Raimondi Angle in patients with idiopathic scoliosis Rodrigues Leite Navarro I.J. (BR)
11.47	Discussion	
11.55	O226	Implementation and validation of automatic coronal Cobb's angle measurement with deep learning Khow J.V. (HK)
12.03	O227	Using vertebrae transverse features from 3D ultrasound to classify adolescent idiopathic scoliosis Yang D. (HK)
12.11	O228	Intra- and inter-evaluator reproducibility of Raimondi vertebral rotation angle measured by using the ISICO app in patients with AIS Rodrigues Leite Navarro I.J. (BR)
12.19	Discussion	
12.30		<b>Lunch Break &amp; Industry Workshops</b>



**SOSORT - INTERNATIONAL SOCIETY ON SCOLIOSIS ORTHOPAEDIC AND REHABILITATION TREATMENT**

**Session 7: Evaluation**

**Chairs: Simony A. (DK) & Wong A. (HK)**

- 14.00 O229 **Changes in surface topography asymmetry are related to global ratings of change in adolescents with idiopathic scoliosis in the Schroth exercise trial for scoliosis**  
Parent E. (CA)
- 14.07 O230 **A novel 3D spinal model reconstruction based on biplanar digitally reconstructed radiographs using deep learning**  
Khaw J.V. (HK)
- 14.14 O231 **A prospective external validation study to predict Cobb angle using deep learning algorithm with three-dimensional depth sensor considering the influence of garment in idiopathic scoliosis**  
Ishikawa Y. (JP)
- 14.21 **Discussion**
- 14.28 O232 **A novel inclinometer based on a palm-sized 3D ultrasound system for mapping axial trunk rotation**  
Lee K.S. (HK)
- 14.35 O233 **Correlation of transverse rotation of the spine using surface topography and 3D reconstructive radiography in children with idiopathic scoliosis**  
Patel/M. (US)
- 14.42 O234 **Sub-optimal reliability of the DRU risk classification**  
Dolan L. (US)
- 14.49 **Discussion**



**SOSORT - INTERNATIONAL SOCIETY ON SCOLIOSIS ORTHOPAEDIC AND REHABILITATION TREATMENT**

**Presidential Lecture**

- Invited Lecture by the SRS President**  
*Introduction by Donzelli S. (IT)*
- 15.00 **New trends in surgery, new approaches and their limits**  
Hu S. (US)
- 15.25 **Discussion**
- 15.30 **SOSORT Presidential Address**  
Wynne J. (US)
- 16.00 **Coffee Break**
- 16.30 – 18.00 **SOSORT Business Meeting (closed)**



## ASIA PACIFIC SPINE SOCIETY

**Best Paper Presentation: Basic science**

Chairs: Sakai D. (JP) &amp; Choi Y.S. (KR)

- 07.30 Introduction
- 07.31 O235 Dural repair: Efficacy assessment of different techniques: A cadaveric study comparing the naked eye and surgical loupes  
Chitragan R. (Th)
- 07.35 O236 The electromyographic discrepancy of paravertebral muscles predicts an early curve progression of untreated adolescent idiopathic scoliosis  
Cheung J.P.Y. (HK)
- 07.39 O237 Analysis of the cement distribution pattern and other risk factors that affect the incidence of reoperation fractures of vertebral bodies after vertebroplasty or kyphoplasty  
Kim S.Y. (KR)

- 07.43 O238 Core planar cell polarity genes VANG11 and VANG12 in predisposition to congenital scoliosis  
Cheung J.P.Y. (HK)
- 07.47 O239 Molecular interactions between intervertebral disc host proteins and putative pathogenic effector proteins in degenerate discs - a predictive insilico analysis  
Sri Vijay Anand K.S. (IN)

07.51 Q&amp;A Session

**Best Paper Presentation: Clinical research I**

Chairs: Chan C.Y.W. (MY) &amp; Cheung J.P.Y. (HK)

- 08.05 Introduction
- 08.06 O240 Long-term outcomes of vertebral body sliding osteotomy for the treatment of cervical myelopathy: A minimum of 5-year follow-up  
Cho S.T. (KR)
- 08.10 O241 Computer-assisted diagnosis with artificial neural networks for odontoid fracture detection  
Liawruangueang W. (Th)
- 08.14 O242 Establishing a relationship using CT between facet distraction and clinical outcomes after ACDF  
Lee J.Y. (KR)
- 08.18 O243 Conservative treatment of atlantoaxial rotatory fixation  
Oshita Y. (JP)
- 08.22 O244 Curve flexibility assessment in Adolescent Idiopathic Scoliosis (AIS) with major main thoracic curve: Comparison and correlation between physician-supervised supine side bending radiographs versus supine Computed Tomography (CT) scan  
Chandrien J.K. (MY)

08.26 Q&amp;A Session



## ASIA PACIFIC SPINE SOCIETY

**Best Paper Presentation: Clinical research II**

Chairs: Shetty A.P. (IN) &amp; Wong Y.W. (JP)

- 08.40 Introduction
- 08.41 O245 Reducing surgical site infections after spine surgery: The optimal amount of normal saline for intra-wound irrigation  
Hsiung W. (TW)
- 08.45 O246 Efficacy of vacuum-assisted closure in postoperative deep spinal infections. A retrospective analysis of 31 patients with spinal instrumentation  
Ramachandran K. (IN)
- 08.49 O247 The infection control and spinal balance in patients receiving Percutaneous Endoscopic Discectomy and Drainage (PEDD) for infectious discitis: A retrospective case analysis  
Chen H.W. (TW)
- 08.53 O248 Is anterior-only approach a reliable surgical strategy in ankylosing spondylitis patients with cervical spine fractures  
Shetty A.P. (IN)
- 08.57 O249 Atlas osteosynthesis screw placement using the intersection between lateral mass and inferomedial edge of the atlas posterior arch: Human cadaveric study  
Bunmaprasert T. (Th)

09.01 Q&amp;A Session

**Best Paper Presentation: Clinical research III**

Chairs: Lee D.H. (KR) &amp; Watanabe K. (JP)

- 09.15 Introduction
- 09.16 O250 The 'Disc-Endplate-Bone-Marrow Complex' classification - A paradigm shift in our understanding of the modic vertebral endplate changes  
Rajasekaran S. (IN)
- 09.20 O251 Anterior column realignment through open preposterior release-anterior-posterior fusion versus hybrid minimally invasive anterior-posterior fusion for dynamic sagittal imbalance of the spine  
Ahn J. (KR)
- 09.24 O252 The criteria of severe dynamic sagittal imbalance in adult spinal deformity and its importance  
Kim Y.C. (KR)
- 09.28 O253 Mechanical complications and global alignment and proportion score after limited long-segment fusion for de novo adult spinal deformity: Comparison of lateral lumbar interbody fusion and three-column osteotomies  
Moridaita H. (JP)
- 09.32 O254 Subcrestal iliac screw technique as an alternative for spinopelvic fixation technique: A cohort study of 73 patients with a modified low profile, free hand technique for insertion of subcrestal iliac screw  
Poon G. (SG)
- 09.36 Q&A Session
- 10.00 **Coffee Break**



## ASIA PACIFIC SPINE SOCIETY

**Symposium 4: Paediatric Deformity – Current management trend from EOS to AIS**

Chairs: Zheng Z. (CN) &amp; Hsu B. (AU)

- 10.30 Introduction
- 10.31 **A) Growing Spine**  
Controversies surrounding traditional growing rod and MAGEC  
Wong Y.W. (JP)
- 10.39 **Is tethering technique the future?**  
Lau L.L. (SG)
- 10.47 **When should we fuse the growing spine?**  
Shetty A.P. (IN)
- 10.55 **B) AIS**  
Shoulder balance matters: How to select the best UIV?  
Kwan M.K. (MY)
- 11.03 **Can we fuse short and still achieve balance: How to select the best IIV?**  
Watanabe K. (JP)
- 11.11 **Is maintaining thoracic kyphosis important: What corrective manoeuvres should we use?**  
Chan C.Y.W. (MY)

11.19 **Q&A Session**11.29 **Case Discussion****Honorary Lecture**

Chair: Rajasekaran S. (IN)

12.00 Introduction

12.05 **Conferment of award to APSS Honorary Member**

Sivananthan K.S. (MY)

12.07 **Durable innovations spinal surgery and future developments**

Sivananthan K.S. (MY)

12.27 **Closing Remarks**12.30 **Lunch Break & Industry Workshops**

## ASIA PACIFIC SPINE SOCIETY

**Free Paper Session VI: Paediatric deformity surgical level selection**

Chairs: Lau L.L. (SG) &amp; Sakai D. (JP)

- 14.00 Introduction
- 14.01 **O255**  
**Curve overcorrection predicts coronal imbalance in selective thoracic fusion in adolescent idiopathic scoliosis**  
Cheung J.P.Y. (HK)
- 14.04 **O256**  
**Directed versus non-directed standing postures in adolescent idiopathic scoliosis: Its impact on curve magnitude, alignment and clinical decision making**  
Cheung J.P.Y. (HK)
- 14.07 **O257**  
**Fusion block tilt following corrective surgery in Lenke 5 Adolescent Idiopathic Scoliosis (AIS)**  
Chung W.H. (MY)
- 14.10 **O258**  
**Validation of the predictive formula for optimal Upper Instrumented Vertebra (UIV) tilt angle (based on pre-operative erect radiograph) in Adolescent Idiopathic Scoliosis (AIS): A comparison with the calculated optimal UIV tilt angle derived from the Supervised Spine Side Bending Films (SSBF)**  
Chung W.H. (MY)
- 14.13 **O259**  
**A dedicated spine team approach optimised the efficiency of operating theatre utilisation while maintaining a standard patient care in adolescent idiopathic scoliosis surgery**  
Lee S.Y. (MY)
- 14.16 **O260**  
**Comparison of perioperative outcomes among Adolescent Idiopathic Scoliosis (AIS) Patients operated by a dedicated spine team approach: Were there any differences between the first, second and the last case?**  
Lee S.Y. (MY)

14.19 **Q&A Session****Symposium 5: Surgical Video Techniques**

Chairs: Rajasekaran S. (IN) &amp; Kwan M.K. (MY)

14.30 Introduction

14.31 **Instability in spinal tuberculosis**  
Kandwal P. (IN)14.41 **AIS Correction techniques**  
Shrivastava A. (IN)14.51 **Spinal osteotomy: Management of neglected adult congenital kyphosis using PVCR**  
Khan M.A. (GB)15.01 **Endoscopic decompression for spinal stenosis using biportal approach transforaminal or Interlaminar**  
Park S.Y. (KR)15.11 **Q&A Session**



## ASIA PACIFIC SPINE SOCIETY

**Free Paper Session VII: Cervical alignment & high cervical pathology**

Chairs: Bunmaiprasert T. (TH) &amp; Lee D.H. (KR)

15.30	Introduction
15.31 O261	The alteration of junctional levels after decompression and alignment correction for cervical kyphotic deformity induced multilevel cervical myelopathy: a retrospective case analysis Chen H.W. (TW)
15.34 O262	Comparison between the bone union rates using auto-iliac bone and bone morphogenetic protein without auto bone in a posterior atlantoaxial fusion procedure: Results from a minimum 1-year follow-up Seok S.Y. (KR)
15.37 O263	Predictive equations for cervical lordosis and T1 slope of young adult population without any neck symptoms - Analysis of 171 radiographs Acharya S. (IN)
15.40 O264	The risk of injury to the internal carotid artery during C1 lateral mass screw fixation Kitagawa R. (JP)
15.43	<b>Q&amp;A Session</b>
16.00	<b>Coffee Break</b>
16.30	<b>Free Paper Session VIII: Adult spinal deformity</b> Niu C.C. (TW) & Joneyed S.A. (BD)
16.30	Introduction
16.31 O265	Sarcopenia in paraspinal muscle as a risk factor of proximal junctional kyphosis and proximal junctional failure after adult spinal deformity surgery Park J.S., Kim J.S. (KR)
16.34 O266	Comparison of proximal and distal junctional failures after long fusion arthrodesis stopping at L5: Incidences and risk factors Kim H.C. (KR)
16.37 O267	<b>Surgical strategy-oriented classification for the patients with severe dynamic sagittal imbalance</b> Kim Y.C. (KR)
16.40 O268	Comparison of surgical outcomes between 3-column osteotomy and anterior-posterior fusion for osteoporotic vertebral fracture Takahashi S. (JP)
16.43 O269	Difference of postoperative radiologic change on sacro-iliac joint by multi-factors in adolescent idiopathic scoliosis Kim S.H. (KR)
16.46 O270	Erector spinae atrophy/fatty degeneration is a risk factor for the development of adult spinal deformity - Results of a 6-year follow-up of a large cohort of residents Nagata K. (JP)
16.49 O271	The role of sPECT/CT in analysing the radiographic prevalence of asymptomatic degenerative spondylosis in a consecutive cohort of patients presenting with cancer Lui D. (GB)
16.52	<b>Q&amp;A Session</b>



