

May 16-20  
2016  
Singapore  
**SpineWeek**

Marina Bay Sands Convention Centre

**Final Program**



**General**



**General**

Floor Plan Venue	2
Welcome by the Participating Societies	4
Program at a Glance	14
Scientific Program	
Monday, May 16	17
Tuesday, May 17	33
Wednesday, May 18	53
Thursday, May 19	75
Friday, May 20	95
Posters	111
ISSLS Special ePosters	112
ISSLS General Posters	117
Africa Spine ePosters	134
AOSPine ePosters	135
APSS ePosters	137
ASSI ePosters	142
CAOS ePosters	144
ISASS ePosters	145
KSSS ePosters	153
NASS ePosters	155
PASS ePosters	157
SMISS ePosters	158
Meetings, Satellite Symposia & Workshops	
Monday, May 16	161
Tuesday, May 17	165
Wednesday, May 18	171
Thursday, May 19	175
Friday, May 20	179
Exhibition	183
Floor plan Exhibition Hall	184
List of Exhibitors (Alphabetical)	185
List of Exhibitors (Stand number)	188
Company Profiles	191
General Information	221
Notes	226

This program book belongs to .....

Email .....

If found, please return to the registration desk on Level 3.

## Welcome by AOSPine - Advancing spine care worldwide

We are very pleased to participate in SpineWeek 2016 in Singapore. As a leading global academic spine society, AOSPine is honored to partner with other major spine societies in this prestigious event. Thanks to its truly global membership, AOSPine will present a program that highlights the most significant advances in clinical spine research, along with findings from our multi-center research groups throughout the world.

The AOSPine Knowledge Forums, comprising of global spine leaders, are gathering prospective data on some of the most interesting and challenging spinal problems, and publishing meaningful clinical research that will advance patient care worldwide. At SpineWeek 2016, AOSPine will present clinical research findings and the most contemporary patient management protocols in the areas of spinal trauma, spinal cord injury, spinal tumors, spinal deformity, and degenerative spinal conditions and biologics.

This AOSPine abstract review process of over 190 submitted abstracts to AOSPine, was completed by 104 reviewers from across the globe.

On behalf of AOSPine, I would like to thank each single reviewer for his time and efforts in going through this review process.

**K. Daniel Riew**  
Chair of the International Board



## Welcome by APSS - Asia Pacific Spine Society

Dear Friends and Colleagues,

The Asia Pacific Spine Society is very grateful to be able to participate and join the other prestigious spine societies in this event for the first time. This meeting will bring the latest update on spine care education, research and innovation. It will also provide us with the opportunity to exchange ideas with various expert faculties from different parts of the world. The Spine Week 2016 will offer a platform for all Asia Pacific spine surgeons to contribute to the advancement of the global spine care by sharing their experience and research especially with regard to the spine problems which are distinctive to this region.

A meeting together with other major societies will encourage social and formal networking with spine surgeons from all over the world.

On behalf of APSS, I would like to thank you for participating in Spine Week 2016.

**Kuniyoshi Abumi**  
Chairman of APSS



## Welcome by ASSI - Association of Spine Surgeons of India

It is our great pleasure to invite you to the SpineWeek 2016 and to the ASSI Sessions. The ASSI is the premier body of spine surgeons in India and has more than 600 life members, both orthopaedic and neurosurgeons spread across the country. The Association has two meetings every year - the Annual meeting and an Instructional course which is usually conducted in association with other major spine societies around the world. In addition, ASSI members form a prominent faculty in instructional courses and symposia all around the country in many regional and state meetings. At the Annual Meeting, the Association grants three national awards: one each in Clinical Science, Basic Science and for the Best Publication.

The SpineWeek offers great opportunities for delegates from many countries and all spine societies to showcase their regional talent and share their high quality academics and research with members of other societies. Apart from the great educational opportunity, there will also be ample opportunities for fellowship, making new friends and strengthening old relationships.

We look forward to seeing you in Singapore.

**Dr. Ram Chaddha**  
President

**Dr. H.S. Chhabra**  
Secretary

**Dr. S. Rajasekaran**  
SpineWeek Co-ordinator



## Welcome by Africa Spine

AfricaSpine was founded on June 2014 by African spine leaders from 12 countries, meeting successfully in Agadir, Morocco. The aim was to create a specialised association for sharing knowledge and experience on Spinal pathologies, which cause big handicaps in the Continent.

This African Spine Society creation appeared as an urgent necessity due to the numerous spine issues, diseases, deformities and infections, etc. ... In addition, another motivation was the frequent spine traumas mainly resulting from the high rate of Road Traffic injuries and the lack of important spine care centres.

It is our honor and privilege to be part of SpineWeek 2016, the most important global spinal meeting, and we are proud to actively contribute to the high quality spine care and research worldwide. Our programme will include Instructional Lectures, Oral and Poster Presentations. We are seeking at participating with very interesting topics on Spine deformities, infections, trauma, tumours and degenerative lesions.

All African Spine Surgeons and SpineWeek attendees are most welcome to join us and support our young and very promising Association.

**Thami Benzakour, MD**  
AfricaSpine President



## Welcome by CAOS - Chinese Association of Orthopedic Surgeons

Dear Members and Friends,

On behalf of Chinese Association of Orthopedic Surgeons (CAOS) we are honored to welcome you to Spine Week 2016 in Singapore.

As the official body of Chinese orthopedics, CAOS provides a whole set of services to Chinese orthopaedic surgeons including speciality entry exam, residency training and CME, sociability of members, events & conferences, humanistic caring & young leadership program.

We are so grateful to join and work with other prestigious spine societies. We believe this meeting will provide us a valuable opportunity to learn the newest outcomes, exchange the up-to-date concepts on spine care education from all Asia Pacific surgeons and over the world.

We are looking forward to seeing you in the beautiful city, Singapore!

**Prof. Yan Wang**  
President of Chinese Association of Orthopedic Surgeons



## Welcome by ESJ - 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 Asia. Not only do we get many manuscript submissions originating from Asia, 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 Singapore. 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 2016.

**Robert Gunzburg, MD, PhD**  
Editor-in-Chief, European Spine Journal



## Welcome by F-Marc - FIFA Medical and Research Centre

The FIFA Medical Assessment and Research Centre (F-MARC) will support and actively participate at the 4th Spine week, by contributing to the interdisciplinary approach in the management of spinal disorders and problems from a football/sports medical perspective. As a central organ of the musculoskeletal system, the spine has been neglected for a long time by football players including their medical staff.

F-MARC has acknowledged these deficiencies based upon large epidemiological studies performed in the mid-nineties and taking the results into consideration, developed and performed the "FIFA 11+" preventative program. The objective of the "FIFA 11+" program is to reduce non-contact injuries but also musculoskeletal symptoms and signs including the spine. An integrated part of the complete warm-up programme are several exercises which are well perceived by the spinal community.

Large prospective randomized studies have presented results justifying the global implementation amongst the football community. Personally for me, it is not only a challenge but a great honour to share my experience of F-MARC, based upon research over the past 20 years in conjunction with leading spine societies to which I have contributed prior to my "football career". No doubt, the partnership of both, the spine and the sporting/football medical group will benefit from each other at such a joint and major event to the advantage of those athletes in our care. The main objective is to promote sport as a health enhancing leisure activity.

**Prof. Jiří Dvořák, MD**  
(Chairman F-MARC / Founding member and former President of the European Spine Society / Member of the International ISSLS / Deputy Editor of Spine / Senior Editor of BJSM)



## Welcome by ICSG - International Consortium for Scoliosis Genetics

Welcome to the 5th meeting of the International Consortium for Scoliosis Genetics.

The International Consortium for Scoliosis Genetics (ICSG) is very pleased to be able to participate in SpineWeek 2016.

The cause of scoliosis continues to be an enigma. ICSG is a unique multidisciplinary group focused on understanding the genetic causes of scoliosis. Our goal is to work together by sharing resources, ideas, and expertise to make new discoveries that would not be achievable through individual efforts. In this way, we will provide answers about the causes of scoliosis and possibilities for new treatments that will benefit patients and their families worldwide. We welcome participation by anybody interested to help unravel this great mystery.

During SpineWeek, ICSG experts will conduct a multidisciplinary instructional course to enhance the understanding of spine care professionals on the aetiology of scoliosis, as well as a scientific symposium on the latest cutting edge research.

**Kenneth M.C. Cheung, MD**  
Co-Chair, International Consortium for Scoliosis Genetics

**Carol Wise, PhD**  
Co-Chair, International Consortium for Scoliosis Genetics





## Welcome by ISASS - The International Society for the Advancement of Spine Surgery

The International Society for the Advancement of Spine Surgery (ISASS) extends to you its inaugural invitation to join the Society at SpineWeek 2016.

In Singapore, our members will be part of a global event, in congruity with our mission to be a global network of professionals advancing the field of spine surgery by means of education and policy relating to the newest techniques and technologies in spine surgery.

With two of the ISASS Board members, Hee Kit Wong, MD, PhD and Marek Szpalski on the steering committee, we look forward to the excellent level of programming.

We look forward to learning from you, teaching you, and fostering further knowledge exchange by our colleagues across the globe.

Together, we can build a better world for spine patients and spine practitioners alike.

**Gunnar Andersson, MD PhD**  
President ISASS



## Welcome by ISSLS - The International Society for the Study of the Lumbar Spine

Dear ISSLS members and guests,

As a rule our annual meeting rotates around the world between Northern America, Europe and Asia. We were in Singapore before, and it is a pleasure to come back to Singapore after all these years. ISSLS is a truly multidisciplinary society, welcoming all those involved in the study of the lumbar spine.

This goes from diagnostics over conservative treatment -including manipulation- to surgery, from biomechanics and psychology, basic science and epidemiology to outcome and health care analyses. Our membership reflects the truly international character of the society with many members being Asian. Of course we hope to attract many clinicians and scientists at our sessions. The highlights of our meeting are the ISSLS Prize Paper presentations and the Presidential and presidential Guest speakers' addresses. We invite all registrants from all societies to join us for these sessions.

The ISSLS annual meetings are more than scientific gatherings, but are also famous for their social program where delegates mingle with accompanying persons and we hope that many will choose to register to SpineWeek via the ISSLS channel, so profiting from this particular aspect of ISSLS. It is my pleasure to invite you all to the ISSLS meeting at SpineWeek 2016 in Singapore.

**James D. Kang**  
ISSLS President 2015-2016



## Welcome by KSSS - Korean Society of Spine Surgery

It is a great honor the Korean Society of Spine Surgery (KSSS) participates in the upcoming 2016 SpineWeek along with other prestigious societies.

The SpineWeek is known to be the one of biggest spine meetings in the world. As a major spine society in Korea, the KSSS is pleased to be able to provide a 1 day comprehensive program.

The KSSS will actively participate in the 2016 SpineWeek in order to help providing an excellent educational and social meeting.

Singapore is a great venue for Asian and international conferences.

**Kyu-Yeol Lee, MD**  
President 2015-2016



## Welcome by NASS - North American Spine Society

Dear Spine Care Professionals,

The North American Spine Society (NASS) welcomes you to participate in SpineWeek 2016 where NASS will present the latest developments in multidisciplinary spine care education, research and innovation.

During this meeting, you will have an opportunity to exchange ideas with expert faculty and attend sessions on timely updates and significant outcomes in the world of spine care. Over the years, NASS has strategically developed and offered pertinent educational programs in partnership with regional spine societies worldwide. These collaborative efforts have allowed NASS to foster superior spine care globally.

NASS is driven by a mission to help spine care providers and patients by fostering the highest quality, evidence-based and ethical spine care. To achieve that mission, NASS is committed to providing the educational programs and professional resources needed to improve spine care practice across various regions of the world. On behalf of NASS, I invite you to contribute to the advancement of the global spine care community through your participation in SpineWeek 2016.

**Christopher M. Bono, MD**  
President 2016



## Welcome by NSpine - Innovative Spine Education

NSpine provides independent multidisciplinary spine healthcare education on the entire range of spinal conditions including topics not covered in depth by the traditional academic societies. The focus in NSpine events is on technical aspects and translation of knowledge into real world clinical applications presented by masters in their field.

NSpine is delighted to be participating at SpineWeek and is proud to host:

Sex and the Spine  
all you ever wanted to know about sex and the spine but were afraid to ask -

The symposium is multidisciplinary in nature and will provide ample time for discussions. The content is of an adult nature - please consider this prior to attending as discussions will be encouraged to be very open.

Learning objectives: Through the "Sex and the Spine" symposium delegates will gain knowledge of:

- o the physiology of male and female sexuality
- o the impact on sexual health by spinal conditions and sexual history
- o current treatment concepts in sexual therapy relevant to spinal disorders

**Broniek Boszczyk**  
Spinal Surgeon & Director NSpine



## Welcome by SBC - Sociedade Brasileira de Coluna

Dear SBC Associates,

The Brazilian Spine Society is honored by the invitation to join SpineWeek 2016 in Singapore. We would like to welcome all spine surgeons colleagues and invite them to attend the event.

This is a great opportunity to show the Brazilian experience in the treatment of diseases affecting the spine along with other representative societies around the world. In the event we can share and openly discuss clinical cases with surgeons of great experience and common sense, perfecting and consolidating knowledge in patient care.

There will be space for the presentation of free themes.

We welcome you at SpineWeek 2016.

**Dr. Mauro dos Santos Volpi**  
Presidente SBC



## Welcome by PASS - Pan Arab Spine Society

The PASS is pleased to participate in the upcoming 2016 International SpineWeek along with other prestigious spine societies from all over the world in its 1st time.

PASS was founded in the year 1999, bringing together all the Arab spine societies and institutes in Spine field. It is a great honor and opportunity to share our knowledge and experience with such great international societies.

The purpose of international Spine week 2016 is to synchronize the annual meetings of leading spine societies in one location. This intense collaboration will certainly guarantee a pleasant and successful meeting of extreme quality.

The various topics of the meeting organized by PASS will be in the area of trauma degenerative spine problems, infection, tumor, deformity, osteoporosis and rehabilitation of spine. The main topics will be covered by a number of eminent guest speakers, free papers section and poster presentations.

It is our great honor to welcome you in the fabulous, extremely beautiful Singapore.

**Abdelfettah Abushaala**  
PASS Secretary General



## Welcome by SILACO - La Sociedad Ibero Latinoamericana de Columna

Dear Colleagues,

The Ibero-Latin American Spine Society (SILACO) is pleased to extend an invitation to join us in SpineWeek 2016 which takes place in the city of Singapore. As in previous occasions, SILACO is participating in the World Congress with the most prestigious World Spine Societies.

As you well know, SILACO is composed by all Latin Americans' Spine Societies and the Iberian Peninsula (Spain and Portugal), joined by their sociocultural roots and with two official languages, Spanish and Portuguese.

In the last SpineWeek - celebrated in Amsterdam - we presented 49 communications and 23 posters, which were being very well attended, even breaking records over previous SpineWeek participations. I hope that this edition will follow the same trend. You are cordially invited to participate in the Singapore SpineWeek 2016.

**Dr. Helton DeÁno**  
Presidente de SILACO en 2016



## Welcome by SMISS - Society for Minimally Invasive Spine Surgery

The Society for Minimally Invasive Spine Surgery (SMISS) is honored to have the opportunity to participate in SpineWeek 2016 in Singapore. We welcome you to join us in our first Global Forum outside of the United States.

SMISS (not to be confused with ISMISS) is a relatively new academic society founded by true minimally invasive spine surgery thought leaders. SMISS is the only society dedicated solely to Minimally Invasive Spine Surgery. The society provides a forum for the exchange of ideas, expertise, and goodwill, where all MIS surgeons will feel welcome and benefit from connecting and engaging.

In Singapore, you will participate in an exciting program that highlights the latest advances in education, research, and technology specifically related to minimally invasive spine surgery treatments while actively engaging with the global community of MIS experts from around the world.

We are eager to share our vision and engage surgeons interested in getting involved in our global SMISS initiatives: Continuous Professional Development, Patient-driven Research, Communities of Practice, and Centers of Excellence. SpineWeek 2016 will be an excellent opportunity for you to meet your peers, colleagues as well as SMISS.

We invite you to get involved in improving the health of patients with spinal disorders by advancing the highest quality of minimally invasive spinal care.

**Greg Anderson, MD**  
Chairperson SMISS International



## Welcome by SOLAS - Society of Lateral Access Surgery

Dear members and friends of SOLAS,

We are honored that the Society of Lateral Access Surgery is included in the list of societies participating in the 2016 Spine Week. With a meeting every four years and a global focus, Spine Week is the "World Cup" of Spine Surgery.

2016 is a significant year for SOLAS as we celebrate 10 years as a society contributing to the advancement of patient care and safer spine surgery. Since 2006, we have over 300 active members across the globe from over 30 countries. It is also our first year as an independent non-profit organization in the Netherlands. Our mission continues to be advancing minimally disruptive lateral access spine surgery techniques through clinical research, peer-to-peer education, and membership initiatives.

The SOLAS meeting at Spine Week is scheduled for the afternoon of Thursday May 19. We understand there is interest from our global membership and we look forward to welcoming any SOLAS members who are planning to attend this "world class" global spine event!

**Frank M. Phillips, MD**  
President, SOLAS

### Download SpineWeek on your mobile phone

and have the most relevant and up-to-date conference information at hand:

- Program
- General and practical information
- Bookmark your favorite sessions
- Abstracts of invited talks & oral presentations
- Info of speakers, chairs & sponsors
- Floor plan
- Twitter feed
- Survey
- ...

The SpineWeek 2016 App will be available in the App Store & Google Play.



## Program at a glance

	Room 1 Heliconia	Room 2 Heliconia	Room 3 Hibiscus	Room 4 Hibiscus	Room 5 Jasmine
<b>Monday</b>	ASSI	F-MARC	PASS	CAOS	AFRICA SPINE
	Break				
	ASSI	NSpine	PASS	CAOS	AFRICA SPINE
	Lunch break + Industry workshops				
	ASSI	NSpine	PASS		AFRICA SPINE
<b>Tuesday</b>	ASSI	KSSS	PASS	ESJ	ISSLS FOCUS GROUP
	Break				
	ASSI	KSSS	PASS	ESJ	ISSLS FOCUS GROUP
	Lunch break + Industry workshops				
	ASSI	ISSLS	PASS	SBC & SILACO	SMISS
<b>Wednesday</b>	APSS	ISSLS	PASS	NASS	ISASS
	Break				
	ASSI & APSS	ISSLS	PASS	NASS	ISASS
	Lunch break + Industry workshops				
	ASSI & APSS	ISSLS	ICSG	AOSPINE	SMISS

## Program at a glance

	Room 1 Heliconia	Room 2 Heliconia	Room 3 Hibiscus	Room 4 Hibiscus	Room 5 Jasmine
<b>Thursday</b>	APSS	ISSLS	ICSG	NASS	SMISS
	Break				
	APSS & SMISS	ISSLS	ICSG	NASS	SMISS & ISASS
	Break + Industry workshops				
	APSS	SOLAS	ISASS & SMISS	AOSPINE	SMISS & ISASS
<b>Friday</b>	APSS	ISSLS	AOSPINE	NASS	
	Break				
	APSS	ISSLS	AOSPINE	NASS	
	Break + Industry workshops				
	APSS	ISSLS	ISASS		

### Abstracts of invited lectures and oral presentations

The abstracts of invited lectures and oral presentations can be consulted via the mobile App or on the SpineWeek website. Registered participants have received a password to access these abstracts.

# Monday, May 16 Scientific Program

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	Room 1 Heliconia	Room 2 Heliconia	Room 3 Hibiscus	Room 4 Hibiscus	Room 5 Jasmine
10.00	ASSI	F-MARC	PASS	CAOS	AFRICA SPINE
	Break				
	ASSI	NSpine	PASS	CAOS	AFRICA SPINE
12.30	Lunch break + Industry workshops				
	ASSI	NSpine	PASS		AFRICA SPINE
16.00	Break				
	ASSI	NSpine	PASS		AFRICA SPINE

## Room 1

### ASSI Association of Spine Surgeons of India

#### Session 1: Trauma

Chairs: Srivastava S. (IN) & Ingalthalikar V.T. (IN)

- 08.00 11 The thoracolumbar AOSpine injury score  
Vialle L. (BR)
- 08.12 12 Role of MISS in thoracolumbar fractures – Is there any advantage?  
Hartl R. (US)
- 08.24 13 Burst fracture without neurodeAcit – Is there role of surgery at all?  
Kekre P. (IN)
- 08.34 14 Neglected cervical facet dislocations – How to go about it  
Mulukutta R. (IN)
- 08.42 Discussion
- ASSI position statement  
Chair: Chhabra H.S. (IN)
- 09.00 Protocol for radiological evaluation in SCI – Working towards a consensus  
Rajasekaran S., Kailash K., Acharya S., Kumar G.R.V., Khujrekar I., Parasnis R. (IN)
- 10.00 Break
- Session 2: Lumbar degenerative  
Chairs: Dalvie S. (IN) & Kekre P. (IN)
- 10.30 15 Lateral approach for lumbar interbody arthrodesis – Indications, techniques and adverse events  
Bains R. (US)
- 10.42 16 Choice of fusion levels in complex lumbar canal stenosis – The importance of sagittal parameters  
Wong C.C. (MY)
- 10.54 17 Current classification systems for spondylolisthesis and treatment recommendations  
Chadda R. (IN)
- 11.06 18 Sacropelvic instrumentations – What has changed in the recent years?  
Lamartina C. (IT)
- 11.18 Discussion
- 11.30 Case Discussions - Sangondimath G., Ray A., Chahal (IN)
- Free papers I:  
Lumbar degenerative/minimally invasive spine surgery  
Chairs: Dalvie S. (IN) & Ingalthalikar V.T. (IN)

- 12.00 O1 Comparative study of various minimally invasive lumbar discectomy procedures and open discectomy based on clinical outcome, muscle injury markers and postoperative imaging changes  
Venkata Ramesh C.V., Chandramowliswara P.B., Ravi K., Lakshmi A.Y., Venkataramana B. (IN)

## Room 1

### ASSI Association of Spine Surgeons of India

- 12.04 O2 Minimally Invasive lumbar TLIF surgeries without use of dedicated percutaneous implant system – A feasibility study  
Sree Harsha C.K., Venkata Ramakrishna T. (IN)
- 12.08 O3 Osteotomy of the spinous process to approach spinal canal  
Rajamani A.A., Pritam A.R. (IN)
- 12.12 O4 Reduction of high grade spondylolisthesis: A technique by posterior only approach using monosegmental, non-reduction polyaxial pedicle screw instrumentation  
Upendra B.N., Sekharappa V., Mahesh B.H., Arun K. (IN)
- 12.16 O5 Endoscopic lumbar discectomy - A simplified approach  
Dey P.C. (IN)
- 12.20 Discussion
- 12.30 Lunch break + Industry workshops
- Session 3: Tumor/Research  
Chairs: Basu S. (IN) & Mulukutta R.D. (IN)
- 14.00 19 Management algorithm for the metastatic spine – When should surgery be avoided  
Kumar N. (SG)
- 14.08 110 Spinal tumors in children – Presentation, evaluation and treatment  
Chatterjee S. (IN)
- 14.16 111 Vertebral hamangiomatous lesions – Evaluation and guidelines of management  
Kanna R. (IN)
- 14.24 Discussion
- 14.32 112 Most cited papers from India  
Garg B. (IN)
- 14.38 113 International Research Awards won by Indians  
Upendra B.N. (IN)
- 14.44 114 How to build up a database for spinal research  
Agarwal D. (IN)
- 14.50 Discussion

# ASSI Association of Spine Surgeons of India

## Free papers II: Miscellaneous

- 15.00 O6 Are we ready for transfusing intraoperative salvaged blood in metastatic spine tumour surgery  
Kumar N., Zaw A.S., Ahmed Q., Lee V., Kumar A., Wong H.K. (SG)
- 15.04 O7 Cageplasty: A novel technique for the trans-pedicular reconstruction of central body lesions  
Shethna S.P., Agnivesh T., Dalvie S.S., Saini P., Shah Y. (IN)
- 15.08 O8 Do thoracolumbar fractures warrant more than Axation  
Kumar A., Satish K., Sachin K., Selvamari M. (IN)
- 15.12 O9 Vacuum Assisted Closure (V.A.C.) in postoperative infections after instrumented spine surgery  
Padalkar P. (IN)
- 15.16 O10 Challenges in comprehensive management of SCI in India & Asia: Findings of a survey of experts, patients and consumers  
Verma S., Chhabra H.S. (IN)
- 15.20 Discussion
- Free papers III: Complications in spine surgery
- 15.30 O11 A case report of rod migration into cerebellum through foramen magnum after lateral mass Axation of cervical spine  
Sharma A., Belsare K. (IN)
- 15.34 O12 Complications of transforaminal lumbar interbody fusion (TLIF)  
Kundnani V., Patil S.N., Gujrathi G., Ruparel S. (IN)
- 15.38 O13 Perforations and angulations of 324 cervical medial cortical pedicle screws: A possible guide to avoid lateral perforations with use of pedicle screws in lower cervical spine  
Upendra B., Bijawara M., Sekharappa V., Kumar A.G.C. (IN)
- 15.42 O14 Comparison of incidence of adjacent segment pathology between single level posterolateral & interbody fusion group of patients  
Mehata H., Bhojraj S., Chaddha R., Nene A., Nagad P., Patel P., Kashikar A., Akbary K., Kumar N. (IN)
- 15.46 O15 Lumbar fusion in elderly with comorbidities, is it safe?  
Upendra B.N., Sekharappa V., Bijawara M., Kumar A. (IN)
- 15.50 Discussion
- 16.00 Break



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# ASSI Association of Spine Surgeons of India

## Session 4: Cervical spine

- Chairs: Volefi S.P. (IN) & Acharya S. (IN)
- 16.30 I15 Congenital AAI and basilar invagination – Related embryology, evaluation and current treatment protocols  
Srivastava S. (IN)
- 16.38 I16 CS palsies after cervical decompressions – Incidence, pathogenesis, prognosis and tips of prevention  
Acharya S. (IN)
- 16.46 I17 Access related complications of anterior cervical surgery  
Babu N. (IN)
- 16.54 I18 Choice of surgery in OPLL – How to deal with the surgical complications?  
Kawaguchi Y. (JP)
- 17.06 Discussion
- Debate
- 17.15 Free hand pedicle screws in the cervical spine is absolutely safe – For and against  
Bijawara M. (IN) & Kumar V. (IN)
- Free papers IV: Cervical spine
- 17.30 O16 Predictors/ Risk factors of poor outcome following an anterior cervical discectomy and fusion - A study of 498 patients  
Sethi G., McLaughlin S.I., Rajat V., Naveed Y., Saeed M., Irfan S. (IN & UK)
- 17.34 O17 Identification and validation of self-screening tests for endemic cervical myelopathy  
Naresh-Babu J., Neelima G., Priyadarshini A., Shabnam A., Anil-Babu P. (IN)
- 17.38 O18 Transforaminal approach in the cervical spine along with use of cervical pedicle screws – Is it safe?  
Upendra B., Bijawara M., Sekharappa V., Kumar A.G.C. (IN)
- 17.42 O19 Is lordosis mandatory for planning a posterior decompressive laminectomy in multilevel cervical spondylotic myelopathy? Evaluation of results with respect to cord shift, postoperative kyphosis and neurological recovery – Minimum 5 yr follow-up  
Kashikar A.K., Patel P.M., Bhojraj S.Y., Nagad P., Kumar N., Akbary K., Prasad G., Hrushikesh M., Jain A. (IN)
- 17.46 O20 Evaluation of spinal cord compression on T2-weighted sequences in patients with cervical spondylotic myelopathy using Axion-extension MRI  
Phadke K., Moolya S., Chhabra H.S. (IN)
- 17.50 Discussion



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# ASSI Association of Spine Surgeons of India

## Free papers V: Cervical spine

- 18.00 O21 Fusion subsidence and alignment in cervical stand alone cage up to 3 levels  
Shethna S., Dalvie S., Kothari M.K., Tikoo A., Saini P., Shah Y. (IN)
- 18.04 O22 Accuracy of a dynamic surgical guidance probe for screw insertion in the cervical spine: A cadaveric study  
Weismann K., Dixon D., Darden B., Casamitjana J., Powell D., Baluch D. (USA & CL)
- 18.08 O23 Transarticular Axation in paediatric population (< 8 yrs) – A new challenge!!  
Kundnani V., Patil S.N., Gujrathi G., Ruparel S. (IN)
- 18.12 O24 Socio-economic impact of cervical spinal cord injury operated in patients with lower income group  
Goel S.A., Modi H., Dave B., Patel P. (IN)
- 18.16 O25 Algorithms for the effective management of various sub-axial cervical fracture types: Experts clinical consensus  
Yelamthy P.K.K., Chhabra H.S., Raghavendra V. (IN)
- 18.20 Discussion



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# FIFA Medical and Research Centre

## Symposium: Spine & Football

- Chairs: Dvorak J. (CH) & Mayer M. (DE)
- 08.00 I19 Medicine & science within football / FIFA  
Dvorak J. (CH)
- 08.10 I20 Epidemiology of head, neck and trunk injuries in FIFA competitions  
Junge A. (DE)
- 08.25 I21 On pitch management of head and neck injuries (Incl. concussion)  
Feddemann N. (DE), Dvorak J. (CH)
- 08.40 I22 Epidemiology of back pain in youth soccer players and risk assessment for back pain in soccer  
Schneider Ch., Mayer M., Dvorak J. (DE & CH)
- 08.55 I23 The prevalence of back pain in retired professional footballers compared with the general UK male population  
Fernandes G.S., Parekh S.M., Fuller C.W., Batt M.E., Zhang W., Doherty M. (UK)
- 09.10 I24 Disc herniations in professional football players  
Mayer M. (DE)
- 09.20 I25 Spondylolysis – The hidden pathology in youth football players  
Mayer M. (DE)
- 09.30 I26 Concept and background of FIFA 11+ prevention programme, RCT's on male, female and children population  
Bizzini M. (CH), Dvorak J. (CH)
- 09.45 I27 Evaluation of the effect of the "FIFA 11+" training programme on isometric force and functional balance of the trunk  
Schneider Ch., Mayer M. (DE)
- 10.00 Break



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## NSpine

### Symposium: Sex and the spine

All you ever wanted to know about sex and the spine but were afraid to ask

#### Session 1

Chair: Boszczyk B. (UK)

- 10.00 Welcome and introduction to sexual health  
Boszczyk B. (UK) & Lee M. (SG)
- 10.20 **I28** History taking using validated sexual health assessment forms in clinical practice  
Dunstan E. (UK)
- 10.40 **I29** Cultural barriers to sexual history taking  
Ismael M. (IT)
- 11.00 **I30** Sexual health in adolescents with idiopathic scoliosis  
Soh R. (SG)
- 11.20 **I31** Body image and sexual health  
Lee M. (SG)
- 11.40 **I32** Surgical scars matter – The impact on body image and sexual health in women  
Hernandez-Sanchez I. (UK) & Czyz M. (UK)
- 12.00 Panel discussion
- 12.30 Lunch break + Industry workshops

#### Session 2

Chair: Dunstan E. (UK)

- 14.00 **I33** Sexual dysfunction and low back pain – An underdiagnosed problem?  
Dunstan E. (UK)
- 14.20 **I34** Spinal biomechanics of sex  
Ismael M. (IT)
- 14.40 **I35** Returning to sexual activity following spinal surgery  
Dunstan E. (UK)
- 15.00 **I36** Positional aids and techniques to minimise spinal impact during sexual activity  
Lee M. (SG)
- 15.20 Panel discussion
- 15.40 Break



## Pan Arab Spine Society

### Session 1: Degenerative lumbar

Chairs: Abushaala A. (LY) & Salah H. (EG)

- 08.00 **I43** Lecture: MIS lumbar spine  
Alves O. (PT)
- 08.15 **O26** Free papers  
Mini open lumbar discectomy, long term follow up  
Benzakour T., Benzakour A. (MA)
- 08.23 **O27** Instrumented reduction and TLIF for adult grade four isthmic spondylolisthesis  
Salah H. (EG)
- 08.31 **O28** 6 Years results with interlaminar disc assistance implant "IntraSPINE"  
Guizzardi G. (IT)
- 08.39 Discussion
- 08.50 Debate: Low grade spondylolisthesis – Interbody fusion needed?  
Always... - Alves O. (PT)
- 09.00 Sometimes... - Salah H. (EG)
- Case scenarios  
Abushaala A. (LY)
- 09.10 Presentation of 2 cases
- 09.40 Break
- Session 2: Tumors  
Chairs: Batterjee K. (SA) & Elzoubi Z. (JO)
- 10.30 **I44** Lecture: En-bloc vertebrectomy – When & how  
Salah H. (EG)
- 10.45 **O29** Free papers  
Complete intra-lesional resection for aneurysmal bone cyst of the spine - A personal experience of 15 consecutive patients  
Salah H. (EG)
- 10.53 **O30** Metastatic spinal tumors - Surgical strategy  
Brodzinsky Z. (AE)
- 11.01 Discussion
- 11.10 Debate: Thoracolumbar metastases: Corpectomy?  
Commonly needed - Emran I. (EG)
- 11.20 Rarely needed - Salah H. (EG)



## NSpine

### Session 3

Chair: Tsegaye M. (UK)

- 16.00 **I37** Physiology of female and male sexuality  
Lee M. (SG)
- 16.20 **I38** Understanding anterior spinal surgery hypogastric plexus lesions in men and women  
Boszczyk B. (UK)
- 16.40 **I39** Survey results on female sexual disorders arising from anterior spinal surgery  
Hernandez-Sanchez I. (UK) & Czyz M. (UK)
- 17.00 **I40** Cauda equina syndrome and sexual health  
Tsegaye M. (UK)
- 17.20 **I41** Treatment options in men with sexual dysfunction arising from neural injury  
Tan R. (SG)
- 17.40 **I42** Treatment concepts and techniques in sexual therapy  
Lee M. (SG)
- 18.00 Panel discussion
- 18.20 Close



## Pan Arab Spine Society

### Case scenarios

Salah H. (EG)

- 11.30 Presentation of 2 cases
- 12.00 Lunch break + Industry workshops
- Session 3: Spinal infections  
Chairs: Kharat K. (LB) & Salah H. (EG)
- 14.00 **I45** Lecture: Spinal TB management challenges – Past to present  
Salah H. (EG)
- 14.15 **O31** Free paper  
Management of postoperative spine wound infections using vacuum assisted closure (VAC) therapy  
Lee R.S., Street J., Boyd M.C., Kwon B., Dvorak M., Fisher C., Paquette S. (UK & CA)
- 14.23 Discussion
- 14.30 Debate: Surgery for thoracolumbar spinal TB: Anterior vs posterior surgery  
Anterior surgery - Alzobi Z. (JO)
- 14.40 Posterior surgery - Elsebae H. (EG)
- 14.50 Combined anterior & posterior surgery - Batterjee K. (SA)
- Case scenarios  
Emran I. (EG)
- 15.00 Presentation of 2 cases
- 15.30 Break
- Session 4: Complications  
Chairs: Alves O. (PT) & Elsebae H. (EG)
- 16.30 Debate: Local vancomycin for infection prevention  
For - Batterjee K. (SA)
- 16.40 Against - Lee R. (UK)
- My worst case  
Salah H. (EG)
- 16.50 Presentation of 2 cases
- 17.30 Wrap up & Adjourn





## Chinese Association of Orthopedic Surgeons

- 08.00 Welcoming address & introduction of CAOS  
Liang Y. (CN)
- Session 1**  
Chairs: Rong L. (CN) & Zhao J. (CN)
- 08.10 **I46** The fate of L5/S1 disc after long fusion to L5 in degenerative scoliosis  
Hai Y. (CN)
- 08.22 **I47** Minimally invasive correction of degenerative deformity: Preliminary EOS study  
Liang Y. (CN)
- 08.34 **I48** Selective thoracic fusion for scoliosis with Chiari malformation and syringomyelia: 2-11 Years follow-up  
Yu K. (CN)
- 08.46 **I49** Adult scoliosis patients with pre-operative frontal imbalance: Options for surgical management  
Liu Z. (CN)
- 08.58 **I50** Posterior unilateral pedicle subtraction osteotomy of hemivertebra and short segment fusion for correction of the adolescent/adult congenital spinal surgery  
Li X. (CN)
- 09.10 Discussion
- 09.20 **Break**
- Session 2**  
Chairs: Hai Y. (CN) & Wang H. (CN)
- 09.30 **I51** The anatomical studies of bony structures atlas and options for the internal fixation  
Wang H. (CN)
- 09.42 **I52** Measurement of lumbar intervertebral space height in normal adults and definition of high lumbar intervertebral space  
Zhao J. (CN)
- 09.54 **I53** Postoperative contralateral radiculopathy following MIS-TLIF  
Rong L. (CN)
- 10.06 **I54** Disc herniation resorption after cervical laminoplasty  
Wu W. (CN)
- 10.18 **I55** Percutaneous anterior odontoid screw fixation: Technique and long-term results in 122 patients  
Wang X.Y., Chi Y.L., Xu H.Z., Lin Y. (CN)
- 10.30 Discussion



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## Africa Spine

- 08.30 Introduction of the AfricaSpine sessions  
Benzakour T. (MA), Otsyeno F. (KE), Moumouni A.E.K. (TG), N'dri Oka D. (CI), Hamidani M. (DZ)
- Welcome presentation  
Benzakour T. (MA)
- Session 1: Trauma**  
Chairs: Benzakour T. (MA), Moumouni A.E.K. (TG) & Elnoamany H. (EG)
- 08.45 **O36** Treatment of odontoid fractures by anterior odontoid screw fixation  
Salah H., Bhawary Y. (EG)
- 09.00 **O37** Thoracolumbar fractures, posterior fixation  
Benzakour T., Benzakour A. (MA)
- 09.15 **O38** Percutaneous stabilization of thoracic and lumbar spine fractures  
Salah H., Bhawary Y. (EG)
- 09.30 Panel discussion
- 09.45 **Break**
- Session 2: Degenerative & deformity**  
Chairs: Abushaala A. (LY), Guizzardi G. (IT) & Sharma A. (IN)
- 10.15 **O39** Management of early aggressive scoliosis  
Alzoubi Z.M. (JO)
- 10.30 **O40** Study of functional outcome of anterior cervical decompression and fusion using tricortical iliac bone graft for degenerative cervical spondylotic myelopathy with modified Japanese orthopedic association score  
Sharma A., Singh V. (IN)
- 10.45 **O41** Interspinous vs new interlaminar device in the lumbar DDD  
Guizzardi G. (IT)
- 11.00 Panel discussion



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## Chinese Association of Orthopedic Surgeons

- Session 3: Free papers**  
Chairs: Hai Y. (CN) & Wang H. (CN)
- 10.40 **O32** Unilateral posterior vertebral column resection for severe thoracolumbar kyphotic deformity caused by old compressive vertebrae fracture  
Wang H., Ding W.Y. (CN)
- 10.52 **O33** Unplanned reoperation of lumbar spinal surgery during the primary admission: A multicenter study based on a large patient population  
Huang S.H., Liu Z.L., Liu J.M., Deng H.L. (CN)
- 11.04 **O34** Biomechanical study of using translaminar facet screw coupled with unilateral pedicle screw in transforaminal lumbar interbody fusion  
Zhang W., Mo J.Q., Luo Z.P. (CN)
- 11.16 **O35** The therapeutic strategy for degenerative deformity: Is correction necessary?  
Liu B., Han W., Wang L., Cui W., Kang W. (CN)
- 11.28 Discussion
- 11.45 Closing remarks  
Liang Y. (CN)
- 12.30 **Lunch break + Industry workshops**



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## Africa Spine

- Session 3: Spinal tumors**  
Chairs: N'dri Oka D. (CI) & Naresh-Babu J. (IN)
- 11.15 **O42** Solitary plasmacytoma of the spine: Piecemeal excision followed by radiotherapy  
Abdel-Wanis M.E. (EG)
- 11.30 **O43** En-block sacrectomy by combined anterior and posterior approach for sacral chordoma  
Bhani M., Naresh-Babu J., Anil-Babu P. (IN)
- 11.45 Panel discussion
- Session 4: Keynote invited speaker lecture**  
Chairs: Benzakour T. (MA) & Otsyeno F. (KE)
- 12.00 **I56** Spinal tuberculosis in Africa, the third killer  
Salah H. (EG)
- 12.30 **Lunch break + Industry workshops**
- Session 5: Spinal infections**  
Chairs: Otsyeno F. (KE) & Vishnu Prasad C.S. (IN)
- 14.00 **O44** Implant infections: Comparison between the use of stainless steel and titanium spinal implants  
Otsyeno F., Mwangi G.P. (KE)
- 14.15 **O45** Single stage posterior only approach in surgical treatment of spinal tuberculosis  
Vishnu Prasad C.S. (IN)
- 14.30 **O46** Combined anterior and posterior versus all posterior approach for surgical treatment of thoracolumbar tuberculosis: An analysis of our outcomes  
Otsyeno F., Mwangi P. (KE)
- 14.45 Panel discussion
- 15.00 **Break**



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**Africa Spine**

**Session 6: Symposium on "spinal metastases": Diagnosis & treatment**  
 Chairs: Hamidani M. (DZ), Abdel-Wanis M.E. (EG) & Alzoubi Z.M. (JO)

- 15.30 Introduction and fundamental issues  
Benzakour T. (MA)
- 15.35 157 Clinical diagnosis and imaging  
Otsyeno F. (KE)
- 15.50 158 Treatment of spinal metastases: Chemotherapy and radiotherapy / Posterior and anterior surgical approaches  
Abdel-Wanis M.E. (EG)
- 16.10 159 Surgical cementoplasty on metastasis management / Vertebroplasty kyphoplasty  
N'dri Oka D. (CI)
- 16.20 047 Percutaneous selective vertebroplasty: State-of-the-art management in well contained metastatic vertebral lesions  
Bnoamany H. (EG)
- 16.35 048 Results of treatment / Prognosis and indications  
Hamidani M. (DZ)
- 16.55 Conclusions  
Benzakour T. (MA)
- 17.00 Panel discussion
- 17.15 Adjourn of the AfricaSpine sessions  
Benzakour T. (MA), Otsyeno F. (KE), N'dri Oka D. (CI), Mounouni A.E.K. (TG), Hamidani M. (DZ)

Tuesday, May 17  
 ScientiAc Program

	Room 1 Heliconia	Room 2 Heliconia	Room 3 Hibiscus	Room 4 Hibiscus	Room 5 Jasmine
	ASSI	KSSS	PASS	ESJ	ISSLS FOCUS GROUP
10.00	Break				
	ASSI	KSSS	PASS	ESJ	ISSLS FOCUS GROUP
12.30	Lunch break + Industry workshops				
	ASSI	ISSLS	PASS	SBC & SILACO	SMISS
16.00	Break				
	ASSI	ISSLS	PASS	SBC & SILACO	SMISS

**ASSI Association of Spine Surgeons of India**

**Session 1: ASSI Award presentations**  
 Chairs: Chaddha R. (IN) & Chhabra H.S. (IN)

- 08.00 160 ASSI - Publication Award - Best Paper: Genetic susceptibility of lumbar degenerative disc disease in young Indian adults  
Rajasekaran S. (IN)
- 08.10 161 ASSI - Clinical Research Award: Validation of simplified sub axial cervical and thoraco lumbar spine fracture classification systems  
Chhabra H.S. (IN)
- 08.20 162 ASSI - Basic Science Research Award: Role of human umbilical cord blood stem cells and neural stem cells in neuronal regeneration and functional restoration: A comparative study in male adult rats with acute spinal cord injuries  
Sinha S. (IN)
- 08.30 163 ASSI - Young Investigators Award: Analysis of spinopelvic parameters with L5 is the new sacrum after fusion in high grade spondylolisthesis - An explanation of satisfactory results with in-situ fusion  
Aiyer S.N. (IN)
- 08.40 164 IASA/ASSI - Research Award: Correlation of Diffusion Tensor Imaging (DTI) tractography with neurological status in patients with dorsal spine tuberculosis with neurodeficit and its role in predicting postoperative neurological recovery  
Kumar K. (IN)
- 08.50 ASSI Presidential Oration: Introduction  
Chadda R. (IN)
- 08.55 165 ASSI Presidential Oration: Spine surgery in the next decade - Challenges and solutions  
Rajasekaran S. (IN)
- VII Gold Medal Papers**
- 09.10 049 How does the sagittal profile change with lumbar surgical decompression without fusion? A preliminary report of an ongoing prospective study  
Pithwa Y.K. (IN)
- 09.18 050 Analysis of sagittal alignment of spinal column at the apex during VCR in rigid post tubercular kyphosis  
Sivastava S.K., Aggarwal R.A. (IN)
- 09.26 051 Single stage reduction and stabilization of subaxial cervical facet dislocations by posterior only approach using pedicle screws  
Upendra B.N., Sekharappa V., Bijawara M., Upendra B., Kumar A. (IN)
- 09.34 052 Prediction of posterior ligamentous complex injury in thoraco-lumbar fractures using non-MRI imaging techniques  
Aiyer S.N., Maheswaran A., Kanna R.M., Shetty A.P., Rajasekaran S. (IN)
- 09.42 053 Computed tomography based study on feasibility of C1 posterior arch screw fixation  
Gururaj G., Chhabra H.S. (IN)
- 09.50 054 Is healing on MRI mandatory for discontinuing ATT in tuberculosis of spine?  
Murugan Y., Krishnan V., Amritanand R. (IN)
- 10.00 Break