## ASIA PACIFIC SPINE SOCIETY

**KSSS/APSS Joint Session****Symposium 6: How to avoid complications in adult spinal deformity surgery?**

Wong H.K. (SG) &amp; Matsuyama Y. (JP) &amp; Kim Y.W. (KR)

17.00	Introduction
17.01	How to select the LIV: Should we always fuse to the ilium to avoid DJK? Cheung J.P.Y. (HK)
17.09	How to select LIV to avoid PJK? Kato S. (JP)
17.17	So many classifications and so many radiographic lines: Which one to use? Hsu B. (AU)
17.25	How to plan and surgically achieve an ideal lumbar lordosis in ASD? Cho K.Y. (KR)
17.33	Does coronal balance still matters in ASD? Watanabe K. (JP)
17.41	<b>Q&amp;A Session</b>
17.51	<b>Case Discussion</b> Kim Y.W. (KR)
18.30	<b>Free Paper Session IX: Paediatric deformity curve progression &amp; outcome studies</b> Chairs: Jawad Saleem M. (PK) & Pun A. (AU)
18.30	Introduction
18.31 O272	The relationship between compliance of physiotherapeutic scoliosis specific exercises and curve regression with mild to moderate adolescent idiopathic scoliosis Cheung J.P.Y. (HK)
18.34 O273	Randomized controlled trial comparing immediate versus gradual brace weaning for adolescent idiopathic scoliosis Cheung J.P.Y. (HK)
18.37 O274	A risk quantification reference table for progressed adolescent idiopathic scoliosis surgery: An exact case matched outcomes analysis Tan J.H. (SG)
18.40 O275	Multicenter validation of using the Distal Radius and Ulna (DRU) classification to predict scoliosis progression - APSS scoliosis focus group study Arima H. (JP)
18.43 O276	The impact on spinal deformity progression among pediatric patients with SMA treated with nusinersen Kwan K.Y.H. (HK)
18.46 O277	Perception of spinal deformity among patients with adolescent idiopathic scoliosis Lau L.L. (SG)
18.49 O278	Comparison of the assessment of Sanders skeletal maturity using single low radiation dose EOS spine hand radiography and conventional hand radiography Poon G. (SG)
18.52	<b>Q&amp;A Session</b>



KOREAN SOCIETY OF SPINE SURGERY

08.00	Welcome Choi Y.S., President of the KSSS	
08.05	<b>Session 1: Surgical technique: Anterior column realignment surgery on lumbar spine</b> Chairs: Kim Y.W. (KR) & Shin D.E. (KR)	
08.10	Redefining of lumbar interbody fusion Hong C.H. (KR)	
08.15	Tip and pitfall of using cage for achieving both indirect decompression and segmental angle restoration Kim S.B. (KR)	
08.20	Technical tip for getting the larger lumbar correction 'with physiologic curve' Kim Y.C. (KR)	
08.25	Strategies of prevention for surgical complication Cha J.K. (KR)	
08.32	Discussion	
08.38	<b>Session 2: Degenerative lumbar scoliosis in lumbar spine</b> Chairs: Shin H.K. (KR) & Kim Y.C. (KR)	
08.44	Does radiographic restoration after surgery promises the better clinical outcome? Park D.H. (KR)	
08.50	Comparative analysis of lower most fusion level: L5 vs S1 vs Ilium Lee B.H. (KR)	
08.56	Proximal coronal curve progression after surgery Nam W.D. (KR)	
09.04	Proximal sagittal curve progression after surgery Kim Y.W. (KR)	
09.08	Discussion	
09.12	<b>Session 3: Special issue</b> Chairs: Lee H.M. (KR) & Chang B.S. (KR)	
09.17	Debate: Lumbar spinal stenosis with sagittal imbalance: When do we operate? Ahn S.J. (KR)	
09.22	We do not have to operate early Kim Y.B. (KR)	
09.25	We should operate early, seize the day Kim Y.B. (KR)	
09.32	Discussion Prevention and management after elderly spine surgery Shin H.K. (KR)	
09.38	Perioperative delirium after elderly spine surgery Discussion	
09.45	<b>Session 4: Intraoperative painful experiences</b> Chairs: Yeom J.S. (KR) & Park J.B. (KR)	
10.00	Vertebral artery injury Kim M.W. (KR)	
10.05	Esophageal injury Ko S.B. (KR)	
10.10	Discussion	



KOREAN SOCIETY OF SPINE SURGERY  
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09.39	Dural tear & neurologic deficit Lee H.D. (KR)	
09.46	Cervicothoracic junctional approach Baik J.M. (KR)	
09.53	Discussion	
10.00	Coffee Break	
10.30	<b>Session 5: Postoperative painful experiences</b> Chairs: Shim D.M. (KR) & Suk K.S. (KR)	
10.38	Retropharyngeal hematoma and management Kim Y.Y. (KR)	
10.46	Dysphagia and dysphonia Min W.K. (KR)	
10.54	Postoperative surgical site infection Lee G.W. (KR)	
11.02	Pseudoarthrosis diagnosis and management Yang J.J. (KR)	
11.12	Discussion	
11.18	<b>Session 6: Endoscopic spinal decompression</b> Chairs: Kim W.J. (KR) & Rhyu K.W. (KR)	
11.24	Pearls and pitfalls in endoscopic decompression technique Park S.Y. (KR)	
11.30	Practical surgical technique of bipoportal endoscopic decompression Park S.M. (KR)	
11.38	How to do bipoportal endoscopic cervical foraminotomy and discectomy Jung S.B. (KR)	
11.44	Discussion	
11.50	<b>Session 7: Update: Minimal invasive interbody fusion</b> Chairs: Park K.H. (KR) & Jun D.S. (KR)	
11.56	Collaboration of lateral lumbar interbody fusion and bipoportal endoscopic spinal decompression in degenerative and traumatic lumbar spine Kang M.S. (KR)	
12.04	Bipoportal endoscopic TUF: Posterolateral approach Kim J.E. (KR)	
12.10	Bipoportal endoscopic TUF: Extraforaminal approach Park H.J. (KR)	
12.16	Discussion	
12.22	<b>Session 8: Tips and techniques: Minimally invasive spine surgery</b> Chairs: Seo H.Y. (KR) & Sun S.D. (KR)	
12.28	Lateral cage insertion in L5/S1 anterior lumbar interbody fusion Ahn T.K. (KR)	
12.34	Microscope assisted direct decompression in anterior lumbar interbody fusion Son E.S. (KR)	
12.40	Anterior column support in severely collapsed osteoporotic vertebrae: Intervertebral cage augmentation Song K.S. (KR)	
12.46	Discussion	





SPINE SOCIETY OF AUSTRALIA

**The getting of wisdom**  
Chair: McCombe P. (AU)

- 14.00 O279 Carey R. (AU)
- 14.20 McPhee I. (AU)
- 14.40 Hall D. (AU)

**Free Paper Session 5: Outcomes II & spinal surgery I**  
Chair: Saravanya D. (AU) & Jamali M. (AU)

- 15.00 O279 Posterior instrumented spinal surgery outcomes in the elderly: A Comparison of the 5-Item and 11-Item modified frailty indices  
Kweh B. (AU)
- 15.10 O280 The concept of recovery kinetics: An observational study of continuous post-operative monitoring in spine surgery  
Fonseka D. (AU)
- 15.20 O281 What is the expected improvement in patient-reported outcome measures in the lumbar hybrid procedure for treating multilevel degenerative disc disease?  
Scott-Young M. (AU)
- 15.30 O282 Lateral-PLIF, modified PLIF technique for spinal arthrodesis: Concept, technique, results, complications, and outcomes  
Barney C. (FR)
- 15.40 O283 Does tether breakage predict progression to fusion? A pilot study of 15 AIS patients after VBT surgery  
Roser M. (AU)
- 15.50 O284 Retrospective review of children and adolescents with neuromuscular scoliosis treated with Bipolar spinal fixation at the Sydney Children's Hospital, Randwick  
Bishop M. (AU)
- 16.00 **Coffee Break**



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**Free Paper Session 6: Cervical spine**  
Chair: Jones C. (AU) & Thompson-Bagshaw D. (AU)

- 16.30 O285 5-year outcomes for single-level total disc replacement with a novel viscoelastic artificial cervical disc compared to Anterior Cervical Discectomy and Fusion (ACDF)  
Phillips F. (US)
- 16.40 O286 First long-term follow-up results on wear-induced osteolysis following cervical total disc replacement using the M6-C™ Artificial Cervical Disc  
Häckel S. (CH)
- 16.50 O287 Lower bone mineral density in DEXA-identified adolescents with idiopathic scoliosis at age 20  
Ng P.T.T. (AU)
- 17.00 – 18.30 SSA AGM (Members only)



KOREAN SPINAL NEUROSURGERY SOCIETY

07.50	Opening Remarks
07.55	Welcome Address Lee J.K., President of KSNs
08.00	<b>Free Paper Session I</b>
08.00	O288 Interplay of radiological parameters and functional outcomes following cervical laminoplasty Borkar S.A. (IN)
08.05	O289 Dysphagia and dysphonia Min W.K. (KR)
08.10	O290 Direct trans-pedicular screw fixation for atypical hangman's fracture: A minimally invasive technique using the tubular retractor system Choi M.K. (KR)
08.15	O291 Cervicothoracic junctional approach Baik J.M. (KR)
08.20	O292 Cervical sagittal parameters in degenerative cervical spondylolisthesis versus degenerative cervical kyphosis with myelodysplasia treated by anterior cervical discectomy and fusion Burmappasett T. (TH)
08.25	O293 Analysis of risk factors associated with distal junctional failure after long level posterior cervical fusion and instrumentation Hong J.T. (KR)
08.30	O294 Effectiveness of nasotracheal intubation in anterior cervical surgery including C3 lesions Kim J.H. (KR)
08.35	O295 C2 nerve root preservation/sacrifice in patients with atlantoaxial dislocation: Clinical outcomes and the feasibility of its preservation Madhivanan K. (IN)
08.40	O296 How useful is C1-C2 fixation for patients with Chiari malformation without instability? Madhivanan K. (IN)
08.45	Discussion

**Session 1: Korean Cervical Spine Research Society - Surgical strategy of OPLL and CSM**

09.00	C5 palsy multicenter study of Korean CSRS Oh J.K. (KR)
09.15	Anterior surgical technique Park J.H. (KR)
09.30	Posterior surgical technique Kim S.H. (KR)
09.45	Timing of surgery of CSM and OPLL Jang C. (KR)
10.00	Coffee Break



KOREAN SPINAL NEUROSURGERY SOCIETY

10.30	O297 <b>Free Paper Session II</b> The expression of mitofusin 1 and mitofusin 2 by oxidative stress in the cells from intervertebral disc Shin J.W. (KR)
10.35	O298 Predictive 3D neural network for progressive collapse after osteoporotic vertebral compression fracture using magnetic resonance images Park S.B. (KR)
10.40	O299 Mesenchymal stem cell transplantation promotes functional recovery through MMP2/STAT3 related astroglial after spinal cord injury Kim C. (KR)
10.45	O300 Effectiveness of adipose tissue-derived stromal vascular fraction and bone morphogenic protein-2 in mini-pig spinal fusion model An S.B. (KR)
10.50	O301 Deep learning model for classifying metastatic epidural spinal cord compression on MRI Kumar N. (SG)
10.55	O302 Multi-modulation of immune-inflammatory response using bioactive molecule integrated PIGA composite for spinal fusion Lee C.K. (KR)
11.00	O303 Comparison of perioperative outcomes following conventional open surgery versus minimally invasive surgery for metastatic spinal tumors - A retrospective, propensity score-matched study Ju G.H. (KR)
11.05	O304 The feasibility of unilateral hemilaminectomy for the removal of intramedullary spinal cord tumors Im S.B. (KR)
11.10	O305 Peripheral nerve-derived stem cell spheroids induce functional recovery and repair after spinal cord injury Kim K.N. (KR)
11.15	Discussion

**Session 2: Korean Spinal Research Society - Bone remodelling and healing current**

11.30	Chairs: Cho D.C. (KR) & Wee N.A. (AU) Identifying the cells and signals that increase cortical bone strength Wee N.A. (AU)
11.50	Disorganization (misalignment, disarrangement) may be the key to the enigma of unexplained musculoskeletal diseases and fragility fractures Zebaze R. (AU)
12.10	Role of Runx/Cbfb complex in skeletal tissues Choi J.Y. (KR)
12.30	Lunch Break & Industry Workshops