**ASSI Association of Spine Surgeons of India**

**Session 2: Choice of surgery**  
 Chairs: Kumar V. (IN) & Nene A. (IN)

- 10.30 166 EOS - Rib to spine vs spine to spine constructs  
Voleti S.P. (IN)
- 10.38 167 Cervical disc prolapse with radiculopathy - ACDF vs TDR  
Kulkarni A. (IN)
- 10.46 168 Monosegmental vs polysegmental fusion in high grade spondylolisthesis  
Amritanand R. (IN)
- 10.54 169 Vertebroplasty vs kyphoplasty  
Dalvie S. (IN)
- 11.02 170 Fixed AAD with BI - Post alone vs ant + post surgery  
Bapat M. (IN)
- 11.10 Discussion
- 11.30 171 **How I do it - Videos**  
C1/C2 fusion, VATS for thoracic TB, Transpedicular discectomy for DL junction disc prolapse, arthro-endoscopic decompression in degenerative LCS  
Kundnani V., Singh R., Bhattoo H.S., Kaushal M. (IN)
- Free papers VI: Spinal deformity/osteoporosis**
- 12.00 055 Management of severe and rigid scoliosis by less invasive release and osteotomies  
Jhala A.C., Mistry M., Patel D.K. (IN)
- 12.04 056 Development of database for scoliosis patients: Early results from a tertiary care spinal deformity centre  
Kandwal P., Vijayaraghavan G., Ragu Kuma S.N., Jayaswal A. (IN)
- 12.08 057 Operative treatment of plasmacytoma, multiple myeloma - An experience of 27 patients  
Kashikar A.K., Bhojraj S.Y., Mohite S., Nagad P., Patel P., Kumar N., Akbary K., Mehata H.
- 12.12 058 Analysis of cement leakage in 140 consecutive patients of Percutaneous Vertebroplasty (VTP) for osteoporotic Vertebral Compression Fractures (VCF) by a single surgeon in a single centre - Does surgeon experience play a role?  
Suri T., Basu S., Ahmed R., Kondeti S.K.C., Biswas A., Kesharwani S. (IN)
- 12.16 059 Use of sublaminar wires and spinal loop rectangle in the management of osteoporotic vertebral fractures with neurological deficit or instability  
Kashikar A.K., Kumar N., Patel P.M., Bhojraj S.Y., Nagad P., Akbary K., Prasad G., Hrushikesh M. (IN)
- 12.20 Discussion
- 12.30 Lunch break + Industry workshops

Monday  
 Tuesday  
 Wednesday  
 Thursday  
 Friday  
 Posters  
 Workshops  
 Monday  
 Tuesday  
 Wednesday  
 Thursday  
 Friday  
 Posters  
 Meetings

## Session 3: Adult deformity

Chairs: Jayaswal A. (IN) &amp; Ahmed A. (IN)

- 14.00 172 MIS options in adult spinal deformity - Magic or gimmick  
Mehta J. (IN)
- 14.12 173 Chin on chest deformity revisited  
Abumi K. (JP)
- 14.24 174 Sagittal and sacropelvic parameters in adult spinal deformity - Do they have any clinical relevance?  
Lamartina C. (IT)
- 14.36 175 Osteotomies in the spine, classification, usage, techniques and complications  
Berjano P. (IT)
- 15.00 Case Discussion - Nanda A., Suri T., Srinivasan P. (IN)

## Free papers VII: Spinal deformity

- 15.30 O60 Comparison of thoracoscopic assisted anterior instrumentation with posterior all hooks / hybrid and all pedicle screw instrumentation for treatment of adolescent idiopathic scoliosis: Surgical & radiological outcome with minimum 5-year follow-up  
Kandwal P., Ruiz J.N.M., Lu G., Liang Z.C., Wong H.K. (IN & SG)
- 15.34 O61 Outcome of selective lumbar fusion and anterior instrumentation in lumbar scoliosis  
Kandwal P., Vijayaraghavan G., Ankur Goswami A., Jayswal A. (IN)
- 15.38 O62 Correlation of scoliosis curve correction with implant density in 36 cases of adolescent idiopathic scoliosis  
Jhala A.C., Mistry M., Patel D.K. (IN)
- 15.42 O63 Use of three column osteotomies in severe, rigid kyphotic spinal deformities  
Garg B. (IN)
- 15.46 O64 Prevention of PJK and PJF - Biomechanics research  
Basankin I.V., Takhmazyan K.K., Afaunov A.A., Shapovalov V.K., Malakhov S.B., Ponkina O.N. (RU)
- 15.50 Discussion
- 16.00 Break

## Session 4: Pediatric deformity

Chairs: Kailash K. (IN) &amp; Jhala A. (IN)

- 16.30 176 Physiology of growth of the spine and thorax - Its correlation of the management of paediatric deformities  
Basu S. (IN)
- 16.40 177 Lenke 5 C curves - Ant vs post surgery  
Wong H.K. (SG)
- 16.52 178 How does the Lenke Classification provide a template for selective thoracic / lumbar fusion  
Luk K. (HK)
- 17.04 179 Complications of growing rods - Has the Magec Rod overcome all of it?  
Cheung K. (HK)
- 17.16 Discussion
- 17.40 GB meeting

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## Free paper session 1:

Cervical spine I - Diagnosis &amp; radiographic evaluation

Chairs: Park H.J. (KR) &amp; Park J.B. (KR)

- 07.30 O65 Inter- and intraobserver reliability between 3 types classification system of cervical spinal stenosis  
Ko S., Kim M., An J. (KR)
- 07.35 O66 What is the most accurate radiographic anterior cervical fusion criteria?  
Song K. (KR)
- 07.40 O67 Radiographic dimensional analysis of open door laminoplasty with pre-contoured plate in cervical spondylotic myelopathy  
Min W.K. (KR)
- 07.45 O68 Efficacy and safety of drain after anterior cervical discectomy and fusion in degenerative cervical spinal diseases  
Ko J.H., Kwon T.Y., Song K.J. (KR)
- 07.50 Discussion
- Free paper session 2: Cervical spine II - Surgical technique  
Chairs: Suk K.S. (KR) & Yeom J.S. (KR)
- 08.00 O69 Distraction arthrodesis of the atlantoaxial facet joint with preservation of the C2 root for the management of intractable occipital neuralgia caused by C2 root compression  
Oh S.C., Kang S.S., Rew K.D., Yi J., Lee G.W., Yeom A., Li Q.Y., Han H.S., Ahn H., Chang B., Lee C., Kim H., Yeom J.S. (KR)
- 08.05 O70 Reoperation rates after anterior cervical discectomy and fusion for cervical spondylotic radiculopathy and myelopathy: A national population-based study  
Park M.S., Ju Y.S., Moon S.H., Kim T.H., Oh J.K., Makhni M.C., Rew K.D. (KR & US)
- 08.10 O71 540° cervical realignment procedure for extensive cervical OPLL with kyphotic deformity  
Lee S.H., Kim K.T., Kang K.C., Lee J.H., Hwang S.P., Jang S.J., Lee W.G. A.B. (KR)
- 08.15 O72 Can we prevent a postoperative spinal epidural hematoma by using larger diameter suction drains?  
Ahn D.K., Chang B.K., Lee J.I. (KR)
- 08.20 Discussion

## Free paper session 3: Lumbar spine I

Chairs: Shin B.J. (KR) &amp; Chang B.S. (KR)

- 08.30 O73 Preemptive multimodal analgesia for postoperative pain management after lumbar fusion surgery: A randomized controlled trial  
Oh I.S., Kim S.I., Kim Y.H., Ha K.Y. (KR)
- 08.34 O74 Efficacy and safety of demineralized bone matrix for lumbar posterolateral fusion  
Ahn J.S., Lee H.J., Park E., Shin B., Song K.S. (KR)
- 08.38 O75 An in-vivo animal model of paraspinal muscle weakness induced by botulinum toxin for a study of disc degeneration  
Han S.K., Kim Y., Lee S.R., Chang K.T., Chun K. (KR)

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- 08.42 O76 Efficacy of ankle brachial index in determining peripheral arterial occlusive disease in patients with lumbar spinal stenosis  
Park S.Y., Suh S.W., Hong J.Y., Lee H.M. (KR)
- 08.46 O77 Hand grip strength correlates with surgical outcome in female patients with lumbar spinal stenosis  
Kim T.H., Yang J.H., Moon S.H., Ki C.H., Hong S.H., Suk K.S., Kim H.S., Lee H.M., Kang Y.M., Kim J.H., Choi H.J. (KR)
- 08.50 Discussion

## Free paper session 4: Lumbar spine II

Chairs: Lee H.M. (KR) &amp; Jeon C.H. (KR)

- 09.00 O78 Analysis of risk factors for early adjacent segment disease underwent revision surgery within 5 years after lumbar spinal fusion  
Soh J., Kim H., Lee J.C., Shin B.J. (KR)
- 09.04 O79 Relation between adjacent superior segmental disease and facet joint violations after lumbar fusion  
Kim M.W., Lee K.Y. (KR)
- 09.08 O80 Comparison of posterior lumbar interbody fusion and posterolateral lumbar fusion in monosegmental vacuum phenomenon within an intervertebral disc  
Baik J.M., An K.C., Park D.H., Kim J.G. (KR)
- 09.12 O81 Infection following percutaneous vertebral augmentation with polymethylmethacrylate  
Lee H.J., Chang B.S., Park S.M., Park J.W., Kwon Y.E., Kim H., Lee C.K. (KR)
- 09.16 Discussion

## Free paper session 5: Pediatric spinal deformity

Chairs: Cho K.J. (KR) &amp; Kim H.S. (KR)

- 09.30 O82 Comparative analysis of shoulder balance by different surgical methods in the treatment of double thoracic AIS  
Chang D.G., Kim J.H., Na K.H., Lee J.H., Lim D.J., Suk S.I. (KR)
- 09.34 O83 Is it enough to stop distal fusion at L3 in adolescent idiopathic scoliosis with major thoraco lumbar/lumbar curves?  
Lee C.S., Ha J.K., Hwang C.J., Lee D.H., Cho J.H. (KR)
- 09.38 O84 Clinical and radiological changes observed during long-term follow-up of pediatric scoliosis patients treated with growing rod technique  
Kim H.S., Suk K.S., Jin S.Y., Park S.J., Lee H.M., Moon S.H., Ahn K.C., Shin D.E. (KR)
- 09.42 O85 Indigenous growing rod technique for early onset scoliosis: Radiological outcome and technical considerations  
Nares-Babu J., Cheekatla S., Anil-Babu P., Bihani M. (IN)

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- 09.46 O86 Adolescent idiopathic scoliosis surgery using minimal invasive surgery technique: A case series study  
Suh S.W., Yang J.H., Chang D.G., Kim S.H., Ham C.H. (KR)
- 09.50 Discussion
- 10.00 Break
- Free paper session 6: Adult spinal deformity  
Chairs: Kee-Yong Ha K.Y. (KR) & Lee C.S. (KR)
- 10.30 O87 Jack-knife posture after correction surgery for degenerative sagittal imbalance - Is it always caused by spinopelvic malalignment?  
Kim S.I., Ha K.Y., Kim Y.H. (KR)
- 10.34 O88 Different risk factors of proximal junctional kyphosis (PJK) and proximal junctional failure (PJF) following long instrumented fusion to the sacrum for degenerative adult spinal deformity: Survivorship analysis of 160 patients  
Park S.J., Lee C.S., Chung S.S., Park H.J. (KR)
- 10.38 O89 Validation of current spinopelvic parameters using inter-observer and CT-radiography based variability  
Park S.A., Kwak D.S., Kim J.Y. (KR)
- 10.42 O90 Anterior & posterior fusion versus posterior fusion only for adult degenerative lumbar scoliosis  
Cho K.J., Kim Y.T., Hong T.H. (KR)
- 10.46 O91 Effect of the contracted flexed osteoarthritic knee on the sagittal alignment of spine and pelvis  
Kim Y.B.B., Kang G., Lee Y., Ko Y. (KR)
- 10.50 Discussion
- Symposium I: Endoscopic spinal surgery  
Chairs: Kim W.J. (KR) & Yung Park Y. (KR)
- 11.00 I80 Can posterior full endoscopic surgery replace open surgery for cervical disc herniation?  
Shin K.H. (KR)
- 11.08 I81 Selection of lumbar endoscopic approach according to the various type of disc herniation  
Kwon Y.S. (KR)
- 11.16 Discussion

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**Korean Society of Spine Surgery**

**Symposium II: Minimally invasive spinal fusion**  
Chairs: Rhyu K.W. (KR) & Jun D.S. (KR)

- 11.20 **182** Posterior surgical options after minimally invasive multi-level anterolateral interbody fusion for adult spinal deformity - Open versus percutaneous pedicle screw instrumentation  
Park S.J. (KR)
- 11.28 **183** Is indirect neural decompression sufficient after lateral lumbar interbody fusion? Indication for additional direct posterior decompression  
Hong J.Y. (KR)
- 11.36 **184** L5-S1 fusion options after multi-level minimally invasive lateral interbody fusion: Open PLIF, MIS TLIF, or OLIF  
Lee J.C. (KR)
- 11.44 **185** Best case scenario for cortical screw fixation in the treatment of various lumbar diseases  
Kim S.W. (KR)
- 11.52 **Discussion**
- 12.00 **Adjourn**
- 12.30 **Lunch break + Industry workshops**

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- 14.00 **Welcome**  
Local Hosts
- 14.05 **Report from program chairman**  
Roberts S. (UK)
- Session 1: Disc herniation**  
Chairs: Kang J. (US) & Yoon T. (US)
- 14.15 **O92** Different loading combinations are associated with different injury risk of the intervertebral disc  
Wilke H.J., Berger-Roscher N., Casaroli G., Rasche V., Galbusera F. (DE)
- 14.22 **O93** Structural properties and failure mechanisms of the human intervertebral disc-vertebra interface  
Berg-Johansen B., Fields A., Lotz J. (US)
- 14.29 **O94** Diffusion tensor imaging of lumbar spinal nerves in patients with lumbar disc herniation  
Chiou S.Y., Hellyer P., Sharp D., Newbould R., Strutton P. (UK)
- 14.36 **Discussion**
- 14.45 **O95** Short (2 weeks) vs. long (6 weeks) postoperative restrictions following lumbar discectomy: A prospective randomized control study  
Bono C.M., Leonard D.A., Schoenfeld A.J., Cha T.D., McGuire K.J., Harris M.B. (US)
- 14.52 **O96** Introduction of the Barricaid annular closure device - Caution with new technology  
Licina P., Johnston E. (AU)
- 14.59 **O97** Effectiveness and costeffectiveness of referral for early rehabilitation after lumbar discectomy  
van Tulder M., Oosterhuis T., Ostelo R., van Dongen J., Peul W., de Boer M., Vleggeert-Lankamp C., Arts M. (NL)
- 15.06 **Discussion**
- Session 2: Mechanics & ligamentum flavum**  
Chairs: Hashizume H. (JP) & Oxland T. (CA)
- 15.15 **O98** Simulating the unique, nonlinear dynamics of the human lumbar intervertebral disc during vibration  
Ferguson S., Marini G., Huber G., Püschel K. (CH)
- 15.22 **O99** Compression-torsion mechanical properties of the human intervertebral disc joint  
O'Connell G., Bezi S. (US)
- 15.29 **O100** A paradigm shift of ligamentum flavum hypertrophy analysis: The hypertrophic activity  
Hur J.W., Lee J.B., Cho T.H., Chung Y.G., Park J.Y. (KR)
- 15.36 **Discussion**
- 15.45 **Break**

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**Session 3: Osteoporosis**  
Chairs: Blumenthal S. (US) & Orita S. (JP)

- 16.15 **O101** Lateral measurement of lumbar bone mineral density can potentially improve the estimation of fracture risk in early postmenopausal women and patients with severe osteoporosis - A study of 2281 cases  
Ishikawa T., Aramomi M. (JP)
- 16.22 **O102** Osteoporosis-related radiating pain following ovariectomy in mice is attenuated by pregabalin and bisphosphonates  
Suzuki M., Millecamps M., Ohtori S., Mori C., Stone LS. (JP)
- 16.29 **O103** Characteristic and natural course of MR findings in osteoporotic vertebral fracture - A multicenter prospective cohort study between 2012 and 2015  
Takahashi S., Hoshino M., Toyoda H., Takayama K., Iseki K., Tsujio T., Sasaoka R., Yasuda R., Kanematsu F., Kohno H., Nakamura H. (JP)
- 16.36 **O104** Changes in the incidence of vertebral fractures in a population-based cohort study of the elderly  
Yamada J., Akeda K., Nakase K., Sudo A. (JP)
- 16.43 **O105** The effect of teriparatide on fracture healing of vertebral compression fracture in postmenopausal women  
Park S.Y., Suh S., Hong J.Y., Kim Y.R. (KR)
- 16.48 **Discussion**
- Invited lecture 1**  
Chair: Hu S. (US)
- 17.00 **186** Reversing ageing is inevitable  
Tucker S. (SG)
- 17.30 **First business meeting (members only)**

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**Session 5: Early onset scoliosis**  
Chairs: Kharat K. (LB) & Ventura N. (ES)

- 08.00 **187** Lecture: Casting for early onset scoliosis - A role to play  
Ventura N. (ES)
- Free paper**
- 08.15 **O106** The results of Shilla technique growing rod in juvenile scoliosis  
Kharat K., Ghostine B., Sebaaly A., Kreichati G. (LB)
- 08.23 **Discussion**
- Debate: Selection of instrumentation for early onset scoliosis**  
Growing rods - Ebebae H. (EG)
- 08.30 **Trolley (Shilla) - Kharat K. (LB)**
- 08.40 **VEPTR - Ventura N. (ES)**
- 08.50 **The 3 hook construct - Azmy A. (PS)**
- Case scenarios**  
Azmy A. (PS)
- 09.10 **Presentation of 2 cases**
- 09.40 **Break**
- Session 6: AIS**  
Chairs: Benzakour T. (MA) & Salah H. (EG)
- 10.30 **188** Lecture: Surgical strategies in AIS  
Ventura N. (ES)
- Free papers**
- 10.45 **O107** The choice of lower instrumented vertebra in AIS - Comparison of Lenke, Suk and Dubouset criteria  
Kharat K., Rizkallah M., Sebaaly A., Kreichati G. (LB)
- 10.53 **O108** Surgical management of difficult and rigid scoliosis with 100 patients in the Arab world  
Alzoubi Z. (JO)
- 11.01 **Discussion**
- Debate: Instrumentation for AIS - How dense does it need to be?**  
Higher density, the better  
Ventura N. (ES)
- 11.20 **Less density gives equal results**  
Ebebae H. (EG)

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## Pan Arab Spine Society

Case scenarios  
Kharat K. (LB)

11.30 Presentation of 2 cases

12.00 Lunch break + Industry workshops

### Session 7: Adult deformity

Chairs: Elsebae H. (EG) & Alves O. (PT)

14.00 189 Lecture: Pelvic parameters & sagittal balance  
Emran I. (EG)

### Free paper

14.15 O109 Surgical management of adult presenting congenital spine deformities  
Salah H. (EG)

14.25 Discussion

Case scenarios  
Abushala A. (LY)

14.45 Presentation of 2 cases

15.15 Break

### Session 8: Spinal osteotomies

Chairs: Batterjee K. (SA) & Elkoubi Z. (JO)

16.30 190 Lecture: Spinal osteotomies – An overview  
Salah H. (EG)

16.45 191 Lecture: PSO – Tips and tricks  
Salah H. (EG)

17.00 Discussion

Case scenarios  
Salah H. (EG)

17.10 Presentation of 2 cases

17.40 Wrap up & adjourn



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## La Sociedad Ibero Latinoamericana de Columna Sociedade Brasileira de Coluna

### Session 1

Chair: Fogaça A. (BR)

14.00 O110 Distraction lengthening plus dynamic self-growing instrumentation for early onset scoliosis (EOS) in neuromuscular patients  
Segal E.D., Couto J.C. (AR)

14.08 O111 Triggered EMG threshold from axillary chest wall electrodes for upper thoracic pedicle screws: Preliminary data  
Weissmann K.A., Descaseaux F., Costa M., Huaquilaf C., Zarate A., Barraza G. (CL)

14.16 O112 Underfunding of spinal deformities treatment and its consequences  
DeAño H., Nunes A.A., Bressan Neto M. (BR)

14.24 O113 Primary spinal tumors in children and young adults – Twenty eight patients with a minimum of one year of follow-up  
Tavares Canto F.R., Lajolo P., Alves A., Chioatto M., Reggiani R., Pinheiro C., Bueno M. (BR)

14.32 O114 Isolated fracture of transverse process of lumbar vertebra in professional soccer player: Case report and literature review  
Vaz de Lima M. (BR)

### Session 2

Chair: Volpi M. (BR)

14.40 O115 Three-dimensional anatomical study of Ligamentum Flavum in cervical spine  
Rahmani S.M., Terai H., Suzuki A., Toyoda H., Hoshino M., Tamai K., Akhgarg J., Hayashi K., Nakamura H. (JP)

14.48 O116 Effect of hypovolemia on traumatic spinal cord injury  
DeAño H., Sampaio O.C., Guimarães EADBB (BR)

14.56 O117 The relationship between central motor conduction time and spinal cord compression in patients with cervical spondylotic myelopathy  
Rikita T., Tanaka N., Nakanishi K., Kamei N., Sumiyoshi N., Kotaka S., Ochi M. (JP)

15.04 O118 Invertebrate atlanto-axial subluxation treated conservatively: Experience in 3 cases and review of the literature  
Weissmann K.A., Huaquilaf C., Costa M., Descaseaux F. (CL)

15.12 O119 The use of teriparatide in delayed case of type odontoid fractures - A case report  
Ura K., Kuroki K., Kanayama M., Oha F., Shimamura Y., Hisada Y., Tashiro K., Suzuki Y., Hashimoto T., Iwasaki N. (JP)



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## European Spine Journal

Spine science forum: Meet the experts

Osteotomies and alternative techniques in the correction of adult deformity

Chairs: Lamartina C. (IT) & Berjano P. (IT)

### Session 1: Cervicohoracic deformity

08.00 192 Opening lecture: Cervical alignment – What parameters should we consider?  
Le Huec J.C. (FR)

08.20 Discussion

### Case-based topic discussions

08.30 Topic 1 - Cervical osteotomies in sagittal imbalance  
Viale L. (BR)

09.20 Topic 2 - Osteotomies in the upper thoracic spine  
Le Huec J.C. (FR)

10.10 Break

### Session 2: Thoracolumbar deformity

10.30 193 Opening lecture: Open standing MRI for the evaluation adult and adolescent deformity  
Zerbi A. (IT)

10.45 Discussion

### Case-based topic discussions

10.55 Topic 3 - Anterior techniques and percutaneous posterior instrumentation for sagittal malalignment  
Berjano P. (IT)

11.45 Topic 4 - PSO avoidance with anterior release techniques in revision cases with sagittal imbalance  
Lamartina C. (IT)

12.35 Closing remarks

12.45 Lunch break + Industry workshops



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## La Sociedad Ibero Latinoamericana de Columna Sociedade Brasileira de Coluna

### Session 3

Chair: DeAño H. (BR)

15.20 O120 Prospective analysis of cages self-blocker stand alone for use in cervical degenerative diseases  
Santana Carvalho F., Goncalves de oliveira S., Franco T.R., Viana Smoes M., Cantisani Neto J. (BR)

15.28 O121 Treatment of symptomatic lumbar stenosis with endoscopy  
Ramirez J.F., Prada N., Ramirez C., Rugeles J.G., Alonso G.O. (CO)

15.36 O122 Cervical endoscopy for degenerative disc disease  
Ramirez J.F., Prada N., Ramirez C., Rugeles J.G., Alonso G.O. (CO)

15.44 O123 Non-endoscopic anterior percutaneous thermocoagulation for cervical discogenic pain – Description of the modified technique and results after six year follow-up  
Ramirez J.F., Prada N., Ramirez C., Rugeles J.G., Alonso G.O. (CO)

15.52 O124 Complications from non-endoscopic percutaneous thermocoagulation for the treatment of discogenic LBP - Comparison of laser vs radiofrequency in 21 years of experience  
Ramirez J.F., Prada N., Ramirez C., Rugeles J.G., Alonso G.O. (CO)

16.00 Break

### Session 4

Chair: Ramirez J.F. (CO)

16.30 O125 Modic type 1 signal change on the posterior elements of the lumbar spine  
Sugiura K., Sakai T., Abe M., Yamashita K., Takata Y., Higashino K., Nagamachi A., Saiyori K. (JP)

16.38 O126 Treatment of low back pain secondary to facet osteoarthritis - 8 Years of experience of 360° facet rhizotomy assisted by radiofrequency  
Ramirez J.F., Prada N., Ramirez C., Rugeles J.G., Alonso G.O. (CO)

16.46 O127 Sagittal plane spinal alignment association with lumbar disc degeneration in young asymptomatic adults  
DeAño H., Menezes-Reis R., Bonugli G.P., Dalto V., Herrero C.F.D.S., Nogueira-Barbosa M.H. (BR)

16.54 O128 Lumbar disc herniation in adolescents: Cases series and literature review  
Weissmann K.A., Martínez J.P., Huaquilaf C., Costa M., Zárate A., Descaseaux F. (CL)

17.02 O129 Lateral lumbar interbody fusion for symptomatic adjacent disc disease  
Santana Carvalho F., Franco T.R., Motta Filho R., Batista Filho G. (BR)



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Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

45

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

47

44

46



**La Sociedad Ibero Latinoamericana de Columna  
Sociedade Brasileira de Coluna**

**Session 5**

Chair: Mahdi H. (ES)

- 17.10 **O130** **Comparative study of TUF techniques and MINI OPEN for degenerative diseases of the lumbar spine**  
Santana Carvalho F., Anacleto V.R., Santos Araujo A.B., Bicalho Maluf F., Goncalves de Oliveira S. (BR)
- 17.18 **O131** **Spine surgery at an ambulatory surgery center (ASC). Is it feasible, safe and cost effective? A prospective evaluation of 2942 consecutive cases**  
Vaz de Lima M., Pettine K., Tschy F. (BR)
- 17.26 **O132** **Does the use of dynamic surgical guidance assist with accurate pedicle screw placement in patients with osteoporosis or osteopenia?**  
DeAño H., Williams J., da Silva Herrero C.F., Betz R., Powell D., Gaughan J. (BR & US)
- 17.34 **O133** **The electromyography threshold for accurate placement of cannulated pedicle screws**  
Zarate A., Weissmann K.A., Costa M., Huaquilar C., Barraza G. (CL)
- 17.42 **O134** **Advantages of navigation in posterior cervical fusion**  
Godino-Martinez O., Lopez-Obamao L., Plans-Ahicit G., Gabarrós-Canals A. (ES)

**Session 6**

Chair: Weissmann K. (CL)

- 17.48 **O135** **Autogenous bone marrow concentrate (BMC) Injection to treat 1 and 2 level symptomatic degenerated lumbar discs - A prospective controlled study, with a minimum 24 month follow up**  
Vaz de Lima M., Pettine K., Tschy F. (BR)
- 17.56 **O136** **Anterior lumbar interbody fusion for the treatment of surgical infection on posterior instrumented spinal approach for degenerative diseases**  
Santana Carvalho F., Siqueira A., Franco T.R., Smoes M.V., Batista G. (BR)
- 18.02 **O137** **Evaluation of individuals with and without chronic low back pain during bridge exercise**  
Vaz de Lima M., Fernandes Byk F., Antunes Bicalho L.A., Barela J.A., Forti Barela A. (BR)
- 18.10 **O138** **Tethered cord syndrome caused by spinal dysraphism: Long term outcome of tethered cord release**  
Kotaka S., Tanaka N., Nakanishi K., Kamei N., Sumiyoshi N., Rikita T., Ochi M. (JP)
- 18.18 **Discussion**
- 18.30 **Adjourn**



**The International Society for the Study of the Lumbar Spine**

**Focus Group meeting**

**Best practices for conducting and reporting spine research involving registry-enhanced administrative data**

This Focus Group will identify best practices for conducting, reporting and reviewing research involving the analysis of administrative data. The group will sample existing literature to identify best practices and common obstacles involving the analysis of administrative data. It will summarize the validity and reliability of administrative algorithms based on codes from the International Classification of Disease and the AMA's Current Procedural Terminology, including classifying spine-related ICD-10 codes. Finally, the group will seek to develop consensus.

12.30 **Lunch break + Industry workshops**

09.00

12.30



**Society for Minimally Invasive Spine Surgery**

**Session 1: MISS - Spinal degenerative disease**

Chairs: Tan S.B. (SG) & Singh K. (US)  
Panel: Pennings F. (US), Khoo L. (US), Taylor W. (US), Yue W.M. (SG), Wu J.C. (TW) & Nene A. (IN)

- 14.00 **Welcome**  
Tan S.B. (SG) & Singh K. (US)
- 14.10 **I94** **Special lecture: MISS in Asia: Past, present, and the challenges that lay ahead**  
Tan S.B. (SG)
- 14.20 **I95** **Update on bone and fusion biologics in spinal surgery**  
Yue W.M. (SG)
- 14.30 **I96** **Update on intradiscal biologic therapy**  
Hartl R. (US)
- 14.40 **Q&A**
- 14.50 **Case: Grade 1 spondylolisthesis with stenosis L4-L5: Yue W.M. (SG)**
- 14.54 **MIS TLIF: Kwon B. (US)**
- 14.58 **Lateral / ALIF: Pennings F. (US)**
- 15.02 **Interspinous process: Nene A. (IN)**
- 15.06 **How case was treated: Yue W.M. (SG)**
- 15.10 **Discussion**
- 15.15 **Case: High grade L5-S1 isthmic spondylolisthesis: Khoo L. (US)**
- 15.19 **Open TLIF: Nene A. (IN)**
- 15.23 **MIS TLIF: Wu J.C. (TW)**
- 15.27 **Anterior - posterior: Pennings F. (US)**
- 15.31 **How case was treated: Khoo L. (US)**
- 15.35 **Discussion**
- 15.40 **Case: Multi level degenerative spine, with multi-level stenosis and recurrent HNP: Taylor W. (US)**
- 15.44 **Decompression without fusion: Yue W.M. (SG)**
- 15.48 **Multi-level TLIF: Khoo L. (US)**
- 15.52 **Lateral: Pennings F. (US)**
- 15.56 **How case was treated: Taylor W. (US)**
- 16.00 **Discussion**
- 16.05 **Break**



**Society for Minimally Invasive Spine Surgery**

**Session 2: MISS - Lateral techniques**

Chairs: Taylor W. (US) & Ishii K. (JP)  
Panel: Kim J.S. (KR), Pimenta L. (BR), Singh K. (US), Guo C.M. (SG) & Wu J.C. (TW)

- 14.30 **Welcome**  
Taylor W. (US) & Ishii K. (JP)
- 14.35 **I97** **Contemporary neuromonitoring for transposo surgical procedures**  
Taylor W. (US)
- 14.50 **I98** **Complications avoidance in lateral transposo surgery**  
Pimenta L. (BR)
- 17.05 **I99** **Complications avoidance in MIS oblique lumbar interbody fusion**  
Kim J.S. (KR)
- 17.20 **Discussion**
- 17.30 **Case: Grade 1 or 2 spondylolisthesis with stenosis L4-L5: Kim J.S. (KR)**
- 17.34 **Stand alone: Pimenta L. (BR)**
- 17.38 **Direct versus indirect decompression: Guo C.M. (SG)**
- 17.42 **Anterior - posterior: Singh K. (US)**
- 17.46 **How case was treated: Kim J.S. (KR)**
- 17.50 **Discussion**
- 17.55 **Case: Thoracic HNP with cord compression: Singh K. (US)**
- 17.59 **MIS/Tubular: Wu J.C. (TW)**
- 18.03 **Open: Guo C.M. (SG)**
- 18.07 **How case was treated: Singh K. (US)**
- 18.11 **Discussion**
- 18.30 **Adjourn**

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**SpineWeek 2016 Singapore**  
 May 16-20  
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**Wednesday, May 18  
 Scientific Program**

	Room 1 Heliconia	Room 2 Heliconia	Room 3 Hibiscus	Room 4 Hibiscus	Room 5 Jasmine
	APSS	ISSLS	PASS	NASS	ISASS
10.00	Break				
	ASSI & APSS	ISSLS	PASS	NASS	ISASS
12.30	Lunch break + Industry workshops				
	ASSI & APSS	ISSLS	ICSG	AOSPINE	SMISS
16.00	Break				
	APSS	ISSLS	ICSG	AOSPINE	SMISS

**Room 1**



**Asia Pacific Spine Society**

**APSS Opening Ceremony**  
 Chair: Liu G. (SG)

08.30 **Program Introduction**  
 Liu G. (SG)

08.35 **Presidential welcome address by APSS chairman**  
 Abumi K. (JP)

08.40 **APSS: Past and present**  
 Shanmugam K.S. (MY)

**Spinal tumour**  
 Chair: Kwan M.K. (MY)

08.50 1100 **Multilevel spinal metastasis: Conservative or surgery?**  
 Wong Y.W. (HK)

09.05 1101 **Spinal tumour reconstruction: Anterior or posterior or both?**  
 Chung J.Y. (KR)

09.20 1102 **Bisphosphomaye & denosab in Treatment of GCT of spine**  
 Jayaswal A. (IN)

09.35 1103 **Recycling intraoperative spinal tumour blood: A myth or a fact?**  
 Kumar N. (SG)

09.50 **Q&A session**

10.00 **Break**



**Asia Pacific Spine Society  
 Association of Spine Surgeons of India**

**ASSI/APSS Joint Session 1: Nontubercular infection**  
 Chairs: Rajasekaran S. (IN) & Thaug M. (MM)

10.30 1104 **Surgical site infections - Current viewpoints of pathogenesis and prevention**  
 Dahl B. (DK)

10.45 1105 **Controversies in the surgical management of SSI**  
 Ignacio J.M.F. (PH)

11.00 1106 **Spinal epidural abscess - Presentation, diagnosis and management**  
 Khan M.A. (PK)

11.15 **Discussion**

**Debate**  
**Postoperative infections in spine - Whether to retain or remove implants?**  
 Ahmed A. (IN) & Krishnan A. (IN)

**Case discussion**  
 Case discussants: Khan M.A. (PK), Sohail M.T. (PK), Ignacio J.M.F. (PH), Dahl B. (DK), Ahmed A. (IN) & Krishnan A. (IN)

11.50 **Case 1: Pyogenic infection of spine - Thaug M. (MM)**

12.10 **Case 2: Postoperative discitis - Rajasekaran S. (IN)**

**Room 1**



**Asia Pacific Spine Society  
 Association of Spine Surgeons of India**

12.30 **Lunch break + Industry workshops**

**ASSI/APSS Joint Session 2: Tubercular infection**  
 Chairs: Chaddha R. (IN) & Liu G. (SG)

14.00 1107 **Clinical and MRI features of various stages of healing of TB spine**  
 Alam Md.S. (BD)

14.10 1108 **MDR TB in the spine - Incidence, evaluation and treatment protocols**  
 Nene A. (IN)

14.20 1109 **Cranio-cervical and lumbosacral tuberculosis - How is it different?**  
 Sohail M.T. (PK)

14.30 1110 **The role of MIS in surgery for TB spine**  
 Jayaswal A. (IN)

14.40 **Discussion**

**Debate**  
**Anterior surgery has no role for the surgical management of Dorsal/Dorsolumbar TB - For and against**  
 Jhala A. & Krishnan A. (IN)

15.10 **Case discussion**  
 Verma R., Mohite S., Kujrekar K. (IN)

**Free papers VIII: Tuberculosis**

15.30 O139 **Diagnostic protocol in management of tuberculosis of spine based on retrospective analysis of 262 cases**  
 Shama A., Chhabra H.S., Mahajan R. (IN)

15.34 O140 **Surgical algorithm in pediatric tubercular spondylitis with myelopathy**  
 Dhawale A., Shah A., Shah I., Mehta R., Nene A. (IN)

15.38 O141 **Multi drug resistant tubercular spondylodiscitis - A social challenge in developing countries**  
 Amritanand R., Arockiaraj J., Karthik R., Krishnan V., David K.S. (IN)

15.42 O142 **Posterior approach in thoracolumbar tuberculosis: A clinical and radiological review of 67 operated cases**  
 Prabhoo T.R., Nene A.M. (IN)

15.46 O143 **Transpedicular decompression / debridement and posterior spinal fusion with instrumentation for single level thoracic spinal tuberculosis with myelopathy - Is anterior column reconstruction necessary?**  
 Kondety SKC., Basu S., Biswas A., Ahmed R., Suri T., Keshawani S. (IN)

15.50 **Discussion**

16.00 **Break**



Asia Pacific Spine Society

Free papers: Spinal tumour & Infections

Session 1: Trauma & Tumour

Chairs: Tiksnadi B. (ID) & Alam Md.S. (BD)

- 16.30 O144 **Metastatic spine tumour surgery: A comparative study of minimally invasive approach using percutaneous pedicle screws fixation versus open approach**  
Kumar N., Maharajan K., Zaw A.S., Malhotra R., Kumar A. (SG)
- 16.34 O145 **Dumbbell score: A new scoring system for the differential diagnosis of malignant and benign spinal dumbbell tumors**  
Matsumoto Y., Harimaya K., Kawaguchi K., Hayashida M., Okada S., Iwamoto Y. (JP)
- 16.38 O146 **Total en bloc spondylectomy for spinal metastasis of lung cancer**  
Takahashi N., Murakami H., Demura S., Kato S., Yoshioka K., Yokogawa N., Fujii M., Igarashi T., Yonezawa N., Tsuchiya H. (JP)
- 16.42 O147 **Flowcytometric evaluation of intraoperative salvaged blood altered with leucocyte depletion after in metastatic spine tumour surgery**  
Kumar N., Zaw A.S., Lam R., Kumar A. (SG)
- 16.46 O148 **Serum interleukin-12 as a prognostic factor for spinal metastases**  
Hayashi H., Murakami H., Demura S., Kato S., Yoshioka K., Yokogawa N., Tsuchiya H. (JP)
- 16.50 O149 **To treat the metastatic spinal tumor following the classification in use, is it the best standard?**  
Ishii K., Sasaki K., Watanabe M. (JP)
- 16.54 O150 **Thromboembolism following lumbar fusion surgery in patients using tranexamic acid**  
Cho K.J., Kim Y.T. (KR)
- 16.58 O151 **Is intrawound application of vancomycin effective for the prophylaxis of surgical site infection? A multi-center cohort study using propensity score matching**  
Horii C., Azuma S., Oka H., Okazaki R., Okamoto N., Yamazaki T. (JP)
- 17.02 Q&A
- Session 2: MIS spine surgery  
Chairs: Khan M.A. (PK) & Yang S.H. (TW)
- 17.12 O152 **Two-year clinical outcomes of multilevel extreme lateral lumbar interbody fusion (XLIF®) with or without minimally invasive transforaminal lumbar interbody fusion (MIS-TLIF) versus isolated open transforaminal lumbar interbody fusion (TLIF) for degenerative scoliosis and spondylolisthesis: A matched comparison study**  
Jiang L., Ng Y.H., Guo C.M., Tan S.B., Yeo W., Chen J.L.T., Fong P.L., Siddiqui M.A. (SG)
- 17.16 O153 **Fluoroscopic guided percutaneous thoracic and lumbosacral pedicle screws, is it safe for Asians?**  
Chan C.Y.W., Chiu C.K., Kwan M.K. (MY)
- 17.20 O154 **Mechanism of radiculopathy contralateral to the side of disc herniation - Microendoscopic investigations**  
Hayashi N., Makiyama K., Ohnaru K., Kano K., Iba H., Nakanishi K., Hasegawa T. (JP)
- 17.24 O155 **Intraoperative radiation exposure to surgeons in single- and multi-level minimally invasive transforaminal lumbar interbody fusion**  
Funao H., Momoshima S., Isogai N., Shiono Y., Fujita N., Hikata T., Iwanami A., Watanabe K., Koyanagi T., Nakamura M., Matsumoto M., Ishii K. (JP)



The International Society for the Study of the Lumbar Spine

Session 4: Special emphasis poster session 1 (eSpine area)

Session 5: Disc cell biology

Chairs: Kim J. (KR) & Nam V. (US)

- 08.45 O167 **Notochordal cell-rich nucleus pulposus matrix as a potential agent for nucleus pulposus regeneration**  
De Vries S., Van Doeseelaar M., Meij B., Tryfonidou M., Ito K. (NL)
- 08.52 O168 **Mechanistic determination of notochordal cell-induced anti-apoptotic signaling in human nucleus pulposus cells**  
Mehrkens A., Karim M.Z., Matta A., Kim S., Fehlings M.G., Schaefer S., Erwin W.M. (CH)
- 08.59 O169 **Protective role of Prostaglandin E1 for disc degeneration by reciprocally regulating collagenases and their endogenous inhibitor TIMP-3 in human intervertebral disc cells**  
Sawaji Y., Suzuki H., Endo K., Tanaka H., Nishimura H., Kosaka T., Yamamoto K. (JP)
- 09.06 Discussion
- 09.15 O170 **Selective interference of mTOR signaling is protective against human disc cellular apoptosis, senescence, and extracellular matrix degradation with autophagy induction**  
Ito M., Yurube T., Kakutani K., Maeno K., Takada T., Miyazaki S., Terashima Y., Kakiuchi Y., Kurosaka M., Nishida K. (JP)
- 09.22 O171 **JAK/STAT inhibitor has potential to inhibit intervertebral disc degeneration**  
Suzuki S., Fujita N., Watanabe K., Tsuji T., Ishii K., Honuchi K., Miyamoto T., Nakamura M., Matsumoto M. (JP)
- 09.29 O172 **Expression, regulation and relevance of hyaluronidases in the intervertebral disc**  
Wuertz-Kozak K., Greutert H., Kupkova O., Grantenbein B., Boos N., Ferguson S.J. (CH)
- 09.36 Discussion
- 09.45 Break
- Session 6: Disc degeneration  
Chairs: Berlemann U. (CH) & Mannion A. (CH)
- 10.15 O173 **Natural history of lumbar disc degeneration and other spinal phenotypes on MRI: A prospective, comparative 8-year longitudinal study**  
Sarmatzis D., Karpainen J., Cheung J., Bow C., Luk K., Cheung K. (HK)
- 10.22 O174 **Measuring lumbar disc degeneration and pathology**  
Battie M., Videman T., Gibbons L., Gill K. (CA)
- 10.29 O175 **Diabetes mellitus is a significant risk factor for lumbar disc degeneration in a longitudinal population-based cohort: The Wakayama Spine Study**  
Teraguchi M., Hashizume H., Yoshimura N., Muraki S., Yamada H., Oka H., Minamide A., Nagata K., Ishimoto Y., Kagotani R., Yoshida M. (JP)
- 10.36 Discussion



Asia Pacific Spine Society

- 17.28 O156 **New minimum invasive technique for lateral lumbar interbody fusion**  
Sasaki K., Ishii K., Watanabe M. (JP)
- 17.32 O157 **Safety entry point, size and direction for placement of thoracic pedicle screw - A cadaveric study**  
Bunmaprasert T., Roobsoong A., Pongmanee S., Khunsee S., Laowattananphong S. (TH)
- 17.36 Q&A
- Session 3: Spine fracture, vertebroplasty & Basic science  
Chairs: Kwan K.Y.H. (HK), Kandwal P. (IN) & Pradhan R. (NP)
- 17.46 O158 **A prospective multicentric observational study on the use of intravertebral implants for traumatic vertebral compression fracture treatment: 12 Months follow-up results**  
Noriega D.C., Ardura F., Baud J., Bkerlein H., Foulongne E., Francaviglia N., Gumpert R., Hassel F., Huet H., Kinsky A., Maestretti G., Ould Simane M., Perot G., Plasencia M., Queinnee S., Renaud C., Sabatier P., Theumann N. (FR, DE, IT, AT, CH, ES)
- 17.50 O159 **Percutaneous vertebroplasty for osteoporotic vertebral fracture with intravertebral cleft: Analysis of poor clinical outcome**  
Nakamae T., Fujimoto Y., Yamada K., Hiramatsu T., Hashimoto T., Suzuki O., Tsuchikawa Y. (JP)
- 17.54 O160 **Surgical outcome of balloon kyphoplasty for painful osteoporotic vertebral fracture**  
Yamada K., Fujimoto Y., Nakamae T., Hiramatsu T., Hashimoto T., Suzuki O., Tsuchikawa Y. (JP)
- 17.58 O161 **Using the regional eggshell technique during Kyphoplasty to prevent cement leakage in various vertebral walls injuries**  
Io H., Chen H.M. (TW)
- 18.02 O162 **The association between lumbosacral transitional vertebrae and lumbosacral nerve root asymmetry**  
Ohno T., Tarukado K., Tono O., Doi T. (JP)
- 18.06 O163 **Vertebral compression fractures treatment - 4 Years retrospective study**  
Noriega D.C., Ardura F., Hernandez R. (ES)
- 18.10 O164 **Identification of life style factors affecting onset of adolescent idiopathic scoliosis**  
Watanabe K., Michikawa T., Yonezawa I., Takaso M., Minami S., Soshi S., Okada E., Asakura K., Nishiwaki Y., Matsumoto M. (JP)
- 18.14 O165 **Aging change of the paravertebral muscles and psoas muscles of the lumbar spine and relation to the low back pain in a general population - The Wakayama Spine Study**  
Hashizume H., Yamada H., Oka H., Teraguchi M., Iwahashi H., Sasaki T., Shinto K., Muraki S., Matsuda A., Minamide A., Nakagawa Y., Yoshimura N., Yoshida M. (JP)
- 18.18 O166 **The contribution of the ribcage to thoracolumbar spine biomechanics in a sheep model: The significance of the intercostal connections**  
Grant C., Newell N., Booker B., Pearcy M.J., Little J.P. (AU)
- 18.22 Q&A