## KOREAN SPINAL NEUROSURGERY SOCIETY

## Free Paper Session III

- 14.00 O306 The usefulness of trabecular CT attenuation measurement at L4 level to predict screw loosening after degenerative lumbar fusion surgery: Consider number of fused levels and postoperative sagittal balance  
Lee B.J. (KR)
- 14.05 O307 Retrospective observation of combinatory effect with rh-BMP-2 and a systemic RANKL inhibitor for osteoporotic patients who undergo posterior lumbar interbody fusion  
Ryu S.J. (KR)
- 14.10 O308 Comparison of inflammatory markers changes in patients who used postoperative prophylactic antibiotics within 24 hours after spine surgery and five days after spine surgery  
Kim S.B. (KR)
- 14.15 O309 Postoperative results and complications after posterior lumbar interbody fusion (PLIF) for spinal stenosis in geriatric patients over than 80 years old  
Choi I.J. (KR)
- 14.20 O310 Difference in the Cobbs angle between standing and supine position as a prognostic factor after vertebral augmentation in osteoporotic vertebral compression fractures  
Bae I.S. (KR)
- 14.25 O311 Thoracolumbar slope is useful parameter for evaluating HRQOL and sagittal imbalance aggravation in adult spinal deformity: A prospective observational cohort study  
Hong J.H. (KR)
- 14.30 O312 The efficacy and safety of E.BMP 2 for lumbar interbody fusion  
Shin D.A. (KR)
- 14.35 O313 Trauma apporionment score of simple osteoporotic vertebral compression fracture with extrinsic factors  
Lee S.G. (KR)
- 14.40 Discussion
- 15.00 Why should we do endoscopic surgery?  
Chough C. (KR)
- 15.10 What is the best indications in one-portal endoscopic spine surgery?  
Kim H.S. (KR)
- 15.20 Standard steps and tips for one-portal endoscopic surgery  
Ju C.T. (KR)
- 15.30 What is the best indication in bi-portal endoscopic spine surgery?  
Jang J.W. (KR)
- 15.40 Standard steps and tips for bi-portal endoscopic surgery  
Park J.Y. (KR)
- 16.00 **Coffee Break**



## KOREAN SPINAL NEUROSURGERY SOCIETY

## Free Paper Session IV

- 16.30 O314 Comparison of postoperative outcomes between conventional and prone single position direct lateral interbody fusion (DLIF): A single center experience  
Kim D.H. (KR)
- 16.35 O315 The next generation spine surgery robot and the future  
Yi S. (KR)
- 16.40 O316 Practical experience of the 1st generation Korean spine surgery robot: Learning curve and screw bias analysis  
Lee J.S. (KR)
- 16.45 O317 Water dynamics in unilateral biportal endoscopic spine surgery and its related factors: An in vivo proportional regression and proficiency-matched study  
Hong Y.H. (KR)
- 16.50 O318 Biportal endoscopic translaminar approach for the lateral recess stenosis and contralateral extratoraminal disc herniation  
Kim D.H. (KR)
- 16.55 O319 Psoas weakness following oblique lateral interbody fusion surgery: A prospective observational study with an isokinetic dynamometer  
Cho D.C. (KR)
- 17.00 O320 Safety and efficacy of intraoperative Doppler sonography-assisted cervical pedicle screw fixation - A retrospective comparison with conventional pedicle screw implantation  
Hong J.T. (KR)
- 17.05 O321 Improvement in spino-pelvic alignment in patients operated for high grade lumbar spondylolisthesis with MIS TLIF  
Kulkarni S. (IN)
- 17.10 Discussion
- 17.30 Closing Remarks

# Wednesday 3 May Scientific Program

	Goldfields Theatre	Sovereign Room (Level 1)	Eureka 1 + 2	Eureka 3	Courtyard Rooms	Hospitality Suite 6
08:00	ISSIS	ASSI	SOSORT	APSS	BIOSPINE	SSA
10:00			Break			
10:30	ISSIS	ASSI	SOSORT	APSS	BIOSPINE	SSA
12:30			Lunch break + Industry workshops			
14:00	ISSIS	ESJ	JSSR	SIS	BIOSPINE	NASS
16:00			Break			
16:30	ISSIS	ESJ	JSSR	SIS	BIOSPINE	NASS



## THE INTERNATIONAL SOCIETY FOR THE STUDY OF THE LUMBAR SPINE

### Session III: Special Poster Session 1

See list of ISLSS General Posters - This session takes place in the ePoster area.

### Session IV: Best Paper Session 1

Chairs: Hodges P. (AU) & Vo N. (US)

08.45 O322 Synergistic effect of RG-7112 &  $\alpha$ -Vanillin combination treatment for intervertebral disc generation  
Haglund L. (CA)

08.52 O323 Electromyogram diagnosed chronic lumbar radiculopathy is highly associated with L4-S1 regional multifidus atrophy on magnetic resonance imaging  
Zoffi M. (AU)

08.59 O324 Investigating disease burden, management approaches, and clinical course prediction of low back pain using machine learning based on data from 6,426 patients in Hong Kong  
Choy W.C. (HK)

09.06 O325 Underweight and overweight are both risk factors for vertebral fracture: A nationwide population-based study  
Lee H.D. (KR)

09.13 Discussion

### Session V: Best Paper Session 2

Chairs: Hodges P. (AU) & Vo N. (US)

09.25 O326 Immunohistochemical analysis of SOD2 expression and oxidative stress markers in human intervertebral discs  
Tamagawa S. (JP)

09.32 O327 Investigation of accuracy in 3D images of lumbosacral nerve roots developed by artificial intelligence technology  
Ukeba D. (JP)

09.39 O328 Nonoperative management of three-column ankylosed spine fractures: Is it possible?  
Nasser A. (US)

09.46 O329 Impact of social determinants of health on preoperative opioid utilization in patients with lumbar degeneration  
Wague A. (US)

09.51 Discussion

10.00 Coffee Break



## THE INTERNATIONAL SOCIETY FOR THE STUDY OF THE LUMBAR SPINE

### Session VI: Emerging Technologies

Chair: Chang D.G. (KR)

10.30 O330 Handheld smartphone-based spinal navigation versus CT-based image-guided navigation in the placement of thoracolumbar pedicle screws  
Aris M.P. (NL)

10.37 O331 Proposed objective scoring algorithm for assessment and intervention recovery following surgery for lumbar spinal stenosis based on relevant gait metrics from wearable devices: The Gait Posture Index (GPI)  
Choy W.J. (AU)

10.44 O332 SpineTrak: The first randomized control trial using the Apple Watch to objectively track spine surgical patients  
Tomkins-Lane C. (US)

10.51 O333 SpineQ: Unsupervised learning-based pipeline for fully automated quantitative analysis of lumbar MRI with preliminary validation  
Zhang T. (CN)

10.58 Discussion

11.10 Harry Farfan Presidential lecture  
Introduction by Yoon T. (US)

The past, present and future of tuberculosis: A story of global health inequity  
Marks G.B. (AU)

11.50 Presidential address  
Introduction by Lotz J. (US)

Reflections of the past and future  
Yoon T. (USA)

Lunch Break & Industry Workshops


**THE INTERNATIONAL SOCIETY FOR THE STUDY OF THE LUMBAR SPINE**
**Session VII: Biomechanics, muscle and motor control**

Chairs: Wong A. (HK) &amp; Zhao F. (CN)

 14.00 O334 Targeted multifidus muscle activation reduces fibrosis of multifidus muscle following intervertebral disc injury  
Hodges P. (AU)

 14.07 O335 Texture analysis of ultrasound images to evaluate multifidus muscle composition: A comparison between healthy subjects and patients with low back pain  
Hodges P. (AU)

 14.14 O336 The pelvic tilt response to ASD realignment surgery depends on preoperative compensatory ability of the thoracic spine  
Takahawa E. (JP)

14.21 Discussion

 14.30 O337 Do spinal degeneration and lumbar multifidus muscle quality affect clinical outcomes in patients with low back pain?  
Jensen J.S. (DK)

 14.37 O338 Does degenerative scoliosis result from loss of mechanical integrity of the annulus fibrosus in degenerated intervertebral discs?  
Bader T. (CA)

 14.44 O339 Touched vertebral as an ideal the lowest instrumented vertebra in thoracic adolescent idiopathic scoliosis: A suggestion of modified Suk Classification  
Chang D.G. (KR)

14.51 Discussion

**Session VIII: Basic Science 2 – Stem cells, regeneration and omics**

Chairs: Weiner B. (US) &amp; Chiba K. (JP)

 15.00 O340 o-Vanillin modulates cell phenotype and extracellular vesicles of human mesenchymal stem cells and intervertebral disc cells  
Haglund L. (CA)

 15.07 O341 Single-cell RNA-seq analysis identifies late-stage nucleus pulposus cell and reveals Seryglycin is an essential biomarker of intervertebral disc degeneration  
Wang J.R. (CN)

 15.14 O342 IL-6-enriched extracellular vesicles from IL-1 $\beta$ -primed mesenchymal stem cells modulate annulus fibrosus cell metabolism  
Neidlinger-Wilke C. (DE)

15.21 Discussion


**THE INTERNATIONAL SOCIETY FOR THE STUDY OF THE LUMBAR SPINE**

 15.30 O344 Roles and mechanisms of curcuglisoid in alleviating nucleus pulposus cell apoptosis by upregulating BMAL1 expression via the JAK/STAT3 pathway  
Wang J.R. (CN)

 15.37 O345 Inhibition of the phosphatase pleckstrin homology domain leucine-rich repeat protein phosphatase (PHPPP) to promote NP cell regeneration  
Illien-Junger S. (US)

15.44 Discussion

16.00 Coffee Break

**Symposium: Research dissemination and the impact of social media: Tips and tricks**

Chair: Bailey J. (US)

Faculty: Bailey J. (US), Samartzis D. (US), Berjano P. (IT), Sheldrick K. (AU)

**Session IX: Basic Science 3 – Immune system and autophagy**

Chairs: Zheng Z.M. (CN) &amp; Kawaguchi Y. (JP)

 17.30 O346 Transient Receptor Potential Vanilloid 4 (TRPV4) knockdown decreases extracellular matrix synthesis via autophagy suppression in rat intervertebral disc  
Matsuo T. (JP)

 17.37 O347 Glial activation in sensory and motor regions of the cortex is related to sensorimotor function in individuals with low back pain maintained by nociceptive mechanisms  
Shraim M. (AU)

 17.44 O348 Intervertebral disc divided into three regions according to the origin and polarity of macrophages  
Yamamoto Y. (JP)

17.51 Discussion

18.00 Adjourn

## ASSOCIATION OF SPINE SURGEONS OF INDIA

**Symposium: Surgical site infections in spine surgery**

Chairs: Kandwal P. (IN) &amp; Pillai S. (IN)

08.00 Case 1: L4/5 infective spondylodiscitis following lumbar discectomy  
Mullukutla R. (IN)

08.30 Panelists: Jhala A. (IN), Iyengar R. (IN), Venkatesan R. (IN), Giridhar P. (IN), Kundnam V. (IN)

09.00 Case 2: Infection post instrumented lumbar fusion  
Chahal R. (IN)**Free Paper Session VII**

Chairs: Sharma A. (IN) &amp; Rathod T. (IN)

09.00 0349 Prognostic value of conventional MRI and diffusion tensor imaging in surgically treated degenerative cervical myelopathy patients  
Prabhakar S.V. (IN)09.05 0350 Anterior cervical hybrid fixation for severe multi-level Ossified Posterior Longitudinal Ligament (OPLL)  
Venkatesan R. (IN)09.10 0351 Midterm results of cervical suspension laminoplasty for degenerative cervical myelopathy  
Dhillon C. (IN)09.15 0352 Does the use of SONOPEI ultrasonic aspirator decrease the complication rate of laminectomy in cervical myelopathy patients?  
Sharma A. (IN)

09.20 Q&amp;A Session

09.30 0353 CT Based morphometric study of the sub axial cervical spine pedicles in a sample of Indian population, to assess the safety and feasibility of cervical pedicle screw in the sub axial spine  
Farooque K. (IN)09.35 0354 Can quantitative analysis of motion of after cervical total disc replacement be accurately done on flexion extension radiographs?  
Amin P. (IN)09.40 0355 The effect of corticosteroids in postoperative dysphagia in anterior cervical spine surgery – a randomised trial  
Basu A. (IN)09.45 0356 Is foramen magnum decompression really needed after C1-C2 posterior fixation for congenital atlantoaxial dislocation/ basilar invagination with Chiari malformation?  
Madhivanan K. (IN)

09.50 Q&amp;A Session

10.00 **Coffee Break**

## ASSOCIATION OF SPINE SURGEONS OF INDIA

**Symposium: Multilevel lumbar canal stenosis**

Chairs: Dave B. (IN) &amp; Arockiaraj J. (IN)