The International Society for the Study of the Lumbar Spine

- 10.45 O176 **Incidence and pain characteristics of disc degeneration accompanied with early-stage lumbar spondylolysis in adolescent patients**  
Aoki Y., Sugiura S., Watanabe A., Nakajima T., Takazawa M., Ohtori S., Takahashi K., Nishikawa S. (JP)
- 10.52 O177 **Heterochronic parabiosis: Is it possible to interrupt the process of age-associated intervertebral disc degeneration?**  
Colangelo D., Pola E., Ramesh Prashanti P., Nasto L.A., Niedemhofer L., Robbins P., Vo N. (IT)
- 10.59 O178 **Vertebral trabeculae adjacent to the disc are higher quality in the cranial than caudal side in the upper lumbar spine, and are unrelated to age or disc degeneration**  
Ge Y., Crites-Battie M., Videman T., Boyd S., Yue W. (CN & CA)
- 11.06 Discussion
- 11.15 I111 **Hany Farfan presidential lecture: The use of acupuncture for musculoskeletal pain**  
Introduction - Kang J. (US)  
Guest Speaker: Tat Leang L. (SG)
- 11.55 I112 **Presidential address: Zen and the art of spine maintenance**  
Introduction - Yoon T. (US)  
Speaker: Kang J. (US)
- 12.35 Lunch break + Industry workshops
- Session 7: Low back pain  
Chairs: Athala J. (IN) & Strömquist B. (SE)
- 14.00 O179 **Family history of low back pain is a significant predictor of pain and disability between extreme stages of lumbar disc degeneration**  
Sarmatzis D., Bow C., Karpainen J., Luk K., Cheung B., Cheung K. (JP & HK)
- 14.07 O180 **The association between the cross-sectional area of the dural sac and low back pain in a large population: The Wakayama Spine Study**  
Iwahashi H., Yoshimura N., Hashizume H., Yamada H., Oka H., Yoshida M. (JP)
- 14.14 O181 **Low back pain and functional limitations in adult population of the united states**  
Nordin M., Yang H., Haldeman S. (US)
- 14.21 Discussion
- 14.30 O182 **The interrelation of Modic changes, other imaging findings and back pain in men**  
Battie M., Wang Y., Gibbons L., Videman T., Gill K. (CA)
- 14.37 O183 **Does RA patient have lumbar lesion or low back pain more frequently than healthy population? - Cross sectional analysis in cohort study with age and sex matched healthy volunteer**  
Suzuki A., Tamai K., Akhgar J., Terai H., Hoshino M., Toyoda H., Hayashi K., Ohyama S., Nakamura H. (JP)
- 14.44 O184 **The influence of lumbar degeneration on the treatment outcome of individuals with low back pain following spinal manipulation**  
Wong A., Parent E., Dhillon S., Prasad N., Sarmatzis D., Kawchuk G. (HK)
- 14.51 Discussion



Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings

Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings



## The International Society for the Study of the Lumbar Spine

### Session 8: Fusion

Chairs: Tanaka N. (JP) & Yabuki S. (JP)

- 15.00 O185 Lateral interbody fusion as a tool in adult spinal deformity surgery: Correction and complications with hybrid versus posterior-only approach  
Deviren V., Strom R., Bae J., Mizutani J., Valone F., Ames C. (US)
- 15.07 O186 Effectiveness of decompression with fusion compared with decompression alone for lumbar spinal canal stenosis in patients aged 80 years  
Kimura A., Takeshita K. (JP)
- 15.14 O187 Effect of bioactive pedicle screws with hydroxyapatite-forming potential in the canine lumbar spine  
Akedo K., Yamaguchi S., Matsushita T., Kokubo T., Murata K., Takegami N., Yamada J., Sudo A. (JP)
- 15.21 Discussion
- 15.30 Break
- 16.00 Symposium I: Muscle  
Chair: Hodges P. (AU)
- I113 Changes in back muscles as a result of pain/injury  
Danneels L. (BE)
- I114 Relationship between muscle changes on imaging and pathology  
Battie M. (CA)
- I115 Contribution of muscle control to pain/injury  
Hodges P. (AU)
- I116 Muscle as a source of pain: Physiology of muscle nociceptors  
Cairns B. (CA)
- Session 9: Deformity  
Chairs: Deviren V. (US) & Togawa D. (JP)
- 17.00 O188 Characterization of the gait pattern and the disability in adult spinal deformity patients - Factors affecting the gait abnormality  
Yagi M., Kaneko S., Yato Y., Machida M., Asazuma T. (JP)
- 17.07 O189 Lumbar disc degeneration and Modic change 35 years after surgery for adolescent idiopathic scoliosis: Long-term MRI follow-up  
Akazawa T., Kotani T., Sakuma T., Minami S., Takaso M., Inoue G., Miyagi M., Aoki Y., Orita S., Takahashi K., Ohtori S. (JP)
- 17.14 O190 Spinal alignment of Parkinson's disease patients with chronic low back pain: Comparison with adult spinal deformity  
Watanabe K., Hirano T., Ohashi M., Shoji H., Endo N., Nishizawa M., Shimohata T. (JP)
- 17.21 Discussion



## The International Society for the Study of the Lumbar Spine

- 17.30 O191 Novel virtual modeling of alignment following ASD surgery: Establishing relationships between compensatory changes and overcorrection due to proximal junctional kyphosis  
LaFage R., Bess S., Glassan S., Ames C., Burton D., Diebo B., Hart R., Kim H., Klineberg E., Line B., Scheer J., Protopsaltis T., Schwab F., LaFage V. (US)
- 17.37 O192 Sagittal imbalance in degenerative scoliosis can be corrected by addressing only the symptomatic levels  
Presciutti S., Louie P., Johnson S., Hellman M., An H. (US)
- 17.44 O193 How to restore an optimal pelvic position in elderly patients with adult spinal deformity  
Yamato Y., Hasegawa T., Kobayashi S., Togawa D., Yasuda T., Matsuyama Y., Iida T., Matsumura A., Hosogane N., Matsumoto M. (JP)
- 17.51 Discussion



## Pan Arab Spine Society

### Session 9. Degenerative cervical

Chairs: Alves O. (PT) & Salah H. (EG)

- 08.00 I117 Lecture: CSM – Anterior, posterior or combined approach  
Alves O. (PT)
- 08.15 Discussion
- 08.30 Debate: Posterior surgery for CSM – Is instrumented fusion always needed?  
Yes- Alves O. (PT)
- 08.40 Occasionally needed - Emran I. (EG)
- Case scenarios  
Salah H. (EG)
- 08.50 Presentation of 2 cases
- 09.20 Break
- Session 10: Complications in deformity surgery  
Chairs: Ventura N. (ES) & Elsebae H. (EG)
- 10.30 I118 Lecture: Strategies in prevention of neurological complications in AIS Surgery  
Salah H. (EG)
- 10.45 I119 Lecture: Neuro signals are fading away – What do I do?  
Ventura N. (ES)
- 11.00 I120 Lecture: Complications with growing rods – Prevention & management  
Elsebae H. (EG)
- 11.15 I121 Lecture: Complications with VEPTR like devices  
Azmy A. (PS)
- 11.30 Discussion
- My worst deformity complication  
Salah H. (EG)
- 11.40 Presentation of 2 cases
- 12.10 Adjourn
- 12.30 Lunch break + Industry workshops



## International Consortium for Scoliosis Genetics

### Session 1

- 14.00 I122 Invited lecture: Why study scoliosis genetics? A surgeon's perspective  
Cheung K. (HK)
- 14.10 I123 Invited lecture: Why study scoliosis genetics? A geneticist's perspective  
Ikegawa S. (JP)
- 14.20 Discussion
- 14.25 O194 Linkage analysis and exome sequencing suggest a variant in CELSR2 as a cause of idiopathic scoliosis in an extended Swedish pedigree  
Grauers A., Einarsdottir E., Kere M., Gerdhem P. (SE & FI)
- 14.40 O195 Genome-wide association study for AIS in Japan  
Watanabe K., Takeda K., Ogura Y., Takahashi Y., Kono K., Kawakami N., Uno K., Ito M., Minami S., Yanagida H., Taneichi H., Yonezawa I., Tsuji T., Suzuki T., Sudo H., Kotani T., Toyama Y., Matsumoto M., Ikegawa S. (JP)
- 14.55 O196 Regulation and function of the Lbx1 gene in spinal development using the mouse model: Implications for adolescent idiopathic scoliosis  
Wilson M.J., Ros J., Wise C.A. (US)
- 15.10 I124 Invited lecture: Are congenital scoliosis and AIS etiologically related?  
Wise C. (US)
- 15.20 I125 Invited lecture: The disc in scoliosis-- current knowledge  
Chan D. (HK)
- 15.30 Discussion
- 15.45 Break
- Session 2
- 16.15 I126 Invited lecture: Studies in the ALSPAC cohort  
Fairbank J. (UK)
- 16.35 O197 mRNA expression of Lbx1 in paravertebral muscles and vertebra of patients with adolescent idiopathic scoliosis  
Man G.C.W., Tang N.L.S., Lee W.Y.W., Xu L.L., Qiu Y., Cheng J.C.Y. (CN)
- 16.50 O198 SPINE-GEL: A global expression library for the developing nucleus pulposus  
Au T., Cheah K., Niu B., Chan D., Zhang M.Q. (CN & US)
- 17.05 O199 Spine surgery in achondroplasts: One center's experience  
Raggio C.L., Manio J., Carter E., Farmer J. (US)
- 17.20 I127 Invited lecture: Scolioscore – Is it useful?  
Raggio C. (US)
- 17.40 Discussion




**North American Spine Society**

- 07.30 **Welcome**
- Paper presentations: Cervical spondylotic myelopathy**  
Chairs: Bono C.M. (US) & Darwano B. (IN)
- 07.35 **O200 Total disc replacement in cervical spondylotic myelopathy, an obstacle to clinical improvement?**  
Dufour Th., Loret J.E., Chailier V., Lafage R., Lafage V. (FR & US)
- 07.41 **O201 Clinical assessment using MRI/18F-FDG PET fusion imaging for patients with cervical compressive myelopathy**  
Horjoh K., Nakajima H., Takahashi A., Kitade M., Izubuchi Y., Yamamoto Y. (JP)
- 07.47 **O202 The analysis of dysfunctions of lower extremities using knee joint position sense and kinesthesia in cervical myelopathy patients**  
Tanaka N., Nakanishi K., Kamei N., Hiramoto T., Sumiyoshi N., Rikita T., Ochi M. (JP)
- 07.53 **O203 Efficacy of Riluzole in the treatment of early cervical spondylotic myelopathy using diffusion tensor imaging - A double blinded, placebo-controlled randomised controlled trial**  
Rajasekaran S., Aiyer S.N., Kanna R., Shetty A.P. (IN)
- 07.59 **O204 Cord signal changes after anterior cervical discectomy and fusion and its association with neurological recovery - A prospective single centre study over 10 years**  
Chatterjee S., Kondety S.K.C. (IN)
- 08.05 **O205 Course of change in patient-rated outcome up to 5 years after surgery for cervical myelopathy: An analysis of prospectively collected data in a large, consecutive group of patients**  
Mannion A.F., Porchet F., Tok S., Becker H.J., Jeszenszky D., Fekete T.F., Kleinstück F.S. (CH)
- 08.11 **O206 Patient satisfaction with posterior decompression surgery for cervical ossification of the posterior longitudinal ligament: Prognostic radiographic factors and patient-reported outcomes for the effectiveness of surgical treatment**  
Ohya J., Oshima Y., Oka H., Saki F., Taniguchi Y., Matsubayashi Y., Tanaka S., Chikuda H., Takeshita K. (JP)
- 08.15 **Discussion**
- Paper presentations: Axial pain disorders**  
Chairs: Heggenes M. (US) & Thng P. (SG)
- 08.30 **O207 Results of a prospective, multicenter, observational study of total lumbar disc replacement with 2 year follow up: Impact on return to work**  
Litrico S., Vardon D., Assaker R., Ritter-Lang K., Fuentes S., Putzler M., Franke J., Jarzem P., Guigui P., Nakach G., Le Huec J.C. (FR, CA & DE)
- 08.36 **O208 Quantifying the spatial distribution of fat content in lumbar paravertebral muscles on T1-weighted MRI: A novel method and reliability analysis**  
Crawford R.J., Ni Mhuiris A., Volken T., Elliott J.M., Hoggarth M., Samartzis D. (CH, US, AU & CN)



Room 4


**North American Spine Society**

- 08.42 **O209 Which clinical tests can better discern differences in lumbar multi-Ådus activity between people with and without low back pain?**  
Wong A.Y.L., Chan S.N.S., Chung M.T.K., Lir.K.W., Lo J., Ng T.K.Y., Nougrou F. (CN & CA)
- 08.48 **O210 Do high levels of neck pain influence the outcome of cervical arthroplasty?**  
Tok S., Mannion A.F., Mutter U., Becker H.-J., Porchet F. (CH)
- 08.54 **O211 Psychological distress in cervical arthroplasty**  
Hammett T.C., Solanki S., Ashpole R.D. (UK)
- 09.00 **Discussion**
- 09.30 **Break**
- Paper presentations: Basic science**  
Chairs: Wetzel F.T. (US) & Kawaguchi Y. (JP)
- 10.00 **O212 Evaluating the osseointegration of a deeply porous titanium scaffold through comparison with PEEK implants and allograft: Biomechanical assessment using a porcine skull model**  
Guyer R.D., Abitbol J.J., Ohnmeiss D.D., Yao C. (US)
- 10.06 **O213 Diffusion characteristics of human annulus Åbrosus - A study documenting the dependence of annulus Åbrosus on endplate for diffusion**  
Naresh-Babu J., Neelima G., Reshma-Begum S.K. (IN)
- 10.12 **O214 FK506, independent of calcineurin inhibition, induces TGF-1Å/smad3 pathway for preventing intervertebral disc degeneration**  
Zou J., Wu C., Yang H. (CN)
- 10.18 **O215 Does disc injury lead to progression of cervical disc degeneration? Histological analysis in an ovine model**  
Colloca C.J., Kuliwaba J.S., Freeman B.J.C., Gunzburg R., Hegazy AÅÅM., Hinrichs R.N. (US, AU & BE)
- 10.24 **O216 Hyperbaric oxygen intervention reduces secondary spinal cord injury in rats via regulation of HMGB1/TLR4/NF-Åb signaling pathway**  
Kang N., Hai Y., Yang J., Liang F., Gao C.J. (CN)
- 10.30 **O217 Treatment of degenerative disc disease with mesenchymal stem cells. Results from clinical trials with autologous and allogeneic cells**  
Noriega D., Ardura F., Hernández-Ramajo R., Martín-Ferrero M.A., Orozco L., Soler R., Alberca M., Sánchez A., García-Sánchez J. (ES)
- 10.36 **Discussion**
- Low back pain diagnosis and treatment: What is the future?**  
Chair: Wetzel F.T. (US)
- 11.00 **Introduction**  
Wetzel F.T. (US)
- 11.05 **I128 Objective measurement: Success key to nonspecific low back pain**  
Dreisinger T. (xx)



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Room 4


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- 11.15 **I129 First line diagnostics: When to order what and why**  
Kawaguchi Y. (JP)
- 11.25 **I130 Mechanism of BMP2 action on peripheral nerves**  
Heggenes M.H. (US)
- 11.35 **Panel discussion**
- 11.45 **I131 Rare intervention 1- Motion Preservation**  
Darwano B. (IN)
- 11.55 **I132 Rare intervention 2- Motion Preservation**  
Wetzel F.T. (US)
- 12.05 **Panel discussion**
- 12.15 **I133 Introsseus nerve**  
Heggenes M.H. (US)
- 12.25 **Panel discussion and conclusion**
- 12.30 **Lunch break + industry workshops**



Room 4


**AOSPINE AOSPine**

- Session 1: Deformity**  
Chair: Lamartina C. (IT)
- 14.00 **I134 Key opening lecture: Adult deformity**  
Lamartina C. (IT)
- 14.30 **O218 Upright, prone and supine spinal morphology in adolescent idiopathic scoliosis**  
Brink R.C., Schlosser T.P.C., Colo D., Vincken K.L., Van Stralen M., Hui S.C.N., Chu W.C.W., Cheng J.C.Y., Castelein R.M. (NL & CN)
- 14.34 **O219 Instrumentation following decompression for spinal metastases - Is there a need for fusion in addition to internal Åxation?**  
Fenton E., Mercier P., Bains I., Jacobs W.B. (CA & US)
- 14.38 **O220 Concomitant isthmic spondylolisthesis does not influence the curve pattern of scoliosis in young patients**  
Schlenzka D., Ylikoski M., Yrjonen T., Lund T., Österman H., Poussa M. (FI)
- 14.42 **O221 Oblique lateral interbody fusion combined with posterior spinal Åxation using transscial pedicle screws in adult spinal deformity**  
Chazono M., Takaaki T., Shun Y., Keishi M. (JP)
- 14.46 **O222 Comparison of autograft versus allograft in patients undergoing posterior instrumentation and fusion for adolescent idiopathic scoliosis**  
Schlenzka D., Puisto V., Yrjonen T., Österman H., Lund T., Laine T. (FI)
- 14.50 **Group discussion**
- 15.00 **O223 Near pre-operative shoulder and trunk range of motion during gait after surgical correction of adolescent idiopathic scoliosis**  
Holewijn R.M., Kingma I., De Kleuver M., Schimmel J., Keijsers N. (NL)
- 15.04 **O224 Prospective investigation of perioperative complications after correction surgery for spinal deformity**  
Takahashi Y., Suzuki S., Nishida M., Fujita N., Yagi M., Kaneko S., Hosogane N., Ishikawa M., Kono H., Fukuda K., Okada E., Hikata T., Nakamura M., Matsumoto M., Watanabe K. (JP)
- 15.08 **O225 Does spinopelvic alignment affect residual low back pain after lumbar spinal fusion?**  
Tashiro K., Kanayama M., Oha F., Shimamura Y., Kuroki K., Hisada Y., Suzuki Y., Hashimoto T., Kaneko K. (JP)
- 15.12 **O226 Health related quality of life in 1252 adults with idiopathic scoliosis - A comparison of untreated, brace treated and surgically treated patients**  
Diabakerli E., Grauers A., Danielsson A., Gerdhem P. (SE)
- 15.16 **O227 Results of the modern Luque Trolley in the 21st century - A self-growing, guided rod system**  
Hammett T.C., Glancz L.G., Kumaria A., Grevitt M.P., Shafay M., Mehdian S.M. (UK)
- 15.20 **Group discussion**
- 15.30 **O228 The choice of upper instrumented vertebra in AIS and shoulder balance**  
Khanat K., Khouri G., Sebaaly A., Ghosn E., Keichati G. (LB)



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Room 4

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

65

Monday

Tuesday

Wednesday

Thursday


Friday

Posters

Meetings

66

67


**AOSPINE AOSpine**

- 15.34 **O229** Risk factors and role of bone cement augmentation for adjacent vertebrae fracture after multilevel adult deformity fusion with low bone mass  
Plashnikov D.A., Masevnikov S.V., Michailov D.A., Smekalenkov O.A., Zaborovskii N.S., Lapaeva O. (RU)
- 15.38 **O230** Which is the best indicator to evaluate craniocervical balance?  
CCG, C1SVA or C2SVA  
Tamai K., Suzuki A., Takahashi S., Terai H., Toyoda H., Hoshino M., Hayashi K., Oyama S., Akhgar J., Suhrab M., Ahmadi S.A., Nakamura H. (JP)
- 15.42 **O231** The use of rhBMP-7 in surgical treatment of paediatric patients affected by symptomatic grade I isthmic spondylolysis: A 7-years follow-up study  
Oggiano L., La Rosa G. (IT)
- 15.46 **Group discussion**
- 16.00 **Break**
- Session 2: Degenerative lumbar**  
Chair: Berjano P. (IT)
- 16.30 **O135** Key opening lecture: Continuum from adult degeneration to deformity  
Berjano P. (IT)
- 17.00 **O232** Autologous disc chondrocyte transplantation in lumbar spine disc degeneration disease – A prospective, controlled, randomized study  
Hohaus C., Dindigkeit F., Meise H.J. (DE)
- 17.05 **O233** When does compensation for lumbar stenosis become a deformity?  
Lafage R., Buckland A., Vira S., Oren J., Lafage V., Liabaud B., Spiegel M., Diebo B., Protopsaltis T., Schwab F., Bendo J. (US)
- 17.10 **O234** Spinal surgery without laboratory investigations – A preliminary report  
Czyz M., Parks R.M., Behrbalk E., Nowicki R., Chrystal M., Boszczyk B.M. (UK)
- 17.15 **Group discussion**
- 17.30 **O235** Relationship between in vivo screw insertion torque and postoperative screw loosening in posterior instrumented fixation for lumbar degenerative diseases - Comparison study between cortical bone trajectory screw and traditional pedicle screw  
Takahashi T., Hanakita J., Kawaoka T., Ohtake Y. (JP)
- 17.35 **O236** The natural polyphenol epigallocatechin gallate protects intervertebral disc cells from oxidative stress  
Wuertz-Kozak K., Krupkova O., Handa J., Klasek J., Ospelt C., Ferguson S. J. (CH & JP)
- 17.40 **O237** Genetics is the main determinant of disc space height one and two levels cranial to the adjacent segment  
Omair A., Mannion A.F., Holden M., Leivseth G., Fairbank J., Hägg G., Fritzell P., Brox J.I. (NO, CH, UK & SE)
- 17.45 **Group discussion**


**The International Society for the Advancement of Spine Surgery**
**Session 1**

Chairs: Anand N. (US) &amp; Kumar N. (SG)

- 08.10 **O241** Impact of race and insurance status on surgical approach for cervical spondylotic myelopathy in the United States: A population-based analysis  
McClelland III S., Marasciachi B.J., Passius P.G., Protopsaltis T.S., Frempong-Boadu A.K., Erico T.J. (US)
- 08.16 **O242** The incidence of Proximal Junctional Kyphosis (PJK) in patients undergoing circumferential minimally invasive surgery (cMIS) for Adult Spinal Deformity (ASD) - A 7 year experience  
Anand N., Cohen J., Cohen R., Khandehroo B., Baron E., Kahwaty S. (US)
- 08.21 **O243** Comparison of complications, clinical and radiographic outcomes between non-obese and obese patients with adult spinal deformity undergoing minimally invasive surgery  
Park P., Wang M., Nguyen S., Mundis G., La Marca F., Uribe J., Anand N., Okonkwo D., Kanter A., Fessler R., Eastlack R., Chou R., Deviren V., Nunley P., Shaffrey C., Mummaneni P. (US)
- 08.27 **O244** Intra operative force and distraction measurement in growing rod for early onset scoliosis and the factors affecting them  
Kandwal P., Vijayaraghavan G., Goswami A., Bidre U., Jayaswal A. (IN)
- 08.33 **Discussion**
- 08.53 **O245** Cervical disc replacement vs. ACDF in the injured worker population  
Kube R.A., Morrow D.M. (US)
- 08.59 **O246** How to prevent proximal junctional kyphosis following combined short anterior and posterior fusion to sacrum without osteotomy in degenerative lumbar kyphosis?  
Shin D.S.J., Lee J.H., Chang D.G., Kim K.T., Lee S.H., Kang K.C., Jeong H.Y. (KR)
- 09.05 **Discussion**
- 09.31 **O247** Stand-alone LLF procedure: In which patient it can be used without cage subsidence?  
Pimenta L., Amaral R., Marchi L., Forti F., Oliveira L., Coutinho E., Jensen R. (BR & US)
- 09.37 **O248** Efficacy of demineralized bone sponges and concentrated bone marrow in posterolateral lumbar fusion  
Yoon B.V., Schroeder J., Abjornson C., Girardi F.P., Sama A.A. (IL & US)
- 09.43 **Discussion**
- 10.00 **Break**
- 10.30 **O249** Analysis of postoperative thoracolumbar spine infections in a prospective randomized controlled trial using the centers for disease control surgical site infection criteria  
McClelland III S., Takemoto R.C., Lonner B.S., Tate A.M., Park J.J., Ricart-Hofaz P.A., Bendo J.A., Goldstein J.A., Spivak J.M., Erico T.J. (US)
- 10.36 **O250** Comparison of radiographic measures of interbody fusion between PEEK and nanostructured porous titanium coated PEEK cages in a sheep model  
Freeman B.J.C., Jones C.F., Colloca C.J., Callary S., Hall D.J., Muliabrahimovic A., Kuliwaba J.S., Szpalski M., Gunzburg R. (BE & AU)


**The International Society for the Advancement of Spine Surgery**

- 10.41 **O251** Identification of risk factors associated with occurrence of neurophysiological alarms during intraoperative monitoring in spinal deformity corrective surgeries  
Kandwal P., Vijayaraghavan G., Jaryal A., Goswami A., Jayaswal A. (IN)
- 10.47 **O252** Biomechanics of expandable lumbar interbody fusion cage deployed through transforaminal approach  
Voronov L.I., Conti Mica M., Carandang G., Havey R.M., Wojewnik B., Patwardhan A.G. (US)
- 10.53 **Discussion**
- 11.03 **O253** Anterior approaches for treating failed posterolateral fusion or dynamic stabilization - A case series  
Pimenta L., Amaral R., Marchi L., Forti F., Oliveira L., Coutinho E., Jensen R. (BR & US)
- 11.09 **O254** What factors will affect the patients' clinical outcome after decompression surgery for lumbar spinal stenosis?  
Hu X., Lieberman I.H. (US)
- 11.15 **O255** Magnetically controlled growing rods for the management of early-onset scoliosis: Results and complications at 3-year follow-up  
La Rosa G., Oggiano L., Ruzzini L. (IT)
- 11.21 **O256** Cost and clinical outcome analysis of adolescent idiopathic scoliosis surgeries - Experience from a non-profit community hospital  
Lieberman I.H., Hu X., Brice S. (US)
- 11.26 **Discussion**
- 11.46 **O257** Effects of intraoperative anesthetic medications on postoperative urinary retention after single level lumbar fusion  
Singh K., Mayo B.C., Massei D.H., Louie P.K., Bohl D.D., Iantomo S., Ahn J., Tabaraee E. (US)
- 11.52 **O258** The accuracy of prognostic scoring systems in predicting survival of lung cancer patients with spinal metastases  
Kumar N., Tan J., Tan K., Zaw A.S., Kumar N. (SG)
- 11.58 **O259** Revision versus primary adult spinal deformity surgery: Comparison of radiographic and clinical outcomes  
Lieberman I.H., Hu X. (US)
- 12.04 **O260** Postoperative narcotic following a single-level minimally invasive transforaminal lumbar interbody fusion: A comparison by body mass index  
Singh K., Massei D.H., Mayo B.C., Long W.W., Modi K.D., Bohl D.D. (US)
- 12.10 **Discussion**
- 12.30 **Lunch break + Industry workshops**



**SMISS Society for Minimally Invasive Spine Surgery**

**Session 1: MISS - Free papers: Part 1**  
Chairs: Kwon B. (US) & Lim H.H. (MY)

- 14.00 **Welcome**  
Kwon B. (US) & Lim H.H. (MY)
- 14.04 **O261 Does greater body mass index increase the risk for revision procedures following a single-level minimally invasive lumbar discectomy?**  
Singh K., Bohl D.D., Ahn J., Massei D.H., Mayo B.C., Long W., Modi K.D., Baques B.A. (US)
- 14.08 **O262 Spine surgeon selection criteria: Factors influencing patient choice**  
Singh K., Manning B.T., Ahn J., Bohl D.D., Louie F.K., Massei D.H., Mayo B.C. (US)
- 14.12 **O263 Correlation of determinant factors for indirect neural decompression after extreme lateral interbody fusion**  
Navarro-Ramirez R., Moriguchi Y., Alimi M., Corredor J.A., Gotfryd A., Berlin C., Härtl R. (US)
- 14.16 **O264 Lumbar spinal canal through extreme lateral interbody fusion (XLIF) procedure is gradually increasing over time: Effect of indirect decompression**  
Otsuka S., Fukuoka M., Mizutani J., Suzuki N., Matsumoto Y., Kondo A., Otsuka T. (JP)
- 14.20 **Discussion**
- 14.30 **O265 Five year clinical outcome comparing 2 level open TLIF versus MIS TLIF: A matched pair analysis**  
Lai M.C., Siddiqui M.A., Lim Y.G., Seng C.S., Yeo W., Chen J.L.T., Fong P.L., Yue W.M., Guo C.M., Tan S.B. (SG)
- 14.34 **O266 A new method to assess indirect decompression after extreme lateral interbody fusion using a new generation of intraoperative computed-tomography scanner (Volumetric Study)**  
Navarro-Ramirez R., Moriguchi Y., Berlin C., Hainland T., Lian X., Härtl R. (US)
- 14.38 **O267 Lateral access anterior lumbar interbody fusion is safe even in the cases with prior abdominal surgery**  
Okudaira T., Baba H., Konishi H., Yamaguchi T., Yokota K., Yamada S., Hirata H. (JP)
- 14.42 **O268 How to strategically predict lumbar lordosis correction with oblique lateral interbody fusion (OLIF) surgery for degenerative lumbar kyphoscoliosis**  
Kotani Y., Gonchar I., Fujita R., Hamasaki M., Beng Tan B., Fukaya H., Masuko T. (JP)
- 14.46 **Discussion**
- 14.56 **O269 Robotic-guided sacro-pelvic fixation using S2 Alar-Iliac screws: Feasibility and accuracy**  
Lieberman I., Hu X. (US)
- 15.00 **O270 Advantages of navigation in minimal invasive TLIF**  
Godino-Martinez O., Lopez-Obanio L., Plans-Ahicart G., Gabarrós-Canals A. (ES)

**SMISS Society for Minimally Invasive Spine Surgery**

- 15.04 **O271 A prospective study of intraoperative radiation exposure to surgeons in minimally invasive transforaminal lumbar interbody fusion – Does the patient's body mass index impact on surgeon's radiation dose?**  
Funao H., Momoshima S., Isogai N., Shiono Y., Fujita N., Hikata T., Iwanami A., Watanabe K., Koyanagi T., Nakamura M., Matsumoto M., Ishii K. (JP)
- 15.08 **O272 Can MCID be achieved in elderly patients undergoing MIS deformity surgery?**  
Anand N., Park P., Okonkwo D., Ming Fu K., Nguyen S., Wang M., Uribe J., Mundis G., Deviren V., Fessler R., Shaffrey C., Chou D., Mummaneni P. (US)
- 15.12 **Discussion**
- 15.22 **O273 Autogenous stem cell injection into the intervertebral disc to treat low back pain - Is it effective and safe? Can we treat more than one degenerated level? A prospective controlled study**  
Vaz de Lima M., Pettine K., Tschy F. (BR)
- 15.26 **O274 Autogenous Bone Marrow Concentrate (BMC) Injection into the intervertebral disc to treat discogenic low back pain – A safe and effective method – Does the concentration (cells/ml) of stem cells in the BMC matter?**  
Vaz de Lima M., Pettine K., Tschy F. (BR)
- 15.30 **O275 Anatomic considerations of extratransforaminal lumbar interbody fusion: A cadaveric study**  
Kumar A., Qureshi S., Merrill R. (US)
- 15.34 **O276 Trans Articular Surface Screw (TASS) for minimum invasive PLIF**  
Terai H., Javid A., Suzuki A., Toyoda H., Tamai K., Hayashi K., Takahashi S., Shurab Rahmani M., Nakamura H. (JP)
- 15.38 **Discussion**
- 15.48 **Concluding comments**
- 16.00 **Break**
- Session 2: MISS - Free papers: Part 2**  
Chair: Taylor W. (US) & Wu J.C. (TW)
- 16.30 **Welcome**  
Taylor W. (US) & Wu J.C. (TW)
- 16.34 **O277 Clinical and radiographic parameters associated with best vs. worst clinical outcomes in minimally invasive deformity surgery**  
Vogel T., Than K., Park P., Ming Fu K., Nguyen S., Wang M., Shaffrey C., Bess S., Akbaria B., Deviren V., Uribe J., Okonkwo D., Mundis G., Mummaneni P.V. (US)
- 16.38 **O278 Acute and hyper-acute corpectomy for traumatic burst fractures using a mini-open lateral approach**  
Smith W., Christian G. (US)
- 16.42 **O279 Accuracy of fluoroscopically-assisted percutaneous pedicle screws placed in patients in the lateral decubitus position**  
Kwon B., Khalil A. (US)



Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings

**SMISS Society for Minimally Invasive Spine Surgery**

- 16.46 **O280 Prevention of neurological complications using a neural monitoring system with a Anger electrode in extreme lateral interbody fusion**  
Narita W., Takatori R., Arai Y., Nagae M., Hayashida T., Kitanaka S., Tonomura H., Harada T., Osawa T., Hase H., Ogura T., Kubo T. (JP)
- 16.50 **Discussion**
- 17.00 **O281 A prospective, multi-center comparison of clinical outcomes between TLIF and XLIF for the treatment of degenerative spondylolisthesis at L4-5 at two-year follow up**  
Smith W., Phillips F., Khajavi K., Kanter A., Peterson M. (US)
- 17.04 **O282 Clinical results of combined multiple OLIF and posterior instrumentation for adult spinal deformities: Emphasis on hybrid posterior MIS technique for improvement of sagittal plane correction**  
Kotani Y., Gonchar I., Hamasaki M., Fujita R., Fukaya A., Masuko T. (JP)
- 17.08 **O283 Clinical and radiological results following lateral (LIF) versus transforaminal lumbar interbody fusion (MI-TLIF)**  
Lee R., Sedra F., Wilson L., Afsharipad A., Dala-Ali B. (UK)
- 17.12 **O284 The impact of minimally invasive spinal deformity surgery on ICU and hospital stay**  
Nunley P., Chou D., Wang M., Ming Fu K., Nguyen S., Mundis G., Shaffrey C., Okonkwo D., Kanter A., Deviren V., Uribe J., Anand N., Park P., Mummaneni P.V. (US)
- 17.16 **Discussion**
- 17.26 **O285 Two-year clinical outcomes of multilevel extreme lateral lumbar interbody fusion (XLIF®) versus minimally invasive surgery – Transforaminal lumbar interbody fusion (MIS-TLIF) for degenerative scoliosis/spondylolisthesis: A matched comparison study**  
Jiang L., Ng Y.H., Yue W.M., Guo C.M., Tan S.B., Siddiqui M.A. (SG)
- 17.30 **O286 MIS-TLIF reduces an incidence of adjacent segment disease in the patient with degenerative spondylolisthesis – Comparative study with conventional TLIF**  
Ishii K., Hikata T., Shiono Y., Funao H., Kaneko Y., Ishihara S., Isogai N., Fujita N., Nakamura M., Matsumoto M., Iwanami A., Watanabe K. (JP)
- 17.34 **O287 Incomplete pars interarticularis fractures treated by percutaneous screw fixation**  
Wilson L., Philippa T., Altaf F., Sedra F., Lee R. (UK)
- 17.38 **O288 Manufacturing and implantation of an individualized 3D printed titanium cage for cervical fusion**  
Spetzger U., Frasca M., Eisen G. (US & DE)
- 17.42 **Discussion**
- 17.52 **Concluding comments**
- 18.00 **Adjourn**

Thursday, May 19  
ScientiAc Program

	Room 1 Heliconia	Room 2 Heliconia	Room 3 Hibiscus	Room 4 Hibiscus	Room 5 Jasmine
	APSS	ISSLS	ICSG	NASS	SMISS
10.00	Break				
	APSS & SMISS	ISSLS	ICSG	NASS	
12.30	Break + Industry workshops				
	APSS	SOLAS	ISASS & SMISS	AOSPINE	SMISS & ISASS
16.00	Break				
	APSS	SOLAS	ISASS & SMISS	AOSPINE	SMISS & ISASS



Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings



Asia Pacific Spine Society

Session 1: Presidential lecture  
Chair: Shanmugam K.S. (MY)

- 08.00 Citation of Professor Kuniyoshi Abumi  
Shanmugam K.S. (MY)
- 08.10 1136 Presidential lecture: In my 40 years' practice of spine surgery: What have I learnt?  
Abumi K. (JP)
- 08.35 Q&A
- Session 2: Cervical spine  
Chair: Liu G. (SG) & Chaddha R. (IN)
- 08.45 1137 Why do Asian have less symptomatic adjacent level cervical disease?  
Chung J.Y. (KR)
- 09.00 1138 A decade old argument for the best approach for multilevel cervical myelopathy: Is there a verdict?  
Shimizu K. (JP)
- 09.15 1139 Is there a solution to C5 palsy?  
Pokharel R. (NP)
- 09.30 1140 Is whiplash treatable?  
Osti O.L. (AU)
- 09.45 Q&A
- 10.00 Break



Society for Minimally Invasive Spine Surgery  
Asia Pacific Spine Society

APSS / SMISS Joint session  
Session 3: Joint meeting APSS + SMISS  
Chairs: Pennings F. (US) & Liu G. (SG)  
Panel: Mummaneni P. (US) & Wang M. (US)

- 10.30 Welcome  
Pennings F. (US) & Liu G. (SG)
- 10.35 1141 APSS Presentations  
Nucleoplasty: Indication techniques and results - Kumar N. (SG)
- 11.00 1142 Tips and tricks for MED decompression technique - Yoshida M. (JP)
- 11.25 1143 Tips and tricks for thoracoscopic surgery technique - Wong H.K. (SG)
- SMISS Presentations
- 11.50 1144 Robotics in spine surgery: Update - Wang M. (US)
- 12.10 1145 Navigation in spine surgery: Update - Mummaneni P. (US)
- 12.30 Lunch break + Industry workshops



Asia Pacific Spine Society

Free papers: Cervical  
Chairs: Shimizu K. (JP) & Yue W.M. (SG)

- 14.00 O289 A MRI study of the dorsal cervical cord migration behaviour in hybrid open-door laminoplasty  
Lee B.H., Gabriel Liu K.P., Poh E., Wong H.K. (SG)
- 14.04 O290 Feasibility and trajectory study of anterior transarticular crossing screw placement for atlantoaxial joint instability: A cadaveric study and description of a novel technique  
Ji W., Chen J., Zhu Q. (CN)
- 14.08 O291 Recommendation of outpatient clinic for numbness (Shibire-clinic in Japanese)  
Neji M. (JP)
- 14.12 O292 Revision surgeries following artificial disc replacement of cervical spine  
Park J.B., Chang H., Yeom J.S., Suk K.S., Lee D.H., Lee J.C. (KR)
- 14.16 O293 Artificial disc replacement versus fusion for multi-level cervical spondylotic radiculopathy  
Ramos M.R., Laput A.P.V., Ver M.R. (PH)
- 14.20 Q&A
- Free papers: Cervical  
Chairs: Yoshida M. (JP) & Yamasaki R. (JP)
- 14.30 O294 Is there an increase in intraoperative bleeding during emergency hybrid open-door laminoplasty for post-traumatic cervical cord injured patient?  
Lee B.H., Gabriel Liu K.P., Wong H.K. (SG)
- 14.34 O295 In continuous type ossification of posterior longitudinal ligament, which one is treatment of choice - Laminectomy or laminoplasty?  
Yoo S., Ryu S., Choi H., Ryu D.S., Cho Y. (KR)
- 14.38 O296 Clinical results and complications of surgical treatment for thoracic myelopathy caused by ossification of the posterior longitudinal ligament: A multicenter retrospective study  
Hayashida M., Harimaya K., Maeda T., Ohta H., Shirasawa K., Tsuchiya K., Terada K., Kaji K., Anzono T., Saito T., Fujiwara M., Iwamoto Y. (JP)
- 14.42 O297 A clavus plate fixation for reconstruction of ventral defect of the craniovertebral junction: A novel fixation device for craniovertebral instability  
Ji W., Chen J., Zhu Q. (CN)
- 14.46 O298 Clinical features and direct medical cost for patients with acute spinal cord injury  
Kato M., Endo Y., Hashimoto T., Tashima H., Udagawa K., Horiuchi K., Fujita Y., Takahashi M. (JP)
- 14.50 Q&A



Asia Pacific Spine Society

Session 4: Operative video sessions: Surgical techniques in cervical spine  
Chair: Rajasekaran S. (IN)

- 15.00 1146 Cervical pedicle screw insertion and management of VA injury  
Abumi K. (JP)
- 15.15 1147 Posterior cervical decompression technique  
Yoshida M. (JP)
- 15.30 1148 Anterior cervical decompression technique  
Shimizu K. (JP)
- 15.45 Q&A
- 16.00 Break

Session 5: Adult spinal deformity  
Chairs: Akbaria B. (US) & Wong Y.W. (HK)

- 16.30 1149 Should we stop at T10 as UIV?  
Ignacio J.M.F. (PH)
- 16.45 1150 Must we perform L5 S1 Fusion in all adult spinal deformity cases?  
Wong Y.W. (HK)
- 17.00 1151 Biologics in deformity  
Berven S. (US)
- 17.15 1152 MIS adult spinal deformity surgery: Is it better?  
Anand N. (US)
- 17.30 Q&A
- Case discussion  
Case discussants: Ignacio J.M.F. (PH) & Wong Y.W. (HK) & Anand N. (US)
- 17.45 Case 1: The adequacy of distal fixation in adult scoliosis surgery  
Wong Y.W. (HK)
- 18.00 Case 2: Neglected adult idiopathic scoliosis  
Case 3: Severe kyphosis after surgical correction for achondroplasia  
Ha K.Y. (KR)
- 18.15 Case 4: Application of ACR in sagittal deformity correction  
Akbaria B. (US)



The International Society for the Study of the Lumbar Spine

Session 10: Complications  
Chairs: Tomkins Lane C. (CA) & Mossaad M. (EG)

- 07.30 O299 Complications and repeat operation associated with greater surgical invasiveness in lumbar spondylolisthesis: Findings of the High Value Healthcare Collaborative  
Martin B., McGuire K., Gladders B., Lurie J., Farokhi F., Weinstein J. (US)
- 07.37 O300 Incidental dura lesions and the effect on outcome after decompression for lumbar spinal stenosis: Results of a prospective multi-center study  
Sepe C., Quante M., Engler N., Pirchner S., Heider F., Kothe R. (DE)
- 07.44 O301 The impact and value of uni- and multimodal intraoperative monitoring (MIOM) on neurological complications during spine surgery: A prospective study of 2728 patients  
Dvorak J., Sutter M., Eggspühler A., Jeszensky D., Kleinstueck F., Fekete T., Haschtmann D., Porchet F. (CH)
- 07.51 Discussion
- 08.00 O302 Validation of the Mirza Invasiveness Index in patients undergoing surgery for lumbar spinal disorders registered in Eurospine's Spine Tango Registry  
Mannion A., Kleinstueck F.S., Jeszensky D., Porchet F., Pigott T., Greiner-Perth R., Berlemann U., Aghayev E. (CH)
- 08.07 O303 Risk factor analysis of surgical site infections after posterior instrumentation fusion surgery for spinal trauma: Prospective multicenter study  
Ogihara S., Yamazaki T., Maruyama T., Chikuda H., Inanami H., Miyoshi K., Oshima Y., Azuma S., Yamada T., Murakami M., Kawamura N., Yamakawa K., Morii J., Saita K. (JP)
- 08.14 O304 The pullout strength of pedicle screws following re-direction after lateral wall breach or end-plate breach  
Goda Y., Higashino K., Takata Y., Sakai T., Saito K. (JP)
- 08.21 Discussion
- 08.30 General poster session (eSpine area)
- Invited lecture II  
Chair: Wong H.K. (SG)
- 09.30 1153 Volcano prognosis: When and how big will be the next eruption?  
Costa Rodriguez F. (SG)
- 10.00 Break
- Session 11: Outcomes  
Chairs: Gibson A. (UK) & Hasegawa K. (JP)
- 10.30 O305 Do lumbar decompression and fusion patients recall their preoperative status? Recall bias in patient-reported outcomes  
Nassr A., Aleem I., Duncan J., Ahmed A., Eck J., Rhee J., Currier B. (US)
- 10.37 O306 Concordance between patients' and surgeons' expectations of lumbar spine surgery  
Girardi F., Mancuso C., Duculan R., Cammisia F., Sama A., Hughes A., Lebl D. (US)





## The International Society for the Study of the Lumbar Spine

- 10.44 O307 InAuence of previous surgery on patient-rated outcome after surgery for degenerative disorders of the lumbar spine  
Zehnder P., Aghayev E., Fekete T.F., Haschtmann D., Pigott T., Mannion A. (CH)
- 10.51 Discussion
- 11.00 O308 Preoperative psychological factors affect surgical satisfaction in elderly patients with lumbar spinal stenosis  
Kawakami M., Ishimoto Y., Nagata K., Kitagawa T., Minetama M., Nakagawa M., Fukui D. (JP)
- 11.07 O309 What health-related outcome measure best predicts future healthcare costs after spine surgery for degenerative spinal disorders?  
Mannion A., O'Riordan D., von Büren M. (CH)
- 11.14 O310 Assessing the utility of a clinical prediction score regarding 30-day morbidity and mortality following metastatic spinal surgery: The New England Spinal Metastasis Score (NESMS)  
Bono C.M., Schoenfeld A.J., Leonard D.A., Harris M.B. (US)
- 11.21 Discussion
- Session 12: Pain  
Chairs: Barz T. (DE) & Kawakami M. (JP)
- 11.30 O311 Proinflammatory cytokine upregulates the expression of glial cell line-derived neurotrophic factor by human intervertebral disc cells  
Yamada J., Akeda K., Masuda K., Yamada K., Cheng K., Takegami N., Nakase K., Sudo A. (JP)
- 11.37 O312 Changes of pain-related behavior and  $\mu$ -opioid receptor expression in a rat lumbar disc herniation model  
Kaneuchi Y., Sekiguchi M., Kobayashi Y., Kameda T., Konno S. (JP)
- 11.44 O313 Effectiveness and cost-effectiveness of radiofrequency denervation for chronic low back pain originating from the facet joints  
Van Tulder M., Maase, Juch J., Ostelo R., Groeneweg G., Kallewaard J.W., Koes B., Verhagen A., van Dongen H., Huijgen F. (NL)
- 11.51 Discussion
- 12.00 Second business meeting (members only)
- 12.30 Lunch break + Industry workshops