10.30 MRI based classifications of LCS- do they co-relate well with clinical symptoms?? How much decompression is adequate??  
Jhala A. (IN)10.37 Multilevel laminectomy  
Patej P. (IN)10.44 Interlaminar decompression  
Babu N. (IN)

10.51 Discussion

11.00 Spinous process splitting  
Venkatesh K. (IN)11.07 Over the top decompression  
Giridhar P. (IN)11.14 Endoscopic decompression  
Deshpande K. (IN)

11.21 Discussion

**Free Paper Session VIII**

Chairs: Sharma M. (IN) &amp; Hadgaonkar S. (IN)

11.30 0357 Starting endoscopic spine surgery practice in a tier 2 city of India: An initial experience and learning curve  
Sathe A. (IN)11.35 0358 Uniportal dual mode dry saline endoscopy for lumbar disc herniation  
Kaushal M. (IN)11.40 0359 Interlaminar endoscopic discectomy versus microdiscectomy for L5-S1 lumbar disc herniation - a propensity matched study  
Ramachandran K. (IN)11.45 0360 Difficult Cases - Analysis of factors for ease of surgery in interlaminar endoscopic lumbar discectomy  
Vemula V.R.C. (IN)

11.50 Q&amp;A Session

12.00 0361 Role of unilateral bipolar endoscopy in treatment of cervical radiculopathy, technical note and early results  
Deshpande K.D. (IN)12.05 0362 Mini-open transforaminal lumbar interbody fusion: A 2 year outcome study  
Sharma A. (IN)12.10 0363 Clinical outcomes following navigation assisted minimally invasive sacroiliac joint fusion through lateral approach  
Parwar J. (IN)12.15 0364 A minimum 2-year MRI evaluation of postoperative spinal canal and foramen expansion in OLIIF patients  
Sheeth S. (IN)

12.20 Q&amp;A Session

12.30 **Lunch Break & Industry Workshops**

**Meet the Experts session on lateral approaches: Advanced indications**

14.00 **Welcome and Session Presentation**  
Gunzburg R. (BE) & Szpalski M. (BE)

**Session 1: Lumbar corpectomy**  
Chair: Berjano P. (IT)

14.05 **Case presentation**  
Thomas A. (US)

14.15 **Lecture: Lumbar corpectomy**  
Lamarfina C. (IT)

14.35 **Case solution**  
Thomas A. (US)

14.45 **Discussion**

**Session 2: Anterior column realignment**

Chair: Berjano P. (IT)

14.55 **Case presentation**  
Lamarfina C. (IT)

15.05 **Lecture: Anterior column realignment**  
Menezes C. (BR)

15.25 **Case solution**  
Lamarfina C. (IT)

15.35 **Discussion**

16.00 **Coffee Break**

**Session 3: Thoracolumbar corpectomy**

Chair: Lamarfina C. (IT)

16.30 **Case presentation**  
Berjano P. (IT)

16.40 **Lecture: Thoracolumbar corpectomy**  
Thomas A. (US)

17.00 **Case solution**  
Berjano P. (IT)

17.10 **Discussion**

**Session 4: Giant thoracic disc herniation**

Chair: Lamarfina C. (IT)

17.20 **Case presentation**  
Menezes C. (BR)

17.30 **Lecture: Giant thoracic disc herniation**  
Berjano P. (IT)

17.50 **Case solution**  
Menezes C. (BR)

18.00 **Discussion**

18.10 **Final Remarks**  
Berjano P. (IT) & Lamarfina C. (IT)

18.30 **End of the meeting**





**SOSORT - INTERNATIONAL SOCIETY ON SCOLIOSIS ORTHOPAEDIC AND REHABILITATION TREATMENT**

**SOSORT Contribution to spinal deformities conservative treatment**

Chairs: *Betts I. (GB) & Schreiber S. (CA)*

- 08.00 Introduction
- 08.05 Bracing for scoliosis: New developments  
*Wynne J. (US)*
- 08.25 Discussion
- 08.34 Physiotherapeutic scoliosis specific exercises: From school and tradition to a common evidence based approach  
*Schreiber S. (CA)*
- 08.54 Discussion
- 09.03 Outcome measures in scoliosis treatment: Is the Cobb angle enough?  
*Donzelli S. (IT)*
- 09.23 Discussion
- 09.32 SOSORT Guidelines for scoliosis conservative treatment: An update  
*Zaina F. (IT)*
- 09.52 Discussion
- 10.00 Coffee Break
- Session 8: Evaluation**  
Chairs: *Marchese R. (AU) & Donzelli S. (IT)*
- 10.30 O365 Development, pilot pathway implementation and evaluation of an advanced practice physiotherapy triage pathway in adolescent idiopathic scoliosis  
*Dunstan E. (GB)*
- 10.37 O366 Using a convolutional neural network with a Huber loss output regression layer to predict the maximum Cobb angle of adolescent idiopathic scoliosis from surface topography torso scans  
*Lou E. (CA)*
- 10.44 O367 Monitoring of spine curvature changes of patients with Adolescent Idiopathic Scoliosis (AIS) using three-dimensional ultrasound  
*Lai K.L. (HK)*
- 10.51 O368 The apex vertebrae of the scoliotic curves - Study of their frequency in 11758 cases  
*Romano M. (IT)*
- 10.58 Discussion
- 11.10 O369 Deep learning and 3D surface modelling facilitating radiation free spine alignments measurements with preliminary clinical validation  
*Zhang T. (HK)*
- 11.17 O370 Evaluation of thoracic flexibility in the sagittal plane with the Thoracic Stiffness test: Intra and inter-operator reliability  
*Romano M. (IT)*



**SOSORT - INTERNATIONAL SOCIETY ON SCOLIOSIS ORTHOPAEDIC AND REHABILITATION TREATMENT**

- 11.24 O371 Surface topographic measurements of trunk asymmetry distinguishes adolescent idiopathic scoliosis stratified by severity and controls  
*Thakur A. (US)*
- 11.31 O372 Surface topographic measurements of trunk asymmetry distinguishes adolescent idiopathic scoliosis in different regions (thoracic, thoracolumbar, and lumbar) and controls  
*Thakur A. (US)*
- 11.38 Discussion
- 12.05 Award Ceremony  
*Cohen L. (AU)*
- 12.15 SOSORT 2024 Boston  
*Wynne J. (US)*
- 12.25 Closing Remarks  
*Zaina F. (IT) & McAviney J. (AU)*
- 12.30 Lunch Break & Industry Workshops



JSSR - JAPANESE SOCIETY FOR SPINE SURGERY  
AND RELATED RESEARCH

- Symposium 1: Current advances in osteoporotic vertebral fracture in a super-aging society**  
Chairs: **Haro H., (JP) & Ito M. (JP)**
- 14.00 O373 Medication for osteoporotic vertebral fracture: Can imminent fracture risk be reduced?  
Takahata M. (JP)
- 14.10 O374 Characteristics of a spinal sagittal malalignment in patients with osteoporosis  
Miyagi M. (JP)
- 14.20 O375 Surgical strategy for osteoporotic vertebral fracture based on multicenter cohort study  
Takahashi S. (JP)
- 14.30 O376 Analysis of treatment effect with teriparatide on device-related vertebral osteopenia after lumbar spinal interbody fusion using Hounsfield unit values  
Miyazaki M. (JP)
- 14.40 O377 Screw fixation techniques and augmentation methods in osteoporotic spine  
Kanno H. (JP)
- Symposium 2: An upgrade on OPLL in Japan**  
Chairs: **Matsuyama Y. (JP) & Sakai D. (JP)**
- 14.50 O378 Association between clinical symptoms and distribution of OPLL based on prospective nationwide study  
Hirai T. (JP)
- 15.00 O379 Long-term outcome of surgery for OPLL  
Kawaguchi Y. (JP)
- 15.10 O380 Anterior versus posterior approach for ossification of posterior longitudinal ligament  
Kato S. (JP)
- 15.20 O381 Current interpretation and usage of MEPs  
Shigematsu H. (JP)
- General session 1**  
Chairs: **Takahashi S. (JP) & Miyagi M. (JP)**
- 15.30 O382 Study of sacral lateral tilt in the idiopathic scoliosis patients with Lenke type 5 curve  
Takada S. (JP)
- 15.36 O383 Non Fusion Anterior Scoliosis Correction (NFASC) for double sided Adolescent Idiopathic Scoliosis (AIS) curves in skeletally mature children: Clinico-radiological outcomes with 2 years follow up  
Akbari K. (IN)
- 15.42 O384 Effect of enhanced Recovery Pathway (ERP) resulting in reduced length of stay (LOS) and opioid consumption after Non-Fusion Anterior Scoliosis Correction (NFASC) surgery for Adolescent Idiopathic Scoliosis (AIS)- a single centre experience  
Reddy H. (IN)
- 15.48 O385 Selection of the appropriate parameter to measure sacral tilt in Lenke type 5C adolescent idiopathic scoliosis  
Kanle Y. (JP)
- 15.54 O386 Automated measurement of spinal alignment for scoliosis using deep learning  
Nakajima N. (JP)
- 16.00 Coffee Break



JSSR - JAPANESE SOCIETY FOR SPINE SURGERY  
AND RELATED RESEARCH

- Symposium 3: Emerging technologies in Japan: Innovation to Impact**  
Chairs: **Nakamura M. (JP) & Watanabe M. (JP)**
- 16.30 O387 Intrahecal administration of recombinant human hepatocyte growth factor for acute traumatic cervical spinal cord injury  
Kitamura K. (JP)
- 16.40 O388 IPSC-derived neural precursor cells: potential for cell transplantation therapy in spinal cord injury  
Nagoshi N. (JP)
- 16.50 O389 Augmented and mixed reality in spine surgery: utility and limitations  
Sakai D. (JP)
- 17.00 O390 A deep learning algorithm to identify cervical ossification of posterior longitudinal ligaments on radiography  
Tamai K. (JP)
- 17.10 O391 Machine learning web application for predicting functional outcomes in patients with traumatic spinal cord injury following inpatient rehabilitation  
Maki S. (JP)
- General session 2**  
Chairs: **Kitamura K. (JP) & Kato S. (JP)**
- 17.25 O392 Comparison of the Cobb angle measurement between manual and digital methods among five military hospitals  
Chitragan R. (TH)
- 17.31 O393 Which spinopelvic and hip morphological parameter are risk factors for hip joint osteoarthritis in postoperative adult spinal deformity patients?  
Inami S. (JP)
- 17.37 O394 3D patient-matched template guides let to benefit of increased mean screw diameter and length, improving accuracy of cortical bone trajectory screws: A 5-years international experience  
Marengo N. (IT)
- 17.43 O395 5-year radiological outcomes post interlaminar device insertion for symptomatic lumbar spinal stenosis  
Kumar N. (SG)
- 17.49 O396 Comparison of posterior and anteroposterior spinal fusion for 7 points of Load Sharing Classification - thoracolumbar vertebral fracture  
Hattori N. (JP)
- General session 3**  
Chairs: **Nagoshi N. (JP) & Tamai K. (JP)**
- 18.00 O397 Pull-out resistance of facet versus laminar C2 screws: An experimental comparative biomechanical investigation  
Meynard A. (FR)
- 18.06 O398 Paraspinal muscle morphology in patients with proximal cervical spondylotic amyotrophy  
Hirota R. (JP)
- 18.12 O399 Cartilage endplate disruption on MRI-T1WI as a novel risk factor for postoperative recurrence of lumbar disc herniation  
Inomata K. (JP)
- 18.18 O400 The effectiveness of chemonucleolysis with condoliase for treatment of recurrent lumbar disc herniation  
Ozaki T. (JP)
- 18.24 O401 Outcome of lumbar intradiscal condoliase injection therapy in our hospital  
Yanagisawa Y. (JP)



## ASIA PACIFIC SPINE SOCIETY

**APSS/ISSR Joint Session****Symposium 7: Recent advance in management of cervical myelopathy**

Chairs: Park J.B. (KR) &amp; Hai Y. (CN) &amp; Takahata M. (JP) &amp; Hirai T. (JP)

07.30	Introduction
	A) How does it affect my approach?
07.31	Lordotic vs. non lordotic spine Kundhani V. (IN)
07.39	Degenerative vs. OPLL Kawaguchi Y. (JP)
07.47	Chin-on-chest deformity. Flexible vs. rigid Suk K.S. (KR)
	B) What techniques to use and how to avoid complications
07.55	Multi level anterior fusion Lee D.H. (KR)
08.03	Laminoplasty vs. laminectomy Wu W.T. (TW)
08.11	Artificial disc replacement in myelopathy Bunmaprasert T. (TH)
08.19	Q&A Session
08.29	Case Discussion
	<b>Oration</b>
	Chair: Rajasekaran S. (IN)
09.00	Introduction
09.05	Conferral of award to APSS Orator 2023 Wong H.K. (SG)
09.07	Anterior surgery for scoliosis - A 30-year journey Wong H.K. (SG)
09.27	Closing Remarks