## Room 3



## International Consortium for Scoliosis Genetics

### ICSG Business meeting

- 07.45 Minutes
- 07.55 Round table discussion: Ethical considerations across continents
- 08.35 I159 Invited lecture: Biobank for early onset scoliosis  
Garcia M. (AU)
- 08.45 Building collaborative biobanks
- 09.25 Update on phenotyping consensus  
Phenotyping subcommittee
- 09.40 Update on genome-wide meta-analysis  
Genetics subcommittee
- 09.55 Proposed ICSG meeting 2017  
Wise C. (US)
- 10.10 Other business
- 10.20 Break
- 10.50 I160 Invited lecture: Scoliosis animal models - Strategies and challenges  
Chan D., Cheah K. (CN)
- 11.10 O314 Compound inheritance of null mutations and the hypomorphic risk haplotype in TBX6 also causes congenital scoliosis in Japanese  
Takeda K., Watanabe K., Ogura Y., Kawakami N., Qudo H., Minami S., Kotani T., Miyake N., Fujita N., Nakamura M., Matsumoto M., Ikegawa S. (JP)
- 11.25 O315 Roentgenographic evaluation of the spine in patients with osteogenesis imperfecta  
Vaz de Lima M. (BR)
- 11.40 O316 Limited consensus regarding choice of phenotypes in idiopathic scoliosis - Results from an international research consortium including basic and clinical researchers  
Dahl B., Cheung K.M., Wise C., Bow C. (DK, CN & US)
- 11.55 I161 Invited lecture: DeÅning scoliosis phenotypes - Lessons from consensus survey  
Dahl B. (DK)
- 12.05 I162 Invited lecture: 3D Phenotyping  
Cheung J. (HK)
- 12.15 Discussion
- 12.30 Lunch break + Industry workshops



## Room 3



## Society of Lateral Access Surgery

- 14.00 Welcome to the SOLAS meeting at SpineWeek 2016  
Program chairs
- Session 1: Hot topics in lateral access surgery  
Chairs: Berjano P. (IT), Smith W. (US) & Pimenta L. (BR)
- 14.10 I154 Overview of lateral lumbar interbody fusion  
Pimenta L. (BR)
- 14.20 I155 Strategies for successful implementation of lateral lumbar surgery  
Smith W. (US)
- 14.30 I156 The value of lateral approach in degenerative lumbar conditions  
Taylor W. (US)
- 14.40 I157 Lateral surgery for degenerative scoliosis  
Berjano P. (IT)
- 14.50 I158 Anterior alternatives to PSO  
Akbaria B. (US)
- 15.05 Panel discussion with audience questions
- Session 2: Case-based discussion - 3 Cases per topic discussed by expert panel with audience participation  
The educational goal of this session is to provide interactive case-based discussion exposing the participants to strategies that can benefit their practice. For those who are new to lateral surgery looking for a better understanding of indications to surgeons with lateral surgery experience looking for pearls to augment their practice, this engaging session will have learning opportunities for all participants.
- 15.10 Case-Based Session # 1: Utility of lateral surgery in revision degenerative lumbar cases  
Chair: Berjano P. (IT)
- Presentation of cases & discussion  
Menezes C. (BR), Kanemura T. (JA), Quante M. (DE)
- 15.55 Break
- 16.25 Case-Based Session # 2: Safe & effective lateral surgery at L4-L5  
Chair: Smith W. (US)
- Presentation of cases & discussion  
Taylor W. (US), Changming G. (S), Quante M. (DE), Cleaver N. (AU)
- 17.20 Case-Based Session # 3: Lateral surgery for deformity and alignment correction  
Chair: Berjano P. (IT)
- Presentation of cases & discussion  
Deviren V. (US), Diwan A. (AU), Akbaria B. (US)
- 18.10 SOLAS meeting adjourns  
Program chairs



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## Room 3



## The International Society for the Advancement of Spine Surgery Society for Minimally Invasive Spine Surgery

Case Discussion: L4-5 Grade 1 degenerative spondylolisthesis with stenosis Back (50%) and leg pain (50%)  
Chairs: Anand N. (US) & Kumar N. (SG)

- 14.00 Introduction
- 14.06 Lumbar decompression  
Kumar N. (SG)
- 14.35 Endoscopic decompression  
Yue J. (US)
- 15.04 Decompression with CoAx  
Yue J. (US)
- 15.30 MIS TLIF  
Anand N. (US)
- 16.00 Break
- 16.30 MIS LLIF with PSF  
Wang M. (US)
- 17.00 ALIF with PSF  
Foley K. (US)
- 17.30 PSF only  
Kumar N. (SG)
- 18.00 ADR  
Pimenta L. (BR)



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**North American Spine Society**

- 07.30 **Welcome**
- Paper presentations: Spinal tumor and traumatic injuries**  
Chairs: Bono C.M. (US) & Kawaguchi Y. (JP)
- 07.35 **O317** Effectiveness of pre-operative selective arterial embolization to reduce intra-operative blood loss in patients with primary tumors of the mobile spine  
Xu N., Wei F., Li Z., Liu X., Jiang L., Liu Z. (CN)
- 07.41 **O318** Quality of life after different surgical procedures for spinal metastases – A prospective cohort study  
de Ruiter G.C.W., Nogaerde C., Wolfs J.F.C., Arts M.P. (NL)
- 07.47 **O319** Pre-operative magnetic resonance and intra-operative computed tomography fusion for real-time neuronavigation in intramedullary lesion surgery  
Costa F. (IT)
- 07.53 **O320** Revision surgery for spinal metastatic disease – Indications and outcomes  
Choudhury M.Z., Bali N.S., Chan S.L., Stirling A.J., Grainger M.F. (UK)
- 07.59 **O321** Are cervical collars required for immobilisation in the emergency trauma setting?  
Gee C., Davies D., Kamani S., Elayed S., Casell J. (UK)
- 08.05 **O322** Early decompression and stabilization following cervical spinal cord injury: Examining the process of care from accident scene to surgery  
Freeman B.J.C., Battistuzzo C.R., Armstrong A., Clark J., Dunlop S.A., Batchelor P.E. (AU)
- 08.11 **O323** Assessment of whole spine MRI for multilevel non-contiguous spinal fractures: Incidence, patterns & missed injuries  
Kanna R., Gaikar C., Maheswaran A., Shetty A.P., Rajasekaran S. (IN)
- 08.15 **Discussion**
- Paper presentations: Predictive factors after surgery**  
Chairs: Wetzel F.T. (US) & Thng P. (SG)
- 08.30 **O324** Effect of a comprehensive pre-surgical education program on the anxiety levels of patients with spinal disorders: A prospective study  
Hu X., Block A.R., Brice S., Bedeman S.S., Lieberman I.H. (US)
- 08.36 **O325** The effect of obesity and being overweight on disability and pain after lumbar fusion: An analysis of 805 patients  
Neva M.H., Sommachii Y., Vintonen K., Kyrölä K., Iizuka H., Takagishi K., Hakkinen A. (FI & JP)
- 08.42 **O326** Comparison of intrathecal diamorphine with conventional methods of analgesia following lumbar spine surgery  
Lee R.S., Krishnan R., Kennedy J., Sedra F. (UK)



Room 4


**North American Spine Society**

- 08.48 **O327** Quality of life and disability – Can they be improved by active postoperative rehabilitation after spinal fusion surgery? A randomised controlled trial with 12-month follow-up  
Neva M.H., Iives O., Dekker J., Pekkanen L., Marttinen I., Vintonen K., Pitulainen K., Järvenpää S., Hakkinen A. (FI & NL)
- 08.54 **Discussion**
- 09.30 **Break**
- Paper presentations: Lumbar disc herniations and stenosis**  
Chairs: Dohring E.J. (US) & Rajasekaran S. (IN)
- 10.00 **O328** Prognostic models of the outcome of surgery for disc herniation  
Mannion A.F., Staub L.P. (CH)
- 10.06 **O329** A comparison of quantitative and qualitative gradings of lumbar spinal stenosis based on MRI  
Mannion A.F., Pacifico D., O'Riordan D., Scizas C. (CH)
- 10.12 **O330** A prospective, multi-center comparison of outcomes for lumbar fusion in the treatment of degenerative spondylolisthesis and degenerative disc disease at two-year follow up  
Smith W., Phillips F.M., Khajavi K., Kanter A., Peterson M. (US)
- 10.18 **O331** Changes in dural sac caliber with standing MRI improve correlation with symptoms of lumbar spinal stenosis  
Lau Y.Y.O., Lee K.L., Chan L.Y., Kwok K.O., Griffiths J.F., Law S.W. (CN)
- 10.24 **O332** Does pre-operative magnetic resonance imaging of the lumbar multi-disc predict clinical outcomes following lumbar spinal decompression for symptomatic spinal stenosis?  
Zotti M.G.T., Vilas-Boas F., Clifton T., Piche M., Yoon W.W., Freeman B.J.C. (AU)
- 10.30 **O333** Decreased CSF area in spinal canal is highly correlated with risk of neurogenic intermittent claudication but not SF-36 or pain  
Peng H.Y., Lin P.C., Tsai W.L., Wu C.C., J Lin J.H., Chiang Y.H. (TW)
- 10.36 **Discussion**



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Room 4


**North American Spine Society**

- Endoscopically-assisted spine surgery: Current state and future directions**  
Chair: Dohring E.J. (US)
- 11.00 **Introduction**  
Dohring E.J. (US)
- 11.10 **I163** Transforaminal endoscopic discectomy  
Wong C.C. (MY)
- 11.25 **I164** Endoscopic rhizotomy  
Yue J. (US)
- 11.40 **I165** Percutaneous endoscopic cervical discectomy  
Lee S.H. (KR)
- 11.50 **I166** Endoscopic spine surgery: What is the future?  
Yeung A.T. (US)
- 12.10 **Discussion, questions**
- 12.30 **Lunch break + Industry workshops**



Room 4


**AOSpine**

- Session 1: Deformity**  
Chair: Liu G. (SG)
- 14.00 **I167** Key opening lecture  
Liu G. (SG)
- 14.30 **O334** The benefit of operative management of post-tumor spinal deformity  
Ptashnikov D., Zaborovskii N., Mikhaylov D., Smekalenkov O., Masevni S., Lapaeva O. (RU)
- 14.34 **O335** Cervical alignment after surgical correction of Scheuermann's Kyphosis  
Hammett T.C., Romana A.B.P., Nasto L., Mehdian H. (UK)
- 14.38 **O336** Age-adjusted alignment goals have the potential to reduce PJK  
Lafage R., Schwab F., Glasman S., Bess S., Diebo B., Sheer J., Hart R., Line B., Burton D., Kim H.J., Klineberg E., Protospaltis T., Ames C., Lafage V. (US)
- 14.42 **O337** Estimated X-ray exposure and additional cancer risk during surgical treatment of scoliosis in the growing spine  
Loughenbury P.R., Gentles S., Murphy E., Tomlinson J., Dunsmuir R.A., Gummerson N.W., Rao A.S., Rowbotham E., Millner P.A., Khan A.L. (UK)
- 14.46 **O338** Defining normative quality metrics in complex high-risk deformity cases: Results from the Scol-Risk 1 study  
Berven S.H., Saigal R., Lafage V., Kelly M., Kopjar B., Smith J., Dahl B., Cheung K.M., Cameron L.Y., Schwab F.J., Espinoza K., Shaffrey C.I., Fehlings M.G., Lenke L.G., Ames C.P. (US DK CN & CH)
- 14.50 **Group discussion**
- 15.00 **O339** De-novo degenerative lumbar scoliosis: A systematic review of prognostic factors for curve progression  
Faraj S., Holewijn R., van Hooff M., de Kleuver M., Haanstra T. (NL)
- 15.04 **O340** Clinical and radiographic risk factor for knee-spine syndrome in 535 elderly volunteers: Retrospective TOEI study  
Kobayashi S., Togawa D., Hasegawa T., Yamato Y., Oe S., Banno T., Mihara Y., Matsuyama Y. (JP)
- 15.08 **O341** Identifying thoracic compensation and predicting reciprocal thoracic kyphosis and PJK  
Lafage R., Protospaltis T., Diebo B., Smith J., Sciubba D., Passias P., Klineberg E., Burton D., Ames C., Shaffrey C., Bess S., Hart R., Schwab F., Lafage V. (US)
- 15.12 **O342** Appropriate treatment for adults with spinal deformity: An international consensus  
Berven S.H., Kamper S.J., Gernscheid N.M., Dahl B., Shaffrey C., Lenke L.G., Lewis S.J., Cheung K.M., Alanay A., Ito M., Polly D.W., de Kleuver M. (US AU CH DK CA TR JP & NL)
- 15.16 **O343** The development of a core outcome set for adolescent deformity surgery for the Nordic spine registries: An AOSpine deformity knowledge forum project  
Faraj S., van Hooff M., Haanstra T., Holewijn R., Gernscheid N., de Kleuver M. (NL & CH)
- 15.20 **Group discussion**



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Room 4

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

84

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

86

**AOSPINE AOSpine**

- 15.30 **O344** Adults with idiopathic scoliosis have similar physical activity level as controls  
Diabakerli E., Grauers A., Danielsson A., Gerdhem P. (SE)
- 15.35 **O345** Three dimensional morphometry of lumbar spine to design pedicle screw: First Indonesian population based study  
Sakti Y.M., Dewo P., Suwardi T., Lanodiyu Z., Magetsari R. (ID)
- 15.40 **O346** Operative strategy of thoracolumbar kyphosis secondary to old osteoporotic vertebral compression fracture  
Jiang Y., Chen Z.Q., Guo Z.Q., Zeng Y., Liu Z.J., Liu X.G. (CN)
- 15.45 **O347** Modified four-rod instrumentation technique to support long posterior fixations at high risk of failure  
Morassi G.L., Shafafy R., Quraishi N., Grevitt M., Boszczyk B.M., Shafafy M. (UK)
- 15.50 **Group discussion**
- 16.00 **Break**
- Session 2: Degenerative lumbar**  
**Chair: Thng P. (SG)**
- 16.30 **I168** **Key opening lecture**  
Thng P. (SG)
- 17.00 **O348** Unlocking TPA's clinical and sagittal significance by analyzing its relation to pelvic tilt  
Lafage R., Liabaud B., Oren J., Vira S., Harris B., Spiegel M., Diebo B., Tanzi E., Protosaltis T., Emco T., Schwab F., Lafage V. (US)
- 17.04 **O349** Histological analysis of bone regeneration with different doses of rhBMP-2 in an ovine lumbar interbody fusion model  
Hohaus C., Segrist K., Seeger J., Meisel H.J. (DE)
- 17.08 **O350** Lumbar paravertebral muscle fatty infiltration: Spatial distribution and association with disc degeneration in an Asian population  
Crawford R.J., Ni Mhuirís A., Cheung J., Bow C., Pang H., Elliott J.M., Karpinen J., Melloh M., Luk K., Cheung K., Samartzis D. (CH, AU, HK, US & FI)
- 17.12 **O351** Calcified giant thoracic disc herniations in adults: A series of 10 patients with at least 2 years of follow up  
Xu N., Wei F., Liu X., Jiang L., Liu Z. (CN)
- 17.16 **Group discussion**
- 17.30 **O352** Day case discectomy - Retrospective analysis of 70 case series  
Tomlinson J., Loughenbury P., Corns R., Derham C., Pal D., Rudol G., Thomson S., Khan A., Timothy J., Rao A., Borse V. (UK)

**AOSPINE AOSpine**

- 17.34 **O353** Synovial cysts of lumbar spine: State of the art – Outcome analysis on a series of two hundred ninety-four consecutive microsurgically resected cysts with long follow-up  
Ciarpaglini R., Ebeling U., Steinsepe K.F. (CH)
- 17.38 **O354** Long time follow up after posterior lumbar interbody fusion with bone morphogenetic protein-2  
Hohaus C., Meisel H.J. (DE)
- 17.42 **O355** Cement augmentation to reduce spinal interbody implant subsidence  
Borse V.H., Uddle A.M., Skrzypiec D.M., Timothy J., Jacob J., Persson C., Engqvist H., Kapur N., Hall R.M. (UK & SE)
- 17.46 **Group discussion**
- 18.00 **O356** Success criteria for core outcome measures in surgery for isthmic spondylolisthesis  
Rassvoll I., Setten Ø., Nygaard Ø.P., Solberg T. (NO)
- 18.04 **O357** The role of lumbar facet and nerve root block in low back pain and sciatic pain  
Marin-Sanabria E.A., Silvero J.R. (PY)
- 18.08 **O358** Early results of a minimally invasive fusion technique with mediolateral pedicle screws  
Orpen N. (UK)
- 18.12 **O359** Early unplanned readmissions in spine surgery: The current incidence and preventive aspects in Indian scenario  
Kanna R., Rajoli S.R., Shetty A.P., Rajasekaran S. (IN)
- 18.16 **O360** Treatment of symptomatic spinal stenosis with the transforminal endoscopic approach  
Yeung A. (US)
- 18.20 **Group discussion**

Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings



**SMISS Society for Minimally Invasive Spine Surgery**

**Session 1: MISS - Trauma and tumor**  
Chairs: Härtl R. (US) & Wong C.C. (MY)  
Panel: Pimenta L. (BR), Nakanishi K. (JP), Khoo L. (US), Kwan M.K. (MY), Nene A. (IN), Yue W.M. (SG) & Tanaka M. (JP)

- 08.00 **Welcome**  
Härtl R. (US) & Wong C.C. (MY)
- 08.05 **I169** Contemporary surgical management of metastatic spine disease  
Tanaka M. (JP)
- 08.17 **I170** Thoracolumbar trauma classifications for the practicing spine surgeon  
Nene A. (IN)
- 08.29 **Q&A**
- 08.35 **Case: Single thoracic metastatic lesion** - Kwan M.K. (MY)
- 08.39 **En bloc resection** - Nene A. (IN)
- 08.43 **Posterior open** - Tanaka M. (JP)
- 08.47 **MIS** - Khoo L. (US)
- 08.51 **How case was treated** - Kwan M.K. (MY)
- 08.55 **Discussion**
- 09.00 **Case: Traumatic TL burst fracture** - Nakanishi K. (JP)
- 09.04 **MIS Anterior-posterior** - Pimenta L. (BR)
- 09.08 **Percutaneous posterior instrumentation without fusion** - Yue W.M. (SG)
- 09.12 **Short versus long segment fixation** - Nene A. (IN)
- 09.16 **How case was treated** - Nakanishi K. (JP)
- 09.20 **Discussion**
- 09.30 **Case: A traumatic TL burst fracture in patient with osteoporosis** - Khoo L. (US)
- 09.34 **Open posterior laminectomy with instrumentation** - Nene A. (IN)
- 09.38 **Short segment vs long segment** - Kwan M.K. (MY)
- 09.42 **Cement augmentation** - Nakanishi K. (JP)
- 09.46 **How case was treated** - Khoo L. (US)
- 09.50 **Discussion**
- 10.00 **Break**



**The International Society for the Advancement of Spine Surgery Society for Minimally Invasive Spine Surgery**

**SMISS / ISASS Joint session**  
**Session 3: MISS - Spinal deformity**  
Chairs: Wong H.K. (SG) & Mummaneni P. (US)  
Panel: Ishii K. (JP), Pimenta L. (BR), Li Wen Wong E. (MY), Wang M. (US), Kwon B. (US) & Härtl R. (US)

- 14.00 **Welcome**  
Wong H.K. (SG) & Mummaneni P. (US)
- 14.05 **I171** Overview of cervical deformity: intrinsic or compensatory?  
Ishii K. (JP)
- 14.15 **Discussion**
- 14.20 **Case: Iatrogenic flatback with pseudarthrosis** - Mummaneni P. (US)
- 14.24 **ACR / Lateral MIS** - Wang M. (US)
- 14.28 **Open Posterior only** - Härtl R. (US)
- 14.32 **Open anterior-posterior** - Li Wen Wong E. (MY)
- 14.36 **How case was treated** - Mummaneni P. (US)
- 14.40 **Discussion**
- 14.45 **I172** Overview of radiographic TL sagittal balance parameters  
Pimenta L. (BR)
- 14.55 **Discussion**
- 15.00 **Case: Mild idiopathic mid lumbar scoliosis** - Wong H.K. (SG)
- 15.04 **Open** - Wang M. (US)
- 15.08 **MIS** - Kwon B. (US)
- 15.12 **Hybrid** - Ishii K. (JP)
- 15.16 **How case was treated** - Wong H.K. (SG)
- 15.20 **Discussion**
- 15.30 **Case: Thoracic PJK** - Mummaneni P. (US)
- 15.34 **Open** - Ishii K. (JP)
- 15.38 **MIS** - Härtl R. (US)
- 15.42 **Hybrid** - Kwon B. (US)
- 15.46 **How case was treated** - Mummaneni P. (US)
- 15.50 **Discussion**
- 16.00 **Break**

Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings





The International Society for the Advancement of Spine Surgery  
Society for Minimally Invasive Spine Surgery

Session 4: MISS - Free papers: Part 3  
Chair: Wang M. (US)

- 16.30 Welcome
- 16.34 O361 Early outcomes in the use of minimally invasive lateral cages in primary adult degenerative scoliosis correction surgery – Minimum 6 month to 2 year follow-up  
Lee R. (UK)
- 16.38 O362 Minimally invasive lateral interbody fusion with segmental lateral Axation for treatment of scoliotic deformity with significant spinopelvic malalignment  
Smith W., Bergmann L. (US)
- 16.42 O363 Surgical outcome of corrective fusion with lateral lumbar interbody fusion for adult spinal deformity with severe imbalance  
Endo H., Mura kami H., Tokunaga K., Tsukimura T., Sato R., Saigo S., Yamabe D., Numata N., Doita M. (JP)
- 16.46 Discussion
- 16.53 O364 Can MIS-TLIF be performed with conventional instrumentation? Prospective randomized clinico-radiological study of para-median inter-transverse MIS-TLIF vs classical TLIF  
Bhani M., Naresh-Babu J., Anil-Babu P. (IN)
- 16.57 O365 Minimally invasive transforaminal lumbar interbody fusion [MI-TLIF] – An attractive option for select failed backs  
Bangalore Kantharajanna S., Kulkarni A.G., Dhruv A., Annu A. (SG & IN)
- 17.01 O366 The effectiveness of transforaminal endoscopic facet cyst resection  
Gibson J.N.A., Oelofse L., Ipreburg M. (UK, ZA & NL)
- 17.05 Discussion
- 17.12 O367 Posterior percutaneous screw-rod instrumentation is a safe and effective alternative approach to a thoracolumbosacral orthosis rigid bracing for single level pyogenic spondylodiscitis  
Colangelo D., Formica V.M., Autore G., Pambianco V., Tamburelli F.C., Nasto L.A., Pola E. (IT)
- 17.16 O368 A new groove-entry technique for inserting thoracic percutaneous pedicle screws  
Ishii K., Shiono Y., Funao H., Kaneko Y., Isogai N., Nagura T., Seki H., Fujita N., Hikata T., Iwanami A., Watanabe K., Nakamura M., Matsumoto M. (JP)
- 17.20 O369 Anatomical consideration of iliac crest on percutaneous endoscopic discectomy using transforaminal approach  
Tezuka F., Sakai T., Abe M., Yamashita K., Takata Y., Higashino K., Saiyo K. (JP)
- 17.24 Discussion



The International Society for the Advancement of Spine Surgery  
Society for Minimally Invasive Spine Surgery

- 17.31 O370 Reducing pedicle drilling radiation by using dynamic surgical guidance with a Jamshidi Needle while maintaining screw placement accuracy  
Williams J., Khoo L., Gaughan J., Betz R. (US)
- 17.35 O371 Does microendoscopic technique reduce mortality and major complications in patients undergoing lumbar discectomy? A propensity score-matched analysis using a nationwide administrative database  
Ohya J., Oshima Y., Chikuda H., Oishi T., Tanaka S., Yasunaga H. (JP)
- 17.39 O372 Percutaneous lumbar intradiscal injection of autologous bone marrow concentrated cells significantly reduces discogenic pain through 24 months  
Vaz de Lima M. (BR)
- 17.43 Discussion
- 17.52 Concluding comments
- 18.00 Adjourn



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Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings

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Friday, May 20  
Scientific Program

	Room 1 Heliconia	Room 2 Heliconia	Room 3 Hibiscus	Room 4 Hibiscus
10.00	APSS	ISSLS	AOSPINE	NASS
	Break			
12.30	APSS	ISSLS	AOSPINE	NASS
	Break + Industry workshops			
16.00	APSS	ISSLS	ISASS	
	Break			
	APSS		ISASS	

Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings



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Asia Pacific Spine Society

Session 1: Early onset of scoliosis: EOS Spine  
Chairs: Jayaswal A. (IN) & Rajasekaran S. (IN)

- 08.00 1173 Luque instrumentation for fusionless surgery?  
Wong Y.W. (HK)
- 08.15 1174 When to use Vertical Expandable Prosthetic Titanium Rib (VEPTR)?  
Wong Y.W. (MY)
- 08.30 1175 Growing rods: What works, what doesn't?  
Akbaria B. (US)
- 08.45 Q&A
- Case discussion  
Case discussants: Shanmugam K.S. (MY), Wong Y.W. (HK) & Akbaria B. (US)
- 09.00 Case 1: Selective thoracic fusion and its complication  
Rajasekaran S. (IN)
- 09.20 Case 2: EOS with intraspinal anomaly  
Jayaswal A. (IN)
- 09.40 Case 3: What happens next after you have put in the growing rods?  
Liu G. (SG)
- 10.00 Break
- Session 2: Adolescent Idiopathic Scoliosis: AIS spine  
Chairs: Luk K.D.K. (HK) & Chan C.Y.W. (MY)
- 10.30 1176 Can you avoid neck and shoulder imbalance in Lenke 1 and 2 scoliosis correction?  
Kwan M.K. (MY)
- 10.45 1177 Lenke IC: Selective vs non selective fusion?  
Rajasekaran S. (IN)
- 11.00 1178 Direct Vertebral Rotation (DVR): Does it work?  
Wong C.C. (MY)
- 11.15 Q&A
- Case discussion  
Case discussants: Kwan M.K. (MY), Rajasekaran S. (IN) & Wong C.C. (MY)
- 11.30 Case 1: Selection of fusion level in Lenke 5 curves  
Chan C.Y.W. (MY)
- 11.50 Case 2: Selection thoracic fusion  
Luk K.D.K. (HK)
- 12.10 Case 3: Severe scoliosis - A safe management strategy  
Lim L.L. (SG)
- 12.30 Lunch break + Industry workshops



Asia Pacific Spine Society

Session 3: Operative video sessions: Surgical techniques in thoracolumbar spine  
Chairs: Wong H.K. (SG), Luk K.D.K. (HK) & Rajasekaran S. (IN)

- 14.00 1179 AIS: Scoliosis reduction techniques  
Chan C.Y.W. (MY)
- 14.15 1180 Video-assisted thoracoscopic instrumentation surgery for AIS: VATI  
Wong H.K. (SG)
- 14.30 1181 Pedicle Subtraction Osteotomy (PSO) techniques  
Jayaswal A. (IN)
- 14.45 Q&A
- 15.00 1182 Posterior Vertebral Column Resection (PVCR)  
Wong C.C. (MY)
- 15.15 1183 MIDUF: Cortical bone trajectory screw  
Shanmugam K.S. (MY)
- 15.30 1184 Lateral lumbar interbody fusion: XLIF  
Akbaria B. (US)
- 15.45 Q&A
- 16.00 Break
- Free papers: Spinal deformity  
Chairs Aydogan M. (TR) & Thanh V.V. (VN)
- 16.30 0373 Sequential assessment of spinal cord location in adolescent idiopathic scoliosis  
Grant C.A., Newell N., Izatt M.T., Keenan B.E., Little J.P., Askin G.N., Labrom R.D., Adam C.J., Pearcy M.J. (AU)
- 16.34 0374 Characterization and predictive value of "segmental curve flexibility" in adolescent idiopathic scoliosis patients  
Cheung J.P.Y., Yao G., Shigematsu H., Cheung K.M.C., Luk K.D.K., Samartzis D. (CN)
- 16.38 0375 Predictability of peak growth spurt and growth cessation using the distal radius and ulna classification  
Cheung J.P.Y., Cheung P.W.H., Samartzis D., Cheung K.M.C., Luk K.D.K. (HK)
- 16.42 0376 Are magnetically controlled growing rods useful as an internal splint in idiopathic scoliosis?  
Yadav S., Cheung J.P.Y., Samartzis D., Cora B., Kenny K.Y.H., Cheung K.M.C. (CN)
- 16.46 0377 Effect of an imbalanced fusion block with residual shift on distal adding-on segments after adolescent idiopathic scoliosis surgical correction  
Shigematsu H., Luk K.D.K., Cheung J.P.Y., Bruzzone M., Mak K.C. (JP, HK & AR)
- 16.50 Q&A



Asia Pacific Spine Society

Free papers: Spinal deformity  
Ignacio J.M.F. (PH) & Tobing D. (ID)

- 17.00 0378 Patient and radiographer assessment of the slump sitting Aexion compared to the conventional forward bending Aexion  
Choong D., Lau E., Lau L.L., Liu G., Wong H.K., Hey D. (SG)
- 17.04 0379 Posterior thoraco-pelvic corrective fusion for severe spinal deformity in patients with Parkinson's disease  
Yamato Y., Hasegawa T., Kobayashi S., Togawa D., Yasuda T., Oe S., Matsuyama Y. (JP)
- 17.08 0380 A prospective monocentric randomized pilot study to compare the safety and effectiveness of two vertebral compression fracture reduction techniques: 1 Year results  
Noriega D.C., Ardura F., Hernandez Ramajo R. (ES)
- 17.12 0381 3D mapping to assess anatomical restoration in vertebral compression fractures  
Noriega D.C., Maestretti G., Dufort P., Krüger A., Ardura F. (ES, CH, CA & DE)
- 17.16 0382 Two-level prophylactic balloon kyphoplasty decreases the risk of proximal junctional kyphosis in adult spinal deformity surgery  
Kaneko Y., Farhan SA., Nozaki T., Lu Y., Yoshioka H., Ishii K., Bedeman S.S. (US, JP)
- 17.20 Q&A
- Session 4: Closing  
Chair: Abumi K. (JP)
- 17.30 Presentation of future APSS activities and meetings  
Kwan M.K. (MY)
- 17.35 1185 What is the future of spine surgery in the next 10 years?  
Luk K.D.K. (HK)
- 18.00 Q&A
- Prize giving ceremony  
Liu G. (SG)
- 18.10 Prize giving ceremony: Best Papers (Oral and Poster)  
Jayaswal A. (IN), Shanmugam K.S. (MY) & Abumi K. (JP)
- 18.20 Closing remarks  
Abumi K. (JP)



The International Society for the Study of the Lumbar Spine

Session 13: Special poster session 2 (eSpine area)

Session 14: The ISSLS Prize Papers

- 07.45 Session 13: Special poster session 2 (eSpine area)
- 09.00 Introduction and Award Ceremony  
Chair: Andersson G. (US)
- 09.10 ISSLS Prize - Clinical  
0383 Consensus on the clinical diagnosis of lumbar spinal stenosis: Results of an International Delphi Study  
Tomkins-Lane C., Melloh M., Lurie J., Smuck M., Battie M., Freeman B., Samartzis D., Hu R., Barz T., Suber K., Schneider M., Haig A., Schizas C., Cheung J., Mannion A., Staub L., Comer C., Macedo L., Ahn S.H., Takahashi K., Sandella D. (CA, CH, US, AU, HK, DE, UK, KR, JP)
- 09.20 Discussion
- 09.30 ISSLS Prize - Biomechanics  
0384 Vibration really does disrupt the disc - A microanatomical investigation  
Schollum M., Wade K., Robertson P., Thambyah A., Broom N. (NZ)
- 09.40 Discussion
- Session 15: Fellowship Award Ceremony  
Chair: Yoon T. (US)
- 09.50 Introduction of fellowships - Mossad M. (EG)  
Recipient - Abdelrazek Hassane M.A. (EG)  
Presentation of Spine Young Investigators Award - Boden S. (US)
- 10.00 Break
- 10.30 Report of special interest group chairs  
Chair: Yoon T. (US)
- Session 16: Sagittal alignment  
Chairs: Bono C. (US) & Sairyo K. (JP)
- 11.00 0385 Paravertebral muscle degeneration is the most significant factor associated with sagittal imbalance: The Wakayama spine study  
Hashizume H., Yoshimura N., Yamada H., Oka H., Teraguchi M., Iwahashi H., Asai Y., Sasaki T., Muraki S., Matsuda K., Tsutsui S., Minamide A., Nakagawa Y., Iwasaki H., Yoshida M. (JP)
- 11.07 0386 Impact of fatigue on maintenance of upright posture: Dynamic assessment of sagittal spinal deformity parameter after 10 minutes of walking  
Bae J., Theologis A.A., Jang J.-S., Lee S.-H., Deviren V. (KR & US)
- 11.14 0387 The difference of total spinal sagittal alignment between up right and stepped position  
Endo K., Suzuki H., Nishimura H., Yonfuji M., Murata K., Tanaka H., Yamamoto K. (JP)
- 11.21 Discussion



Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings  
Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings



## The International Society for the Study of the Lumbar Spine

- 11.30 O388 Spino-pelvic mismatch is the most significant indicator on low back symptom measured by ODI score  
Hasegawa K., Okamoto M., Hatsushikano S., Shimoda H., Ono M. (JP)
- 11.37 O389 Effects of pre-existing adjacent-level pathologies and spinopelvic alignment on the prevalence of adjacent segment disease after single-level lumbar fusion  
Shimamura Y., Kanayama M., Oha F., Kuroki K., Hisada Y., Tashiro K., Suzuki Y., Hashimoto T., Kaneko K. (JP)
- 11.44 O390 Does sarcopenia impact on sagittal malalignment or not?  
Ohyama S., Hoshino M., Toyoda H., Takahashi S., Terai H., Suzuki A., Hayashi K., Tamai K., Nakamura H. (JP)
- 11.51 Discussion
- Session 17: Disc degeneration  
Chairs: Yoon T. (US) & Kolaru N. (JP)
- 12.00 O391 Intervertebral disc repair with autologous nucleus pulposus cell transplantation: A two-year clinical study  
Ruan D.K., Wang C.F., He Q., Zhang C., Hou L.S., Li C., Bai X.D., Ji W., Weng T.Y. (CN)
- 12.07 O392 Disc regeneration using MSC transplanted via the endplate route  
Vadala G., Russo F., Musumeci M., De Strobel F., Bernardini M., Denaro L., D'Avella D., Giordano R., Denaro V. (IT)
- 12.14 O393 Functional self-assembled peptide nano-fibers for BMSCs encapsulation in nucleus pulposus regeneration  
Wu Y., Ruan D., Jia Z. (CN)
- 12.21 Discussion
- 12.30 Lunch break + Industry workshops
- 14.00 Symposium II
- 1186 Diagnosis and non-surgical treatment of SI joint pain  
Smuck M. (US)
- 1187 SI Joint Fusion - Clinical update  
GarAn SR (US)
- Session 18: Imaging  
Chairs: Smuck M. (US) & Ishii K. (JP)
- 14.40 O394 Axial loading during MRI combined with T2 mapping provide new insights into disc degeneration and biomechanics in LBP patients  
Hebelka H., Lagerstrand K., Brisby H., Nilsson M. (SE)
- 14.47 O395 The influence of sub-diagnosis on radiographic and clinical outcomes after lumbar fusion for degenerative disc disorders: A 15-year meta-analysis  
Bhalla A., Schoenfeld A., George J., Bono C. (US)
- 14.54 O396 Can Propionibacterium acne really cause Modic changes? Evidence from a rabbit model  
Zhao F., Shan Z., Li S., Zhang X., Yu T. (CN)



## The International Society for the Study of the Lumbar Spine

- 15.01 Discussion
- 15.10 O397 Psychometric alterations and brain images in chronic low back pain  
Yabuki S., Fukui S., Kikuchi S., Konno S. (JP)
- 15.17 O398 Observation of bone volume change in osteoporotic vertebral body after vertebral fracture by CT color mapping technique  
Hamasaki T., Sadaoka D. (JP)
- 15.24 O399 The diagnosis of double-crush lesion in the L5 lumbar nerve using diffusion tensor imaging  
Kanamoto H., Eguchi Y., Ohtori S., Suzuki M., Okawa Y., Yamanaka H., Tamai H., Kobayashi T., Orita S., Yamauchi K., Suzuki M., Aoki Y., Watanabe A., Takahashi K. (JP)
- 15.31 Discussion
- Session 19: Spinal stenosis  
Chairs: Jacobs W. (NL) & Takahashi K. (JP)
- 15.40 O400 The change of dural sac cross-sectional area (DCSA) with symptomatic lumbar spinal stenosis: 10-Year community follow-up  
Igari T., Otani K., Sekiguchi M., Seki S., Tominaga R., Kobayashi Y., Kameda T., Kaneuchi Y., Sato R., Konno S. (JP)
- 15.47 O401 Prognosis and prognostic factors after successfully treated by non-surgical procedures in patients with lumbar spinal canal stenosis  
Tsubosaka M., Kaneyama S., Yano T., Sumi M., Kasahara K., Kanemura A., Takabatake M., Koh A., Hirata H., Takeoka Y. (JP)
- 15.54 O402 Determinants of patient satisfaction after surgery for central spinal stenosis without concomitant spondylolisthesis - A register study of 5100 patients  
Strömqvist B., Sigmundsson F. G., Jönsson B. (SE)
- 16.01 Discussion
- 16.10 Announcement - Best Paper and Poster Awards  
Chair: Roberts S. (UK)  
Closing remarks: Luk K. (HK)

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

100



## Room 3

## AOSPINE AOSpine

### Session 1: Degenerative cervical

Chair: Vialle L. (BR)

- 08.00 1188 Key opening lecture: Cervical Sagittal Alignment  
Vialle L. (BR)
- 08.30 O403 Cervical - Foot print anthropometry in Indian population: Implications on design of artificial disc replacement devices  
Kulkarni A., Patil V., BK S., Saraf A. (IN)
- 08.35 O404 More than 20 years of follow-up after en bloc cervical laminoplasty  
Kawaguchi Y., Nakano M., Yasuda T., Seki S., Suzuki K., Makino H., Kimura T. (JP)
- 08.40 O405 Incidence and functional outcomes of reintubation after anterior cervical spine surgery: Results from AOSpine North America multicenter study on 8,887 patients  
Nagoshi N., Fehlings M.G., Nakashima H., Tetreault L., Riew D. (CA, JP & US)
- 08.45 Group discussion
- 09.00 O406 Impact of cranio-cervical balance on surgical outcomes of laminoplasty  
Tamai K., Suzuki A., Terai H., Toyoda H., Hoshino M., Hayashi K., Oyama S., Takahashi S., Nakamura H. (JP)
- 09.05 O407 Results of anterior surgery for spondylotic cervical myelopathy-role of the posterior longitudinal ligament in outcome  
Chatterjee S., Dutta D. (IN)
- 09.10 O408 Sequence of segmental contributions in the lower cervical spine during active extension and flexion: Healthy controls vs. cervical degenerative disc disease patients  
Boselle T.F.M., van Santbrink H., de Bie R.A., van Mameren H. (NL)
- 09.15 Group discussion
- 09.30 O409 3-Year radiological evolution in a cohort of 384 patients treated with cervical arthroplasty  
Dufour Th., Bernard P., Beaurain J., Huppert J., Hovorka I., Vila T., Steib J.P., Vital J.M. (FR)
- 09.34 O410 Are spacer fixations necessary for every opened lamina in expansive open-door laminoplasty? Matched case-control study  
Terakawa M., Tsujio T., Tamai K., Hoshino M., Seki M., Nakamura H. (JP)
- 09.38 O411 Adjacent level cervical disc degeneration: Incidence and cause - Prospective study for 10 years  
Chatterjee S. (IN)
- 09.42 O412 Accuracy of retrospective evaluation of pre-operative neurological function following decompressive surgery among patients with cervical spondylotic myelopathy (CSM)  
Xu N., Wang S., Yu M., Liu Z., Liu X., Jiang L., Wei F. (CN)
- 09.46 Group discussion
- 10.00 Break



102



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## Room 3

## AOSPINE AOSpine

### Session 2: Spinal trauma

Chair: Rajasekaran S. (IN) &amp;

Berjano P. (IT)

- 10.30 1189 Key opening lecture  
Knowledge gaps in thoraco-lumbar fracture management  
Rajasekaran S. (IN)
- 11.00 O413 Computed tomography parameters for atlanto-occipital dislocation in adult patients: The occipital condyle-C1 interval  
Chang S., Martinez-del-Campo E., Kalb S., Soriano-Baron H., Turner J.D., Neal M.T., Uschold T., Theodore N. (US)
- 11.04 O414 Radiographical risk factors of vertebral artery injury in cervical spine dislocation - Multi-institutional study using CT angiography  
Nagata K., Chikuda H., Inokuchi I., Ishii K., Kobayashi A., Kanai H., Miyoshi K. (JP)
- 11.08 O415 Cervical spinal cord injury assessment based on the Diffusion Tensor Imaging  
Czyz M., Szewczyk P., Yoon W., Jamundowicz W., Boszczyk B.M. (UK & PL)
- 11.12 O416 Rib-sparing minimally invasive vertebrectomy is a safe and effective treatment for single-level metastatic spinal disease - A case series of 15 patients  
Loughenbury P.R., Wilson J., Rice E., Knights M., Timothy J. (UK)
- 11.16 O417 Thoracolumbar fractures: Comparison between percutaneous and traditional fixation  
Nunes A.M., Caetano A.C., Sousa J.M., Almeida R.M., Consciência J.G. (PT)
- 11.20 Group discussion
- 11.30 O418 Overnight reporting of spinal trauma - Are registrar reports sufficient to guide management?  
Loughenbury P., Ferrier J., Tachibana A., Rowbotham E. (UK)
- 11.34 O419 Early outcome of surgical decompression for cervical spinal cord injury without bony injuries in the elderly  
Inoue T., Suzuki S., Endo T., Uenohara H., Tominaga T. (JP)
- 11.38 O420 Corpectomy and expandable cage implantation for A2 subaxial cervical spine injury: Analysis of outcomes with minimum 3 years follow-up  
Byvaltsev V.A., Kalinin A.A., Budayev A.A., Egorov A.A. (RU)
- 11.42 O421 Clinical outcomes of the posterior spinal shortening for delayed paralysis after osteoporotic vertebral fracture  
Chikawa T., Toki S., Kashima M., Yoshioka S., Nakagawa T., Nakamura M., Nakano S. (JP)
- 11.46 Group discussion
- 12.00 O422 A cross-sectional survey of the understanding of cauda equina syndrome  
Taha R., Thompson A., Kamani S., Elsayed S. (UK)
- 12.04 O423 The CT-based fractal analysis of trabecular bone structure may help in detecting decreased quality of bone prior to urgent spinal procedures (novel technique)



www.spineweek.org

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

103

- 12.08 O424 Czyn M., Radwan H., Eyzov K., Boszczyk B.M. (US & UK)  
Is the thoracolumbar injury classification and severity score (TIIJCS) applicable to UK practice?  
Loughenbury P.R., Tomlinson J., Mann C., Lamb J., Dunsmuir R.A., Millner P.A., Rao A.S., Khan A.L., Gummerson N.W. (UK)
- 12.12 O425 The value of CT and MRI in the classification and assessment of stability in patients with thoracolumbar spinal injuries  
Rajasekaran S., Vaccaro A.R., Kanna R.M., Schroeder G.D., Oner F.C., Vialle L., Hapman J., Dvorak M., Fehlings M., Shetty A.P., Schnake K., Maheshwaran A., Kandzora F. (IN, US, NL, CA, DE & BR)
- 12.16 O426 CT-based navigation system for C1-C2 posterior fixation surgery: Evaluation of 19 consecutive patients  
Borsa S., D'Orto S., Bertani G., Rampini P., Pluderi M. (IT)
- 12.20 **Group discussion**
- 12.30 **Lunch break + Industry workshops**

**Session 2**

Chairs: Anand N. (US) &amp; Kumar N. (SG)

- 14.10 O427 Analysis of actual segmental lordosis obtained with lordotic and hyperlordotic lateral cages - Is degenerative scoliosis a risk factor for adult thoracolumbar spinal fractures? A 7000 multi-racial asian patients review Analysis of 218 levels  
Anand N., Khandehroo B., Cohen J., Cohen R., Baron E., Kahwaty S. (US)
- 14.16 O428 How is the spine different in standing and in sitting? Important considerations in spinal deformity correction  
Hey D., Teo A.Q.A., Ng N.L.W., Chong D., Ruiz J., Lau L.L., Liu K.P.G., Wong H.K. (SG)
- 14.22 O429 A morphology and prevalence study of degenerative lumbar scoliosis in over 7000 multi-racial asian adults  
Ng R., Liu G., Tan J.H., Ee G., Chan Y.H., Low S.L., Wong H.K. (SG)
- 14.28 O430 Is degenerative scoliosis a risk factor for adult thoracolumbar spinal fractures? A 7000 multi-racial asian patients review  
Tan J.H., Ng R., Liu G., Win M.T.M., Wong H.K. (SG)
- 14.34 **Discussion**
- 14.54 O431 Minimally invasive lateral interbody fusion with segmental lateral fixation for adult degenerative scoliosis: Mid-term clinical and radiographic results  
Smith W.D., Bergmann L. (US)
- 15.00 O432 Clinical and radiographic results of indirect decompression and posterior cervical fusion for single level cervical radiculopathy using an expandable implant with 2-year follow-up  
Semionow K., Janusz P., Phillips F., McCormack B. (US & PL)
- 15.06 O433 Multi-level fusion versus hybrid surgery in three-level cervical disc disease: Retrospective matched analysis of clinical and radiologic results in minimum 2-year follow-up  
Hur J.W., Ryu K.S., Kim J.S., Seong J.H. (KR)
- 15.12 **Discussion**
- 16.00 **Break**
- 16.30 O434 A MRI characterization of the dorsal cervical cord migration behaviour in hybrid open-door laminoplasty  
Liu Ka Po G., Lee B.H., Poh E., Wong H.K. (SG & UK)
- 16.36 O435 Impact of age on patient outcomes after cervical disc arthroplasty or anterior cervical discectomy and fusion: Comparison at 5-year follow-up  
Hisey M., Ziegler J., Guyer R., Ohnmeiss D. (US)
- 16.42 O436 Comparison of one- and two-level treatment with cervical disc arthroplasty or anterior cervical discectomy and fusion  
Hisey M., Bae H., Ohnmeiss D. (US)
- 16.48 O437 Comparison of 1 & 2 level versus 3 & 4 level cervical disc arthroplasty: An outcome analysis - Results from a single centre  
Reddy G., Friesem S., Khan S., Rajesh M., Berg A., Bhatia C., Aneibia K. (UK)
- 16.54 **Discussion**

- 17.14 O438 Rib cage measurement reproducibility using biplanar stereographic 3D reconstructions in severe adolescent idiopathic scoliosis  
Pietton R., Bouloussa H., Vergani C., Skalli W., Vialle R. (FR)
- 17.20 O439 A comparative study of axial pain in cervical myelopathy patients treated with laminoplasty and healthy volunteers  
Kawakami M., Ishimoto Y., Nagata I.K., Kitagawa T., Matsuoka T. (JP)
- 17.26 O440 Analysis of the 10 best and 10 worst functional outcomes of circumferential minimally invasive surgical (CMIS) correction of adult spinal deformity (ASD)  
Anand N., Millard J., Cohen R., Cohen J., Khandehroo B., Baron E., Kahwaty S. (US)
- 17.32 O441 The convex manipulation: An alternative technique in surgical treatment of adolescent idiopathic scoliosis  
Oggiano L., La Rosa G. (IT)
- 17.38 **Discussion**
- 17.58 O442 Does poor post-op sagittal vertical alignment directly correlate with poor functional outcomes in patients with circumferential minimally invasive correction of adult spinal deformity?  
Anand N., Khandehroo B., Cohen J., Cohen R., Baron E., Kahwaty S. (US)
- 18.04 O443 MIS TLIF improves functional ability in injured workers as compared to open TLIF  
Kube R., Morrow D. (US)
- 18.10 **Discussion**
- 18.20 **Adjourn**

- 07.30 **Welcome**
- Paper presentations: Innovative surgical techniques**  
Chair: Bono C.M. (US)
- 07.35 O444 Debridement and indwelling irrigation with diluted gentamicin solution for postoperative spinal infection  
Su Q.J., Wei Y., Hai Y. (CN)
- 07.41 O445 Anterior hyperlordotic cages: Early experience and radiographic results  
Kadam A., Saville P.A., Smith H.E., Arlet V. (US)
- 07.47 O446 Comparing radiation exposure using conventional fluoroscopy versus intra-operative cone-beam computed tomography (O-arm) to perform minimally invasive transforaminal lumbar interbody fusion, a single surgeon series  
Lee R.S., Sedra F., Kumano Y., Edwards J. (UK)
- 07.53 O447 Efficiency and learning curves in image guided spinal surgery: A human factors analysis  
Drazin D., Catchpole K., Pashman R., Johnson J.P., Kim T.T. (US)
- 07.59 O448 To evaluate the results of a single staged simultaneous decompression surgery for tandem spinal stenosis - A review of 149 patients  
Patel P.M., Bhojraj S.Y., Nagad P., Kashikar A.K., Kumar N., Akbary K., Prasad G., Hrushikesh M. (IN)
- 08.05 O449 Porous silicon nitride spacers versus PEEK cages with autograft - 24 Month outcomes data from the CASCADE noninferiority trial  
Arts M.P., Wolfs J., Corbin T.P. (NL & US)
- 08.11 **Discussion**
- Paper presentations: Surgical complications**  
Chair: Wetzel F.T. (US)
- 08.30 O450 Previous surgery significantly increases the risk of both surgical and general complications during surgery for degenerative disorders of the lumbar spine  
Mannion A.F., Zehnder P., Porchet F., Jeszenszky D., Kleinstück F.S., Pigott T., Aghayev E. (CH & UK)
- 08.36 O451 Factors associated with the retro-odontoid soft tissue enlargement after middle and lower cervical spine surgery in non-rheumatoid arthritis patients  
Dohzono S., Toyoda H., Takahashi S., Suzuki A., Terai H., Nakamura H. (JP)
- 08.42 O452 A comparative analysis of risk assessment tools in spine surgery  
Veeravagu A., Swinney C., Li A., Alamin T., Cheng I., Desai A., Hu S., Park J., Ratliff J. (US)
- 08.48 O453 Recovery patterns of delayed postoperative foot drop after lumbar fusion surgery - Its association with reduction, type of pathology and type of surgery  
Basu S., Kondety S.K.C., Biswas A., Ahmed R., Suri T., Kesharwani S. (IN)

NASS North American Spine Society	
08:54	O454 <b>Rheumatoid arthritis is a risk factor for adjacent segment disease after PLIF irrespective of disease activity</b> Fujwara H., Makino T., Yonenobu K., Honda H., Matsuo Y., Kaïto T. (JP)
09:00	O455 <b>Perioperative prevalence and risk factors for deep vein thrombosis in elective spine surgery</b> Nakamoto H., Murakami M., Shiono H., Yamamoto S. (JP)
09:06	<b>Discussion</b>
09:30	<b>Break</b>
	<b>Paper presentations: Spinal deformity</b> Chairs: Dohring E.J. (US) & Yeung A.T. (US)
10:00	O456 <b>Prevalence and factors affecting cervical deformity in adolescent idiopathic scoliosis patients</b> Hu X., Lieberman L.H. (US)
10:06	O457 <b>Biplanar stereography predicts pulmonary function tests in adolescent idiopathic scoliosis</b> Pietton R., Bouloussa H., Vergari C., Haen T.X., Skalli W., Vialle R. (FR)
10:12	O458 <b>Sagittal spinal and pelvic parameters in patients with Scheuermann's disease: A preliminary study</b> Lieberman L.H., Farhan S.A., Echler M., Hu X., Belanger T.A., Pendi A., Bedeman S.S. (US)
10:18	O459 <b>An uniquely shaped rod improves curve correction in surgical treatment of adolescent idiopathic scoliosis</b> Gehrchen M., Oht-Nissen S., Hallager D.W., Dahl B. (DK)
10:24	O460 <b>Accuracy of pre-operative surgical planning software in predicting postoperative alignment in patients undergoing minimally invasive multilevel anterior column reconstruction for positive sagittal balance deformity</b> Lee R.S. (UK)
10:30	O461 <b>Intra- and perioperative complications with the OUIF approach in 812 patients</b> Korge A., Mehren C., Sauer D., Sepe C., Mayer H.M. (DE & AT)
10:36	O462 <b>3D-Navigation reduces radiation exposure and operative time in lumbopelvic Axations</b> Hoffmann M.F., Schildhauer T.A. (DE)
10:42	<b>Discussion</b>

NASS North American Spine Society	
	<b>Controversies in spine surgery</b> Chair: Bono C.M. (US)
11:00	<b>Introduction</b> Bono C.M. (US)
11:10	I190 <b>Geriatric odontoid fractures: Operative or nonoperative treatment?</b> Bono C.M. (US)
11:25	I191 <b>Recurrent lumbar disc herniations: Revision discectomy alone or with fusion?</b> Luk K.D. (HK)
11:40	I192 <b>Spinal epidural abscess: Is it always an operative indication?</b> Rajasekaran S. (IN)
11:55	I193 <b>Interspinous process devices: Are these implants just looking for indications?</b> Dohring E.J. (US)
12:10	<b>Discussion, Questions</b>
12:30	<b>Lunch break + Industry workshops</b>

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings


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109

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

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111


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108

110



## The International Society for the Study of the Lumbar Spine

Special emphasis poster session I (Wednesday, May 18, 07.30 - 08.45)

### A. Low back pain

Chairs: Leionen V. (FI) & Vadala G. (IT)

- SP1 **Effectiveness and cost-effectiveness of radiofrequency denervation for chronic low back pain originating from the sacroiliac joints**  
Juch J.N.S., Maas E.T., Groeneweg J.G., Ostelo R.W.J.G., Kallewaard J.W., Koes B., Verhagen A.P., van Dongen J.M., van Tulder M.W., Huygen F.J.P.M. (NL)
- SP2 **Does breast size predict back pain?**  
Lees D., Bowey A., Serrano-Pedraza I., Sanderson P.L. (UK & ES)
- SP3 **Simulation of multifactorial causes of low back pain**  
Cholewicki J., Pathak P.K., Reeves N.P., Popovich M.J. Jr. (US)
- SP4 **Novel classification and risk factors of high intensity zones of the lumbar spine: The Wakayama spine study**  
Teraguchi M., Samartzis D., Hashizume H., Yamada H., Muraki S., Oka H., Cheung J., Yoshimura N., Cheung K., Yoshida M. (JP & HK)
- SP5 **Prevalence and genetic associations of modic endplate changes in the lumbar spine**  
Kanna R.M., Rajasekaran S., Senthil N., Raveendran M., Panjani V.R., Cheung K.M.C., Chan D., Shetty A.P. (IN & CN)
- SP6 **Psychological stress results in mechanical allodynia, but not in low back pain in the rat**  
Fukui D., Kawakami M., Matsumoto T., Naiki M. (JP)

### B. Spinal alignment & tumours

Chairs: Hall D. (AU) & Kobayashi S. (JP)

- SP7 **Defining the role of lower limbs in compensating for sagittal malalignment**  
Lafage R., Liabaud B., Diebo B., Oren J., Gammal J., Vira S., Spiegel M., Tanzi E., Protopsaltis T., Erico T., Schwab F. (US)
- SP8 **Peak scoliosis brace can reduce pain in adults with painful scoliosis: Results from a prospective cohort study**  
Zaina F., Poggio M., Donzelli M., Lusini M., Minnella S., Negri S. (IT)
- SP9 **Progressive pattern of vertebral deformity throughout four years in a population-based cohort study of vertebral fracture**  
Nakase K., Akeda K., Yamada J., Sudo A. (JP)
- SP10 **Less invasiveness in minimally invasive spine stabilization (mist) for metastatic spinal tumor**  
Hikata T., Isogai N., Shiono Y., Funao H., Okada E., Fujita N., Iwanami A., Watanabe K., Nakamura M., Matsumoto M., Ishii K. (JP)
- SP11 **Efficacy of zoledronate against metastatic spinal tumors: Evaluation of bone strength using finite element analysis**  
Matsumaru S., Takaishi H., Fujita N., Kobayashi Y., Takahashi Y., Shinozaki Y., Ogawa J., Anazawa U. (JP)
- SP12 **Evaluation of the safety of using intraoperative salvaged blood in metastatic spine tumour surgery: Using microwell technique**  
Kumar N., Zaw A.S., Khoo B.L., Kumar A., Thiery J.P. (SG)



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## Special ePosters



## The International Society for the Study of the Lumbar Spine

### E. Spinal stenosis

Chairs: Guyer R. (US) & Nordin M. (FR)

- SP25 **Lifestyle related disease increases thickness of spinal epidural fat in the patients with lumbar spinal stenosis**  
Ishihara S., Fujita N., Hikata T., Iwanami A., Watanabe K., Ishikawa M., Fukui Y., Nakamura M., Matsumoto M., Ishii K. (JP)
- SP26 **Thickness of spinal epidural fat influences surgical outcomes in the patients with lumbar spinal stenosis**  
Ishihara S., Fujita N., Hikata T., Iwanami A., Watanabe K., Ishikawa M., Fukui Y., Nakamura M., Matsumoto M., Ishii K. (JP)
- SP27 **Early effects of medicare's bundle payment for care improvement program for lumbar fusion on episode costs, volume and safety**  
Martin B.L., Testerson A.N.A., Lurie J.D., Farrokhi F., McGuire K.J., Mirza S.K. (US)
- SP28 **Objective measurement of free-living physical activity (performance) in lumbar spinal stenosis: Are physical activity guidelines being met?**  
Smuck M., Tomkins-Lane C., Norden J., Sinha A., Hu R. (US & CA)
- SP29 **Use of the L5 spinal nerve angle on oblique coronal double echo steady state magnetic resonance imaging and the range of L5/S motion for foraminal stenosis diagnosis**  
Murata Y., Wada K., Tamaki R., Numaguchi D., Kato Y. (JP)
- SP30 **Natural history study of ossification of the yellow ligament: Five-year longitudinal MRI follow-up**  
Cheung J.P.Y., Tang C.Y.K., Samartzis D., Cheung K.M.C. (HK)

Special emphasis poster session II (Friday, May 20, 07.45 - 09.00)

### F. Disc herniation & Bone

Chairs: Wilke H.J. (DE) & Patwardhan A. (US)

- SP31 **Mechanism of developing sciatica experienced in lumbar disc herniation: Change in intradiscal oxygen saturation by intraoperative SLR test**  
Kobayashi S., Yonezawa T., Hashishin Y., Matsuoka H. (JP)
- SP32 **Gender differences in the surgical treatment of lumbar disc herniation in elderly**  
Strömqvist B., Strömqvist F., Jönsson B., Karlsson M. (SE)
- SP33 **Nucleotomy alters internal strain distribution of the human lumbar intervertebral disc**  
Vreslovic E.J., Claeson A.A., Showalter B.L., Wright A.C., Gee J.C., Malhotra N.R., Elliott D.M. (US)
- SP34 **Quantifying intervertebral disc inter-lamellar and inter-bundle mechanics**  
Vergari C., Mansfield J., Meakin J.R., Winlove C.P. (UK)
- SP35 **Tubular discectomy vs conventional microdiscectomy for the treatment of lumbar disk herniation - Long-term results of randomized controlled trial**  
Overvest G.M., Peul W.C., Brand R., Koes B.W., Bartels R.H.M.A., Tan W.F., Arts M.P. (NL)
- SP36 **Bone healing activation effect of freeze-dried platelet-rich plasma preserved for 8 weeks**  
Shiga Y., Kubota G., Orita S., Yamauchi K., Inage K., Sato J., Fujimoto K., Abe K., Kanamata H., Inoue M., Kinoshita H., Takahashi K., Ohtori S. (JP)



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### C. Cell biology

Chairs: Vleggeert Lankamp C. (NL) & Sakai D. (JP)

- SP13 **Intervertebral disc cells secrete BMP antagonists that alter osteogenesis of human mesenchymal stromal cells**  
Tekari A., Frauchiger D.A., Chan S.C.W., Benneker L.M., Sebald H.J., Gantenbein B. (CH)
- SP14 **Synergistic effect of nerve growth factor and insulin-like growth factor-1 on anti-apoptosis and extracellular matrix synthesis of rat intervertebral disc cells**  
Park J.B., Chang D.G. (KR)
- SP15 **Genetic attenuation of ATM signaling mitigates age-associated spine degeneration in mouse model of accelerated aging**  
Han Y.C., Hartman R.A., Dong Q., Niedemhofer L.J., Sowa G.A., Vo N.V., Kang J.D. (US)
- SP16 **RADA16-I conjugated with BMP-7 short peptide can retard degeneration of intervertebral disc**  
Wu Y.H., Jia Z.W., Wang C.F., Tao H., Ruan D.K. (CN)
- SP17 **A novel inducible system to regulate expression of the therapeutic transgene TIMP1 for treating intervertebral disc degeneration**  
Han Y.C., Hartman R.A., Dong Q., Wang B., Vo N.V., Sowa G.A., Kang J.D. (US)
- SP18 **Expression of the RANK/RANKL/OPG system in the human intervertebral disc**  
Akeda K., Takegami N., Yamada J., Nakase K., Sudo A. (JP)

### D. Imaging & SCI

Chairs: Wong D. (US) & Park J.B. (KR)

- SP19 **Enhanced disc/bone marrow cross-talk in Modic changes**  
Dudli S., Hu S., Burch S., Berven S., Deviren V., Lotz J. (US)
- SP20 **Evaluation of water retention in lumbar intervertebral disks before and after exercise stress with T2 mapping**  
Chokan K., Murakami H., Endo H., Yamabe D., Tsukimura I., Doita M. (JP)
- SP21 **Relationship between Modic changes, anterior vertebral osteophytes and spinal instability in the lumbar spine**  
Tsukamoto M., Morimoto T., Yoshihara T., Snochata M., Mawatari M. (JP)
- SP22 **Anatomical characteristics of lumbo-sacral nerve root and furcal nerve with 3.0-Tesla MR neurography**  
Kobayashi H., Tanji H., Kato K., Watanabe K., Nikaide T., Otani K., Yabuki S., Kikuchi S.I., Kono S.I. (JP)
- SP23 **Analysis of motion preservation following tdr at the lumbosacral junction: A prospective long-term clinical and radiographic investigation**  
Würtinger C., D'Agostino Annes R., Hitzl W., Korge A., Mehren C., Mayer M.H., Sepe C.J. (DE & AU)
- SP24 **Induction of endogenous neuronal stem cells proliferation by extracorporeal shock waves after spinal cord injury**  
Ha K.Y., Kim J.W., Cho Y.K., Shin D.C., Kim S.I., Kim Y.H. (KR)



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## Special ePosters



## The International Society for the Study of the Lumbar Spine

### G. Spinal stenosis II

Chairs: Weiner B. (US) & Zhuojing L. (CN)

- SP37 **Discrimination between lumbar intraspinal stenosis and foraminal stenosis using diffusion tensor imaging parameters**  
Kanamoto H., Eguchi Y., Ohtori S., Suzuki M., Oikawa Y., Yamanaka H., Tamai H., Kobayashi T., Orita S., Yamauchi K., Suzuki M., Aoki Y., Watanabe A., Takahashi K. (JP)
- SP38 **One year results of a prospective randomized controlled trial comparing minimally invasive interspinous process device (IPD) with standalone decompressive surgery: Neurogenic Intermittent Claudication Evaluation (NICE) study**  
Le Huec J.C., Meyer B. (FR & DE)
- SP39 **Morphology and clinical importance of epidural membrane and peridiscal fibrous tissue in lumbar spinal stenosis**  
Miyachi A., Sumida T., Kaneko M., Manabe H., Nakasaki K. (JP)
- SP40 **The branches of the lumbar artery running vertically on the intervertebral disc of the lower lumbar spine: An anatomical study**  
Nojri H., Miyagawa K., Banno S., Koike M., Sawa M., Iwase Y., Sakamoto I., Kaneko K. (JP)
- SP41 **Novel use of accelerometry data to develop phenotypes of free-living physical activity (performance) and differentiate between lumbar spinal stenosis, knee osteoarthritis, and matched healthy populations**  
Tomkins-Lane C., Norden J., Sinha A., Hu R., Smuck M. (US & CA)
- SP42 **Comprehensive non-surgical treatments decrease the need for spine surgery in patients with degenerative spondylolisthesis**  
Demir-Deviren S., Cil H., Ozcan-Eks EE., Tay B., Burch S., Berven S. (US)

### H. Fusion

Chairs: Lund T. (FI) & Hasegawa T. (JP)

- SP43 **Decompression with or without concomitant fusion for patients suffering from stenosis in combination with degenerative spondylolisthesis**  
Dijkerman M.L., Overvest G.M., Vleggeert-Lankamp C.L.A. (NL)
- SP44 **The impact of flat back on patients with persistent low back pain after spinal fusion (short seg. vs long seg.)**  
Murata K., Endo K., Suzuki H., Nishimura H., Matsuoka Y., Tanaka H., Shishido T., Yamamoto K. (JP)
- SP45 **CT graft bone densitometry as a predictor of fusion status in posterior lumbar interbody fusion and its clinical significance**  
Sawakami K., Ito T., Takahashi I., Ishikawa S. (JP)
- SP46 **Anatomical analysis of the lumbar segmental artery in the oblique lateral interbody fusion approach**  
Orita S., Shiga Y., Inage K., Sato J., Fujimoto K., Kanamoto H., Abe K., Yamauchi K., Takahashi K., Ohtori S. (JP)
- SP47 **Effect of spinopelvic alignment on adjacent segment disease after multi-level lumbar fusion: Risk factor analysis**  
Hisada Y., Kanayama M., Oha F., Shimamura Y., Kuroki K., Tashiro K., Hashimoto T., Iwasaki N. (JP)
- SP48 **Degenerative Spondylolisthesis (DS) - An opportunity to implement value based spine care**  
Kulkarni A., Dutta S. (IN)



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Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings

Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings



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### I. Disc degeneration

Chairs: Samarziz D. (HK) & Park M.S. (KR)

- SP47 **Lumbar disc degeneration was not related to bone mineral density in Chinese populations: Facet joint degeneration confounds the association**  
Pan J.J., Tong X., Wang Y. (CN)
- SP50 **Technical differences in microsurgical, endoscopic and endoscopically-assisted lumbar discectomies result in different complications but do not affect long-term QoL**  
Belykh E.G., Morgan B.G., Theodore N., Preul M.C., Byvaltsev V.A. (RU & US)
- SP51 **How reliable are the reported genetic associations in disc degeneration? The influence of phenotypes, age, population size and inclusion sequence in 809 patients**  
Rajasekaran S., Kanna R.M., Senthil N., Raveendran M., Ranjani V.R., Cheung K.M.C., Chan D., Shetty A.P. (IN & CN)
- SP52 **The preventive effect of dynamic stabilization against adjacent segment degeneration after posterior interbody fusion**  
Tachibana N., Kawamura N., Masuyama S., Hirao Y., Maruyama H., Izuka M., Shimizu T., Yamato Y., Kunogi J. (JP)
- SP53 **Do degenerated human lumbar spine segments exhibit biphasic viscoelastic properties?**  
Costi J.J., Amin D., Lawless I.M., Sommerfeld D., Stanley R.M., Ding B. (AU & DE)
- SP54 **The anti-angiogenic capacity of rabbit notochordal cells in the proliferation of human endothelial cells under hypoxia**  
Kwon W.K., Moon H.J., Park Y.K., Kim J.H. (KR)

### J. Outcome measurements & complications

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

- SP55 **What do patients consider to be an acceptable level of symptoms to live with after surgery for adult spinal deformity?**  
Mannion A.F., Wunderlin S., Obeid I., Pellisé F., Bago J., Acaroglu E., Alanay A., Pérez-Gueso F.S., Kleinstück F.S., European Spine Study Group (ESSG) (CH, FR, ES & TR)
- SP56 **Stiffness after pan-lumbar arthrodesis for adult spinal deformity does not significantly impact patient functional status or satisfaction**  
Hart R.A., Hratzka J., Kane M.S., Lafage V., Klineberg E., Ames C.P., Line B.G., Schwab F., Scheer J.K., Bess S., Hamilton D.K., Shaffrey C.I., Mundis G., Smith J.S., Burton D.C., Sciubba D.M., Devenyi V., Boachie-Adjei V., The International Spine Study Group (US)
- SP57 **The Dartmouth/consumer reports treatment outcomes calculator for surgical and nonsurgical treatment of disc herniation, spinal stenosis and degenerative spondylolisthesis**  
Tosteson T.D., Lurie J.D., Mycek K., Peters D., Schwarz S., Zhao W., Spratt K., Scherer E.A., Pearson L., Weinstein J. (US)
- SP58 **Fulfillment of expectations two years after lumbar spine surgery**  
Mancuso C.A., Cammisia F.P., Sama A.A., Hughes A.P., LeBl D.R., Duculan R., Girardi F.P. (US)
- SP59 **Analysis of hospital length of stay following lumbar anterior/posterior combined fusion: Is there a disadvantage associated with shorter stays?**  
Guyer R.D., Putney E., Ohnmeiss D.D., Ziegler J.E., Blumenthal S.L. (US)
- SP60 **The occurrence of adjacent segment pathology and of adjacent disc degeneration in one-level lumbar fusion after 5 years follow-up: in comparison with the decompression surgery group**  
Jeon C.H., Chung N.S., Lee H.D. (KR)



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## Posters



## The International Society for the Study of the Lumbar Spine

- P14 **Impact of lumbar degenerative spondylolisthesis on lumbo-pelvic alignment in sit-to-stand motion**  
Suzuki H., Endo K., Nishimura H., Matsuoka Y., Tanaka H., Yamamoto K. (JP)
- P15 **An association between expression of neurotrophic factors and pain-related behavior induced by nucleus pulposus applied on the nerve root in rats**  
Seki S., Sekiguchi M., Konno S.I. (JP)
- P16 **Postoperative changes of the gait in patients with lumbar spinal canal stenosis**  
Goto T., Sakai T., Takata Y., Higashino K., Katoh S., Saito K. (JP)
- P17 **Osteoporosis would be a factor that can promote the progress of disc degeneration**  
Li S., Shan Z., Yu T., Zhang X., Mamuti M., Zhao F. (CN)
- P18 **The relationship between gait and spinal sagittal parameters in patients with low back pain**  
Murata K., Endo K., Suzuki H., Nagai T., Nishimura H., Matsuoka Y., Tanaka H., Yamamoto K. (JP)
- P19 **Magnetic resonance imaging of the annulus fibrosus shows changes in tissue diffusion and anisotropy following mechanical loading: A pilot study in ovine tissue**  
Tourel M., Kirkwood M., Momot K., Pearcy M., Little J.P. (AU)
- P20 **Lumbar interbody fusion with the application of rhMP-2 are bone resorption and overzealous bone growth dose- and/or concentration-dependent? Results of a large animal study**  
Heil G., Gerlach K., Vergroesen P., Hohaas C., Meise H.J. (DE, CH & NL)
- P21 **Does an interbody fusion cage with nanoscale porous titanium coating increase spinal segmental stiffness? An in vivo biomechanical analysis in an ovine model**  
Gunzburg R., Colloca C.J., McAviney J., Hegazy M., Jones C.F., Hall D.J., Szpalski M., Freeman B.J.C. (BE, AU & US)
- P22 **Why does cement leakage easily occur in Basivertebral Foramen (BF) during vertebral augmentation procedures? A viewpoint from trabecular orientation and injury**  
Li S., Wang C., Yu T., Zhang X., Shan Z., Zhao F. (CN)
- P23 **An in vitro biomechanical comparison of anterior thoracolumbar reconstruction with sliding and rigid rod constructs: Kinematics and load-sharing**  
Zhou R.Z., Huang Z.P., Liu X., Tong J., Ji W., Liu S.T., Chen J.T., Zhu Q.A. (CN)
- P24 **Influence of dynamic factors in L5/S1 foraminal stenosis - Evaluation by 3D finite element analysis**  
Shinozaki Y., Takaishi H., Fujita N., Matsumaru S., Kobayashi Y., Takahashi Y., Ogawa J. (JP)
- P25 **Real time evaluation of spinal mechanics using MRI**  
Parish A.J., Gowland P., McNally D.S. (UK)
- P26 **Effect of loosening and retightening on pedicle screw closure mechanism strength: A biomechanical study**  
Nuckley D.J., Mehdob A., Ferry C., Gandhi A. (US)
- P27 **Characterization of the standing posture in adult spinal deformity patients**  
Yagi M., Kaneko S., Yato Y., Machida M., Asazuma T. (JP)
- P28 **Effect of posture on injury of the thoracolumbar junction under axial loading**  
Christou A.K., Spurner E., Grigoriadis G., Masouros S.D. (UK)



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### ISLS General posters (On display on the poster boards)

- F1 **Factors affecting anterior trunk bending during level walking in patients with lumbar spinal stenosis**  
Igawa T., Katsuhira J., Sakurai A., Hosaka A., Fukui Y. (JP)
- F2 **The use of TLIF procedure in management of degenerative spine deformities - A retrospective clinical study to evaluate the efficiency of this technique**  
Mossaad M. (EG)
- F3 **Quantitative computed tomography protocols affect QCT/FEA predicted stiffness**  
Giambini H., Dragomir-Daescu D., Nassr A., Yaszemski M.J., Zhao C. (US)
- F4 **Correlating common human postures with their associated lumbar alignment - A better understanding of the lumbar spine**  
Lau E., Hey D., Choong D., Lau L.L., Liu G., Wong H.K. (SG)
- F5 **Risk assessment of lumbar segmental artery injury during lateral transpos approach in the patients with lumbar scoliosis**  
Takata Y., Sakai T., Tezuka F., Yamashita K., Abe M., Higashino K., Saito K. (JP)
- F6 **Vertebral column resection in management of severe spinal deformities - Outcome and complications**  
Mohammed K.M., Mossaad M.M., B-Nighey A.A., B-soufy M.A. (EG)
- F7 **The pathological mechanism of L3 degenerative spondylolisthesis**  
Fukushima M., Oshima Y., Oka H., Matsuyoshi Y., Tamiguchi Y., Chikuda H., Tanaka S. (JP)
- F8 **Trade-off between restoring stability and endplate stresses in the lumbar spine using different volume grades of a nucleus arthroplasty system: A finite element study**  
Chamoli U., Tsafnat N., Diwan A.D. (AU)
- F9 **Biomechanical evaluation of a bilateral spondylolytic defect at L5 and its progression into two clinically observed spondylolisthesis patterns: A finite element study**  
Chamoli U., Tsafnat N., Diwan A.D. (AU)
- F10 **Spinal movement improved after decompression surgery in patients with lumbar spinal stenosis on three-dimensional gait analysis**  
Kawahara W., Tanaka N., Nakanishi K., Fujita N., Asaeda M., Nakamura H., Kono Y., Okamoto T., Watanabe H., Deie M. (JP)
- F11 **The effect of a selective acid-sensing ion channels (ASICs) inhibitor on pain-related behavior by nucleus pulposus applied on the nerve root in rats**  
Kobayashi Y., Sekiguchi M., Konno S.I. (JP)
- F12 **Computer-assisted pre-operative planning of deformity correction surgeries: Numerical modeling to go beyond the consolidated image-based approaches**  
Galbusera F., Bassani T., La Barbera L., Ottardi C., Schlager B., Brayda-Bruno M., Wilke H.-J. (IT & DE)
- F13 **Significant effects on T2 relaxation times of axial loading during MRI in lumbar discs - A feasibility study on patients with low back pain**  
Lagerstrand K., Nilsson M., Brisby H., Hebelka H. (SE)



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## Posters



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- P29 **Intervertebral disc and facet joint contributions to the six degree of freedom mechanical properties of degenerated human spine segments**  
Lawless I.M., Amin D., Sommerfeld D., Stanley R.M., Ding B., Costi J.J. (AU)
- P30 **Rapid and distortion-free diffusion tensor imaging for evaluation of lumbar nerve roots using direct coronal single-shot turbo spin-echo diffusion sequence**  
Sakai T., Aoki Y., Yoneyama M., Yanagawa N. (JP)
- P31 **Assessment of magnetic field interactions and radiofrequency heating on metallic spinal implants at 7 Tesla**  
Tsukimura I., Murakami H., Numata N., Endo H., Yamabe D., Saigo T., Chokan K., Doita M. (JP)
- P32 **Adaptation of the global sagittal balance of the spine and the segmental orientation of each vertebra from the standing to the sitting position - A C2 to S1 study with the EOS system**  
Rousseau M.A., Tahari L., Brusson A., Lazennec J.Y. (FR)
- P33 **Swelling pressure in the nucleus pulposus: Do we really understand it?**  
Emanuel K.S., Veen A.J., Vergroesen P., Laan K., Kingma I., Smit T.H. (NL)
- P34 **Biomechanical evaluation of vertebral column replacement for osteoporotic vertebral collapse - Importance of anterior load support by the lateral wall of the vertebra**  
Takaishi H., Fujita N., Matsumaru S., Kobayashi Y., Takahashi Y., Shinozaki Y., Ogawa J. (JP)
- P35 **Basic science research topic trends in spine-related publications**  
Sng D.C., Dudley S. (US)
- P36 **Comparative biomechanical study of anterior column support by unilateral PLIF, bilateral PLIF and IIF in degenerative lumbar scoliosis**  
Fujita N., Takaishi H., Matsumaru S., Kobayashi Y., Takahashi Y., Shinozaki Y., Ogawa J. (JP)
- P37 **Reducing rod breakage and nonunion in pedicle subtraction osteotomy: The importance of rod number and configuration in 264 patients with 2-year follow-up**  
Gupta M., Henry J., Lafage V., Schwab F., Ames C., Klineberg E., Smith J., Devire V., Shaffrey C., Hart R., Hostin R., Mundis G., Kim H.J., Burton D.C., International Spine Study Group (US)
- P38 **Do different dichotomization strategies of responders and non-responders and different corresponding biomechanical responses following spinal manipulative therapy?**  
Wong A.Y.L., Parent E.C., Dhillon S., Prasad N., Samarziz D., Kawchuk G.N. (CH & CA)
- P39 **The angiogenic capacity of human dura mater: A potential factor promoting peri-dural adhesion and fibrosis**  
Moon H.J., Kwon W.K., Kim J.H., Park Y.K. (KR)
- P40 **Mechanical burden on adjacent levels varies with construct length following lumbar fusion - An in vitro study**  
Patwardhan A., Sullivan R., Voronov L., Havey R., Carandang G., Muriuk M., Khayatzaeh S., Sears W. (US & AU)
- P41 **Reliability of a pelvic asymmetry measurement using MRI-based 3-dimensional models**  
Gamada K., Katayama K., Kumagai H., Ogura H., Hoshi K. (JP)
- P42 **Effects of the pelvic and thoracic realignment device on pelvic asymmetry in patients with low back pain**  
Gamada K., Katayama K., Kumagai H., Takeda K., Ogura H., Hoshi K. (JP)



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- P43** SHOX2 is required to maintain the function of nucleus pulposus cell: A protective factor for intervertebral disc degeneration?  
Zheng Z. (CN)
- P44** Injectable microcryogels reinforced alginate encapsulation of mesenchymal stromal cells for leak-proof delivery and alleviation of canine disc degeneration  
Chen C., Zeng Y., Ruan D., Du Y. (CN)
- P45** Increased apoptosis, expression of matrix degrading enzymes and inflammatory cytokines of annulus fibrosus cells in genetically engineered diabetic rats  
Park J.B., Chang D.G. (KR)
- P46** Diffusion of lumbar disc end-plate by using DCE-MRI after intervertebral disc allograft transplantation in beagle model  
Ruan D.K., Li H., Wu Y.H., Hou L.S., Jia Z.W., Chen C., He Q., Ji W. (CN)
- P47** Effect of donor age and culture passage on mesenchymal stem cells derived from nucleus pulposus: An in vitro study on rats  
Zhao Y.C., Jia Z.W., Wu Y.H., Liu L.G., Wang D.L., Ruan D.K. (CN)
- P48** Macrophages in the degenerated intervertebral disc produce inflammatory cytokines, but not growth factors, in a mouse model of disc injury  
Miyagi M., Uchida K., Fujimaki H., Inoue G., Nakazawa T., Imura T., Saito W., Takahira N., Takaso M. (JP)
- P49** Biological characteristics of nucleus pulposus mesenchymal stem cells in human degenerative intervertebral disc with different Pfirrmann grade  
Li X., Bai X., Wu Y., Liu L., Wang D., Ruan D. (CN)
- P50** Influence of pro-inflammatory stimulation by IL-1 $\beta$  on chondrogenic differentiation of human mesenchymal stem cells (MSCs) versus adipose-derived stem cells (ASCs)  
Neidlinger-Wilke C., Nagl I., Teixeira G.Q., Ketsas D., Wilke H.-J., Ignatius A. (DE, PT & GR)
- P51** Intervertebral disc nucleus pulposus has intensive involvement of autophagy compared to other musculoskeletal tissues and its degeneration is linked with decreased autophagy  
Yunbe T., Hirata H., Ito M., Kakiuchi Y., Kakutani K., Maeno K., Takada T., Miyazaki S., Terashima Y., Kurosaka M., Nishida K. (JP)
- P52** Biological behavior of purified human nucleus pulposus mesenchymal stem cells: A comparison of healthy and degenerative nucleus pulposus source  
Wang D.L., Tang Y., Jia Z.W., Yang P.S., He Q., Ruan D.K. (CN)
- P53** Hepatocyte growth factor/c-Met signal promotes proliferation, suppresses apoptosis, and improves matrix metabolism in rabbit nucleus pulposus cells in vitro  
Ishibashi H., Tomomura H., Ikeda T., Sakata M., Takatori R., Mikami Y., Nagae M., Kubo T. (JP)
- P54** Effect of a selective inhibitor of c-Fos/activator protein-1 on intervertebral disc degeneration  
Makino H., Seki S., Yahara Y., Kawaguchi Y., Motomura H., Nogami M., Watanabe K., Shiozawa S., Kimura T. (JP)
- P55** Cartilage-derived morphogenetic protein-2 signal via SMAD and Mitogen-Activated Protein (MAP) kinase pathways during extra cellular matrix production in human disc cells  
Wei1 A., Shen B., Staff S., Williams L., Sebald W., Diwan A. (AU & DE)
- P56** The intrinsic and extrinsic apoptotic pathways are both activated in human degenerated intervertebral discs  
Barreto Henriksson H., Jönsson E., Tschernitz S., Brisby H. (SE)



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- P57** How can we define a facet tropism with facet orientation? A comparative analysis of 200 Asian young adult populations without disc degeneration  
Jeon C.H., Chung N.S., Lee H.D. (KR)
- P58** Propionibacterium acnes can induce modic changes  
Dudli S., Miller S., Demir-Deviren S., Lotz J.C. (US)
- P59** FH1-Mint3 axis does not control HIF transcriptional activity in nucleus pulposus cells  
Hirose Y., Chiba K., Nakamura M., Matsumoto K., Sato J., Shiga Y., Kanamoto H., Abe K., Inoue M., Kinoshita H., Takahashi K., Ohtori S., Campana M.W. (JP & US)
- P60** Low-density lipoprotein receptor-related protein-1 maintains the structure and myelination of Schwann cell in the peripheral nervous system  
Orita S., Yamauchi K., Inage K., Fujimoto K., Sato J., Shiga Y., Kanamoto H., Abe K., Inoue M., Kinoshita H., Takahashi K., Ohtori S., Campana M.W. (JP & US)
- P61** ER stress inhibitor suppresses intervertebral disc degeneration  
Fuji T., Fujita N., Suzuki S., Watanabe R., Watanabe K., Ishii K., Tsuji T., Miyamoto T., Horuchi K., Matsumoto M., Nakamura M. (JP)
- P62** What's in a name: A systematic review of use of the term 'degenerative disc disease'  
Battie M.C., Weiner B. (US)
- P63** Inhibition of ERK pathway restores the discogenic phenotype of inbred intervertebral disc cells  
Tekari A., Marazza A., Benneker L.M., Gantenbein B. (CH)
- P64** Establishment of a bovine nucleus pulposus tissue culture model with early physiological degeneration model  
Hlavna M., Krupkova O., Ito K., Ferguson S.J., Wuertz-Kozak K. (CH & NL)
- P65** The fate of Tie2+ nucleus pulposus progenitor cells injected into a papain degenerated organ culture model with and without hydrogel  
Frauchiger D.A., Tekari A., Benneker L.M., Sakai D., Gantenbein B. (CH & JP)
- P66** Physical limitations to tissue engineering of intervertebral disc cells using growth factors - Effect of bone morphogenetic protein (bmp)-2 and 7 on glycosaminoglycan production and cell metabolism  
Kobayashi S., Takeno K., Miyazaki T., Hayakawa K., Meir A. (JP & UK)
- P67** Implications for cell survival and regeneration in the intervertebral disc: Factors affecting nutrient transport  
Giers M.B., Munter B., Ide G., Eyster K., Newcomb A., Byvaltsev V., Kelly B., Crawford N.R., Preul M., Theodore N. (US & RU)
- P68** The alterations of adiponectin receptor expression with disc degeneration in rat intervertebral disc cells  
Terashima Y., Kakutani K., Takada T., Yurube T., Hirata H., Maeno K., Miyazaki S., Ito M., Kakiuchi Y., Kurosaka M., Nishida K. (JP)
- P69** Mesenchymal stem cell treatment of intervertebral disc lesion prevents fatty infiltration and atrophy of the multi-axial muscle, but not cytokine and muscle fiber changes  
James G., Blomster L., Hall L., Schmid A.B., Shu C.C., Little C.B., Melrose J., Hodges P.W. (AU & UK)
- P70** Small interference RNA (siRNA) targeting for fas inhibits apoptosis of rat notochordal cells  
Park J.B., Park E.Y. (KR)



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- P71** Interplay of micro-topographies and growth factors in mesenchymal stem cell based annulus fissure engineering  
Chuah Y.J., Wee S.N., Lim H.T.D., Khang M.N.K., Tan J.R., Tee C.A., Hee H.T., Kang Y.J. (SG & CN)
- P72** Microfabrication strategy to develop the annular microstructure of an intervertebral disc composite  
Seong L.C., Lim C.S., Chuah Y.J., Wu Y., Tay L.M., Hee H.T., Kang Y.J. (SG & CN)
- P73** Characterization of cells in different regions of intervertebral disc through microfluidic cell sorting  
Wee S.N., Tee C.A., Chuah Y.J., Yin L., Teo T.G., Hee H.T., Han J., Kang Y. (SG, US & CN)
- P74** Percutaneous Kyphoplasty (PKP) induces proteoglycan loss in the adjacent disc: Preliminary evidence from a rabbit model  
Feng Z., Chen L., Chen Z., Wang Y. (CN)
- P75** Relationship between spinal deformity and joint contracture of lower extremities  
Shimizu M., Kobayashi T., Ito H. (JP)
- P76** Physical and radiological influence of vertebral fracture upon adult spinal deformity: Population-based cohort study  
Senoo I., Kobayashi T., Ito H. (JP)
- P77** The time course changes in bone metabolic markers after administering the anti-RANKL antibody and drug compliance among patients with osteoporosis  
Inage K., Orita S., Yamauchi K., Suzuki M., Sato J., Fujimoto K., Shiga Y., Abe K., Kanamoto H., Inoue M., Kinoshita H., Takahashi K., Ohtori S. (JP)
- P78** Heparin based polyelectrolyte complex enhances the therapeutic efficacy of bone morphogenetic protein-2 for posterolateral fusion in a large animal model  
Wang M., Lam R.W.M., Abbah S.A., Hu T., Toh S.Y., Cooi S., Bhakoo K., U.J., Goh J.C.H., Wong H.K. (SG)
- P79** Exposure of the spine surgeon to radiation during myelography  
Yamane K., Kai N. (JP)
- P80** Evaluation of quality of life and neuropathic pain in patients with low back pain using Japanese version of the PainDETECT questionnaire  
Hiyama A., Watanabe M., Sakai D., Katoh H., Sato M., Mochida J. (JP)
- P81** Rehabilitation following lumbar fusion surgery (REFS), a randomised controlled feasibility study - Interim results  
Greenwood J., McGregor A.M., Johnson J., Webley K.W., Hurley M.V. (UK)
- P82** Validation study of reinforcement methods to elicit knee jerk  
Morimoto T., Tsukamoto M., Yoshihara T., Sonohata M., Masaaki Mawatari M. (JP)
- P83** Sagittal spino-pelvic alignment in rapidly destructive coxarthrosis  
Morimoto T., Tsukamoto M., Yoshihara T., Sonohata M., Masaaki Mawatari M. (JP)
- P84** Innovative equipment for abdominal trunk muscle exercises with a built-in measurement system for muscle strength for patients with chronic low back pain  
Kato S., Murakami H., Demura S., Yoshioka K., Yokogawa N., Fujii M., Igarashi T., Takahashi N., Yonezawa N., Tsuchiya H. (JP)



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## The International Society for the Study of the Lumbar Spine