## ASIA PACIFIC SPINE SOCIETY

**Presidential Lecture**

Chair: Kwan M.K. (MY)

09.30	Introduction
09.35	Lessons learnt from 25 years in spine surgery Rajasekaran S. (IN)
09.58	Closing Remarks
10.00	<b>Coffee Break</b>
	<b>Symposium 8: Spinal Technology: The future?</b>
	Chair: Kwan K. (HK) & Kandwal P. (IN)
10.30	Introduction
10.31	What is the current advantage and limitation of robotic spine surgery? Kumar D. (SG)
10.39	Stem cells therapy in spinal cord injury - What is the correct evidence? Sakthi Y.M. (ID)
10.47	How Augmented Reality (AR) & Mixed Reality helps with complex spinal surgery? Sakai D. (JP)
10.55	Would future Artificial Intelligence (AI) replace the decision-making by the spine surgeon? Lanang G. (ID)
11.03	Q&A Session
	<b>APSS Annual General Assembly</b> (in conjunction with APSS Annual Scientific Meeting)
	11.30 – 12.00
	<b>APSS Closing Ceremony &amp; Best Paper Prize Presentation</b>
	Chair: Liu G. (SG)
12.00	Preview of APSS future activities & annual meeting in 2024 Cheung J.P.Y. (HK) & Kwan K. (MY)
12.10	APSS Scoliosis Focus Group update Shigematsu H. (JP)
12.20	APSS Anterior column reconstruction Focus Group update Cheung J.P.Y. (HK)
12.25	Best Paper Prize Announcement
12.35	Presidential inauguration 2023/2025 & Presentation of token to past president Rajasekaran S. (IN) & Kwan M.K. (MY)
12.38	Word of thanks by the scientific chairman of APSS @ SpineWeek 2023 Liu G. (SG)
12.43	Closing Remark by the President of APSS Rajasekaran S. (IN)
12.30	<b>Lunch Break &amp; Industry Workshops</b>



## SIS - SPINE INTERVENTION SOCIETY

**Session 1: Advanced concept in neuromodulation**

Chair: Verillis P. (AU)

14.00	<b>The brain salience network: Why pain becomes overwhelming</b> De Ridder D. (NZ)
14.20	<b>Neuromodulation: Objective therapy performance approach to deploying and monitoring therapy – Data and AI</b> Karantonis D. (AU)
14.40	<b>Discogenic pain: Fusion vs. Neuromodulation</b> Awad M. (AU)
15.00	<b>Neuromodulation for back pain: Virgin and 'failed' surgery syndrome: An evolving algorithm</b> Bates D. (AU)
15.20	<b>Breakthrough technologies: The future</b> Chakravarthy K. (US)
15.40	<b>Discussion</b>
16.00	<b>Coffee Break</b>

## SIS - SPINE INTERVENTION SOCIETY

**Session 2: Sacroiliac Joint Pain: Up-to-date diagnosis and treatment strategies**

Chair: MacVicar J. (NZ)

16.30	<b>Update on diagnosis: Imaging and physical exam</b> Kennedy D.J. (US)
16.50	<b>The role of therapeutic intra-articular injections</b> Schwazer A. (AU)
17.10	<b>Lateral branch radiofrequency neurotomy: Selection criteria and outcomes</b> Stout A. (US)
17.30	<b>Sacroiliac joint fusion: Selection criteria and outcomes</b> Dohring E.J. (US)
17.50	<b>Discussion</b>
18.00	<b>Adjourn</b>



BIOSPINE

08.00	Opening Remarks Sakai D. (JP)
08.10	0402 Effective modulation of inflammation to promote intervertebral disc regeneration using a 3D hybrid protein nanoscaffold Han I. (KR)
08.20	0403 Adiponecetin receptor agonist AdipoRon prevents the progression of intervertebral disc degeneration in a rat tail puncture model Ohnishi H. (JP)
08.30	0404 Study of the effect of adipose tissue dysfunction in IVDD Ruiz-Fernandez C. (JP)
08.40	0405 Matrix production enhancing effect of laminin in cultured human nucleus pulposus progenitor cells Sama H. (JP)
08.50	0406 Combination of ultra-purified stem cells with an alginate sodium reduces discogenic pain Suzuki H. (JP)
09.00	0407 <b>Session 2: Osteoporosis, bone fusion and bone regeneration</b> Chairs: Kaito T. (JP) & Kim Y.Y. (KR)
09.10	0408 Bioactive glass (5S3P54) and polyethylene-glycol and glycerol water soluble synthetic adhesive as an effective fusion promoter in anterior lumbar interbody fusion surgery Cofulka S. (HR)
09.20	0409 A novel treatment strategy for nonunion targeting senescence cells Kitahara T. (JP)
09.30	0410 Preclinical study of human bone marrow-derived mesenchymal stem cells using a three-dimensional manufacturing setting for enhancing spinal fusion Shin H.E. (KR)
09.40	0411 Stem cell-exosome efficacy for osteoclast activity regulation Lee G.W. (KR)
09.50	0412 The iPS cell-derived platelet preparation reduces bone morphogenetic proteins requirements and suppresses adverse events in bone formation promoting Shiga Y. (JP)
10.00	<b>Coffee Break</b>



BIOSPINE

10.30	0413 <b>Session 3: Spinal cord and nerve tissue regeneration</b> Chairs: Han I. (KR) & Khang G. (KR)
10.40	0414 The role of microglia macrophages activation and TLR4 NF-kB MAPK pathway in distraction spinal cord injury-induced inflammation Hai Y. (CN)
10.50	0415 Multimodal therapy strategy based on a bioactive hydrogel for repair of spinal cord injury Roh E.J. (KR)
11.00	0416 <b>Session 4: New insights of spine biomechanics</b> Chairs: Han I. (KR) & Khang G. (KR)
11.10	0417 Determining the instantaneous center of rotation of the cervical spine via computer-assisted radiographic analysis Shin J. (KR)
11.20	0418 Design and biomechanical analysis of stand-alone lumbar cage implant for posterior inter body fusion Sudhir G. (IN)
11.30	0419 Comparison in the accuracy of thoraco-lumbo-sacral orthosis designed by a conventional contact casting technique with a plaster bandage versus by a new non-contact 3D digital scanning technique Ryu M. (JP)
11.40	0420 Ligamentum flavum hypertrophy significantly contributes to the severity of neurogenic intermittent claudication in patients with lumbar spinal canal stenosis Hur J.W. (KR)



BIOSPINE

**Session 5: Advances in supporting artificial intelligence, virtual reality and augmented reality**

**Chairs:** Lee G.W. (KR) & Maki S. (JP)

- 11.30 O419 Smart glasses can reduce radiation exposure and improve the accuracy of percutaneous pedicle screw insertion  
*Hironaka Y. (JP)*
- 11.40 O420 Augmented reality navigation technology for spinal cord tumor resection  
*Tezuka F. (JP)*
- 11.50 O421 Establishment of an intraoperative assisted endoscopic common iliac vein segmentation model and object detection model for OIIF51 (Oblique Lateral Lumbar Interbody Fusion 51)  
*Ueda R. (JP)*
- 12.00 O422 The accuracy comparison of automatic pedicle screw and cortical screw trajectory planning using domain-transform manifold learning  
*Ryu S.J. (KR)*
- 12.10 O423 Magnetic resonance image segmentation of the compressed spinal cord in patients with degenerative cervical myelopathy using convolutional neural networks  
*Maki S. (JP)*
- 12.20 Discussion

**Lunch Break & Industry Workshops**

**Session 6: Clinical development of spine technologies**

**Chairs:** Kim S.B. (KR) & Yurube T. (JP)

- 14.00 O424 3D Printing in spinal surgery: Current and future  
*Kim S.B. (KR)*
- 14.10 O425 The current evidence for 3D printing vs PEEK cage in lumbar interbody fusion  
*Kim J.S. (KR)*
- 14.20 O426 Polymer based bone regeneration research  
*Kim Y.T. (KR)*
- 14.30 O427 Discoscopic findings in the high-intensity zone of lumbar intervertebral discs  
*Fujimoto S. (JP)*
- 14.40 O428 Temporal MRI analysis of degenerated discs following platelet-rich plasma release injection for discogenic low back pain patients  
*Akeda K. (JP)*
- 14.50 O429 Efficacy of PRP administration for intervertebral disc in low back pain patients with Modic type 1 change: two cases report  
*Kawabata S. (JP)*
- Chairs:** Cho J.E. (KR) & Takeoka Y. (JP)
- 15.00 O430 Bone union and strength effect of Romosozumab: An imaging and mechanical study using a rat posterolateral lumbar fusion model  
*Mukaihata T. (JP)*
- 15.10 O431 Effects of a probe with an electrical conductivity-measuring device on pedicle screw insertion in patients with severe syndromic or neuromuscular scoliosis  
*Yurube T. (JP)*

BIOSPINE

- 15.20 O432 Posterior spinal fixation for thoracolumbar fractures with diffuse idiopathic skeletal hyperostosis using the penetrating endplate screw technique  
*Hishiya T. (JP)*

- 15.30 O433 Comparing MIDLF and PLIF cPS for clinical outcome including sagittal balance: Degenerative lumbar spine disease in geriatric patients over 80 years old - A single-center, one-decade experience  
*Jang G.W. (KR)*

- 15.40 O434 History of cortical bone trajectory, a modified version of pedicle screw placement  
*Choy W.J. (AU)*

15.50 Discussion

16.00 **Coffee Break**

- 16.30 Cocktail session open for all participants  
*Park J.B. (KR) & Hai Y. (CN)*

- 17.30 Closing Remarks  
*Ohtori S. (JP)*

## SPINE SOCIETY OF AUSTRALIA



- Free Paper Session 7: Spinal deformity II**  
Chairs: Licina P. (AU) & Chalmers R. (AU)
- 08.30 O435 Patient satisfaction does not depend on radiographic reduction in adult scoliosis with primary lumbar curves  
Baecker H. (NZ)
- 08.40 O436 Effect of non fusion anterior scoliosis correction on shoulder balance in Lenke type 1 adolescent idiopathic scoliosis patients: is it detrimental or beneficial?  
Achar S. (IN)
- 08.50 O437 Can muscle size (a)symmetry be quantified using magnetic resonance imaging in adolescent idiopathic scoliosis  
Duncombe P. (AU)
- 09.00 O438 Posterior scoliosis correction with thoracoplasty: effect on pulmonary function with a mean follow-up of 4.8 years  
Altarf. (AU)
- 09.10 O439 Are we looking at a paradigm shift in the management of adolescent idiopathic scoliosis - Comprehensive retrospective analysis of 75 patients of Non-Fusion Anterior Scoliosis Correction (NFASC) with 2-5 years follow up - A single centre experience  
Badikilaya V. (IN)
- 09.20 O440 Development of a patient-oriented smartphone application (myScoliosis) to improve the healthcare journey of paediatric patients with scoliosis  
Suhr A.E. (AU)
- 09.30 O441 Surgical site infection in paediatric spine deformity surgical: A review of 933 procedures in a tertiary children's hospital  
Davis M. (AU)
- 09.40 O442 Intraspinal anomalies associated with complex spine deformity: Different approach, different measures to achieve optimum outcome  
Patel H.R. (IN)
- 09.50 O443 Patient reported outcomes vs radiographic measurements with a hybrid anterior lumbar reconstruction for the management of symptomatic low-grade L5-S1 isthmic spondylolisthesis  
Rackham M. (AU)
- 10.00 **Coffee Break**
- Free Paper Session 8: Lumbar spine II & spinal surgery II**  
Chairs: Stanford R. (AU) & Tredan D. (AU)
- 10.30 O444 TANGO: Development of consumer information leaflets to support TAPERING of Opioids in older adults with low back pain and hip and knee osteoarthritis  
Marcelo A.C. (AU)
- 10.40 O445 Lumbar total disc replacements for degenerative disc disease: A systematic review of outcomes with a minimum of 5 years follow-up  
Wen D.J. (AU)
- 10.50 O446 Incidence of temporary intra-operative iliac artery occlusion in anterior spinal surgery  
Matham G. (AU)