- P85** Does bisphosphonate-based anti-osteoporotic medication affect osteoporotic spinal fracture healing?  
Ha K.Y., Kim S.I., Kim Y.H. (KR)
- P86** Is jackknife stretch effective on the improvement in flexibility of the leg and trunk? A comparative and controlled study  
Ishigaki N., Aihara T. (JP)
- P87** Evaluation of lumbar instability using digital lomosynthesis  
Tanimoto K., Takebayashi T., Yoshimoto M., Iesato N., Hamada S., Yamashita T. (JP)
- P88** Gender trends in authorship of spine-related academic literature - A 38-year perspective  
Sng D.C., Ouyang D., Hu S.S. (US)
- P89** Relationship between kyphosis and falls in community-dwelling men and women: The locomotive syndrome and health outcome in aizu cohort study  
Tomimaga R., Fukuma S., Yamazaki S., Sekiguchi M., Otani K., Kikuchi S.I., Fukuhara S., Konno S.I. (JP)
- P90** Are deep and superficial lumbar multi-axial differentially activated during walking at different speeds and inclinations?  
Crawford R.J., Gizzi L., Ni Mhuirís A., Falla D. (CH, AU & DE)
- P91** Does the asymmetric morphology of the facet joint affect bilateral L5 spondylolysis?  
Ishitani H., Aihara T., Ishigaki N., Ezure T. (JP)
- P92** Polyelectrolyte complex for osteogenic growth factor with heparin binding domain  
Lam R.W.M., Wang M., Ng F., Naidu M., Hu T., Ting K., So C., Goh J.C.H., Wong H.K. (SG & US)
- P93** Location and characteristics of vertebral compression refracture after healing of acute vertebral compression fracture  
Aoki K., Toru Uehara T., Yamada S., Inada A. (JP)
- P94** Relationship between clinical symptoms of osteoporotic vertebral fracture with intra-vertebral cleft and radiographic findings  
Nakamae T., Fujimoto Y., Yamada K., Hiramatsu T., Hashimoto T., Suzuki O., Tsuchikawa Y. (JP)
- P95** A study on the shape of the vertebral body and the intervertebral lumbar disc in patients with Crowe type 4 completely dislocated hips  
Yoshihara T., Mizuta K., Morimoto T., Tsukamoto M., Sonohata M., Mawatari M. (JP)
- P96** Orthopedic intervention in the initial diagnosis of multiple myeloma  
Toda Y., Morimoto T., Tsukamoto M., Sonohata M., Mawatari M. (JP)
- P97** The course of pain intensity in patients undergoing herniated disc surgery: A longitudinal observational study  
Dorow M., Meisel H.J., Löbner M., Stein J., Pabst A., Konnopka A., Günther L., Meixensberger J., Sengler K., König H.-H., Riedel-Heller S.G. (DE)
- P98** Transforming growth factor-activated kinase 1 induces an inflammatory response in spinal microglia in vitro  
Fujimaki H., Inoue G., Uchida K., Miyagi M., Sekiguchi H., Aikawa J., Saito W., Takaso M. (JP)



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## The International Society for the Study of the Lumbar Spine

- P99** Prevalence and characteristics of osteoporotic vertebral fractures in elderly patients with spinal kyphosis  
Yabu A., Hoshino M., Terai H., Toyoda H., Suzuki A., Takahashi S., Hayashi K., Tamai K., Oyama S., Terakawa M., Tsujio T., Seki M., Nakamura H. (JP)
- P100** The diagnostic value of bone SPECT/CT for low back pain-causing pathology  
Takahashi T., Kato S., Murakami H., Demura S., Matsubara H., Yoshioka K., Yokogawa N., Fujii M., Igarashi T., Yonezawa N., Tsuchiya H. (JP)
- P101** Preliminary data of in-vivo magnetic resonance imaging measurement of spinal cord displacement in the thoracolumbar region of subacute lumbar intervertebral disc protrusion patients  
Pesonen J., Rade M., Könönen M., Marttila J., Vanninen R., Kankaanpää M., Airaksinen O. (FI & CR)
- P102** Usefulness of the lumbar spinal stenosis-specific symptom scale: Evaluation of surgical efficacy  
Watanabe K., Otani K., Nikaïdo T., Kato K., Kobayashi H., Sekiguchi M., Yabuki S., Kikuchi S., Konno S. (JP)
- P103** Non-specific low back pain is really a highly specific group and not a homogeneous one  
McIntosh G., Hall H., Gregg C., Hoffman C., Carter T. (NZ)
- P104** Radiographic natural course of lumbar degenerative spondylolisthesis and its risk factors related to the progression and onset in a 15-year community-based cohort study: The Miyama study  
Enyo Y., Yoshimura N., Yamada H., Hashizume H., Yoshida M. (JP)
- P105** Does a retrospective "global assessment" of long-term treatment outcome accurately reflect changes in serial measures of self-rated disability in patients with chronic LBP?  
Mannion A.F., Brox J.L., Fairbank J.C. (CH, NO, & UK)
- P106** Part 1: Developing methods of in vivo MRI measurement of spinal cord displacement in the thoracolumbar region of asymptomatic subjects with unilateral and bilateral straight leg raise tests  
Rade M., Shacklock M., Könönen M., Vanninen R., Marttila J., Kankaanpää M., Airaksinen O. (FI, CR & AU)
- P107** Part 2: In vivo MRI measurement of spinal cord displacement in the thoracolumbar region of asymptomatic subjects with unilateral and sham straight leg raise tests  
Rade M., Könönen M., Marttila J., Shacklock M., Vanninen R., Kankaanpää M., Airaksinen O. (FI, CR & AU)
- P108** Part 3: Normative data of multidirectional spinal cord displacement with unilateral and bilateral straight leg raise tests in asymptomatic subjects  
Rade M., Könönen M., Marttila J., Shacklock M., Vanninen R., Kankaanpää M., Airaksinen O. (FI, CR & AU)
- P109** Lumbar facet joint orientation & osteoarthritis: Association with degenerative spondylolisthesis and intervertebral disc degeneration  
Lau Y.Y.O., Chan L.Y., Kwok K.O., Griffiths J.F., Law S.W. (HK)
- P110** Asymmetrical lumbar spine facet joint osteoarthritis and spondylolysis in professional baseball players  
Kato K., Kenichi O., Shoji Y., Otani K., Nikaïdo T., Watanabe K., Kobayashi H., Tominaga R., Kikuchi S.I., Konno S. (JP)



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## The International Society for the Study of the Lumbar Spine

- P111** Influence of lumbar disc degeneration and spondylolysis on career outcomes in professional baseball players  
Kato K., Kenichi O., Shoji Y., Otani K., Nikaïdo T., Watanabe K., Kobayashi H., Tominaga R., Kikuchi S.I., Konno S.I. (JP)
- P112** Bone mineral density of the spine in spinal stenosis patients in comparison to hip arthroplasty patients and controls  
Bergh C., Söderpalm A.-C., Johansson L., Brisby H. (SJ)
- P113** Characteristic magnetic resonance images of fresh osteoporotic vertebral fractures were associated with poor long-term prognosis  
Hoshino M., Terai H., Tsujio T., Suzuki A., Namikawa T., Kato M., Matsumura A., Toyoda H., Takayama K., Takahashi S., Takaoka K., Nakamura H. (JP)
- P114** Development of an outcomes questionnaire for low literacy patients in underserved populations - The World Spine Care (WSC) Charly  
Outerbridge G., Ford T., Brady O., Hondras M., Hurwitz E., Haldeman S., Kopansky-Giles D., Nordin M. (US, DE, US & CA)
- P115** Clinical and electrophysiological evaluations including paraspinal EMG have prognostic role in the response to transforaminal epidural injections in unilateral L5 radiculopathy  
Leblebici M.A., Kaplan B.M., Ercelik T., Gunduz O.H. (TU)
- P116** LBP in adolescent top level athletes: Impact of physiological factors  
Minnella S., Grillo E., Donzelli S., Lusini M., Zaina F., Negrini S. (IT)
- P117** Magnetic resonance imaging accurately measures vertebral marrow lesion size  
Kazakia G.J., Fields A.J., Liebenberg E.C., Gary K., Carbalido-Gamio J., Han M., Krug R., Lotz J.C. (US)
- P118** The psychological component has important impact on the QoL and ADL change in the course of acute osteoporotic vertebral fracture  
Suzuki N., Fukuoka M., Mizutani J., Otsuka S., Matsumoto Y., Kondo A., Otsuka T. (JP)
- P119** Expected surgical intensity and its complication of 14 model cases in healthy control vs patients with lumbar spinal stenosis  
Yang J.H., Ki C.H., Kim T.H., Hong S.H., Kang Y.M., Kim J.H., Suk K.S., Kim H.S., Lee H.M., Moon S.H., Choi H.J. (KR)
- P120** Radiological features of foraminal stenosis after osteoporotic lumbar compression fracture  
Shimizu T., Kawamura N., Masuyama S., Hiraó Y., Maruyama H., Tachibana N., Iizuka M., Yamato Y., Kunogi J. (JP)
- P121** Effects of hip diseases on the measurement of pelvic tilt parameters  
Shoji S., Miyagi M., Fukushima K., Inoue G., Nakazawa T., Imura T., Saito W., Namba T., Shirasawa E., Takahira N., Takaso M. (JP)
- P122** Prevalence and location of neuropathic pain in lumbar spinal disorders: Analysis of 1,804 consecutive patients with primary lower back pain  
Orita S., Yamashita T., Ohtori S., Yonenobu K., Kawakami M., Taguchi T., Kikuchi S.I., Ushida T., Konno S.I., Nakamura M., Fujino K., Matsuda S., Yone K., Takahashi K. (JP)
- P123** Impact of the athletic activity and muscular tightness on low back pain in young female figure skaters  
Abe A., Aihara T., Sato K., Mitsuëda S., Kimura M. (JP)



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## The International Society for the Study of the Lumbar Spine

- P124** Are Tarlov cysts being identified on lumbar spine MRI scan in patients with sciatica  
Clarke G.W.J., Kapoor V., Baxter J.A. (UK)
- P125** Effects of the dynamic factor in lumbosacral foraminal stenosis with the osteophyte at the disc level  
Shinozaki Y., Hikata T., Fujita N., Matsumaru S., Kobayashi Y., Takahashi Y., Takaiishi H., Ogawa J., Nakamura M., Matsumoto M., Ishii K. (JP)
- P126** Relation between the low back pain and rotation range of motion of the hip joint and trunk in the female professional golfer  
Ezure T., Aihara T. (JP)
- P127** MRI considerations in a university vs non-university setting  
Mirkovic S. (US)
- P128** Cross-sectional study for MRI findings and low back pain in the community  
Otani K., Nikaïdo T., Watanabe K., Kato K., Kobayashi H., Yabuki S., Kikuchi S., Konno S. (JP)
- P129** Do metabolic markers predict union status of thoracolumbar osteoporotic vertebral fracture under bisphosphonate treatment?  
Iwata A., Kanayama M., Oha F., Hashimoto T., Masahiko T., Iwasaki N. (JP)
- P130** The effect of weight bearing and non-weight bearing group exercising on females with non-specific chronic low back pain  
Masharawi Y., Nadaf N. (IL)
- P131** The effect of Pilates group exercises on transverse abdominal muscle thickness and functional and postural parameters in females with non-specific chronic low back pain and healthy  
Goldberg N., Dar G., Masharawi Y. (ISR)
- P132** Comparison of the reliability of sagittal and transverse CT-based classification of stress fractures of the lumbar spine for conservative treatment  
Kamiya M., Hanamura S., Wakao N., Takeuchi M., Hirasawa A., Murotani K., Deie M. (JP)
- P133** Lumbar paraspinal muscle atrophy and fatty infiltration following botulinum toxin injections in a rabbit model  
Popovich J.M. Jr., Klosterman E.L., Hubert J.D., Tonson A., Meyer R.A., Amoczy S.P. (US)
- P134** Chordoma: A systematic review of incidence and clinical prognostic factors predicting (disease-free) survival  
Bakker S.H., Jacobs W.C.H., Pondaag W., Gelderblom A.J., Nout R.A., Dijkstra P.D.S., Peul W.C., Vleggeert-Lankamp C.L.A.M. (NL)
- P135** Improving the outcome of spinal injured patients in the developing world  
White K.A., Neil I.D., Diwan A. (JM & AU)
- P136** Risk assessment for avoidance of major vascular injury due to lateral transpos approach  
Sakai T., Tezuka F., Abe M., Yamashita K., Takata Y., Higashino K., Saiyo K. (JP)
- P137** Does low back pain improve after lumbar discectomy for disc herniations?  
Moghimi M.H., Walley K.C., Phukan R.D., Leonard D.A., Bono C.M., McGuire K.J. (US)
- P138** Relationship between size of disc and early postoperative outcomes after lumbar discectomy  
En'wezoh D.C., Leonard D.A., Schoenfeld A.J., Harris M.B., Zampini J.M., Bono C.M. (US)



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## The International Society for the Study of the Lumbar Spine

- P139** Good clinical outcomes in nonunion cases after facet fusion with a percutaneous pedicle screw system for degenerative lumbar spondylolisthesis  
Miyashita T., Ataka H., Kato K., Tanno T. (JP)
- P140** Is an instrumented fusion required with decompression for lumbar foraminal stenosis and single level disc disease? A RCT with 12-18 years follow-up  
Clement N.D., Muschik S.S., Gibson J.N.A. (UK)
- P141** Modic type 1 change influences surgical outcome in selected patients with diskogenic low back pain  
Ohtori S., Orita S., Yamauchi K., Eguchi Y., Aoki Y., Suzuki M., Kubota G., Inage K., Sainoh T., Sato J., Fujimoto K., Shiga Y., Abe K., Kanamoto H., Takahashi K. (JP)
- P142** Mini-open anterior retroperitoneal lumbar interbody fusion: Oblique lateral interbody fusion for degenerated lumbar spinal kyphoscoliosis  
Ohtori S., Orita S., Yamauchi K., Eguchi Y., Aoki Y., Suzuki M., Kubota G., Inage K., Sainoh T., Sato J., Fujimoto K., Shiga Y., Abe K., Kanamoto H., Takahashi K. (JP)
- P143** Reoperation following lumbar microendoscopic decompression: Microendoscopic discectomy and microendoscopic laminotomy  
Aihara T., Ikeda Y., Hatakeyama K., Urushibara M., Ouchi J., Yamagata M. (JP)
- P144** Spinal restabilization of lumbar degenerative spondylolisthesis associated with spinal instability following minimally invasive spinal decompression surgery  
Minamide A., Yoshida M., Yamada H., Hashizume H., Nakagawa Y., Iwasaki H., Tsutsui S., Takami M., Okada M., Nakao S.I. (JP)
- P145** Risk factors for reoperation after lumbar recapping laminoplasty  
Tachibana N., Kawamura N., Masuyama S., Hiraó Y., Maruyama H., Iizuka M., Shimizu T., Yamato Y., Kunogi J. (JP)
- P146** Skin damage prevention with olive oil verification of efficacy in prone spinal surgery  
Sakamoto H., Ueda M., Iida T., Katayanagi J., Mine K., Tomura T., Ozeki S. (JP)
- P147** Microdiscectomy under loupes magnification - A safe and cost effective treatment for health systems with limited resources  
Paxinos O. (GR)
- P148** Lumbo-pelvic "negative mismatch" contributes to cervical kyphosis after laminoplasty  
Matsuoka Y., Suzuki H., Endo K., Nishimura H., Tanaka H., Yamamoto K. (JP)
- P149** Three dimensional anatomical study analysis of yellow ligaments in humans cadaveric lumbar spine  
Akhtar J., Terai H., Suzuki A., Toyoda H., Suhrab M., Tamai K., Hayashi K., Takahashi S., Nakamura H. (JP)
- P150** Surgical results for posterior lumbar interbody fusion with adjacent segment decompression  
Hidekazu T., Hiroyuki A., Toshiyuki O. (JP)
- P151** Factors influencing neurological deficit in lumbar disc prolapse and their role in neurological recovery following surgical decompression  
Kanna R., Krishnan V., Shetty A.P., Rajasekaran S. (IN)
- P152** Preoperative measurement of BMD using DXA and QCT could be useful to predict the strength of pedicle screw fixation  
Ishikawa K., Eguro T., Ozawa T., Shirahata T., Kudo Y., Inagaki K., Toyone T. (JP)



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### The International Society for the Study of the Lumbar Spine

- P153** Accuracy of pedicle screw placement in posterior lumbosacral instrumentation under CT evaluation - Safety is not safe in L5 and S1  
Yu T, Wang C., Shan Z, Mamuti M., Zhang X., Zhao F. (CN)
- P154** In-hospital repeat spine surgery following lumbar fusion surgery for degenerative conditions and fractures  
Engler I.D., Martin B.I., Lurie J.D., Farokhi F.R., Weinstein J.N. (US)
- P155** Cervical alignment after shortening vertebroplasty for vertebral fractures in thoraco-lumbar region  
Murata K., Endo K., Suzuki H., Nishimura H., Matsuoaka Y., Tanaka H., Yamamoto K. (JP)
- P156** Establishment of a novel radiolucent spinal fusion chamber for study of the lumbar interbody spinal fusion  
Hu T., Naidu M., Yang Z., Lam R.W.M., Ng F., Kumarsing R.A., Ren X.F., Wang M., Tan K.C., Kwok K.T., Goodman S., Goh J., Wong H.K. (SG)
- P157** Clinical results analysis of L4~5 stenosis with first grade degenerative spondylolisthesis with CoAx  
Xianglong M., Yong H. (CN)
- P158** The outcome of the corrective long fusion surgery for sagittal imbalance due to multiple vertebral-body fractures in severe osteoporosis patients: A minimum one-year follow-up study  
Nishida K., Takada T., Kakutani K., Maeno K., Yurube T., Miyazaki S., Terashima Y., Ito M., Kakiuchi Y., Iguchi T., Kurosaka M. (JP)
- P159** Over three-year postoperative outcomes of prospective controlled study for degenerative lumbar spondylolisthesis - Comparison between the decompression without fusion and the decompression with posterolateral fusion  
Koh A., Kaneyama S., Sumi M. (JP)
- P160** Correlation between postoperative value of pelvic incidence minus lumbar lordosis and clinical outcomes after adult spinal deformity surgery in Japanese patients  
Ohashi M., Hirano T., Watanabe K., Yamazaki A., Hasegawa K., Shoji H., Endo N. (JP)
- P161** Novel ALIF cage with self-adapting lordosis performs well in initial clinical usage  
Castelain J.E., Rigal J., Cogniet A., Aunoble S., Le Huec J.C. (FR)
- P162** Nerve reconstruction with oriented collagen tubes combined with basic fibroblast growth factor  
Fujimaki H., Inoue G., Uchida K., Miyagi M., Saito W., Takaso M. (JP)
- P163** Matrix Metalloproteinase-12 (MMP-12) expression in an neuropathic pain rodent model, from activity to probe prototype development  
Lam R.W.M., Hu T., Goh P.S.H., Khanna S., Lee T.H.A., Kishore B., Lam Y., Wong R.M.W., Kadir N.D.B., Ho R.C.M., Wong H.K. (SG)
- P164** Magnetic resonance image findings in the early post-operative period after microscopic bilateral decompression via a unilateral approach  
Iio R., Kita T., Takayama K., Sakanaka H., Yamano Y., Nakamura H. (JP)
- P165** Oblique lateral interbody fusion versus extreme lateral interbody fusion: Comparative study of differences in clinical/radiologic outcomes and complications  
Hoshino M., Terai H., Toyoda H., Suzuki A., Takahashi S., Hayashi K., Tamai K., Ohyama S., Nakamura H. (JP)
- P166** Three-column spinal osteotomy with sagittal plane correction using suk vertebral derotator  
Kanayama M., Iwata A., Oha F., Shimamura Y., Kuroki K., Hisada Y., Tashiro K., Hashimoto T. (JP)



www.spineweek.org



### The International Society for the Study of the Lumbar Spine

- P167** Is surgical site infection following spinal surgery affected by infection-related risk factors and the duration and generation of prophylactic antibiotics regimen?  
Jeon C.H., Chung N.S., Lee H.D. (KR)
- P168** Occult tethered cord syndrome can cause a low back pain  
Nakanishi K., Tanaka N., Kamei N., Sumiyoshi N., Rikita T., Kotaka S., Ochi (JP)
- P169** New growing rods instrumentation for early-onset spinal deformities at 3-year follow-up: A preliminary report  
Wang W.J., Yan Y.G., Wang C., Ouyang Z.H. (CN)
- P170** TPA is a useful parameter to assess the outcome of adult spinal deformity surgery  
Banno T., Hasegawa T., Yamato Y., Kobayashi S., Togawa D., Oe S., Mihara Y., Kurosu K., Matsuyama Y. (JP)
- P171** Modic changes on magnetic resonance imaging and endplate remodeling on computed tomography after posterolateral fusion surgery  
Shiga Y., Orita S., Yamauchi K., Inage K., Sato J., Fujimoto K., Abe K., Kanamoto H., Inoue M., Kinoshita H., Takahashi K., Ohtori S. (JP)
- P172** Factors associated with having an indication for surgery in patients with adult spinal deformity  
Wunderlin S., Mannion A.F., Obeid I., Pellis F., Acaroglu E., Alanay A., Pérez-Gueso F.S., Keinstuck F.S., European Spine Study Group (ESSG) (CH, FR, ES & TR)
- P173** Radiological evaluation after posterior fusion combined with vertebroplasty for nonunion of osteoporotic vertebral fractures  
Tanimoto K., Takebayashi T., Yoshimoto M., Terashima Y., Yamashita T. (JP)
- P174** The clinical results of the percutaneous endoscopic lumbar discectomy with electromyogram under general anesthesia  
Kitahama Y. (JP)
- P175** A comparison of balloon kyphoplasty and calcium phosphate cement-assisted vertebroplasty for osteoporotic vertebral fractures  
Tsujio T., Hoshino M., Nakamura H. (JP)
- P176** Efficacy of the intraoperative analgesic injection including dorsal rami and cutaneous nerve conduction block with ropivacaine in postoperative pain management after lumbar decompression surgery  
Hayashi K., Hoshino M., Toyoda H., Takahashi S., Terai H., Suzuki A., Tamai K., Ohyama S., Nakamura H. (JP)
- P177** A validation of efficacy of povidone-iodine solution for the spinal surgery  
Yamato Y., Kawamura N., Muraki S., Masuyama S., Hirao Y., Maruyama H., Tachibana N., Shimizu T., Kunogi J. (JP)
- P178** Age is not a contributory factor to poor clinical outcome when performing single level minimally Invasive Transforaminal Lumbar Interbody Fusion (MIS-TLIF) at 5 years  
Lai M.C., Siddiqui M.A., Seng C.S., Yeo W., Fong P.L., Yue W.M., Guo C.M., Tan S.B. (SG)
- P179** Decompression for spinal stenosis is not adequately represented on postoperative MRI  
Schenck C.D., Van Susante J.L.C., Van Gorp M., Belder R., Vleggeert-Lankamp C.L.A. (NL)
- P180** Vertical instability of translation segment and decompression surgery outcomes in degenerative lumbar spondylolisthesis  
Nikaido T., Otani K., Watanabe K., Kato K., Kobayashi H., Yabuki S., Kikuchi S., Konno S. (JP)



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### The International Society for the Study of the Lumbar Spine

- P181** Does percutaneous vertebroplasty for vertebral compression fracture with intra-vertebral cleft restore the collapsed vertebral body?  
Chang B.S., Park S.M., Lee H.J., Park J.W., Zheng G.B., Kim H., Lee C.K. (KR)
- P182** Neurological complications after posterior spinal surgeries  
Ahn D.K., Lee J.S., Kang M., Yi S. (KR)
- P183** Particular features of surgical site infection in posterior lumbar interbody fusion  
Ahn D.K., Kim J.W., Kim G.W. (KR)
- P184** Selective lumbar fusion in patients with adolescent idiopathic scoliosis of Lenke type 6C: Can it be an effective treatment option just as in Lenke type 5C?  
Lee C.K., Kim H., Zheng G.B., Park S.M., Park J.W., Lee H.J., Chang B.S. (KR)
- P185** Muscle mass measurement using bioelectrical impedance analysis may be a useful indicator of surgical outcome after lumbar surgery  
Fujimoto K., Inage K., Yamauchi K., Orita S., Suzuki M., Kubota G., Sainoh T., Sato J., Shiga Y., Abe K., Kanamoto H., Inoue M., Kinoshita H., Takahashi K., Ohtori S. (JP)
- P186** Retrospective investigation of perioperative complications in 155 patients who underwent oblique lateral interbody fusion surgery: Perspectives and indications from a multicenter survey  
Abe K., Mannoji C., Motegi H., Aramomi M., Ishikawa T., Kotani T., Akazawa T., Morinaga T., Fujiyoshi T., Hasue F., Yamagata M., Hashimoto M., Yamauchi T., Eguchi Y., Suzuki M., Hanaoka E., Orita S., Ohtori S., Takahashi K. (JP)
- P187** Intervertebral overcorrection using oblique lateral interbody fusion may be a risk factor for adjacent segment degeneration  
Fujimoto K., Ohtori S., Yamauchi K., Orita S., Inage K., Sato J., Shiga Y., Abe K., Kanamoto H., Inoue M., Kinoshita H., Takahashi K. (JP)
- P188** Is the duration of pre-operative conservative treatment associated with the clinical outcome following surgical decompression for lumbar spinal stenosis? An analysis from an international Spine Registry  
Zweig T., Mannion A., Melloh M., Sobottke R., Freeman B., Aghayev E. (CH & AU)
- P189** Potential involvement of inflammatory cytokines in the etiology of idiopathic spinal epidural lipomatosis  
Fujita N., Hosogane N., Hikata T., Iwanami A., Watanabe K., Shiono Y., Okada E., Ishikawa M., Horiiuchi K., Nakamura M., Matsumoto M., Ishii K. (JP)
- P190** Cause and rate of revision surgery for the patients with adult spinal deformity  
Togawa D., Hasegawa T., Yamato Y., Kobayashi S., Yasuda T., Oe S., Banno T., Arima H., Mihara Y., Kurosu K., Matsuyama Y. (JP)
- P191** Comparison of minimally invasive vs traditional open posterior procedure combined with XLF in the treatment of low back pain due to adult spinal deformity in the elderly  
Yamada H., Yoshida M., Hashizume H., Minamide A., Nakagawa Y., Iwasaki H., Tsutsui S., Masanari T., Nakao S., Kagotani R. (JP)
- P192** Development and validation of the iDI - A short self-rating disability instrument for low-back disorders.  
Boos N., Rolli-Salathé C., Mayer M., Tüschel A., Ogon M., Effring E. (CH, DE & AU)
- P193** Surgical treatment of low lumbar osteoporotic vertebral collapse  
Nakajima H., Honjoh K., Sakamoto T., Kitade M., Izubuchi, Yamamoto Y. (JP)



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- P194** Effect of boomerang-shaped cage versus box-shaped cage on the local alignment after posterior lumbar interbody fusion with bilateral facetectomy  
Kuroki K., Kanayama M., Oha F., Shimamura Y., Hisada Y., Tashiro K., Hashimoto T., Iwasaki N. (JP)
- P195** Radiation exposure to the surgeon and patient during a fluoroscopic procedure: How high is the exposure dose? A cadaveric study  
Yamashita K., Higashino K., Morimoto M., Abe M., Takata Y., Sakai T., Fukui Y., Sairoy K. (JP)
- P196** Modic change type III may be a risk factor for low back pain in patients with lumbar spinal stenosis  
Fujimoto K., Ohtori S., Yamauchi K., Orita S., Inage K., Sato J., Shiga Y., Abe K., Kanamoto H., Inoue M., Kinoshita H., Takahashi K. (JP)
- P197** Wrong site surgery in spine  
Hara N., Yamazaki T., Matsutani S. (JP)
- P198** Prediction of treatment outcomes for patients with chronic low back pain: The development of a clinical decision guideline for spine surgeons  
Van Hooff M.L., Van Dongen J.M., Groot D., Spruit M., Coupé V.M.H., Ostelo R.W.J.G., De Kleuver M. (NL)
- P199** Impacts of percutaneous posterior Axation surgery on the performance status, activities of daily living, and quality of life in patients with spinal metastasis  
Yurube T., Kakutani K., Maeno K., Takada T., Miyazaki S., Terashima Y., Ito M., Kakiuchi Y., Sakai Y., Kurosaka M., Nishida K. (JP)
- P200** MRI-based scoring of multi-Modus inadequately characterizes muscle tissue quantity and quality in patients with chronic lumbar spine disease  
Shahidi B., Hubbard J.C., Gibbons M., Zomistic V., GarAh G., Allen R.T., Ward S.R. (US)
- P201** Transpedicular foraminal decompression: A new technique for the management of radicular pain from foraminal stenosis  
Brooks F.M., Fraser R.D. (AU)
- P202** Stand-alone minimally invasive anterior lumbar interbody fusion for the treatment of adjacent segment disease: A case series  
Jain D., Verma K., Mizutani J., Tay B., Burch S., Deviren V. (US)
- P203** The shortcomings of the thoracolumbar injury classification and severity scale and the load-sharing classification in the evaluation of thoracolumbar burst fractures  
Katoh H., Watanabe M., Miyama A., Sakai D., Sato M., Mochida J. (JP)
- P204** Bilateral decompression via unilateral approach for lumbar spinal stenosis have advantage? Follow-up study  
Hatakeyama K., Aihara T., Urushibara M. (JP)
- P205** Patients with an elevated SVA and a low PT [ack of pelvic compensation for a high SVA] indicates a greater risk of deterioration of thoracic kyphosis following pedicle subtraction osteotomy for rigid degenerative lumbar kyphosis  
Toyone T., Ozawa T., Shirahata T., Kudo Y., Matsuoaka A. (JP)
- P206** Comparative analysis of three different surgical strategies for adult spinal deformity  
Bae J.S., Theologis A.A., Strom R., Tay B., Burch S., Berven S., Mummaneni P., Chou D., Ames C.P., Deviren V. (KR & US)



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Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings

Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings



## The International Society for the Study of the Lumbar Spine

- P207 Tubular surgery with the assistance of endoscopic surgery via paramedian or midline approach for lumbar spinal canal stenosis of single L4/5 level**  
Komatsu J., Iwabuchi M., Fukuda H., Watanabe T., Shirado O. (JP)
- P208 Reliability of evaluation for lumbar interbody fusion by multi planer reconstruction CT**  
Hasegawa T., Haro H., Takahashi J., Ebata S., Mukaiyama K., Yamato Y., Kobayashi S., Togawa D., Ojima T., Matsuyama Y. (JP)
- P209 Radiographical results of a prospective, multicenter, observational study of total lumbar disc replacement, 24 months follow up**  
Le Huec J.C., Assaker R. (FR)
- P210 Effect of BMI and age on minimally invasive fusion (MIIF): One year follow up**  
Franke J., Manson N., Senker W. (DE, CA & AU)
- P211 Discrepancies between planned post-operative alignment and age-adjusted ideals: What are the implications of planning to over- or under-correct?**  
Henry J., Spiegel M., Oren J., Lafage R., Diebo B., Worley N., Jalaic C., Protosaitis T., Erico T., Lafage V., Schwab F. (US)
- P212 Importance of preoperative planning for adult spinal deformity correction**  
Henry J., Spiegel M., Gammal I., Lafage R., Tanzi E., Diebo B., Oren J., Protosaitis T., Erico T., Lafage V., Schwab F. (US)
- P213 Sagittal plane correction using lateral transposas approach: Effect of cage angulation and surgical technique on segmental lordosis**  
Yoon S.T., Melikian R., Kim J.Y., Park K.Y., Yoon C.J., Hutton W.C. (US)
- P214 Long term pain recurrence rates following lumbar discectomy or epidural injection**  
Kennedy D.J., Schneider B.J., Huynh L., McCormick Z., Levin J., Smuck M. (US)
- P215 Outcomes in adult deformity surgery: What happens to those patients who are lost to follow up**  
Beckerman D.A., Sharf T., Ntshaykolo J.J., Burch S., Berven S., Racine L. (US)
- P216 Appropriate surgical procedures in older patients with spinal deformity: A comparison of surgical approaches**  
Hohenstein N.A., Verma K., Burch S., Deviren V., Berven S.H., Beckerman D.A. (US)
- P217 Is there an optimal upper thoracic upper-instrumented vertebral endpoint in adult spinal deformity surgery?**  
Theologis A.A., Bae J., Burch S., Tay B., Chou D., Mummaneni P., Berven S., Ames C.P., Deviren V. (US & KR)
- P218 Does sagittal alignment indicate response after lumbar surgery augmented with DIAM interspinous implant?**  
Crawford R.J., Malone Q.J., Price R.I. (CH, AU)
- P219 Complications of cortical screw fixation in the lumbar spine - A 3-year learning curve**  
Thillainadesan T., Edis D. (AU)
- P220 Comparison of postoperative outcomes for degenerative disc disease patients in comparison with posterior vs. anteroposterior interbody fusion surgery**  
Orita S., Inage K., Sato J., Fujimoto K., Shiga Y., Kanamoto H., Abe K., Inoue M., Kinoshita H., Yamauchi K., Takahashi K., Ohtori S. (JP)



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## Africa Spine

- P1 Screwing of the lateral mass of atlas: About 3 cases**  
Moumouni A.K., Haidara A., Beketi K.A., Kpelao E., Doleagbenou A., Kone N., N'dri O.D., Ba Zeze V., Dossim M. (TG & CI)
- P2 Thoracic trauma spine - About 24 cases**  
Ait Saadi M., Benaïda A., Sahraoui B., Khaouas M., Hamidani M. (DZ)

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## The International Society for the Study of the Lumbar Spine

- P221 Ambulatory surgery for lumbar disc herniation: Pioneer experience in a french teaching hospital**  
Lamerain M., Jubert P., Heyberger C., Rousseau M.A. (FR & R)
- P222 Pre-vertebroplasty transpedicular "vertebrography" assessment in delayed-union/pseudarthrosis associated with osteoporotic vertebral fracture**  
Kato T., Yoshii T., Inose H., Hirai T., Yamada T., Okawa A. (JP)
- P223 Does stopping of teriparatide treatment change the volume of bone fusion mass after lumbar posterolateral fusion in women with postmenopausal osteoporosis?**  
Ohtori S., Orita S., Yamauchi K., Eguchi Y., Aoki Y., Suzuki M., Kubota G., Inage K., Sainoh T., Sato J., Fujimoto K., Shiga Y., Abe K., Kanamoto H., Takahashi K. (JP)
- P224 Characteristics of patients with lumbar spinal stenosis who had maintained disc height**  
Yano T., Iguchi T., Yamamoto J., Kakutani K., Nishida K. (JP)
- P225 Comparative analysis of sagittal balance and pelvic parameters between low-grade lumbar spondylolisthesis (isthmic and degenerative) and spinal stenosis**  
Jeon C.H., Chung N.S., Lee H.D. (KR)
- P226 The effect of Capacitively Coupled (CC) electrical stimulation on human intervertebral disc cells and the relationship between CC and BMP**  
Wang Z., Hutton W.C., Yoon S.T. (US)



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### Degenerative cervical

- P1 Finite element analysis of anterior release and pedicular screwing fixation for cervical kyphotic myelopathy associated with athetoid cerebral palsy**  
Kano H., Takaiishi H., Miyamoto A., Tachibana A., Watanabe Y., Nakamichi K., Kataoka T. (JP)
- P2 Treatment of cervical degenerative disc diseases with single-level disc prosthesis: 3 Years outcomes - Multicenter study**  
Byvaltsev V.A., Kalinin A.A., Shepelev V.V., Bardanova L.A., Sorokovikov V.A. (RU)
- P3 Factors affecting cage subsidence of single-level anterior cervical discectomy and fusion**  
Fukao S., Kidooka M., Isozumi T., Li H., Kayatani H. (JP)

### Degenerative lumbar

- P4 Osteoporotic vertebral collapse of the type A3.1.3 incomplete inferior burst fracture can cause the radiculopathy associated with dynamic foraminal stenosis**  
Takaiishi H., Fujita N., Matsumaru S., Kobayashi Y., Takahashi Y., Shinozaki Y., Ogawa J. (JP)
- P5 Non-surgical spinal decompression in a multi-disciplinary neurosurgical clinic**  
Telman K., Keshishyan T., Betts M. (US)
- P6 Finite element analysis of posterior lumbar interbody fusion using a cortical bone trajectory screw construct: Anterior column support stability and spondylolisthesis reduction**  
Takaiishi H., Fujita N., Matsumaru S., Kobayashi Y., Takahashi Y., Shinozaki Y., Ogawa J. (JP)
- P7 Adjacent segment degeneration after lumbar spinal fusion compared with motion preservation procedures: A meta-analysis**  
Pan A., Hai Y., Yang J., Zhou L., Chen X., Guo H. (CN)
- P8 ILIF™ (Interlaminar Lumbar Instrumented Fusion): Clinical, radiological and safety results of a mini case-series (30 cases)**  
Carrahs G., Sessa G., Sca G. (IT)
- P9 Risk factors for lumbar degenerative spondylolisthesis in Japanese patients with osteoarthritis of the hip: A radiographic study**  
Sasagawa T., Nakamura T. (JP)
- P10 Evaluation of the temporal changes of the bone grafts on the X-ray and reconstruction CT images after single level L5-S1 TLIF**  
Kobayashi Y., Shinozaki Y., Fujita N., Matsumaru S., Takahashi Y., Takaiishi H., Ogawa J. (JP)
- P11 Do modic changes progress with aging?**  
Tanukado K., Ono T., Tono O., Doi T. (JP)

### Spinal deformity

- P12 A novel technique in treating a catastrophic proximal junctional failure in a patient with Osteogenesis Imperfecta**  
Morassi G.L., Shafafy R., Kapinas A.V., Shafafy M. (UK)
- P13 A novel technique for the diagnosis of spinal implant infection**  
Morassi G.L., Shafafy R., Ashraf W., Bayston R., Shafafy M. (UK)



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- P14 **Focal Ponte osteotomy for more effective periapical segmental vertebral derotation in adolescent idiopathic scoliosis**  
Seki S, Kawaguchi Y, Nakano M, Yasuda T, Suzuki K, Makino H, Kimura T. (JP)
- P15 **Comparison of clinical and radiologic outcome of adolescent idiopathic scoliosis treated by hybrid thoracic hook lumbar screw versus universal clamp system**  
Ghayem Hassankhani E. (IR)
- P16 **Focal and dynamic cervical alignment pathology correlates with myelopathy severity in cervical deformity patients**  
Lafage R, Lafage V, Protosaltis T, Hart R, Passias P, Klineberg E, Smith J, Neuman B, Hamilton K, Jain A, Mundis G, Zabala L, Shaffrey S, Ames C. (US)

## Spinal trauma

- P17 **A cross sectional review on spinal cord injuries**  
Upadhyay U, Tan G, Setiobudi T. (SG)



- P1 **Qualitative grading on magnetic resonance imaging as a tool for decision making in lumbar spinal stenosis**  
Soman S.M., Modi J.V., Tharadara G. (IN)
- P2 **Comparative study of anterior and posterior approach for unstable thoracolumbar burst fractures (20 cases each)**  
Soman S.M., Modi J.V., Tharadara G. (IN)
- P3 **Effects of wearing type lumbosacral support for low back pain among hospital workers: A randomized controlled trial**  
Hagiwara Y, Yabe Y, Yamada H, Watanabe T, Kanazawa K, Koide M, Sekiguchi T, Hatano H, Iwasaki T, Itoi E. (JP)
- P4 **Changes in segmental range of motion after laminoplasty and clinical results based on a 2-year follow-up**  
Shigematsu H, Iwata E, Okuda A, Morimoto Y, Masuda K, Kura T, Tanaka Y. (JP)
- P5 **Cervical spinal canal stenosis first presenting after spinal cord injury due to minor trauma: An insight into the value of preventive decompression**  
Shigematsu H, Mak K.C., Bruzzone M., Luk K.D.K., Cheung J.P.Y. (JP, CN & AR)
- P6 **If and when an interlaminar elastic assistance device can stop or reverse the degenerative cascade of the lumbar spine - Purpose of the study**  
Guizzardi G. (IT)
- P7 **New computed radiography processing condition for whole spine X-ray**  
Sasagawa T, Kamiya N, Kunogi J. (JP)
- P8 **The clinical utility of a one-shot energy subtraction method for thoracic spine radiography**  
Sasagawa T, Kamiya N, Kunogi J. (JP)
- P9 **The impact of curative surgical resection of spinal metastases from thyroid carcinoma**  
Kato S, Murakami H, Demura S, Yoshioka K, Yokogawa N, Fujii M, Igarashi T, Yonezawa N, Takahashi N, Tsuchiya H. (JP)
- P10 **Anterior decompression via a posterolateral approach for ossification of posterior longitudinal ligament in the thoracic spine**  
Kato S, Murakami H, Demura S, Yoshioka K, Yokogawa N, Fujii M, Igarashi T, Yonezawa N, Takahashi N, Tsuchiya H. (JP)
- P11 **Appropriate size and angulation for axis screw placement**  
Bunmaprasert T, Treearong N, Khamkhad A. (TH)
- P12 **Lamina closure after cervical open-door laminoplasty**  
Takahata T, Ikuma H, Muraoka S, Maehara T. (JP)
- P13 **Matched comparative study between ACDF and laminoplasty for 2-3 levels cervical myelopathy, neurological outcome and late kyphosis**  
Abdelrazek M.A., Cheung J.P.Y., Mossad M.M., Cheung K.M.C. (HK & EG)
- P14 **Prevalence of high-intensity zone in lumbar discs by age and correlation between high-intensity zone and other degenerative findings on MR images**  
Takeuchi M., Nagamachi A., Tamaki Y. (JP)
- P15 **The characteristics of regional bone quality in the cervical vertebrae considering BMD**  
Kim M.K, Park K.H., Kim I.B., Kwak D.S. (KR)



- P16 **Adjacent segment degeneration after minimally invasive posterior lumbar interbody fusion**  
Takahata T, Ikuma H, Muraoka S, Maehara T. (JP)
- P17 **Recurrent herniation after microendoscopic discectomy for lumbar disc herniation**  
Ikuta K, Masuda K. (JP)
- P18 **Long-term benefits of percutaneous anatomical restoration of vertebral compression fractures linked to malignancy**  
Noriega D., Krüger A., Hernandez Ramajo R, Ardura F. (ES & DE)
- P19 **Analysis of the relationship between surgical outcomes after double-door laminoplasty for cervical spondylotic myelopathy and dynamic factors**  
Miyazaki M., Notani N., Ishihara T., Yoshiwa T., Tsumura H. (JP)
- P20 **Analysis of the relationship between surgical outcomes after double-door laminoplasty for cervical spondylotic myelopathy and clinical characteristics on super elderly patients (more than 80 years old)**  
Notani N., Miyazaki M., Ishihara T., Yoshiwa T., Tsumura H. (JP)
- P21 **Analysis of the relationship between surgical outcomes after double-door laminoplasty for ossification of posterior longitudinal ligament of the cervical spine and dynamic factors**  
Miyazaki M., Notani N., Yoshiwa T., Tsumura H. (JP)
- P22 **Adjacent disc degeneration after thoracolumbar vertebral fractures: Which factors have an influence and early diagnosis with diffusion MRI**  
Noriega D.C., Ardura F., Hernandez Ramajo R, Sanchez-Lite I, Toribio B. (ES)
- P23 **Sequentially quantifying progressive anterior overgrowth in the vertebrae of adolescent idiopathic scoliosis patients**  
Newell N., Grant C.A., Keenan B.E., Izatt M.T., Pearcy M.J., Adam C.J. (AU)
- P24 **Accuracy and pitfalls of pre-operative simulation of pedicle subtraction osteotomy using a computer software**  
Chen H.Y., Syu D.K., Hu M.H., Chen P.Q., Yang S.H. (TW)
- P25 **Application of pedicle subtraction osteotomy with excision of proximal adjacent intervertebral disc (Schwab grade IV osteotomy) to correction of post-traumatic kyphosis**  
Chen H.Y., Syu D.K., Hu M.H., Chen P.Q., Yang S.H. (TW)
- P26 **Blood loss in spinal tumour surgery: Evaluation of influencing factors**  
Kumar N., Zaw A.S., Maharajan K, Kumar A. (SG)
- P27 **The influence of histological subtype in predicting survival of lung cancer patients with spinal metastases**  
Kumar N., Tan K., Tan J., Zaw A.S., Kumar N. (SG)
- P28 **Versatility of percutaneous pedicular screw fixation in metastatic spine tumour surgery**  
Kumar N., Zaw A.S., Malhotra R, Kumar N. (SG)
- P29 **Magnetic resonance image findings in the early post-operative period after cervical laminoplasty**  
Kazushi Takayama K, Kita T, Lio R, Sakanaka H, Yamano Y, Nakamura H. (JP)
- P30 **Surgical Site Infection surveillance in spinal surgery**  
Chikawa T., Toki S., Kashima M., Yoshioka S., Nakamura M., Nakagawa T., Nakano S. (JP)



- P31 **Cervical myelopathy without exaggerated patellar tendon reflex depends on peripheral neuropathy?**  
Nishida K, Mochizuki Y. (JP)
- P32 **Investigation of ossification in the posterior longitudinal ligament using micro-focus X-ray CT scanning and histological examination**  
Fukutake K, Takahashi H, Tsuchiya K, Yokoyama Y, Iida Y, Hasegawa K, Kuzuhara A., Wada A. (JP)
- P33 **Long term outcome of surgical treatment for cervical ossification of the posterior longitudinal ligament**  
Hirose T, Misawa H, Takeuchi K, Nakahara S. (JP)
- P34 **Spinal cord drift after non instrumented posterior cervical laminectomy**  
Sebaaly A., Nabhane N., Kharrat K, Moussa R. (LB)
- P35 **The outcome of pedicle screw instrumentation removal for ongoing low back pain following posterolateral lumbar fusion**  
Zotti M.G.T., Brumby-Rendell O.P., McDonald B., Fisher T, Tsimikis C., Yoon W.W., Osti O.L. (AU)
- P36 **Pre-existing lumbar degeneration as a predictor of adjacent segment degeneration after posterior spinal instrumented fusion**  
Lau Y.Y.O., Kwok K.O., Chan L.Y., Grifths J.F., Law S.W. (HK)
- P37 **Standing MRI exaggerated the degree of lumbar foraminal stenosis but not improved correlation with patient symptoms**  
Lau Y.Y.O., Lee K.L., Chan L.Y., Kwok K.O., Grifths J.F., Law S.W. (HK)
- P38 **Comparison of Modified Marmot operation and lumbar spinous process splitting laminectomy about short-term outcome in lumbar spinal stenosis**  
Masuda K, Shigematsu H, Iwata E, Morimoto Y, Okuda A., Tanaka Y. (JP)
- P39 **Comparison of response to anti tubercular treatment in contiguous and noncontiguous multilevel Pott's spine**  
Bhardwaj V., Kandwal P., Jayaswal A. (IN)
- P40 **Results of single stage posterior surgery in predicted dorsal and dorso-lumbar tubercular progressive kyphosis**  
Ahsan K., Sakeb N. (BD)
- P41 **Results of transforaminal lumbar interbody fusion (TLIF) versus posterior lumbar interbody fusion (PLIF) in symptomatic lumbar instability**  
Sakeb N., Ahsan K. (BD)
- P42 **Repair of symptomatic pars defect by intra-laminar screws and bone graft: Outcome of 24 cases**  
Ahsan K., Sakeb N. (BD)
- P43 **Efficacy of early decompression for central cervical cord injury**  
Hiromitsu O., Kanji S., Keiji I., Mizuki W. (JP)
- P44 **The alignment risk factor of proximal junctional kyphosis in corrective long fusion from T10 to sacroiliac region for lumbar degenerative kyphosis**  
Katayanagi J., Iida T, Oyama Y., Mine K, Ozeki S. (JP)