## SPINE SOCIETY OF AUSTRALIA



- 11.00 O447 Surgical, radiographic and patient-reported outcomes following multilevel lumbosacral fusion utilising a novel minimally invasive multi-incision technique  
Cunningham G. (AU)
- 11.10 O448 Lateral single position Anterior-Posterior (AP) lumbar fusion outperforms conventional AP fusion with patient repositioning at 2-year minimum follow-up  
Buckland A. (AU)
- 11.20 O449 Reverse pedicle subtraction osteotomy – Rationale and early clinical experience of a novel PSO technique  
Sears W.R. (AU)
- Top 10 Posters & Award Ceremony**  
Chairs: Stovell M. (AU) & Ho S. (AU)
- 11.30 O450 Surgical and patient-reported outcomes support Anterior Lumbar Interbody Fusion for the treatment of low back pain  
Celentza A. (AU)
- 11.35 O451 A hybrid antiaxial fusion technique utilising a transarticular and C1 lateral mass screw technique: investigation of surgical and patient-reported outcomes, and finite element analyses of the biomechanical properties  
Cunningham G. (AU)
- 11.40 O452 Retrieval analysis of interbody cages  
Kim S.J. (AU)
- 11.45 O453 Characteristics of baseline frequency data in spinal RTIs do not suggest widespread fraud  
Levayer M.M.S. (AU)
- 11.50 O454 Cooled radiofrequency ablation of the sacroiliac joint a retrospective case series  
Madelbouy J. (AU)
- 11.55 O455 Use of cannulated pedicle screws for posterior spinal fixation in fractures are correlated with higher blood loss in some groups  
Rajabifard P. (AU)
- 12.00 O456 The effect of progressive herniation on lumbar intervertebral disc six degree of freedom mechanics  
Russo M. (AU)
- 12.05 O457 Development and validation of a virtual digital scoliometer  
Suresh S. (AU)
- 12.10 O458 Spinal cord stimulation for treatment of neuropathic pain in failed back surgery syndrome: A fifteen years experience using percutaneous leads insertion  
Morell D. (BE)
- 12.15 O459 3D-printed patient specific interbody implants in anterior lumbar interbody fusion: A case series and review of early clinical and radiological results  
Tredan D. (AU)
- 12.20 **Award Ceremony**
- 12.30 **Lunch Break & Industry Workshops**

## NORTH AMERICAN SPINE SOCIETY

14.00	14.00	<b>Welcome</b> Finkenberg J. (US)
		<b>Paper Presentations III: Diagnostics and interventions</b> Chair: Finkenberg J. (US)
14.05	O460	Improved productivity using deep learning augmented reporting for MRI lumbar spine Kumar N. (SG)
14.11	O461	Bimodal Artificial Intelligence differentiating spinal tumors based on integrated Magnetic Resonance Imaging and patient information Kita K. (JP)
14.17	O462	A diagnostic machine learning model for primary bone tumors and tumor-like lesions Nye L. (US)
14.23	O463	Comparison of CTA and MRI for C1 instrumentation presurgical planning Arzani A. (US)
14.29	O464	Correlation between MRI canal dimensions and clinical severity in lumbar canal stenosis – A cross-sectional study Althala J. (IN)
14.35		<b>Questions and Discussion</b>
		<b>Paper Presentations IV: Spinal deformity</b> Chair: Reitman C. (US)
15.00	O465	The clinical application of individualized digital surgical planning and precise execution and 3D printing guidance templates in the treatment of severe adult rigid deformity Hai Y. (CN)
15.06	O466	Beware of positive SPECT/CT findings when investigation pain generators in patients with scoliosis: Hospital cohort of cancer patients shows high prevalence of high uptake degenerative changes Lui D. (GB)
15.12	O467	Role of high sensitive C-reactive protein as a prognostic marker in determining functional outcome after interlaminar epidural steroid injection in cervical radiculopathy Gani V. (IN)
15.18	O468	Re-revision rate of revision surgery for rod fracture after surgical correction with pedicle subtraction osteotomy in adult spinal deformity - Comparison of rod change only, lateral lumbar interbody fusion around pedicle subtraction osteotomy site, and accessory rod constructs Lee J.H. (KR)
15.24		<b>Questions and Discussion</b>
16.00		<b>Coffee Break</b>

## NORTH AMERICAN SPINE SOCIETY

		<b>Symposium: Cervical myelopathy</b> Chair: Ghogawala Z. (US)
16.30		<b>Introduction</b> Ghogawala Z. (US)
16.40		<b>Neuromonitoring pro and cons</b> Vogel R. (US)
17.00		<b>Surgery – anterior</b> Reitman C. (US)
17.20		<b>Surgery – laminoplasty</b> Ghogawala Z. (US)
17.40		<b>Surgery – laminectomy and fusion</b> Finkenberg J. (US)
18.00		<b>Adjourn</b>





# Thursday 4 May Scientific Program

	Goldfields Theatre	Sovereign Room (Level 1)	Eureka 1 + 2	Eureka 3	Courtyard Rooms	Hospitality Suite 6
08.00	ISSLS	ACA/CA	AO		SIS	SMISS AP
10.00			Break			
10.30	ISSLS	ACA/CA	AO		SIS	SMISS AP
12.30			Lunch break + Industry workshops			
14.00		ACA/CA	NASS	BSS SILACO	SIS	SMISS AP
16.00			Break			
16.30		ACA/CA	NASS		SIS	SMISS AP



## THE INTERNATIONAL SOCIETY FOR THE STUDY OF THE LUMBAR SPINE

<b>Session X: Non-Surgery</b>	
Chairs: Wilke H.J. (DE) & Otani K. (JP)	
07.30	O469 Effects of sustained locomotion training rehabilitation on the spine-pelvis-lower extremity alignment in outpatients with locomotive syndrome: A prospective >2-year cohort study Yurube T. (JP)
07.37	O470 Clinical characteristics of early-stage lumbar spondylolysis detected by magnetic resonance imaging in male adolescent baseball player Kato K. (JP)
07.44	O471 Causes of residual low back pain in patients with osteoporotic vertebral fractures without poor prognostic factors on MRI Iwamae M. (JP)
07.51	Discussion
08.00	O472 Association between opioid utilization and patient reported outcome measures following lumbar spine surgery Wague A. (US)
08.07	O473 Changes of the posterior paraspinal and psoas muscle in patients with low back pain – A 3-year longitudinal study Arzami A. (US)
08.14	O474 Widespread degeneration on MRI after the pubertal growth spurt predicts low back pain in adulthood Lund T. (FI)
08.21	Discussion
08.30	O475 Objective quantification of physical activity and sleep quality among patients with chronic low back pain Smuck M. (US)
08.37	O476 Physiotherapy aided by a clinical decision support system versus standard physiotherapy for treating persistent low back pain: Results of a pilot randomised controlled trial Hahne A. (AU)
08.44	O477 Impact of COVID-19 on bone mass, muscle, and low back pain scores in patients with osteoporosis in Japan Yokozeki Y. (JP)
08.51	Discussion
09.00	<b>Session XI: General Poster Session</b> See list of ISSLS General Posters - This session takes place in the ePoster area.
10.00	<b>Coffee Break</b>



## THE INTERNATIONAL SOCIETY FOR THE STUDY OF THE LUMBAR SPINE

<b>Session XII: Surgery 2 – Outcomes from surgery</b>	
Chairs: Garg B. (IN) & Hashizume H. (JP)	
10.30	O478 A prospective study comparing lumbar facet arthroplasty to transforaminal interbody fusion in the treatment of degenerative spondylolisthesis with stenosis: 2-year outcomes from the total posterior spine system (TIPS) IDE study Nasser A. (US)
10.37	O479 Decompression and dynamic sagittal tether stabilization vs T1IF for degenerative spondylolisthesis - 24-month follow-up from an FDA IDE trial Alamin T.F. (US)
10.44	O480 Prospects of returning to work after lumbar spine surgery for patients considering disability pension: A nationwide study based on data from the Norwegian Registry for Spine Surgery Hammer L. (NO)
10.51	Discussion
11.00	O481 Multi-centre randomised trial comparing the clinical outcome of trans-foraminal epidural steroid injection to surgical microdiscectomy for the treatment of radicular pain secondary to prolapsed intervertebral disc: NERVE Root Block VERSUS Surgery (NERVES) Wilby M.J. (GB)
11.07	O482 Minimally invasive versus open surgery in the treatment of lumbar spondylolisthesis: One-year results of a randomized, controlled trial Arts M. (NL)
11.14	O483 Impact of diffuse idiopathic skeletal hyperostosis on surgical outcomes of posterior lumbar interbody fusion for lumbar spinal stenosis with spondylolisthesis Ozaki M. (JP)
11.21	Discussion
<b>Session XIII: Basic Science 4 – Genetal Biology</b>	
Chairs: Dudli S. (CH) & Kawakami M. (JP)	
11.30	O484 Transient Receptor Potential Vanilloid 4 (TRPV4) activation promotes autophagy and increases extracellular matrix synthesis through AMPK pathway in rat intervertebral disc cells Kuroshima K. (JP)
11.37	O485 Activation of Nr1f2 signaling by 4-octyl itaconate attenuates the cartilaginous endplate degeneration by inhibiting E3 ubiquitin ligase ZNF598 Zhao F. (CN)
11.44	O486 Comparative metagenomics of intervertebral disc nucleus pulposus and endplate provide insights into the genesis of the disc microbiome Rajasekaran S. (IN)
11.51	Discussion
12.00	Second Business Meeting (Members only)

ACA/CA - AUSTRALIAN CHIROPRACTORS ASSOCIATION  
 AND CHIROPRACTIC AUSTRALIA
**Session 1**

Chair: President ACA

08.00		Opening Remarks
08.10	0487	Is there an association between patient and practitioner characteristics and the selection of therapeutic interventions in a chiropractic clinical encounter? Secondary analysis of the COAST and O-COAST study data Jenkins H. (AU)
08.20	0488	Satisfaction and expectations of chiropractic care in patients with lumbar radiculopathy - A mixed methods study Jensen R.K. (DK)
08.30	0489	Predictors of disability in older adults with LBP: Findings from the BACEC - A study de Luca K. (AU)
08.40		Question time
08.50		Lecture Buchbinder R. (AU)
09.20		Lecture: What is the role of non-pharmacological interventions in the evidence-based management of low back pain? Maher C. (AU)
09.50		Discussion
10.00		Coffee Break
		<b>Session 2</b>
		Chair: French S. (AU)
10.30	0490	The use of diagnostic imaging in the management of older adults presenting for chiropractic care for low back pain in Australia - Analysis of data from the BACK complaints in Elders: Chiropractic - Australia (BACEC-A) cohort study Jenkins H. (AU)
10.40	0491	The association between stressful life events and low back pain in older men: The Osteoporotic Fractures in Men Study McNaughton D.T. (AU)
10.50	0492	Trends of low back pain research in older and working-age adults from 1970 to 2022: A bibliometric analysis Zheng K. (CN)
11.00	0493	Pain trajectories in patients with lumbar spinal stenosis Jensen R.K. (DK)
11.10		Question time
11.20		Lecture: A critical appraisal of interventions for spinal stenosis Ferreira M. (AU)
11.50		Lecture: Three critical concepts for treating older adults with low back pain de Luca K. (AU)
12.20		Discussion
12.30		Lunch Break & Industry Workshops

**Session 3**

Chair: de Luca K. (AU)

14.00		Opening Remarks
14.10	0494	A comparison of two forward head posture corrective approaches in elderly with chronic non-specific neck pain: A randomized controlled study Harrison D. (US)
14.20	0495	Is there an association between diabetes and neck and back pain? An updated systematic review with meta-analyses Dale H. (AU)
14.30	0496	The effect of clinical guidelines on the utilisation of radiographs in chiropractic clinics in Denmark - An interrupted time series analysis Jensen T.S. (DK)
14.40		Question time
14.50		Discussion Panel: Challenges and opportunities for improving the care of patients with low back pain Jenkins H. (AU) & Hancock M. (AU)
15.50		Discussion
16.00		Coffee Break
		<b>Session 4</b>
		Chair: Swain M. (AU)
16.30		Lecture: How will the new Low Back Pain Clinical Care Standard influence chiropractic care in Australia? French S. (AU)
17.00		Discussion
17.10	0497	A systematic review of the effectiveness of superficial heat and cold for decreasing pain and improving disability in adults with low back pain de Luca K. (AU)
17.20	0498	Prognosis of a new episode of low-back pain in a community inception cohort Hancock M. (AU)
17.30	0499	MAINTAIN tool implementation for new spinal pain patients at chiropractic teaching clinics: Cross-sectional findings and impact on treatment plans Pohlman K. (US)
17.40		Question time
18.00		Adjourn

**Symposium: Lumbar Degeneration: Should the SIJ be considered as the most digital mobile spine segment?**

by AO Spine Knowledge Forum

Chairs: Diwan A. (AU) & Coriuka S. (HR)

Rapporteur: Chopra N. (AU)