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- P45** Prediction of walking ability of the osteoporotic patients presenting with acute thoracolumbar vertebral fractures  
Kitahara J. (JP)
- P46** 3D MRI/CT fusion imaging for preoperative planning of translaminar microdiscectomy for lumbar disc herniation migrated into the hidden zone  
Fujioka Y., Sasaki M., Hori J., Nimoto T., Kazusa H. (JP)
- P47** Limited laminectomy approach for extensive epidural abscess  
Prasath V.C.S. (IN)
- P48** C1-C2 Potts Disease: A unique picture of spine tuberculosis  
Real A.L., Padua M.R., Catbagan A. (PH)
- P49** Therapeutic strategy and pathosis of dropped head syndrome  
Tanaka H., Endo K., Kobayashi H., Suzuki H., Nishimura H., Matsuoka Y., Yamamoto K. (JP)
- P50** Elderly patients have poorer outcome after single level open Transforaminal Lumbar Interbody Fusion (TLIF) at 5 years  
Lim Y.G., Siddiqui M.A., Yeo W., Lai M.C., Yue W.M., Chen J.L.T., Guo C.M., Tan S.B. (SG)
- P51** Outcome evaluation of a zero-profile cage plate for single and multiple level anterior cervical discectomy and fusion (2 years maximum follow-up)  
Bustos W.S., Lee J.Y.Y., Yeo W., Chen J.L.T. (SG)
- P52** Surgical management of spinal extradural arachnoid cysts - A case series  
Vemula V.R.C., Bodapati C.P. (IN)
- P53** Spinal fractures in patients with diffuse idiopathic skeletal hyperostosis - CT-based analysis by fracture level  
Okada E., Shimizu K., Kato M., Fukuda K., Kaneko S., Ogawa J., Watanabe K., Matsumoto M., Ishii K. (JP)
- P54** Rotatory range of motion of atlanto-occipital joint increases after spontaneous osseous fusion following remodeling therapy for chronic atlantoaxial rotatory Axiation  
Kitamura K., Iwanami A., Hikata T., Fujita N., Watanabe K., Matsumoto M., Ishi K. (JP)
- P55** Neurological recovery in two patients with cauda equina syndrome secondary to L5 lumbar spine giant cell tumour after treatment with Denosumab without surgery  
Randhawa S.S., Kwan A.K.N., Chiu C.K., Chan C.Y.W., Kwan M.K. (MY)
- P56** Assessment of intraoperative blood loss at different surgical stages during posterior spinal fusion surgery in the treatment of adolescent idiopathic scoliosis  
Chiu C.K., Chan C.Y.W., Azzi I., Hassan M.S., Kwan M.K. (MY)
- P57** Surgery in spine tuberculosis - Anterior or posterior?  
Iqbal M., Noor Z. (ID)
- P58** Minimally assess anterior spine surgery using intraoperative computed tomography integrated navigation - A case series study  
Wu M.H., Huang T.J., Li C.Y., Lee C.H., Kuo Y.J. (CN)
- P59** Correlation study between clinical special tests for myelopathy and MRI findings in patients seen for cervical dysfunction  
Zamzuri Z., Ariff M.S., Hishamudin D., Azian A.A. (MY)



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- P60** Patient satisfaction after lumbar microdecompression under general vs. progressive local anesthesia  
Ramos M.R.D., Ver M.R. (PH)
- P61** The UTE MRI Disc Sign (UDS): A novel imaging biomarker associated with spine degeneration, pain and disability  
Pang H., Hui E., Bow C., Cheung J., Borthakur A., Karppinen J., Inoue N., Wang H.Q., Luk K.D.K., Cheung K.M.C., Samartzis D. (HK, US, R & CN)
- P62** Incidence of DJK after selective thoracic fusion with low implant density in AIS  
Kwan K., Wong J., Cheung J.P.Y., Wong Y.W., Cheung K.M.C. (HK)
- P63** Challenging giant spinal nerve sheath tumours - Multidisciplinary approach  
Ivanov M., Lee M.T., Panbehchi S., Rao J., Chiverton N. (UK)



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## ASSI Association of Spine Surgeons of India

- P1** Radiological sagittal parameters of lumbosacral spine in Indian young adults  
Bothakar B. (IN)
- P2** Experts consensus algorithms for management of various thoraco-lumbar fracture types  
Chhabra S., Raghavendra V. (IN)
- P3** Bilateral endoscopic decompression of degenerative lumbar spinal stenosis involving a unilateral approach by Arthrospine system  
Kaushal M., Kaushal M. (IN)
- P4** Chronic neglected atlantoaxial rotatory subluxation in adolescence  
Padalkar P. (IN)
- P5** Neglected traumatic spinal cord injuries: Causes, consequences and outcomes in an Indian setting  
Moolya S.N., Chhabra H.S. (IN)
- P6** Titanium coated PEEK cages: Revolution or not?  
Willems K. (BE)
- P7** Preoperative transarterial embolisation of spinal tumours - Our experience  
Ganesan S. (IN)
- P8** Incidence and types of congenital posterior arch defects of atlas in Indian population  
Gururaj G., Chhabra H.S., Salimath S., Nanda A. (IN)
- P9** Does fusion method influence functional outcome? Does outcome vary between different methods of fusion with respect to indication of fusion?  
Mehata H., Bhojraj S., Chaddha R., Nene A., Nagad P., Patel P., Kashikar A., Akbari K., Kumar N. (IN)
- P10** Analysis of complications of surgical treatment of degenerative stenosis  
Basankin I.V., Shapovalov V.K., Afaunov A.A., Kuznenko A.V., Piyasov S.A. (RU)
- P11** Management of Anderson's lesion in ankylosing spondylitis by posterior-only approach - Short term and mid term results: A case series of 18 patients  
Shaik I., Bhojraj S., Naggad P., Kashikar A., Patel P. (IN)
- P12** Modification of Oswestry disability index for Indian rural patients, part I - Development of a modified disability index questionnaire  
Janardhana A.P., Kumar S., Shodhan A., Kotian M.S. (IN)
- P13** Effect of cervical kyphotic deformity type on the motion characteristics and dynamic spinal cord compression  
Phadke K., Moolya S., Nanda A., Chhabra H.S. (IN)
- P14** Clinico-radiological criteria for fusion in prolapsed intervertebral disc in lumbar spine: A single centre retrospective analysis  
Akbari K., Bhojraj S., Nagad P., Patel P., Kashikar A., Mehata H., Kumar N. (IN)
- P15** Minimal invasive atlanto axial Axiation - A new paradigm (Minimal invasive trans-articular screw). Study evaluating efficacy of MIS-TAS & Allograft without supplemental wiring in management  
Kundnani V., Patil S.N., Gujrathi G., Ruparel S. (IN)
- P16** Results of spinal loop rectangle and sublaminar wires in idiopathic scoliosis correction  
Patel P.M., Bhojraj S.Y., Nagad P., Kashikar A.K., Kumar N., Akbari K., Prasad G., Hrushikesh M. (IN)



www.spineweek.org

ePosters

## ASSI Association of Spine Surgeons of India

- P17** Results of posterior surgery in thoraco-lumbar spine injury - A series of 122 patients  
Karim R., Alam S., Rahman A., Jonayed, Pivash, Mirza, Raju, Azzad, Habib, Ismail (IN)
- P18** Spinal tuberculosis presenting as Immune Thrombocytopenic Purpura (ITP)  
Govindasamy R., Srinivasa V. (IN)
- P19** Circumferential fusion through all-posterior approach in Andersson lesion: Results of 20 patients  
Kanna R., Rajoli S.R., Shetty A.P., Rajasekaran S. (IN)
- P20** Changes in sagittal pelvic parameters after L5-S1 fusion in high grade spondylolisthesis - Reduction Vs in-situ fusion  
Rajasekaran S., Das G., Dian T.A., Shetty A.P., Kanna R. (IN)
- P21** Delayed post-operative foot drop in lumbar fusion - Natural history of recovery, association with type of pathology and type of surgery  
Basu S., Kondety S.K., Bswasa., Ahmed R., Sun T., Kesharwani S. (IN)
- P22** A case report of extramedullary haematopoiesis in lumbosacral region presenting as cauda equina syndrome  
Tharadara G., Soman S. (IN)
- P23** Seizure-induced lumbar spine burst fracture  
Muraoka S., Ikuma H., Takahata T. (JP)
- P24** The role of facet tropism in the Indian population  
Prabhoo T.R., Joshi N.N., Kothari J., Nene A.M. (IN)
- P25** Drug resistance patterns in 119 cases of drug-resistant tuberculosis spine  
Tikoo A., Nene A., Kothari M., Shah K., Patil S.S. (IN)
- P26** Infective spondylodiscitis in pre-existing spinal deformity  
Prasath V.C.S. (IN)
- P27** Superior sulcus lesion presenting as cervical radiculopathy - A surprise diagnosis  
Murugan Y. (IN)



www.spineweek.org

ePosters

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

141

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

143



## Chinese Association of Orthopedic Surgeons

- P1** Radiological analysis of degenerative lumbar scoliosis in relation to pelvic incidence  
Wang H., Hui W., Ding W. (CN)
- P2** Comparison between posterior vertebral column resection and anterior corpectomy and instrumentation for correcting late post-traumatic thoracolumbar kyphosis  
Wang H., Hui W., Ding W. (CN)
- P3** An action research on assisting a family caregiver of a person with spinal cord injury in Hong Kong - A pilot study  
WU W.S., KU H.B. (CN)
- P4** The feasibility of a novel hydrogel intradiscal implant for nucleus augmentation  
Yeung A.T., Morganstem R., Knight M., Prewett A. (US & UK)
- P5** Acoustic-frequency vibratory stimulation regulates the balance between osteogenesis and adipogenesis of human bone marrow-derived mesenchymal stem cells  
Chen X., Zhong D.Y., Luo Z.P. (CN)
- P6** Assessing the symptom burden of Chinese patients with spinal tumor: Validation of the Chinese version of the MD Anderson Symptom Inventory - Spine Tumor Module (MDASI-SF)  
Xu N., Li Z., Wei F., Liu X., Jiang L., Liu Z. (CN)



## The International Society for the Advancement of Spine Surgery

- P1** The concept of MISS & interlaminar dynamic stabilization in lumbar degenerative cascade  
Darwono B. (ID)
- P2** Primary or metastatic spine tumor patients with back and/or radicular pain as initial  
Lieberman I.H., Hu X. (US)
- P3** Results of various surgical procedures for osteoporotic vertebral compression fractures (OVCF): Based on a recently developed theory  
Izuka T., Ikenaga M., Ueda Y. (JP)
- P4** Effects of pedicle screw and interspinous distraction on adjacent foramina  
Jeffrey J., Bubolz A., Karas C. (US)
- P5** Stability with cortical screw-rod versus pedicle screw-rod fixation in the lumbar spine: Effects of screw size  
Newcomb A., Lehman J., Soriano H., Reis M., Reyes P., Chang S., Chin K., Chang S.W., Crawford N., Kelly B.P. (US)
- P6** Biomechanical evaluation of the CD HORIZON Spine Z spinal system with pedicle and facet fixation  
Kelly B.P., Newcomb A., Godzik J., Reis M., Reyes P., Martinez-del-Campo E., Kalb S., Singh V., Walker C.T., Chang S., Crawford S.W., Crawford N.R. (US)
- P7** Single-level, multi-level (two, three and four levels) and hybrid cervical disc arthroplasty: Age & sex-weighted linear regression analysis - Results from a single centre  
Rajesh M., Khan S., Friesem S., Bhatia C., Reddy G. (UK)
- P8** Additional pain block procedures combined with kyphoplasty for the patients with osteoporotic vertebral compression fractures  
Kim M.S., Koh Y.D. (KR)
- P9** MIS SIJ fusion improves functional work status in the workers' compensation population  
Kube R.A., Morrow D.M. (US)
- P10** MIS TLIF improves functional ability in injured workers as compared to open TLIF  
Kube R.A., Morrow D.M. (US)
- P11** Incidence and behavior of SIJ disease in private spine practice  
Kube R.A., Morrow D.M. (US)
- P12** Minimal access surgical treatment of lumbar spondylolisthesis in the elderly patient: Trans-facet pedicle screw instrumentation  
Kushkuley J., Pennings F. (US)
- P13** Are stand-alone cages sufficient for anterior lumbar interbody fusion for L5/S1 low-grade spondylolisthesis? A case series  
Pimenta L., Amaral R., Marchi L., Forti F., Oliveira L., Coutinho E., Jensen R. (BR & US)
- P14** Can stand-alone construction achieve fusion in anterior lumbar procedure using self-blocking cage? A CT study  
Pimenta L., Amaral R., Marchi L., Forti F., Oliveira L., Coutinho E., Jensen R. (BR & US)
- P15** Postoperative narcotic consumption in workers' compensation patients following anterior lumbar interbody fusion  
Massei D.H., Mayo B.C., Long W.W., Modi K.D., Bohl D.D., Singh K. (US)

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

145



www.spineweek.org



www.spineweek.org

## ePosters



## The International Society for the Advancement of Spine Surgery

- P16** The impact of worker's compensation claims on surgical outcomes following anterior lumbar interbody fusion  
Massei D.H., Mayo B.C., Long W.W., Modi K.D., Bohl D.D., Singh K. (US)
- P17** Multimodal versus patient controlled analgesia following transforaminal lumbar interbody fusion  
Bohl D.D., Louie P.K., Kim T.D., Ahn J., Massei D.H., Mayo B.C., Long W.W., Modi K.D., Buva nendran K., Singh K. (US)
- P18** Minimally invasive transforaminal lumbar interbody fusion: Comparison of grade I versus grade II isthmic spondylolisthesis  
Massei D.H., Mayo B.C., Long W.W., Modi K.D., Bohl D.D., Singh K. (US)
- P19** Differences in clinical outcomes between isthmic and degenerative spondylolisthesis following a mini-open anterior lumbar interbody fusion  
Massei D.H., Mayo B.C., Long W.W., Modi K.D., Bohl D.D., Singh K. (US)
- P20** Efficacy comparison of two commercially available demineralized bone matrices against autologous bone in a rat posterolateral spine fusion model  
Brecevic A.T., Kiely P.D., Yoon B.V., Nguyen J., Cammisa F.P., Abjornson C. (US)
- P21** Polishing less a factor in cell adhesion than roughness of titanium plasma spray coatings on PEEK  
Yoon B.V., Cammisa F.P., Abjornson C. (US)
- P22** Optimizing surface roughness for cell adhesion and proliferation on titanium plasma spray coatings on PEEK  
Yoon B.V., Cammisa F.P., Abjornson C. (US)
- P23** Achievement of spine fusion via 2 pathways in a porous tantalum device as demonstrated through a human retrieval with plating and bone graft  
Konz R., Dawson J., Epperson R., Zimmerman C. (US)
- P24** Finite element model development and validation of a healthy human lumbar spine  
Xu M., Yang J., Lieberman I., Haddas R. (US)
- P25** Comparative analysis of two different types of titanium mesh cage (with or without endcap) for single-level anterior cervical corpectomy and fusion in terms of radiologic and clinical outcomes: Is angulated endcap effective in preventing cage subsidence and restoring cervical lordosis?  
Hur J.W., Ryu K.S., Kim J.S., Seong J.H. (KR)
- P26** Influence of adverse events on clinical outcomes of patients in an FDA IDE clinical trial of cervical total disc replacement versus anterior cervical discectomy and fusion  
Ohnheiss D., Hisey M., Bae H. (US)
- P27** Minimal access surgical treatment of lumbar spondylolisthesis in the elderly patient: Trans-facet pedicle screw instrumentation  
Kushkuley J. (US)
- P28** Risk factors for kyphotic change after short-segment temporary fixation for thoracolumbar burst fractures  
Hiroyuki A. (JP)
- P29** Operative fusion of multilevel cervical spondylotic myelopathy: Impact of patient demographics  
McClelland III S., Marasciachi B.J., Passius P.G., Protopsaltis T.S., Frempong-Boadu A.K., Erico T.J. (US)



## The International Society for the Advancement of Spine Surgery

- P30** Randomized controlled trial between two different cervical disc arthroplasty implants - Three year follow-up  
Berg A.J., Killen M.C., Jensen C.D., Khan S., Maigatil R., Reddy G.R., Friesem T. (UK)
- P31** The influence of coronal alignment of device on radiographic degeneration in the case of cervical total disc replacement  
Kim S.W. (KR)
- P32** Stand-alone LLIF procedure: In which patient it can be used without cage subsidence?  
Pimenta L. (BR)
- P33** Can stand-alone construction achieve fusion in anterior lumbar procedure using self-blocking cage? A CT study  
Pimenta L. (BR)
- P34** Are stand-alone cages sufficient for anterior lumbar interbody fusion for L5/S1 low-grade spondylolisthesis? A case series  
Pimenta L. (BR)
- P35** Anterior approaches for treating failed posterolateral fusion or dynamic stabilization - A case series  
Pimenta L. (BR)
- P36** Computer-assisted patient specific prototype template for thoraco-lumbar cortical bone trajectory screw placement: Cadaveric study  
Kim S.B., Won Y., Yoo H.J., Lee S.W., Kim W.J. (KR)
- P37** Is there a role of spinal cord monitoring in surgeries for patients with traumatic spinal injuries?  
Liu G., Yin M.L., Yang W.K., Kumar N., Lau L.L., Thambiah J., Wong H.K. (SG)
- P38** In-vivo endoscopic visualization of pain generators in the lumbar spine  
Yeung A. (US)
- P39** A biomechanical comparison of short segment posterior fixation including the fractured vertebra versus 360 degree fixation in the burst fractures of the lumbar spine in calf spine model  
Sait A., Bangalore Kantharajanna S. (IN)
- P40** The impact of commercial health plan prior authorization programs on the utilization of services for low back pain  
Goodman R., Powell C., Park P. (US)
- P41** Stability with cortical screw-rod versus pedicle screw-rod fixation in the lumbar spine: Effects of screw size  
Newcomb A. (US)
- P42** Slump sitting X-rays of the lumbar spine is better than conventional flexion view  
Lau E.T.C., Hey D., Choong D., Tan C.S., Wong H.K. (SG)
- P43** Recurrent or retained lumbar disc herniations treated with full endoscopic lumbar intraforaminal discectomy  
Russo G. (US)
- P44** Radiographic analysis of indirect neural decompression for central canal stenosis following lateral lumbar interbody fusion (LLIF) estimation of cutoff value for additional decompression  
Park S.J., Lee C.S., Chung S.S., Kim J.H., Kim J.S. (KR)

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

147



www.spineweek.org



www.spineweek.org

144

146



## The International Society for the Advancement of Spine Surgery

- P45** Lumbar root diagnostic radiofrequency sensory stimulation in order to And the symptomatic lumbar root in multiple lumbar stenosis  
Kang S.H. (KR)
- P46** A biomechanical evaluation of a versatile and novel anterior cervical fusion device possessing modular and integrated Åktion capabilities  
Panchal R., Wanebo J., Gandhi A., Ferry C., Farmer S. Das K. (US)
- P47** An *in-vitro* biomechanical evaluation of a novel lateral lumbar interbody fusion cage with integrated modular plate Åktion  
DenHaeese R., Gandhi A., Ferry C., Farmer S., Porter R. (US)
- P48** Continuous distraction induced delayed spinal cord injury on motor evoked potentials and histological changes of spinal cord in a porcine model  
Hong J.Y., Suh S.W., Yang J.H. (KR)
- P49** Computer tomography assessment of pedicle screw placement in obesity people: Comparison between free-hand and C-arm based Intraoperative three-dimension navigation techniques  
Liu Y., Tian W., An Y., Jin P. (CN)
- P50** Correlation between implant motion and patient reported outcome measures following single level cervical disc replacement surgery  
Berg A.J., Jensen C.D., Khan S., Malgatil R., Reddy G.R., Bhatia C., Friesem T. (UK)
- P51** Perioperative experience with a novel lateral interbody fusion cage possessing integrated modular plate Åktion  
DenHaeese R., Hill C., Strenge B., Kranenburg A., Ferry C., Moore C., Bejin B., Martineck S., Martin K. (US)
- P52** Long term follow up of multi-level (three & four levels) cervical disc arthroplasty - Results from a single center  
Friesem S., Khan S., Rajesh M., Berg A., Reddy G., Bhatia C. (UK)
- P53** Interspinous process Åktion versus pedicle screw Åktion in circumferential arthrodesis: 1-Year outcomes from a prospective randomized multi-center trial  
Kim K., DenHaeese R., Hill C., Strenge B., de Moura A., Kranenburg A., Dennis M., Cappuccino A., Thaiyananthan T., Arnold P., Passias P., Bejin B., Moore C., Martineck S., Ferry C., Martin K. (US)
- P54** Comparison of hybrid versus 3 and 4 levels cervical disc arthroplasty - Results from a single centre  
Khan S., Rajesh M., Friesem S., Bhatia C., Reddy G., Aneiba K. (UK)
- P55** Anterior versus lateral circumferential lumbar fusion: 1-Year outcomes from a prospective multi-center study  
Kim K., DenHaeese R., Hill C., Strenge B., de Moura A., Kranenburg A., Dennis M., Cappuccino A., Thaiyananthan T., Arnold P., Passias P., Bejin B., Moore C., Martineck S., Ferry C., Martin K. (US)
- P56** Long term results of multi-level (three and four levels) cervical disc arthroplasty: Age-weighted linear regression analysis - Results from a single centre  
Rajesh M., Khan S., Friesem S., Bhatia C., Reddy G. (UK)



[www.spineweek.org](http://www.spineweek.org)

ePosters



## The International Society for the Advancement of Spine Surgery

- P73** Clinical and radiological outcomes of a new modular stand-alone PUF in patients with lumbar disc herniation  
Alves O.L., Santos P., Costa B., Reinas R. (PT)
- P74** Percutaneous kyphoplasty for Kummell's disease with severe spinal canal stenosis  
Chen G.D., Yang H.L., Luo Z.P. (CN)
- P75** Adolescent idiopathic scoliosis treated by a less invasive lateral approach  
Pimenta L., Amaral R., Marchi L., Oliveira L., Fortti F., Coutinho E., Jensen R. (BR & US)
- P76** Minimally invasive iliac screw Åktion in treating metastatic lumbosacral deformity  
Liu G., Hasan M.Y., Wong H.K. (SG)
- P77** The feasibility of an intradiscal hydrogel implant for nucleus augmentation in discogenic pain  
Yeung A., Morganstem R., Knight M., Prewett A. (US, ES & UK)
- P78** Percutaneous full endoscopic posterior cervical disc surgery  
Shin K.H. (KR)
- P79** 'Wireless' percutaneous screw Åktion: A three-years experience with a new system  
Jacquot F., Gastambide D. (FR)
- P80** Complications associated with the anterior approach to the lumbar spine: Analysis of 2,881 consecutive cases during a 6-year period  
Zigler J., Shivers J., Guyer R., Ohnmeiss D. (US)
- P81** Clinical outcomes and radiological results after posterior surgical correction of severe thoracic osteoporotic kyphosis in eleven patients with a minimum 3-year follow-up  
Doria C., Balsano M., Mantio T., Milia F. (IT)
- P82** Robot-assisted posterior C1-C2 transarticular screw Åktion for atlantoaxial instability  
Tian W., Liu Y., Fan M., Lang Z. (CN)
- P83** Revisional PELD for recurred lumbar HNP  
Kwon Y.S. (KR)
- P84** Comparison of complications and clinical and radiographic outcomes between non-obese and obese patients with adult spinal deformity undergoing minimally invasive surgery  
Park P., Wang M., Nguyen S., Mundis G., La Marca F., Urbe J., Anand N., Okonko D., Kanter A., Fessler R., Eastlack R., Chou D., Deviren V., Nunley P., Shaffrey C., Mummaneni P., International Spine Study Group (US)
- P85** Sclerotic vertebral metastases. study with sequences dedicated in gradient echo in and out of phase and DWI - Preliminary experience  
Costantino S., Mosele G.R., Balsano M., Conti M., Doria C. (IT)
- P86** Posterior closing-shortening osteotomy for vertebral collapse after osteoporotic compression fractures in lower lumbar spine  
Iizuka T., Ikenaga M., Ueda Y., Naito K., Yamada M., Iwata Y., Kishida M., Masada N. (JP)



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ePosters



## The International Society for the Advancement of Spine Surgery

- P57** Biomechanical evaluation of interbody Åktion with secondary augmentation: Direct lateral versus posterior and transformal interbody fusion  
Kelly B., Reis M., Perez-Ombo L., Reyes P., Godzik J., Kalb S., Martinez-del-Campo E., Singh V., Newcomb A., Crawford N., Chang S. (US)
- P59** Unilateral neurophysiological alerts - Is this clinically significant?  
Li C., Lau L.L., Liu G., Naresk K., Wong H.K. (SG)
- P60** Finite element-based adjacent level analysis after lumbar fusion for scoliosis  
Haddas R., Xu M., Lieberman I., Yang J. (US)
- P61** Experience with a novel, automated, external cerebrospinal fluid drainage control device  
Eckermann J., Lieberman R., Meyer W., Leitch K., Trang T. (US)
- P62** Comparison of 1 & 2 levels Discovey vs 1 & 2 levels Nune cervical disc arthroplasty: An outcome analysis - Results from a single centre  
Khan S., Lagarasa A., Rajesh M., Hernandez M., Bhatia C., Friesem S. (UK)
- P63** Novel ALIF cage with self-adapting lordosis performs well in initial clinical usage  
Castelain J., Rigal J., Cogniet A., Aunoble S., Le Huec J.C. (FR)
- P64** *In vitro* fatigue behavior of the cervical spine with no-proÅkte or traditional plates  
Konz R., Freeman A., Dawson J., Davis R. (US)
- P65** Incidence and behavior of SII disease in private spine practice  
Kube R. (US)
- P66** Cervical disc replacement vs. ACDP in the injured worker population  
Kube R. (US)
- P67** Clinical usefulness and safety of selective lumbar nerve root blocks  
Rudol G., Richardson D., Kassi A., Jensen C. (UK)
- P68** Hyperbaric oxygen intervention reduces secondary spinal cord injury in rats via regulation of HMGB1/TLR4/NF-κB signaling pathway  
Kang N., Hai Y. (CN)
- P69** Long-term prospective randomized outcomes following lumbar total disc replacement: A single site experience with 6 years follow-up  
Yue J. (US)
- P70** New classification of the lumbar modic sign and of its surgical strategy impact  
Gastambide D., Jacquot F., Gardeur D. (FR)
- P71** Clinical experience of anterior cervical discectomy and fusion with self-locking cages for multi-segmental cervical myelopathy  
Jin D., Li Q., Yan H. (CN)
- P72** Effects of volitional spine stabilization on asymmetric lifting task in individuals with recurrent low back pain  
Haddas R., Lieberman I. (US)



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ePosters



## The International Society for the Advancement of Spine Surgery

- P87** Dose-dependent nerve inflammatory response to rhBMP-2 in a novel rodent spinal nerve model  
Liu Z.Q.G., Lam R.W.M., Hu T., Toh S.Y., Wong H.K. (SG)
- P88** Robot-assisted percutaneous pedicle screw placement using 3D fluoroscopy: Animal and clinical experiments  
Tian W., Liu Y., Fan M., Lang Z. (SG)
- P89** Utility of fusion surgery in patients with degenerative lumbar spondylolisthesis & their outcome  
Alam M.S., Karim M.R., Jonayed S.A., Munir H.K., Chakraborty S., Alam T. (BD)
- P90** Three column Åktion - A dynamic method in scoliosis surgery  
Alam M.S., Karim M.R., Jonayed S.A., Munir H.K., Chakraborty S., Alam T. (BD)
- P91** Surgery for spinal tuberculosis: A multi-center experience of 582 case  
Alam M.S., Phan K., Karim M.R., Jonayed S.A., Munir H.K., Sarkar D., Chakraborty S., Alam T. (BD & AU)
- P92** Anterior cervical decompression, fusion & stabilization by cervical plate & screws for traumatic lower cervical spinal injury - A series of 62 patients  
Jonayed S.A., Alam M.S., Karim M.R., Munir H.K., Chakraborty S., Alam T. (BD)
- P93** Results of posterior surgery in thoraco-lumbar spine injury  
Karim M.R., Alam M.S., Islam S.S., Rahman A., Jonayed S.A., Osman Beg M., Saha P. (BD)
- P94** Biomechanical analysis of anterior cervical discectomy and fusion supplemented with posterior cervical cages  
Semonow K., Phillips F.M., Voronov L., Havey R.M., Carandang G., Janusz P., Patwardhan A.G. (US & PL)
- P95** Quality of life analysis in symptomatic spine osteoarthritis - Nationwide health survey analysis of elderly population with EQ-5D  
Hong J.Y., Suh S.W., Ynag J.H. (KR)
- P96** What is the role of epidural steroid injections in lumbar spinal disease with moderate disability? Comparative study in patients with or without surgery up to 1 year  
Hong J.Y., Suh S.W., Yang J.H., Park S.Y. (KR)
- P97** Factors for early pull-out of pedicle screws after posterior pedicle screw Åktion for thorolumbar burst fractures  
Hong C.H., Shin B.J., Lee J.C., Kim D.S., Kim S.B., Min S.H. (KR)
- P98** Radiological evaluation of the rate of interbody fusion using posterior/transformal interbody fusion with a missed screw technique  
Khan S., Mansha M., Hernandez M., Batra A., Bhatia C., Krishna M. (UK)
- P99** Selective thoracic fusion for adolescent idiopathic scoliosis: Anterior vs posterior surgery in different Lenke 1 subtypes  
Ruiz J.N., Lau L.L., Liu G., Wong H.K. (SG)
- P100** Is cervical plate necessary for anterior cervical fusion? Radiological analysis of fusion rate for anterior cervical discectomy and fusion without plating  
Mansha M., Khan S., Hernandez M., Batra A., Bhatia C., Krishna M. (UK)



[www.spineweek.org](http://www.spineweek.org)

ePosters



## The International Society for the Advancement of Spine Surgery

- P101** 'Awake' MIS TLIF without general anesthesia: initial clinical and radiographic results with one-year follow-up  
Wang M., Grossman J. (US)
- P102** Safety evaluation of extreme lateral interbody fusion for the treatment of lumbar degenerative diseases  
Rong L. (CN)
- P103** Uncommon intradural-extradural tumors removed by uniportal minimally invasive technique: Clinical and radiological results - A study with 12 months of follow up  
Arias Pesántez C. (EC)
- P104** New sintered titanium cages for minimally invasive transforaminal lumbar interbody fusion (MIS TLIF): Postoperative imaging, subsidence and fusion rates  
Hubbe U., Sircar R., Klingler J.H., Krueger M.T., Scholz C., Rätz R. (DE)
- P105** Novel suction-integrated retractor reduces operating time in spinal surgeries  
Eckermann J., Lieberman R., Leitch K. (US)



## Korean Society of Spine Surgery

- P1** Adjacent segment disease after anterior cervical interbody fusion using conventional plate versus zero-profile implant - A preliminary report  
Ahn J.S., Lee H.J., Park E.J., Shin B.K. (KR)
- P2** Suction drain tip culture after spine surgery: Is it worth to predict a surgical site infection?  
Park E., Lee H., Ahn J., Shin B., Lee J. (KR)
- P3** The outcomes of short and long segment posterior instrumentation of thoracolumbar burst fractures with a load sharing score of 7 or more  
Lee K.Y., Kim M. (KR)
- P4** Serial changes of interspinous motion on dynamic cervical radiographs after anterior cervical arthrodesis in postoperative 1 year: Anterior cervical plating vs. grafts alone  
Song K., Ahn Y.J., Shim J. (KR)
- P5** The location of instant center of rotation in the cervical spine during in vivo dynamic flexion-extension  
Song K. (KR)
- P6** A study of sacral anthropometry to determine S1 screw placement for spinal lumbosacral fixation in the Korean population  
Oh I.S., Kim S.I., Kim Y.H., Ha K.Y. (KR)
- P7** Prevalence of Abromyalgia and its characteristics in lumbar spinal stenosis  
Yang J., Ki C., Kim T., Hong S., Kang Y., Kim J., Lee H., Moon S., Kim H., Suk K., Choi H.J. (KR)
- P8** Can C3 laminectomy reduce interlaminar bony fusion and preserve cervical range of motion after cervical laminoplasty?  
Ha J., Cho J.H., Lee C.S., Hwang C.J., Lee D. (KR)
- P9** Surgical treatment of primary spinal sarcoma  
Chang B.S., Park S.M., Park J.W., Kwon Y.E., Lee H.J., Kim H., Lee C.K. (KR)
- P10** A novel comprehensive MRI classification system for cervical foraminal stenosis  
Lee S.H., Park S.Y., Wang J.C., Kim K.T., Hwang S.P., Lee W.G. (KR & US)
- P11** Quality of life analysis in people with symptomatic spine osteoarthritis (OA) using the results of a cross-sectional, nationwide survey  
Hong J., Suh S., Yang J., Park S. (KR)
- P12** Relationship between hormone therapy and symptomatic spine osteoarthritis  
Hong J., Suh S., Yang J., Park S. (KR)
- P13** CT scan: Always necessary for the preoperative planning in the cervical spine surgery?  
Suk K., Kim H., Moon S., Lee H., Yang J., Jin S., Mella P. (KR)
- P14** Accuracy of pedicle screwing using free hand technique in revisional scoliosis surgery  
Yang J.H., Chang D., Suh S.W., Kim S.H., Ham C.H. (KR)
- P15** Effect of posterior multilevel vertebral osteotomies on coronal and sagittal balance in fused scoliosis deformity caused by previous surgery: Preliminary results  
Yang J.H., Chang D., Suh S.W., Lee T.J. (KR)
- P16** Spinal sagittal balance status affects both functional outcomes reflecting risk of falling and quality of life after decompression and fusion surgery in patients with lumbar spinal stenosis  
Lee B.H., Lee H., Yang J., Kim H., Suk K., Moon S. (KR)



www.spineweek.org



www.spineweek.org

ePosters

ePosters



## Korean Society of Spine Surgery

- P17** Lateral recess stenosis is a common and missed cause of failed back surgery syndrome resolved with transforaminal endoscopic decompression  
Yeung A. (US)
- P18** Hyper-coagulability and postoperative epidural hematoma - Why cannot suction drains prevent postoperative spinal epidural hematoma?  
Ahn D.K., Shin W.S., Kim J.W. (KR)
- P19** Anterolateral versus posterior-only approach for the correction of degenerative adult spinal deformity: A matched cohort analysis  
Lee C.S., Park S.J., Chung S.S., Park H.J., Park J.S., Lee K.J. (KR)
- P20** Efficacy and safety of anterior lumbar epidural adhesiolysis in the treatment of lumbar disc and spinal stenosis  
Chang H.G., Park S.W., Paik S.H., Shin J.H. (KR)
- P21** Long term radiologic effect of posterior hemivertebra resection and short segment fusion with pedicle screw fixation in congenital scoliosis in children under age ten years  
Kim J.H., Chang D.G., Na K.H., Lee J.H., Lim D.J., Suk S.I. (KR)
- P22** Anterior pullout of lower side of plate and screws after two level anterior cervical fusion with semi constrained plate system (Zephir)  
Seo J.Y., Roh J., Ha K.Y. (KR)
- P23** Prognosis of implant-related complications after anterior cervical discectomy and fusion with cage and plate constructs  
Kwon T., Ko J., Song K. (KR)
- P24** Quality of life of patients with osteoporotic vertebral compression fractures  
Park S., Jung H., Park Y., Seo H., Lee J., An K., Kim J., Shin B. (KR)
- P25** The efficacy and accuracy of ultrasonography-guided sacral nerve block  
Kim C.S., Kim T.G., Shim D.M., Kang H.S. (KR)
- P26** Cervical alignment, range of motion and segmental instability after cervical laminoplasty: A single-center experience  
Lee J.S., Son D.W., Lee S.W., Song G.S., Sung S.K. (KR)
- P27** Video-assisted thoracoscopic direct lateral interbody fusion of T11-T12 level  
Shim J., Kang C. (KR)
- P28** Risk factors and postoperative prognostic factors of the spontaneous spinal epidural hematoma  
Kim W.J., Park G.H., Jung S.W., Choi W.S., Park K.Y., Chang S.H. (KR)
- P29** Association between whole body sagittal balance and risk of falls among elderly patients with back pain  
Lee B.H., Kim T., Park M.S., Kim Y., Kim S.W. (KR)



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## North American Spine Society

- P1** Anorexia nervosa: A risk factor for scoliosis? Insights from a cross sectional study  
Zaina F., Pesenti F., Negrini S., Persani L., Capodaglio P., Polli N. (IT)
- P2** The dilemma of the treatment of  $\alpha$ 3-type thoracolumbar fractures: Pearls and pitfalls of percutaneous fixation and balloon kyphoplasty  
Massari L., Gildone A., Lorusso V., Osti R., Canuso G. (IT)
- P3** Artificial disc, new indications for cervical spine surgery: The French and US experiences at five years follow up  
Steib J.P., Dufour T., Huppert J., Bernard P., Vila T., Bumenthal S.L., Davis R.J., Hisey M.S., Bae H.W., Beaurain J. (FR & US)
- P4** Single stage, posterior only, global reconstruction for acute tubercular spondylodiscitis  
Kanna R., Shetty A.P., Rajasekaran S. (IN)
- P5** Five year clinical outcomes of minimally invasive versus open transforaminal lumbar interbody fusion in the elderly  
Seng C.S., Siddiqui M.A., Lai M.C., Yeo W., Yue W.M., Guo C.M., Chen J.L.T., Tan S.B. (SG)
- P6** Effect of a postural orthosis on lumbar sacral spine alignment and pelvic anteversion assessed by gait analysis  
Fozzato S., Forte F., Raggi A., Cherubino P., Surace M.F. (IT)
- P7** After nine years of three-column osteotomies, are we doing better? Performance curve analysis of 573 surgeries with 2-year follow up  
Diebo B., Lafage V., Gupta M., Sciubba D., Ames C., Kebaish K., Shaffrey C., Hostin R., Obeid I., Burton D., Hart R., Lafage R., Erico T., Schwab F., ISSG (US)
- P8** Machine learning (latent Dirichlet allocation) based classification of 38 years of spine-related literature into 100 research topics  
Sng D.C., Metz L.N., Dudli S. (US)
- P9** Does smoking history affect the outcome of adult spinal deformity surgery?  
Hu X., Lieberman I.H. (US)
- P10** Spinal osteotomy for sagittal deformities using 'Posterior Only Approach' - A novel classification system  
Rajasekaran S., Rajoli S.R., Shetty A.P., Kanna R. (US)
- P11** Comparison of lumbar disk height changes on preoperative functional aims and after Oblique Lateral Interbody Fusion (OLIF) spinal reconstruction for degenerative lumbar kyphoscoliosis  
Gonchar I., Kotani Y., Fujita R., Hamasaki M., Tan B.B., Fukaya H., Masuko T. (JP & MY)
- P12** Effect of indirect neural decompression with oblique lumbar interbody fusion was influenced by preoperative lumbar lordosis in adult spinal deformity surgery  
Tan B.B., Kotani Y., Gonchar I., Hamasaki M., Fujita R., Fukaya H., Masuko T. (JP)
- P13** The clinical feature of chemical meningitis after spinal surgery  
Takeshta Y., Miyoshi K. (JP)
- P14** Biomechanical analysis of anterior column realignment for adult spinal deformity - An in-vitro human cadaver study  
Pekmezci M., Herfat S., Theologis A., Valone F., Coughlin D.G., Tumer A., Ames C.P., Deviren V. (US)



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ePosters

ePosters

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

Monday

Tuesday

Wednesday


**North American Spine Society**

- P15** Sarcopenia, osteoporosis, and adult spinal deformity: ASAP study  
Kobayashi T, Jimbo S, Senoo I, Shimizu M, Ito H, Chiba H, Sugisawa H, Sugawara T, Habaguchi T. (JP)
- P16** Comparison of the CTM brace against nighttime braces in adolescent idiopathic scoliosis using biplanar stereography and 3C spinal reconstructions  
Bouloussa H, Vergani C, Pietton R, Skalli W, Vialle R. (FR)
- P17** Is there a correlation between the apical vertebral rotation and the pelvic incidence in adolescent idiopathic scoliosis?  
Sebaaly A, Rachkidi R, Ass A, Kreichati G, Ghanem I, Kharat K. (LB)
- P18** Demographics of tuberculosis of spine and factors affecting neurological improvement in patients suffering from tuberculosis of spine - A retrospective analysis of 312 cases  
Sharma A., Chhabra H.S, Chabra T. (IN)
- P19** Clinical relevance of the sagittal balance of the spine in degenerative lumbar disorders: A systematic review of the literature  
Ochtman A.EA., de Gast A., Kersten R.F.M.R., Le Huec J.C., Öner F.C., van Gaalen S.M. (NL & FR)
- P20** Role of intervertebral discs in the sagittal plane correction of thoraco-lumbar angular kyphosis after spinal osteotomy  
Nares-Babu J., Cheekatla S., Neelima G. (IN)
- P21** An in vivo biomechanical analysis of the effects of nanoscale porous titanium cage coating in lumbar vertebral interbody fusion  
Colloca C.J., Gunzburg R., McAviney J., Hegazy A.A.M., Jones C.F., Hall D.J., Szpalski M., Freeman B.J.C. (US, BE & AU)
- P22** A comparative analysis of thoracic and thoracolumbar kyphosis between young and old men  
B. Kim Y., Ahn Y., Kang G., Kim Y.J., Ko Y., Lee Y., Song K. (KR)
- P23** Coronal multiplane reconstructed CT image determining lateral notch-referred pedicle screw entrance localization in subaxial cervical spine  
Pan Z, Wu C., Duan P., Zhou S, Cao K. (CN)
- P24** CT-based image-guided system (IGS) in spinal surgery – State-of-the-art through 10 years of experience  
Costa F. (IT)
- P25** Better height restoration and kyphosis correction of osteoporotic vertebral compression fractures when using intravertebral reduction devices (SpineJack): 1 Year follow-up results from a clinical study  
Lin J.H., Wang S.H., Lin E.Y., Chiang Y.H. (TW)
- P26** Clinical and radiographic outcomes of thoracolumbar fractures treated by corpectomy and fusion through a mini-open lateral approach  
Smith W.D., Li X., Bergmann L. (US & CN)
- P27** Incidence of facet violation of the cervical lateral mass screws using Roy-Camille technique  
Abe M., Sakai T., Yamashita K., Takata Y., Higashino K., Saiyo K. (JP)
- P28** Preoperative factors affecting postoperative axial neck pain following cervical laminoplasty  
Oshima Y., Chikuda H., Taniguchi Y., Matsubayashi Y., Takeshita K., Tanaka S. (JP)


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**Pan Arab Spine Society**

- P1** Anatomical location of common iliac veins at the level of sacrum – Perforation risk is related to the trajectory angle of screw  
Akhtar J., Terai H., Rahmani M.S., Suzuki A., Toyoda H., Tamai K., Hayashi K., Takahashi S., Nakamura H. (JP)
- P2** CD34 and CD133 stem cells in treatment of complete spinal cord injuries  
Atzoubi Z.M. (JO)


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**Society for Minimally Invasive Spine Surgery**