- 08.00 Introduction  
Diwan A. (AU) & Coriuka S. (HR)
- 08.05 Biomechanics on the SIJ from a spine surgeon prospective  
Coriuka S. (HR)
- 08.13 Should SIJ degeneration be considered as a cause or a result of failed degenerative spine surgeries  
Rao P. (AU)
- 08.21 When to fuse the SIJ during a degenerative spine surgery - A comprehensive list  
Hamouda W. (EG)
- 08.29 Available techniques in SIJ fusion, pros and cons  
Selby M. (AU)
- 08.37 Discussion
- Free Paper Session I: Lumbar degeneration**  
Chair: Diwan A. (AU)  
Rapporteur: Sheildrick K. (AU)

08.40 O500 Slippage reduction and patient-reported outcomes following surgical fusion of lumbar degenerative spondylolisthesis: Is less really more?  
Rogalski M. (US)

08.48 O501 Lumbar fusion surgery in the era of an aging society: Analysis of a nationwide population cohort with minimum 8-year follow up  
Kwon W.K. (KR)

08.56 O502 The safety of multi-level kyphoplasty of 4 or more vertebral levels in myeloma patients  
Lui D. (GB)

09.04 O503 Onset, progression and risk factors of lumbar disc degeneration: 10-year longitudinal study of a population cohort  
Chan D. (HK)

09.12 CUTE (Catch-Up-Time)

09.20 O504 Analysing gait patterns in degenerative lumbar spine disease using inertial wearable sensors - An observational study  
Natarajan P. (AU)

09.28 O505 A deep learning algorithm for early detection of lumbar degenerative spondylolisthesis on conventional radiograph  
Nye L. (US)

09.36 O506 New axially expandable oblique cage for anterior to psoas (ATP) stand alone approach - Clinical-radiological outcomes in a series of patients with symptomatic Degenerative Disc Disease (DDD)  
Miscusi M. (IT)

09.44 O507 Endoscopic transforaminal lumbar interbody fusion through bi-portal technique: Clinical experience with 2-year outcomes  
Quillo-Olivera J. (MX)

09.54 O508 Biomechanical assessment of pedicle screw fixation strength in non-osteoporotic and osteoporotic pedicles: Comparison of straight dual-lead versus single-to dual-lead threadforms  
Permeswaran V. (US)

10.00 **Coffee Break**

**Symposium: Tuberculosis Spine**

Chair: Diwan A. (AU)

Rapporteur: Sima S. (AU)

- 10.30 Introduction and launch of AO SAP electronic book
- 10.35 Epidemiology, emerging science, eradication of TB  
Marks G. (AU)
- 10.45 When not operating makes sense  
Kundhani V. (IN)
- 10.55 When operating makes sense  
Mahapatra B. (IN)
- 11.05 Discussion
- Free Paper Session II: Adult Deformity**  
Chair: Hai Y. (CN) & Ito G. (SG)  
Rapporteur: Zhang T. (HK)

11.10 O509 Curve progression and Health Related Quality of life (HRQoL) in idiopathic scoliosis – 40-year follow-up from diagnosis  
Ragborg L.C. (DK)

11.18 O510 Minimally invasive surgery vs standard posterior approach in the treatment of idiopathic scoliosis: A two years follow-up retrospective study  
Marfikos K. (IT)

11.26 O511 The recent 10-year trends in cervical laminoplasty and 30-day complications, 2008-2017  
Takasawa E. (JP)

11.34 O512 Decision making for bracing in >40-degree curves  
Cheung J.P.Y. (HK)

11.42 CUTE (Catch-Up-Time)

11.50 O513 Factors influencing complications after 3-columns spinal osteotomies for fixed sagittal imbalance from multiple etiologies: A multicentric cohort study about 286 cases in 273 patients  
Barrey C. (FR)

11.58 O514 EMG activity shows surgeons risk overuse injury with manual pedicle screw technique, while power-assisted techniques are protective  
Permeswaran V. (US)

12.06 O515 Unilateral convex pedicle subtraction osteotomy for correction of lumbar curves in idiopathic adult scoliosis  
Marfikos K. (IT)

12.14 O516 Posterior lumbar Interbody Fusion (PLIF) as a supplement to posterior spinal fusion in patients with adult spinal deformity – A 2 year follow-up on revision rates and sagittal alignment  
Ragborg L.C. (DK)

12.22 CUTE (Catch-Up-Time)

12.30 **Lunch Break & Industry Workshops**



## NORTH AMERICAN SPINE SOCIETY



## NORTH AMERICAN SPINE SOCIETY

- 14.00 **Welcome**  
Reitman C. (US)
- Paper Presentations V: Cervical and spinal deformity**  
Chair: Reitman C. (US)
- 14.05 O517 The efficiency of preoperative Halo-gravity traction in the treatment of severe spinal deformity  
Hai Y. (CN)
- 14.11 O518 Distal foundation augmentation enhances the 'bridge' role of single traditional growing rod in the treatment of severe early-onset scoliosis  
Hai Y. (CN)
- 14.17 O519 Pedicle subtraction osteotomy in the surgical treatment of severe Scheuermann's kyphosis  
Marfikos K. (IT)
- 14.23 O520 Intervertebral disc transplantation in the treatment of cervical degenerative disease: An average of 10 years follow-up  
Ruan D. (CN)
- 14.29 O521 Bridging the cervicothoracic junction during multi-level posterior cervical decompression and fusion – A systematic review and meta-analysis  
Truumees E. (US)
- 14.35 O522 Accuracy and safety in cervical pedicle screw fixation using 3D-printed navigation guides  
Marengo N. (IT)
- 14.41 **Questions and Discussion**
- Paper Presentations VI: Biomechanics, motion and psychosocial aspects of care**  
Chair: O'Brien D. Jr. (US)
- 15.00 O523 How does overstuffing affect ROM in cTDA? A biomechanics study  
Pemeswaran V.N. (US)
- 15.06 O524 Revisions and removals of cervical total disc replacement devices in a consecutive series of 1,473 patients beginning with the first case experience in 2003  
Blumenthal S.L. (US)
- 15.12 O525 Long-term clinical outcomes after one-level lumbar total disc arthroplasty: 7-21 years follow-up of 772 patients, comparing never operated versus operated and with versus without disc herniation  
Mamay T. (FR)
- 15.18 O526 Mobility parameters in two-level lumbar TDR vs hybrid construct: Clinical results in 235 patients  
Mamay T. (FR)

- 15.24 O527 What perioperative factors are associated with high-risk daily morphine milligram equivalent totals in spinal decompressions?  
Truumees E. (US)
- 15.30 O528 Women in spine surgery  
Jurenovich K. (US)
- 15.36 **Questions and Discussion**
- 16.00 **Coffee break**
- Symposium: Procedural management of low back pain**  
Chairs: Reitman C. (US)
- 16.30 **Introduction**  
Reitman C. (US)
- 16.35 **Diagnostic evaluation**  
O'Brien D. Jr. (US)
- 16.55 **Basivertebral nerve ablation**  
Truumees E. (US)
- 17.15 **Lumbar disc arthroplasty**  
Guyer R. (US)
- 17.35 **Lumbar fusion**  
Blumenthal S. (US)

**BSS/SILACO - SOCIEDAD IBERO LATINOAMERICANA DE COLUMNA AUSTRALIA  
AND SOCIEDADE BRASILEIRA DE COLUNA**
**Free Paper Session I**
**Chairs: Alves J. (PT) & Fogaça Cristante A. (BR)**

- 14.00 O529 **External leverage technique for lordosis restoration in minimally invasive Transforaminal Lumbar Interbody Fusion (TLIF) - Surgical technique and intraoperative radiological results**  
Weissmann K.A. (CL)
- 14.05 O530 **Identification of risk factors associated with 30-day readmission of patients undergoing cervical spine surgery by the anterior and posterior routes: A meta-analysis**  
Mistro Neto S. (BR)
- 14.10 O531 **Surgical blood loss in spinal fusion is related to the brand of tranexamic acid used in the surgery**  
Weissmann K.A. (CL)
- 14.15 O532 **The use of o-arm and radioscope in spine surgery: A comparative study**  
Mistro Neto S. (BR)
- 14.20 O533 **The utility of electrophysiological examination measuring F-waves and compound action potentials of upper extremities for prognosis of the symptom of cervical radiculopathy**  
Sumiyoshi N. (JP)
- 14.25 **Q&A Session**
- 14.33 O534 **Analysis of cervical sagittal parameters in patients with rheumatoid arthritis**  
Mistro Neto S. (BR)
- 14.38 O535 **Transforaminal endoscopic lumbar discectomy: Learning curve and survival rate of a case series**  
Fleiderman Valenzuela J. (CL)
- 14.43 O536 **Comparison of two safety methods in the installation of pedicle screws used in minimally invasive spine surgery**  
Zarate A. (CL)
- 14.48 O537 **Comparison of preoperative quality of life questionnaires in a population with lumbar stenosis**  
Mistro Neto S. (BR)
- 14.53 **Q&A Session**

**BSS/SILACO - SOCIEDAD IBERO LATINOAMERICANA DE COLUMNA AUSTRALIA  
AND SOCIEDADE BRASILEIRA DE COLUNA**
**Free Paper Session II**
**Chairs: Menezes C.M. (BR) & Soriano J.A. (MX)**

- 15.00 O538 **Comparative study of the correction of adolescent idiopathic scoliosis using three different techniques**  
Garcia E. (BR)
- 15.05 O539 **The L-TLIF: A less invasive and blood-sparing technique as an alternative for the TLIF**  
Weissmann K. (CL)
- 15.10 O540 **Adolescent idiopathic scoliosis: Progression of untreated cases**  
Mistro Neto S. (BR)
- 15.15 O541 **Surgical outcomes in Adolescent Idiopathic Scoliosis (AIS) versus Young Adult Idiopathic Scoliosis (YAIS)**  
Weissman K.A. (CL)
- 15.20 O542 **Epidemiological portrait of patients with pediatric scoliosis in a tertiary hospital in the region of Campinas - SP**  
Mistro Neto S. (BR)
- 15.25 **Q&A Session**
- 15.33 O543 **Comparison between two methods of measuring pelvic obliquity in cerebral palsy and myelomeningocele**  
Mistro Neto S. (BR)
- 15.43 O544 **Lateral versus posterior approaches to degenerative pathologies: Systematic review and meta-analysis of recent literature**  
Pimenta L. (BR)
- 15.48 O545 **Use of leverage force in the surgical correction of the sagittal plan of the spine**  
Garcia E. (BR)
- 15.53 **Q&A Session**
- 16.00 **Coffee Break**



SIS - SPINE INTERVENTION SOCIETY

SIS - SPINE INTERVENTION SOCIETY



**Session 3: Non-surgical interventions for lumbar zygapophysial joint pain**  
Chair: Stout A. (US)

- 08.00 History of diagnosis and treatment  
Bogduk N. (AU)
- 08.30 Treatment outcomes of other techniques  
Sibell D.M. (US)
- 08.55 Treatment outcomes of SIS technique  
Schwarzer A. (AU)
- 09.20 Influence of diagnosis protocols on outcomes  
MacVicar J. (NZ)
- 09.45 Discussion
- 10.00 Coffee Break

**Session 4: Masqueraders of spine disease**  
Chair: Vivian D.G. (AU)

- 10.30 Shoulders vs. neck  
Sibell D.M. (US)
- 10.50 Hip vs. spine  
MacVicar J. (NZ)
- 11.10 Vascular  
Smuck M. (US)
- 11.50 Peripheral nerve  
Stout A. (US)
- 12.05 Neurologic and systemic disease  
Schwarzer A. (AU)
- 12.20 Discussion
- 12.30 Lunch Break & Industry Workshops

**Session 5: Do epidural injections influence spine surgery outcomes?**  
Chair: Shah V. (US)

- 14.00 Epidural steroid injections: Predictors of success  
MacVicar J. (NZ)
- 14.15 Diagnostic spinal nerve block: Indications and utility  
Kennedy D.J. (US)
- 14.30 Surgical planning: The role of epidural injections and diagnostic spinal nerve blocks  
Alamin T. (US)
- 15.00 Surgical and health risks after epidural injections  
Stout A. (US)
- 15.20 Discussion

**Session 6: Case review from the radiologist perspective**

- 15.30 My perspective  
Shah V. (US)

**Coffee Break**

**Session 7: Lumbar Spinal Stenosis (LSS): Percutaneous and minimally invasive treatments**  
Chair: Smuck M. (US)

- 16.30 Mechanisms of symptoms of LSS  
Smuck M. (US)
- 16.46 Evidence regarding lumbar epidural steroid injections and LSS  
Sibell D.M. (US)
- 17.02 Non-injection, interventional treatments for LSS  
Chakravarthy K. (US)
- 17.20 Spandylolisthesis with LSS: Surgical approaches  
Alamin T. (US)
- 17.45 Discussion
- 18.00 Adjourn



## SOCIETY FOR MINIMALLY INVASIVE SPINE SURGERY

**Session 1: Spine Endoscopy #1**

Chairs: Oh J. (SG), Selby M. (AU)

08.00	<b>Welcome Message</b> Choi J. (AU) & Phillips F. (US)
08.05	<b>President Speech – SMISS AP</b> Kotani Y. (JP)
08.10	<b>Promotion of SMISS AP</b> Kim J.S. (KR)
08.15	08.15 O546 <b>Case-matched radiological and clinical outcome evaluation of interlaminar endoscopic versus microsurgical decompression of lumbar spinal stenosis</b> Hasel F. (DE)
08.25	08.25 O547 <b>The anatomical relationship between the cervical nerve roots, intervertebral discs and bony cervical landmark for posterior endoscopic cervical foraminotomy and discectomy: A cadaveric study</b> Keerachana G. (TH)
08.35	08.35 <b>How endoscopy can influence the spinal disease pathway: Roles of spine endoscopy of ASD</b> Kim J.S. (KR)
08.50	08.50 <b>How I manage the extreme lumbar stenosis with biportal endoscopic spine surgery</b> Park C.W. (KR)
09.05	09.05 <b>Biportal endoscopic posterior cervical foraminotomy - skin incision to wound closure</b> Heo D.H. (KR)
09.20	09.20 O548 <b>Applications of biportal endoscopic techniques in revision spine surgery</b> Pao J.L. (TW)
09.30	09.30 O549 <b>Clinical &amp; radiological outcomes of transforaminal lumbar interbody fusion using biportal endoscopic technique &amp; double cages</b> Pao J.L. (TW)
09.40	09.40 O550 <b>Comparative study in operative time between posterior endoscopic cervical foraminotomy and microendoscopic cervical foraminotomy</b> Iwai H. (JP)
09.50	09.50 <b>Housekeeping - Gala Dinner Invite - Golf Results</b> Choi J. (AU)
10.00	10.00 <b>Coffee Break</b>

**Session 2: Robotics / VR / AI / Nav**

Chairs: Choi J. (AU), Soh R. (SG)

10.30	10.30 <b>The Indian experience of robotic assisted spine surgery</b> Hegde S. (IN)
10.45	10.45 <b>MIS applications and future directions of robotic-spine surgery in the USA</b> Kazemi N. (US)
11.00	11.00 O551 <b>Minimally invasive C1-2 robot-assisted posterior instrumented fusion – Technical aspects and case series</b> Choi H. (US)
11.10	11.10 O552 <b>The application of robotic navigation in single position lateral spine surgery - Technical note and surgical experience</b> Galani A.R. (ID)
11.20	11.20 <b>The next generation robotic spine surgery in Korea</b> Yi S. (KR)
11.35	11.35 <b>What are current challenges with robotic spine surgery?</b> Galizzi M. (US)
11.50	11.50 O553 <b>Intraoperative computed tomography-guided navigation versus fluoroscopy techniques for single-position surgery after lateral lumbar interbody fusion</b> Hiyama A. (JP)
12.00	12.00 <b>VR / MR and ER in spine surgery</b> Limthongkul W. (TH)
12.15	12.15 O554 <b>Influence of multilevel robotic minimal invasive trans foraminal lumbar interbody fusion on spino-pelvic parameters and clinical outcome in lumbar degenerative disc diseases</b> Achar S. (IN)
12.30	12.30 <b>Lunch Break &amp; Industry Workshops</b>
14.00	14.00 <b>Session 3: ATP / Anterior / Lateral lumbar surgery</b> Chairs: Kwon T. (US), Kotani Y. (JP)
14.15	14.15 <b>Lateral single position surgery</b> Kwon B. (US)
14.30	14.30 O555 <b>Prone transposas surgery - The evolution of lateral surgery</b> Pimenta L. (BR)
14.40	14.40 O556 <b>Vascular and visceral complications following prone transposas lateral lumbar interbody fusion: A comparative study to a historical survey study on standard lateral lumbar interbody fusion</b> McMains C. (US)
14.50	14.50 O557 <b>Clinical and radiographic outcomes following 110 Prone Transposas (PTP) surgeries at a single center</b> Howell K. (US)
	14.50 O557 <b>Feasibility of the Prone Transposas (PTP) approach in the obese and morbidly obese</b> McMains C. (US)



## SOCIETY FOR MINIMALLY INVASIVE SPINE SURGERY





## SOCIETY FOR MINIMALLY INVASIVE SPINE SURGERY

- 15.00 How has lateral evolved in deformity surgery?  
Anand N. (US)
- 15.15 OLF in single position surgery... enables simultaneous manipulation  
Hynes R. (US)
- 15.30 O558 Single position minimally invasive corpectomy with robotic assisted instrumentation: Technique review and early lessons learnt  
Chan J.Z. (SG)
- 15.40 O559 Retrospective case series of porous printed titanium cages in anterior to psoas oblique lumbar interbody fusion surgery assessing subsidence and functional outcomes  
Maalouly J. (AU)
- 15.50 O560 Comparing anterior to psoas lumbar interbody fusion with stand alone implant and posterior lumbar interbody fusion for the treatment of adjacent segment lumbar disease  
Sasipratha P. (TH)
- 16.00 **Coffee Break**



## SOCIETY FOR MINIMALLY INVASIVE SPINE SURGERY

- Session 4: Innovation in MIS surgery**  
Chairs: Kim L. (SG), Ryu S. (US)
- 16.30 **Appendables: Are they clinically valuable or an expensive marketing play?**  
Phillips F. (US)
- 16.45 **3D spinal devices - Design, production and cost considerations**  
Edis D. (AU)
- 17.00 O561 **Efficacy of restorative neurostimulation for non-surgical chronic low back pain according to underlying aetiology and radiographic severity**  
Bailey J. (US)
- 17.12 O562 **A novel repositioning system for use in lateral and prone surgeries for single position surgeon procedures**  
Hynes R. (US)
- 17.24 **Sustainable spine surgery – Single use instrumentation**  
Corluka S. (HR)
- 17.40 **Neuromuscular dysfunction in low back pain**  
Yau Y.H. (AU)
- 17.55 O563 **Risk factors for post-arthroplasty subsidence - Retrospective analysis of Bryan disc arthroplasty**  
Lee C.Y. (TW)
- 18.10 **Role of BMP in ALIF**  
Blumenthal S. (US)
- 18.25 **Reminder of Gala Diner at Eureka 89**  
Henkel N. (US)
- 18.30 **Adjourn**



# Friday 5 May Scientific Program

	Goldfields Theatre	Sovereign Room (Level 1)	Eureka 1 + 2	Eureka 3	Courtyard Rooms	Hospitality Suite 6
08.00	ISSIS	ACA/CA	AO	BSS SILACO	SIS	SMISS AP
10.00			Break			
10.30	ISSIS	ACA/CA	AO	BSS SILACO	SIS	SMISS AP
12.30			Lunch break + Industry workshops			
14.00	ISSIS	ACA/CA	AO			SMISS AP
16.00			Break			
16.30	ISSIS	ACA/CA	AO			SMISS AP



### THE INTERNATIONAL SOCIETY FOR THE STUDY OF THE LUMBAR SPINE

#### Session XIV: Special Poster Session II

07.30 List of special posters and location will be made available.

#### Session XV: ISSLS Prize Papers

Chair: Brisby H. (SE)

Introduction and Award Ceremony

Brisby H. (SE)

#### ISSLS Basic Science Prize

08.55 O564 Lactate in lumbar discs – Metabolic waste or energy biofuel? Insights from in-vivo MRS and

T<sub>2</sub> analysis following exercise and nimodipine in healthy volunteers

Rajasekaran S. (IN)

Discussion

#### ISSLS Clinical Prize

09.15 O565 Comparison of degenerative MRI features of the intervertebral disc between those with and without chronic low back pain. An exploratory study of 2 large female populations using automated annotation

Fairbank J. (GB)

Discussion

#### ISSLS Bioengineering Prize

09.35 O566 Age- and sex-related differences in lumbar intervertebral disc degeneration between patients with chronic low back pain and asymptomatic controls

Fields A. (US)

Discussion

#### Focus Groups Reports

Loz J. (US)

Coffee Break

#### Session XVI: Fellowship Award Ceremony

Chair: Lotz J. (US)

10.00 Introduction of Fellowships  
Announcement ISSLS Willise Lifetime Awards

10.30



### THE INTERNATIONAL SOCIETY FOR THE STUDY OF THE LUMBAR SPINE

#### Session XVII: Epidemiology

Chairs: Kato K. (JP) & Zaina F. (IT)

10.45 O567 Lumbar spinal stenosis is a risk factor for the development of dementia: Locomotive syndrome and health outcomes in the Aizu cohort study (LOHAS)

Kobayashi H. (JP)

10.52 O568 The role of remote working in patients affected by low back pain: A cross-sectional study

Ambrosio L. (IT)

Discussion

11.15 O569 Prevalence of lumbar spondylolisthesis and its association with low back pain, physical activity, and sarcopenia in the general population: The 2nd survey of the ROAD study

Arita S. (JP)

11.22 O570 Muscle strength and trunk muscle mass rather than appendicular skeletal muscle mass might affect spinal sagittal alignment, low back pain, and health-related quality of life

Tanaka Y. (JP)

11.29 O571 Backing down? Lumbar disc herniation surgery for the sad and nervous

Beck P.J.M. (SE)

Discussion

#### Session XVIII: Imaging

Chairs: Rade M. (FI) & Iwabuchi M. (JP)

11.45 O572 A study on the usefulness of MRI new imaging method "FRACTURE" in the diagnosis of lumbar spondylolysis

Hatakeyama K. (JP)

11.52 O573 How does diffuse idiopathic skeletal hyperostosis affect the sagittal spinopelvic alignment in lumbar spinal stenosis patients?

Sun X. (CN)

11.59 O574 Automatic classification of the endplate lesions in MRI images by deep learning model

Bassani T. (IT)

12.06 O575 A machine learning algorithm for automated detection of lumbar disc degeneration on MRI

Nye L. (US)

12.13 O576 Learning a model of lumbar disc degeneration progression from a cross-sectional population cohort

McSweeney T. (FI)

Discussion

12.30 Lunch Break & Industry Workshops



### THE INTERNATIONAL SOCIETY FOR THE STUDY OF THE LUMBAR SPINE

**Symposium: Potential candidates for intervertebral disc repair: Cell-based or cell-free regeneration?**

Chair: Ambrosio L. (IT)

Faculty: Ambrosio L. (IT), Schol J. (JP), Vadalà G. (IT), Neidlinger-Wilke C. (DE)

1.4.00

**Session XIX: Surgery 3 – Predicting outcomes from surgery**

Chairs: Hai Y. (CN) & Lund T. (FI)

**Effect of central sensitization on the surgical outcome of lumbar spinal canal stenosis patients: A multicenter prospective study**  
Akeda K. (JP)

1.4.40

**Effects of the severity of stenosis on clinical outcomes of indirect decompression using oblique lumbar interbody fusion**  
Kang D.H. (KR)

1.4.47

**Is there a correlation between degree of facet degeneration and increase in spinal canal volume after a minimally invasive pre-ppsads interbody fusion? A minimum 2 year follow-up study**  
Anand N. (US)

1.4.54

15.01

**Discussion**  
**Does preoperative sagittal imbalance affect the clinical outcomes in short-segment lumbar interbody fusion?**  
Shimamura Y. (JP)

15.10

**The influence of bone health on the risk of mechanical complications after lumbar spinal fusion for degenerative disease: a systematic review**  
Filley A. (US)

15.17

**Assessing the importance of radiographic and clinical parameters when choosing decompression without fusion for LDS: Results from the CSORN prospective LDS study**  
Rodrigues Fernandes R.J. (CA)

15.24

15.31

**Discussion**



### THE INTERNATIONAL SOCIETY FOR THE STUDY OF THE LUMBAR SPINE

**Session XX: Surgery 4 – Scoliosis surgery**

Chairs: Kanayama M. (JP) & Diwan A. (AU)

**Patients treated by magnetic growing rods for early onset scoliosis reach the expected average growth**  
Oggiano L. (IT)

1.5.40

**Nerve root retraction time during lumbar endoscopic discectomy surgery: Association with post-operative radiculitis**  
Buser Z. (US)

1.5.47

**Adding sacral anchors through an S1 alar screw and multi-rod construct as a strategy for lumbosacral junction augmentation: An In Vitro comparison to S1 pedicle screws alone with sacroiliac fixation**  
Hai Y. (CN)

1.5.54

**Discussion**

1.6.01

**Closing Remarks**  
Chiba K. (JP)

1.6.15