- P1** Minimally invasive surgery for adult spinal deformity  
Masato T., Yoshinisa S., Shinya A., Tomoyuki T. (JP)
- P2** Elderly patients can achieve comparable clinical and radiological outcomes as younger patients after minimally invasive transforaminal lumbar interbody fusion: A 2-year matched-cohorts study  
Joshi N., Lim J., Yeo W., Yue W.M. (SG)
- P3** An in-vitro biomechanical evaluation of a next generation interspinous Åxation device with in-situ shortening/extension capabilities  
Wagener C., Denhaese R., Ghandi A., Ferry C., Famer S. (US)
- P4** Lateral lumbar interbody fusion with modular plate Åxation: Initial experience with a novel technology - Intra-op and 1-year outcomes  
Denhaese R., Hill C., Strenge B., Ferry C., Moore C., Bejin B., Martineck S., Martin K. (US)
- P5** In-vivo endoscopic visualization of pain generators in the lumbar spine  
Yeung A. (US)
- P6** Efficacy of posterior segmental decompression surgery for pincer mechanism in cervical spondylotic myelopathy: A retrospective case-control study using propensity score matching  
Minaide A., Yoshida M., Yamada H., Hashizume H., Nakagawa Y., Iwasaki H., Tsutsui S., Oka H. (JP)
- P7** Application of minimum invasive posterior spinal fusion assisted with vertebralplasty in the treatment of osteoporotic vertebral collapse  
Nakano M., Kawaguchi Y., Yasuda T., Nogami S., Seki S., Hachinota J. (JP)
- P8** Transpedicular vertebralplasty after intravertebral cavity formation for osteoporotic burst fractures  
Nakano M., Kawaguchi Y., Hirano N., Kimura T. (JP)
- P9** Treatment of grade II isthmic spondylolisthesis: Comparison of minimally invasive transforaminal and anterior lumbar interbody fusion  
Masset D.H., Mayo B.C., Long W.W., Modi K.D., Bohl D.D., Singh K. (US)
- P10** Clinical results of microendoscopic discectomy for lumbar disc herniation - Minimally 5-year follow up  
Yoshimoto M., Takebayashi T., Yamashita T. (JP)
- P11** Percutaneous endoscopic lumbar discectomy as an alternative to open lumbar microdiscectomy for large lumbar disc herniation  
Kim J.S., Choi K.C. (KR)
- P12** Long-term follow up results of MIS-TLIF for patients with degenerative disease of the lumbar spine - MIS procedure reduces adjacent segment degeneration  
Wada A., Iida Y., Yokoyama Y., Hasegawa K., Tsuge S., Fukutake K., Takamatsu R., Takahashi H. (JP)
- P13** Clinical comparison of two spinal reconstruction techniques for osteoporotic vertebral collapse: Conventional pedicle screw vs modified CBT screw  
Fujita R., Kotani Y., Gonchar I., Hamasaki M., Fukaya H., Masuko T. (JP)
- P14** Differences in clinical outcomes between isthmic and degenerative spondylolisthesis following a minimally invasive transforaminal lumbar interbody fusion  
Masset D.H., Mayo B.C., Long W.W., Modi K.D., Bohl D.D., Basques B.A., Singh K. (US)


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**Society for Minimally Invasive Spine Surgery**

- P15** Narcotic consumption in workers' compensation patients following a minimally invasive transforaminal lumbar interbody fusion  
Masset D.H., Mayo B.C., Long W.W., Modi K.D., Bohl D.D., Singh K. (US)
- P16** Narcotic consumption following a minimally invasive transforaminal lumbar interbody fusion: An age based analysis  
Masset D.H., Mayo B.C., Modi K.D., Long W.W., Bohl D.D., Singh K. (US)
- P17** Accuracy of percutaneous screws inserted under O-arm and navigation  
Lee R.S. (UK)
- P18** Pre-operative narcotic utilization: Accuracy of self-reporting prior to spinal surgery  
Ahn J., Bohl D.D., Eboghdady I.M., Massel D.H., Mayo B.C., Modi K.D., Long W.W., Singh K. (US)
- P19** A multicenter, retrospective evaluation validating a novel less-invasive, medialized approach for posterior lumbar interbody fusion  
Smith W., Deol G., Khanna N., Poulter G., Ahuja A. (US)
- P20** Early outcomes in the use of minimally invasive lateral cages in lumbar revision surgery – Minimum 6 month to 2 year follow-up  
Lee R.S. (UK)
- P21** Minimally invasive spine stabilization with percutaneous sacropelvic Åxation for spondylodiscitis in the lower lumbar spine  
Funao H., Kebaish K., Isogai N., Fujita N., Hikata T., Iwanami A., Watanabe K., Koyanagi T., Nakamura M., Matsumoto M., Ishii K. (JP & US)
- P22** The use of tubular retractors for translaminar discectomy for cranially and caudally extruded discs  
Bangalore Kantharajanna S., G. Kulkarni A., Dhruv A., Annu A. (SG & IN)
- P23** Minimally invasive TLIF using cannulated and fenestrated augmented pedicle screws for lumbar spondylolisthesis in patients with osteoporosis  
Vemula V.R.C., Bodapati C.P., Kumar J. (IN)
- P24** What is the (maximum) safe angle of incidence for cage insertion to avoid neural injury in oblique lateral interbody fusion?  
Kim J.S., Choi W.S., Ryu K.S. (KR)
- P25** The accuracy of pedicle screw insertion in the spine: A retrospective comparative study by the CT-based navigation system versus iso-C navigation system  
Uchino K., Nakanishi K., Ohnaru K., Hasegawa T. (JP)
- P26** Partial pediclectomy for lumbar foraminal stenosis following osteoporotic vertebral fracture: A case report  
Hama S., Yasuda H., Konishi S., Nakamura H. (JP)


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ePosters

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

157

Monday

Tuesday

Wednesday

Thursday

Friday

Posters

Meetings

158



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**Meetings,  
Satellite Symposia  
& Workshops**  
**Monday, May 16**

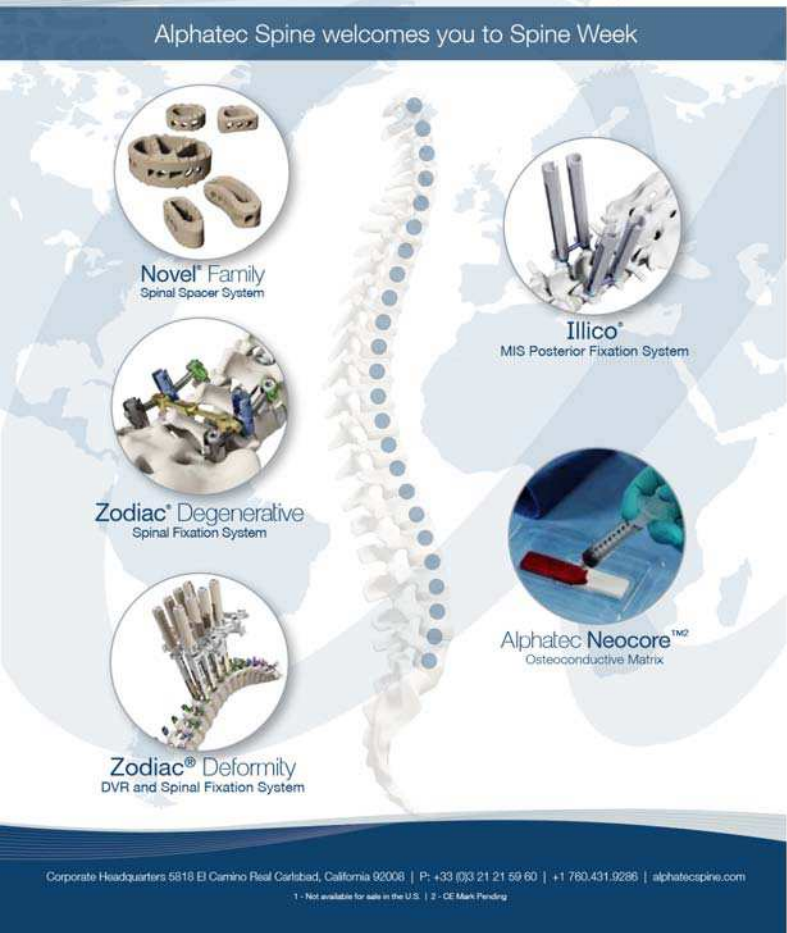
Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings

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161



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**Monday Meetings**

**Sponsored Satellite Symposium**  
**ORTHOFIX<sup>®</sup>** **Room: Jasmine 12**

- Posterior Percutaneous Stabilization & Miniopen Medial/Lateral techniques in Spine Surgery**  
Pennings F.A. (US)
- 12.30 Welcome & opening
  - 12.35 Posterior percutaneous stabilization
    - Indications
    - Techniques for short & long term deformities
    - Cases
  - 12.50 Sawbone workshop PHOENIX & CDX
  - 13.05 Miniopen approach with a new screw placement technology
    - Indications
    - Technique
    - Cases
  - 13.20 Sawbone workshop JANUS Screw
  - 13.40 Podium discussion / closing remarks

**Additional Meetings**  
 **Room: Jasmine 2**

- 13.30 -16.30 **ISSLS Focus Group Meeting #1: Degenerative Spinal Phenotypes**  
Battié M. (CA), Lane C. (CA), Mellish M. (CH) & Samartzis D. (HK)
- The International Taskforce on Diagnosis and Management of Lumbar Spinal Stenosis and the Disc Degeneration Focus Group will be having a combined, back-to-back focus group session in Singapore under the umbrella topic of Degenerative Spinal Phenotypes.
- 16.30 -18.00 **Women of ISSLS Networking Group**  
O'Connell G. & Sowa G. (US)
- The purpose of this focus group is to establish and strengthen the interactions between the women in ISSLS, both scientifically and professionally. To date the proportion of women attending ISSLS is low. By increasing the network of women and collaborations between them, we hope to have a positive influence on the scientific contributions and on the role of women within ISSLS and also to find ways to recruit more women into the society and into lumbar spine research.

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Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings

163



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## Meetings, Satellite Symposia & Workshops

### Tuesday, May 17

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Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings

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- ▶ Join us for an Industry Workshop

TOPIC PEEK-OPTIMA HA Enhanced Pre-clinical Studies & Clinical Adoption

SPEAKER Mark Brady, Ph.D., Spine Technology Manager  
Invbio Biomaterial Solutions

DATE AND TIME 17<sup>th</sup> May – 12:30pm-1:30pm

VENUE Jasmine 3, Level 3, MBS Convention Centre

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1. Study evaluated the bone ongrowth of PEEK-OPTIMA® Natural and PEEK-OPTIMA® HA Enhanced in a bone defect model in sheep. Data on file at Invbio. This has not been compared with human clinical experience.  
2. Study evaluated the in vivo response to PEEK-OPTIMA® Natural, PEEK-OPTIMA® HA Enhanced and allograft in a cervical spine laminectomy in sheep. Data on file at Invbio. This has not been compared with human clinical experience.

## Tuesday Meetings

### Sponsored Satellite Symposia

- Invbio** Room: Jasmine 3  
BIO-MATERIAL SOLUTIONS
- 12.30 - 14.00 **PEEK-OPTIMA® HA Enhanced: Pre-clinical studies and clinical adoption**  
Brady M. (UK)
- joimax** Room: Jasmine 10
- Chair: Gibson A. (UK) & Ipreburg M. (NL)
- 12.30 - 14.00 **Endoscopic spine surgery: Experience and evolution over years**  
Gibson A. (UK), Ipreburg M. (NL) & Wagner R. (DE)
- NUVASIVE** Room: Jasmine 12  
Based on Innovation
- 12.30-14.00 **Importance of pre-op planning and intra-op assessment for degenerative disorders**  
Berjano P. (IT), Lamartina C. (IT), Quante M. (DE)
- Additional Meeting** Room 5: Jasmine
- 09.00 - 12.00 **ISSLS Focus Group Meeting #2: Best practices for conducting and reporting spine research involving registry-enhanced administrative data**  
Martin B.I. (US)

This Focus Group will identify best practices for conducting, reporting and reviewing research involving the analysis of administrative data. The group will sample existing literature to identify best practices and common obstacles involving the analysis of administrative data. It will summarize the validity and reliability of administrative algorithms based on codes from the International Classification of Disease and the AMA's Current Procedural Terminology, including classifying spine-related ICD-10 codes. Finally, the group will seek to develop consensus-based recommendations for conducting, reporting and reviewing spine research that involves administrative data.

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Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings

# ALIGNMENT MATTERS.



## SPINWEEK LUNCH WORKSHOPS:

**Tuesday, May 17, 12:00 – 14:00, Jasmine 12**

Importance of Preoperative Planning and Intraoperative Assessment for Degenerative Disorders

Dr. Pedro Berjano, M.D., Ph.D., Prof. Claudio Lamartina, M.D., Prof. Dr. Markus Quanté

**Wednesday, May 18, 12:00 – 14:00, Jasmine 12**

Anterior Column Realignment (ACR<sup>®</sup>): Anterior Techniques to Restore Spinal Alignment

Dr. Pedro Berjano, M.D., Ph.D., Prof. Claudio Lamartina, M.D., Prof. Dr. Markus Quanté

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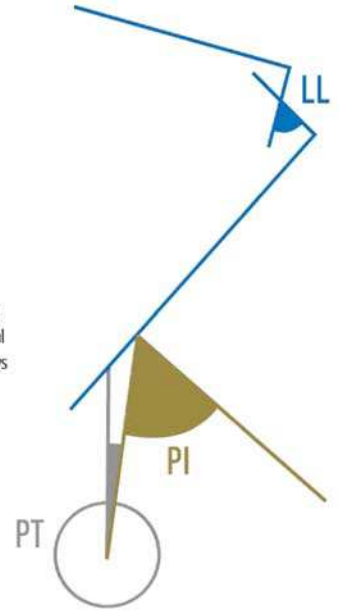
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Monday  
 Tuesday  
 Wednesday  
 Thursday  
 Friday  
 Posters  
 Meetings

Sponsored Satellite Symposia



Chair: G. Liu (SG)

12.45 -13.45 **Expanding the frontiers of navigated spine surgery - The AIRO system**  
Rajasekaran S. (IN)

Room: 1



12.30 - 14.00 **Spinal Deformity: An Evidence-based Approach To Surgical Techniques**  
Berven S. (US)

Room: Jasmine 10



12.30 -14.00 **Anterior Column Realignment (ACR®): Anterior techniques to restore spinal alignment**  
Berjano P. (IT), Lamartina C. (IT) & Quante M. (DE)

Room: Jasmine 12

Sponsored Satellite Symposia



12.30 - 14.00 **Advanced treatments of thoracolumbar diseases**  
Cardi J.M. (US), Verma R.K. (IN) & Suga Y. (JP)

Room: Jasmine 3

- Topics:
- Deformity
  - Minimally Invasive Surgery (MIS)
  - Dynamic Stabilization

Additional Meeting



12.30 - 14.00 **European Spine Journal Workshop: How to be a good reviewer**  
Schizas C. (CH), Aebi M. (CH), Mannion A. (CH) & Edwards K. (UK)

Room: Jasmine 15

ISSLS Special ePoster Session



07.30 - 08.45 **Special emphasis poster session 1**

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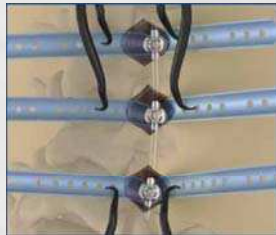
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Orthopedic Medical Device Manufacturers  
Government / Hospital representatives  
Materials research/production companies  
Processing equipment suppliers  
Contract Manufacturing  
testing / certification / advisory body  
Universities / research institutes  
Others

**Contact us:**

BoneTec-China 2016  
Shanghai Guang Mao Exhibition Services Inc  
Tel: 0086-21-51865308  
Mobile: 0086-13817254690  
Email: [info@bonetec-china.com](mailto:info@bonetec-china.com)  
Website: [www.bonetec-china.com.cn](http://www.bonetec-china.com.cn)

**Exhibits:**

joint replacement products (knee, hip, shoulder, elbow, etc.)  
Bone plates, bone screws  
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Bone cement  
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orthopedic implants Laser Processing  
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Universities / research institutes  
orthopedic devices agents  
Orthopedics Lab Supplies  
Orthopedics drugs  
Orthopedic endoscope  
Orthopedic rehabilitation technologies  
Others



BoneTec-China 2016 Focus on the whole industry of orthopedic implants and orthopedic biomaterials. It is a prestigious and well established Exhibition being held in Shanghai every year. BoneTec-China is committed to building the best platform for the procurement, mutually beneficial cooperation, networking and training in the orthopedic implants and biomaterials industry in China. Based upon our domestic visitors and exhibitors, BoneTec-China will invite exhibitors and visitors globally, and will provide exhibitors and buyers an excellent opportunity to expand overseas markets and learning the Cutting-edge technology in the industry.

Sponsored Satellite Symposia



Room: 1

Recent advancements in MIS surgery for spinal metastasis and spinal deformity  
Chair: Kwan M.K. (MY)

12.45 - 13.15 Recent advancement in MIS spinal metastasis surgery  
Kwan M.K. (MY)

13.15 - 13.45 Recent advancement in MIS adult spinal deformity surgery  
Lee R. (UK)

Medtronic

Room: Jasmine 10

12.30 - 14.00 Biologics in spine surgery: Matching bone graft materials with clinical needs  
Berven S. (US)

Additional Meeting



Room: Jasmine 10

Chairs: Lamartina C. & Berjano P. (IT)

12.30 - 14.00 European Spine Journal Workshop: How to get your paper published

How to embark on a study - Ismael Aguirre M.F. (IT)

How to design a study: From idea to question, from question to objective  
Berjano P. (IT)

How to analyse results - Edwards K. (UK)

How to write and present a paper - Lamartina C. (IT)



eSpine Area

ISSLS General Poster Session

08.30 - 09.30 General poster session



[www.spineweek.org](http://www.spineweek.org)

Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Posters  
Meetings

## Meetings, Satellite Symposia & Workshops

Friday, May 20

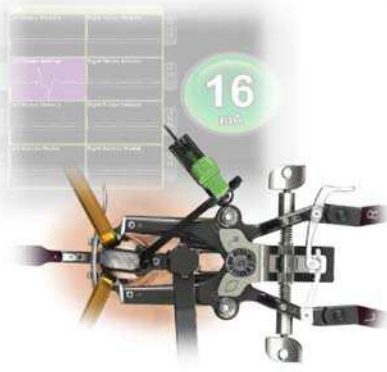
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**NUVASIVE SPINEWEEK IN-BOOTH PRESENTATIONS**

- Tuesday, May 17**  
 10:00 | XLIF Expanded Applications | *Dr. Ashish Diwan, M.D., William D. Smith, M.D.*  
 16:00 | Methods of Preoperative Planning and Intraoperative Assessment | *Prof. Dr. Markus Quante*
- Wednesday, May 18**  
 10:00 | XLIF Expanded Applications | *Dr. Neil Cleaver, M.D., Dr. Luiz Pimenta, M.D., Ph.D., Dr. William D. Smith, M.D.*  
 16:00 | Methods of Preoperative Planning and Intraoperative Assessment | *Prof. Dr. Markus Quante, Dr. Pedro Berjano, M.D., Ph.D.*
- Thursday, May 19**  
 10:00 | MAGEC® – A Revolutionary Treatment for Early Onset Scoliosis | *Dr. Behrooz Akbarnia, M.D.*



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Sponsored Satellite Symposium



Room: 1

**Recent advancements in treatment of EOS spine: Anterior vs. posterior**  
**Chair: Liu G. (SG)**

12.45 - 13.15 **Posterior approach: Magnetic growing rods system**  
*Akbarnia B. (US)*

13.15 - 13.45 **Anterior Approach: Scol Tether System**  
*Wong H.K. (SG)*

ISSLS Special ePoster Session



eSpine Area

07.45 - 09.00 **Special poster session 2**

Monday  
 Tuesday  
 Wednesday  
 Thursday  
 Friday  
 Posters  
 Meetings



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# Medtronic

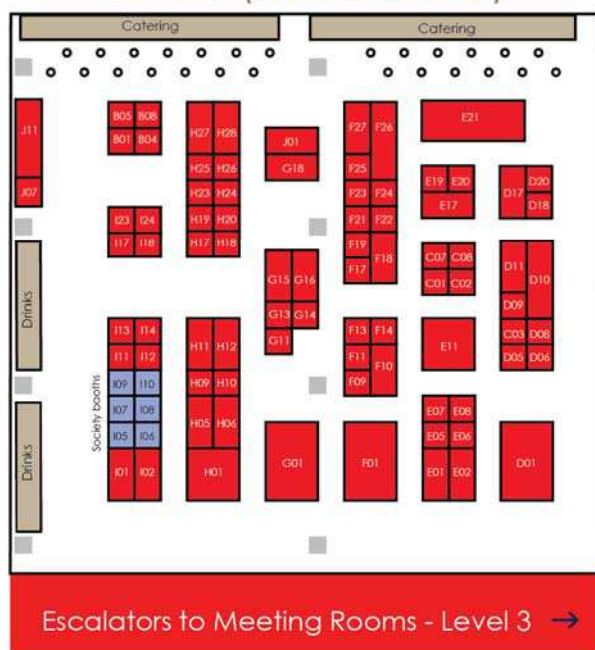
Exhibition

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# Exhibition Hall

## Level 1 (Ground Floor)



Street Entrance & Taxi Station

### List of Exhibitors (Alphabetical order)

COMPANY	ROW	NR
Allen Medical Systems	F	26
Amedica	H	09
AOSpine	I	05
ASSI	I	07
Australian Biotechnologies	I	11
AXS Medical - DMS Group	H	19
B. Braun Aesculap	E	17
Bauerfeind AG	B	01
BAUI Biotech Co., Ltd.	F	14
Berkeley Advanced Biomaterials, Inc.	D	20
Biomatlante	F	13
Carl Zeiss Meditec AG	E	21
Cerapedics Inc	F	18
Clarus Medical, LLC.	E	07
Cousin Biotech	G	16
Elliquence LLC	C	07
EOS imaging	H	12
Esate SpA	E	06
Eurocoating SpA	I	23
Eurospine	H	17
Fehling Instruments GmbH & Co. KG	D	18
FzioMed, Inc.	C	03
General Surgical Company (India) Pvt Ltd	F	10
Globus Medical	F	19
GS Medical	H	27
Hansbiomed	G	13
Hebbar Surgical Instruments	G	14
Imedicom co., Ltd.	I	17
In'Tech Medical	H	24
Intocare	D	08
Invio Ltd.	G	18
ISASS	I	09
Jayon Implants Pvt. Ltd	F	27
Joimax	J	11



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185

## Exhibitors

### List of Exhibitors (Alphabetical order)

COMPANY	ROW	NR
K2M Inc.	H	01
Kasios	H	11
Keyleader HongKong Company Limited	C	02
KLS Martin Group	H	28
L&K Biomed Co., Ltd.	F	23
LDRAsia PaciaC	D	17
Mahe Medical GmbH	E	08
MedAx international, LLC	E	01
Medi GmbH & Co. KG	H	20
Medicrea International	G	01
Meditech Implant	J	07
Medtronic	D	01
Medyssey	H	23
Misonix	H	26
Mizuho Medical Co., Ltd.	E	11
NASS	I	06
Naton Medical Group	I	01
Nuvasive	F	01
Open Operating Theatre, ESJ, Ecce Learning	I	12
Orthobion	B	05
OrthoAx	H	06
Orthopaedic & Spine Development OSD	F	24
OrthoPediatrics	E	05
Paradigm Spine	I	18
PASS	I	10
Phacon GmbH	I	24
Premia Spine Ltd	H	18
ResearchBooks Asia	D	10
RTI Surgical	I	02
S14 Implants	F	22
Safe Orthopaedics	D	06
Sawbones Worldwide	E	19
SBC / SILACO	I	08



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## Exhibitors

### List of Exhibitors (Alphabetical order)

COMPANY	ROW	NR
Seaspine	C	08
Shanghai Bojin Electric Instrument & Device Co., Ltd	G	11
Shangai Kinetic Medical Co., Ltd.	F	21
Showa Ika Kohgyo Co., Ltd.	H	10
Siemens Healthcare GmbH	E	02
Signus Medizintechnik GmbH	F	17
Solco Biomedical Co. (I) Pvt. Ltd.	D	09
Söring GmbH	D	05
SpineGuard	B	04
SpineWay	E	20
Surgaid Medical (Xiamen) Co., Ltd.	F	09
Tecres spa	I	14
TeDan Surgical Innovations	G	15
Teknimed	I	13
Thompson Surgical Instruments, Inc.	C	01
Tsunami	J	01
Vertebral Technologies, Inc.	H	25
Vexim SA	B	08
Waston Medical Appliance	F	25
Xiant Medical	F	11
Ziehm Imaging GmbH	D	11
Zimmer Biomet	H	05



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187

## List of Exhibitors (By stand number)

ROW NR	COMPANY
B 01	Bauerfeind AG
B 04	SpineGuard
B 05	Orthobion GmbH
B 08	Vexim SA
C 01	Thompson Surgical Instruments, Inc.
C 02	Keyleader HongKong Company Limited
C 03	FzioMed, Inc.
C 07	Elliquence LLC
C 08	Seaspine
D 01	Medtronic
D 05	Söring GmbH
D 06	Safe Orthopaedics
D 08	Infocare
D 09	Solco Biomedical CO. (I) Pvt, Ltd.
D 10	ResearchBooks Asia
D 11	Ziehm Imaging GmbH
D 17	LDRAsia PaciAc
D 18	Fehling Instruments GmbH & Co. KG
D 20	Berkeley Advanced Biomaterials, Inc.
E 01	MedÅx International, LLC
E 02	Siemens Healthcare GmbH
E 05	OrthoPediatrics
E 06	Esaote SpA
E 07	Clarus Medical, LLC
E 08	Mahe Medical GmbH
E 11	Mizuho Medical Co., Ltd.
E 17	B. Braun Aesculap
E 19	Sawbones Worldwide
E 20	Spineway
E 21	Carl Zeiss Meditec AG
F 01	Nuvasive
F 09	Surgaid Medical (Xiamen) Co., Ltd.
F 10	General Surgical Company (India) Pvt, Ltd.



## List of Exhibitors (By stand number)

ROW NR	COMPANY
F 11	Xtant Medical
F 13	Biomatlante
F 14	Baui Biotech Co., Ltd.
F 17	Signus Medizintechnik GmbH
F 18	Cerapedics Inc
F 19	Globus Medical
F 21	Shanghai Kinetic Medical Co., Ltd.
F 22	S14 Implants
F 23	L&K Biomed Co., Ltd.
F 24	Orthopaedic & Spine Development OSD
F 25	Waston Medical Appliance
F 26	Allen Medical Systems
F 27	Jayon Implants Pvt, Ltd
G 01	Medicrea International
G 11	Shanghai Bojin Electric Instrument & Device Co., Ltd
G 13	Hansbiomed
G 14	Hebbar Surgical Instruments
G 15	TeDan Surgical Innovations
G 16	Cousin Biotech
G 18	Invibio Ltd.
H 01	K2M Inc.
H 05	Zimmer Biomet
H 06	OrthoÅx
H 09	Amedica
H 10	Showa Ika Kohgyo Co., Ltd.
H 11	Kasios
H 12	EOS imaging
H 17	Eurospine
H 18	Premia Spine Ltd.
H 19	AXS Medical - DMS Group
H 20	Medi GmbH & Co. KG



## Exhibitors

## List of Exhibitors (By stand number)

ROW NR	COMPANY
H 23	Medyssey
H 24	In'tech Medical
H 25	Vertebral Technologies, Inc.
H 26	Misonix
H 27	GS Medical
H 28	KLS Martin Group
I 01	Naton Medical Group
I 02	RTI Surgical
I 05	AOSpine
I 06	NASS
I 07	ASSI
I 08	SBC / SILACO
I 09	ISASS
I 10	PASS
I 11	Australian Biotechnologies
I 12	Open Operating Theatre, ESJ, Ecce Learning
I 13	Teknimed
I 14	Tecres spa
I 17	Imedicom co., Ltd.
I 18	Paradigm Spine
I 23	Eurocoating SpA
I 24	Phacon GmbH
J 01	Tsunami
J 07	Meditech Implant
J 11	Joimax

Company Profiles



**Allen Medical Systems**

100 Discovery Way  
01720 Acton  
United States

Tel.: +1 978-266-4286  
andres.surrea@hill-rom.com  
www.allenmedical.com



Allen Medical, part of Hill-Rom, is an innovator in patient positioning and surgical site access. The Allen Spine portfolio offers innovative solutions to help with all of your patient positioning challenges in spine surgery. Whether you are looking for a stand-alone, dedicated spine table for complex spine surgical procedures or positioning systems for simple spine procedures, Allen provides many options.

**Amedica**

1885 West 2100 South  
84119 Salt Lake City  
United States

Tel.: +1 801-839-3539  
jsmith@amedica.com  
www.amedica.com



Amedica is the only manufacturer of medical grade silicon nitride. Aside from being a biomaterial supplier to medical device OEM and private label partners, Amedica markets its own proprietary spinal fusion products. Amedica's products are manufactured in its ISO 13485 certified manufacturing facility and its spine products are FDA-cleared, CE-marked.

**Australian Biotechnologies**

5/25 Frenchs Forest Road  
2086 Frenchs Forest  
Australia

Tel.: +61 438 603 048  
lynette.newby@ausbiotech.com.au  
www.ausbiotech.com.au



Australian Biotechnologies is Australia's largest distributor of allograft products, and has supplied over 25,000 allografts to date. As a market leader in spinal and orthopaedic allograft solutions, Australian Biotechnologies' pioneering research programme has resulted in the expansion of their allograft range, and the opportunity to make their soft tissue, structural, and super-critical fluid treated bone allograft products available to healthcare professionals across Asia. For more information visit [www.ausbiotech.com.au](http://www.ausbiotech.com.au), or contact Lynette Newby, Business Development Manager, at [lynette.newby@ausbiotech.com.au](mailto:lynette.newby@ausbiotech.com.au).

**AXS Medical - DMS Group**

393 rue Charles Lindbergh  
34130 Mauguio  
France

Tel.: +33 467504900  
lmarin@dms.com  
www.biomod.fr



In July 2015, the DMS Group acquired AXS Medical, a start-up specialized in developing diagnostic tools used for spinal pathologies. The technologies developed by AXS allow DMS-Apelem to reinforce its position in the domain of diagnostic imaging by being able to offer stereo-radiographic imaging and 3D modelization tools particularly dedicated to orthopedic applications. The technology BIO-MOD™3S combines optic information about back morphology with a radiographic image of the spine (stitching) to yield a 3D model of the vertebral column. The 3D model gives the practitioner a complete view of the spine for a thorough and accurate evaluation of spine deformities.

**B. Braun Aesculap**

Am Aesculap Platz  
78532 Tuttlingen  
Germany

Tel.: +49 7461 95 0  
elena.metzger@aesculap.de  
www.aesculap.com



Aesculap Spine, a division of the B. Braun Group, has been developing competitive spinal treatment concepts since the early 80's. In close collaboration with clinical authors, implants and handling orientated instruments are designed. Aesculap combines its core competence in surgical instrument manufacturing with unique ideas and innovative engineering to create high quality spine systems. Dedicated to patients' and surgeons' needs we develop innovative implant and instrumentation systems for the stabilization of the cervical and thoracolumbar spine and the preservation of the mobility of the spinal column. Aesculap Spine products are designed for safe surgical procedures and good clinical results.

**Bauerfeind AG**

Triebeser Strasse 16  
07937 Zeulenroda - Triebes  
Germany

Tel.: +49 36628-661000  
isabell.rietsch@bauerfeind.com  
www.bauerfeind.com



Bauerfeind AG manufactures medical aids, such as supports, orthoses, compression stockings and foot orthoses. Its high quality products make an important contribution towards maintaining and restoring health and are available from specially medical retailers. The family business, founded in 1929 in Zeulenroda (Thuringia, Germany) is one of the market leaders in its industry. Bauerfeind employs a staff of around 2,000 worldwide. However, the products are exclusively "Made in Germany" and are partly hand-made. Awards for design and materials affirm the high product quality.

**Baui Biotech Co., Ltd.**

6F., No.6, Sec.1,  
Zhongxing Road, Wugu Dist.,  
24872 New Taipei City  
Taiwan

Tel.: +886289769538  
angel@baui.com.tw  
www.baui.com.tw



BAUI Biotech Co., Ltd. is found in 2009 by a group of elite engineers with experiences of producing Spinal and External Fixation Systems since 1988. BAUI is the No.1 spinal implants manufacturer and best seller in Taiwan. Our mission is to provide users the best experience with using BAUI systems; our vision is to provide patients the best quality of life after surgery. With a full line up of the spinal system and the upcoming innovated products in the future, BAUI Biotech Co., Ltd. is your one stop solution for Spine industry.

**Berkeley Advanced Biomaterials, Inc.**

901 Grayson Street  
CA 94710 Berkeley  
United States

Tel.: +1 510 883-0500  
pluo@osteic.com  
www.berkeleyadvancedbiomaterials.com



Berkeley Advanced Biomaterials, Inc. (BAB) was founded in 1996 to develop biomaterials and devices for skeletal repair. In the past 18 years, BAB has grown to include many FDA registered products and become an ISO Certified and American Association of Tissue Banks (AATB) accredited tissue bank. We are actively developing new applications for biomaterials with a focus on orthopedic, spine, dental, and sport patients. Our focus is providing the highest quality products to ensure our patients have healthy bones and healthy lives.

**Biomatlante**

5 rue Edouard Belin  
ZA Les Quatre Nations  
44360 Vigneux-de-Bretagne  
France

Tel.: +33 22802009  
claire.daculsi@biomatlante.com  
www.biomatlante.com



Over the last 20 years, we have established ourselves as specialists in biomaterials for bone regeneration. Our philosophy has been to develop best-in-class solutions for regenerative surgeries. Backed by extensive clinical research, our products offer wide ranging solutions to the treatment of even the most challenging cases. All the Spine surgery line is made of MBCP™ Technology, a unique HA/TCP 3D interconnected scaffold, with over 30 years of background and more than 650 scientific and clinical literatures. EZ Cure Strip™; Mineralized Sponge MBCP™; Micro/Macroporous bone graft (inserts, sticks) In'Os™; Synthetic Bone Graft MBCP™ Gel and MBCP™ Syringe Distributors wanted.

**Carl Zeiss Meditec AG**

Goeschwitzer Strasse 51-52  
07745 Jena  
Germany

Tel.: +49 3641 - 220 0  
jarine.mcdonald@zeiss.com  
www.zeiss.com/med



The main activities of the Carl Zeiss Meditec AG, parent company of the Carl Zeiss Meditec Group, are located in the field of ophthalmology and microsurgery. Carl Zeiss Meditec AG supplies and provides innovative technologies and application-oriented solutions designed to help doctors improve their patients' quality of life • complete packages of solutions for the diagnosis and treatment of ophthalmic diseases, including implants and consumables • innovative visualization solutions in the field of microsurgery • promising, future-oriented technologies such as intraoperative radiotherapy. The company's spine surgery portfolio includes a comprehensive line of surgical microscopes and loupes for spine surgery.

**Cerapedics Inc.**

11025 Dover Street,  
Suite 1600  
80021 Westminster  
United States

Tel.: +1 303 974 6275  
sjefferson@cerapedics.com  
www.cerapedics.com



Cerapedics is an orthobiologics company focused on developing and commercializing novel bone grafts that enhance and accelerate bone growth in a variety of orthopedic procedures. i-FACTOR™ (iFM) Peptide Enhanced Bone Graft, the Company's lead product, is the only biologic bone graft that incorporates a unique anorganic bone mineral (ABM) and a synthetic, small peptide (P-15) - a combination that is differentiated, predictable, and validated. The novel i-FACTOR Bone Graft "Attract, Attach, Activate" mechanism of action enhances the body's natural bone healing process, resulting in bone formation that is predictably bound to the surface of the bone graft.

**Clarus Medical, LLC**

13355 10th Avenue North  
55441 Minneapolis, MN  
United States

Tel.: +1 763-525-8400  
Admin@Clarus-Medical.com  
www.Clarus-Medical.com



Clarus Medical, LLC is a leading manufacturer of devices for less invasive medicine. Clarus produces small diameter instrument systems used in the spine for nucleotomy. Clarus is well known for developing devices utilizing small diameter, endoscopic and Laser Fibers. Clarus also partners with other leading medical companies as an OEM manufacturer.

## Cousin Biotech

8, rue de l'Abbé Bonpain  
59117 Wervicq-Sud  
France

Tel.: +33 320144107  
v.callemeyn@cousin-biotech.com  
www.cousin-biotech.com



Cousin Biotech, based in France, is specialist of textile-based surgical implants and offers a wide range of handmade innovative products, developed to make surgical technique easier and ensure better quality of life for patients. Thanks to its innovative dynamic interlaminar device (IntraSPINE), allowing real motion preservation. Cousin Biotech was able to develop a strong worldwide distribution network (more than 30 countries) and establish a new standard in non-fusion treatment for DDD. New products will now enhance Cousin's spinal offer. For more information, please visit our booth n°G13 or have a look at [www.cousin-biotech.com](http://www.cousin-biotech.com).

## Elliquence LLC

2455 Grand Avenue  
11510 Baldwin  
United States

Tel.: +1 516 277 9000  
struelson@elliquence.com  
www.elliquence.com



Elliquence, LLC manufactures patented Radiowave technology with innovative devices for orthopedic, neurosurgery, and pain management applications. Surgi-Max® Plus permits precision tissue preservation, non-adherent bipolar effects and surgical versatility. Cobbra™ Energized Cobb Elevator, and Disc-FX™ Discectomy System are examples of the full line of surgical accessories offered for use with the Surgi-Max Plus energy source. elliquence focuses on sparing healthy tissue while precisely treating pathology.

## EOS Imaging

10 Rue Mercoeur  
75011 Paris  
France

Tel.: +33 1 55256127  
aachache@eos-imaging.com  
www.eos-imaging.com



The EOS imaging system is a low and micro dose orthopedic imaging solution developed by a team of engineers, orthopedic surgeons and radiologists. An EOS exam captures full-body, weight bearing images at a significant dose reduction. The sterEOS workstation does not only offer a global assessment of balance and posture, it also provides 3D measurement tools. The patient's 3D data is used by orthopedic surgeons for diagnosis, surgical planning, control and follow-up. Radiologists can create 3D models in-house using sterEOS or through EOS3Dservices.com.

## Esaote SpA

Via di Caciolle 15  
50127 Florence  
Italy

Tel.: +39 05542291  
anouk.pluijmekers@esaote.nl  
www.esaote.com



Over 30 years of innovation in the field of dedicated musculoskeletal MRI results in cost-effective systems that provide clinicians with outstanding image quality, flexibility, ease of use, and patient comfort. We were the first to develop dedicated MR systems for knee, shoulder and extremity imaging. Recently, we created G-scan Brio, a cutting-edge weight-bearing MRI system focused on MSK and spine imaging procedures. With more than 2,400 Esaote MRI systems installed around the world, from large hospitals to private clinics, orthopedic/sports medicine centers, rheumatology practices, podiatric offices and trauma departments, we're the leading designer, manufacturer and marketer of dedicated MRI systems.

## Eurocoating SpA

Via Al Dos de la Roda  
60 - loc. Ciriè  
I 38057 Pergine Valsugana  
Italy

Tel.: +39 0461518973  
francescaambrosio@eurocoating.it  
www.eurocoating.it



Eurocoating, Surface Dynamics and Anteco, members of the Unitedcoatings Group, are serving over 120 OEMs globally. They have plants in Italy and in US, and a new plant in China is under construction. World leaders in plasma spray coatings for orthopedic, dental, spine, and trauma applications; they produce and provide CE marked CoP bone substitutes able to enhance bone regeneration. They offer creativity and flexibility in surface treatments; Titanium and Hydroxyapatite coatings on metal, ceramics and PEEK; and metal 3D printing. Brands like Osprovit® and Ti-Growth® represent golden standards in reliability, tradition and innovation.

## Eurospine

3, Avenue des Dahlias  
94240 L'Hay Les Roses  
France

Tel.: +33 1 46 86 60 07  
julette.eurospine@orange.fr  
www.eurospine.com



Our backbone is based on the pillars of innovation. The heart of our commitment beats louder through the experience garnered since 1998. Our spirit is marked by the concern of a single minutia and a rare simplicity in the design of spinal implants. We constantly bring new solutions to sort out the evils of the spine, alleviate fears of the patient and strengthen the expertise of the surgeon. Eurospine shares his vision worldwide to address patient discomfort.



## Exhibitors

## Fehling Instruments GmbH & Co. KG

Hanauer Landstr. 7A  
63791 Karlstein  
Germany

Tel.: +49(0)6188 9574 - 0  
info@fehling-instruments.de  
www.fehling-instruments.de



Fehling Instruments is a traditional family owned and family run company with more than thirty years of experience in the medical business. Fehling Instruments develops, manufactures, and distributes surgical instruments, implants and single use products for use mainly in the OR and provides all corresponding repair service. Fehling Instruments is constantly striving for excellence in function and economy of products. This objective is achieved by continuous innovation in materials, mechanics and design.

## FzioMed, Inc.

231 BoneHill Drive  
93401 San Luis Obispo, CA  
United States

Tel.: +1 (805) 549-7126  
ffanning@fziomed.com  
www.fziomed.com



FzioMed develops and commercializes absorbable surgical biomaterials based on its patented polymer science, for use in many surgical applications including spine, orthopedics, tendon, peripheral nerve, gynecology and general surgery. • Oxiplex® Spine Gel helps reduce adhesion formation and related symptoms such as pain. CE marked and approved in over 70 countries. • Dynavisc® Adhesion Barrier Gel for tendon and peripheral nerve surgeries is CE marked and available throughout the EU, MEA and Australia. • Oxiplex®/AP, an effective adhesion barrier for peritoneal surgery, helps reduce the incidence, extent, and severity of postoperative adhesions. CE marked and available in Europe. [www.fziomed.com](http://www.fziomed.com)

## General Surgical Company (India) Pvt, Ltd.

G-6, Gee Gee Crescent  
114 Poonamallee High Road  
600084 Chennai  
India

Tel.: +91-44-28360602  
gesco@gescoindia.com  
www.gescoworld.com



GESCO is a 54-year-old manufacturer and exporter of Spine Implants & Instruments with certifications such as ISO 13485-2012, USFDA, WHO GMP and C.E.

Our implants are manufactured from Titanium or PEEK:  
Minimally Invasive Pedicle-screws - PLIF and TLIF cages - Occipital-Cervical Spinal Fixation - Cervical Plates - Distractable Spacer (with and without plate) - Anterior Cervical Fusion Cage - Anterior Cervical Cage with screws - Cannulated Odontoid Fixation - Artificial Cervical Disc

We also manufacture long lasting Spinal instruments including our new range of MIS products. We have been alleviating pain for last Five decades and are keen to further extend our market reach and looking for Dealers.

## Globus Medical

2560 General Armistead Ave  
19403 Audubon  
United States

Tel.: +1 6109301800  
kdale@globusmedical.com  
www.globusmedical.com



Globus Medical, Inc. is a leading musculoskeletal implant company based in Audubon, PA. The company was founded in 2003 by an experienced team of professionals with a shared vision to create products that enable surgeons to promote healing in patients with musculoskeletal disorders.

## GS Medical

90, Osongsangmyeong 4-ro  
Osong-eup, Cheongwon-gun  
Chungcheongbuk-do  
363-951 Osong, South Korea

Tel.: +82-43-237-7393  
syyoon@gsmedi.com  
www.gsmedi.com



GS Medical is an innovative medical device company focused on developing premium, quality surgical implants and instruments for the use in spine surgery. Since establishment, our products have been used in thousands of spine surgeries throughout the USA, and hundreds of thousands globally. Our mission is to improve the treatment of patients with back, neck, or leg pain by creating simple and intuitive products and procedures. GS Medical which has slick to only one area for 20 years will be the world's lip-topmost company by practicing global leadership through constant research and development and practice of satisfying consumers.

## Hansbiomed

807, 55, Seongsui-ro,  
Seongdong-gu, Seoul  
04779 Seoul  
South Korea

Tel.: +82 2 466 2266  
peter@hansbiomed.com  
www.hansbiomed.com



HansBiomed Corp, is the leading bio technology company in Korea, has committed to developing high quality product in area of Allotraft and Synthetic bone. We always support assist our partners to achieve mutual benefit and goal.



## Exhibitors



## Exhibitors

## Hebbar Surgical Instruments

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174/321 Arcal Road  
Vadapalani, 600 026 Chennai  
India

Tel.: +91-9566113774  
hebbargroup@gmail.com  
www.hebson.in



Manufacturers and exporters of high quality surgical instruments for over 5 decades.

## Imedicom Co., Ltd.

# 612, 172 LS-ro  
435-824 Gunpo  
South Korea

Tel.: +82 31 479 1156  
leejames@imedicom.co.kr  
www.imedicom.co.kr



Imedicom Co., Ltd. is one of fast growing orthopaedic company that manufactures Balloon kyphoplasty system, Epidural catheter and Surgical power tools with Saw blades. All products of Imedicom are in compliance with CE, FDA regulations and ISO9001, ISO13485.

## In'Tech Medical

158, Rue de l'Eglise  
62180 Rang du Fliers  
France

Tel.: +33 3 21 89 60 00  
lfazzari@intech-medical.com  
www.intech-medical.com



Founded in France in 2000, In'Tech Medical is a global leader in orthopedic contract-manufacturing. With the company's recent acquisition of Turner Medical, Inc., In'Tech is now the world's largest provider of surgical instruments to the Spine Industry. Powered by a diverse product portfolio, an ability to find solutions to complex engineering challenges, and with close to 500 employees globally, In'Tech Medical is ideally positioned for sustainable growth and personalized customer care.

## Intocare

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#428, Ganap-ri Gwangjuk-myun  
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Tel.: +82-31-851-7206  
intocare@info-care.com  
www.info-care.com



Disc pain management devices from INTOCARE for the latest percutaneous pain relief techniques! INTOCARE develops percutaneous disc pain management devices under the motto of "Creating Optimal Options for Spine". Meet our percutaneous disc tissue ablation devices using controllable electrode and other pain management products launching ahead.

## Invibio Ltd.

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FY5 4QD Lancashire  
United Kingdom

Tel.: +44 1253899005  
isun@vicfretex.com  
www.invibio.com



Invibio® Biomaterial Solutions continues to revolutionize spinal device design by introducing the implantable polymer PEEK-OPTIMA® HA Enhanced. As a proven medical device partner we have continued to pioneer spinal industry innovation driven by clinical need and our customers' desire to continually improve patient outcomes. Our polymers, unsurpassed manufacturing and regulatory support, together with deep device knowledge have enabled device companies around the world to bring innovative products to market for over 15 years.

## Jayon Implants Pvt, Ltd.

IV/1064,  
Industrial Development Area  
678623 Kanjikkode, Palakkad  
India

Tel.: +914912566816  
vijayjayon@gmail.com  
www.jayonimplants.com



Jayon Implants Pvt.Ltd that has been in the business as the Manufacturers of Spinal Orthopaedic Implants & Instruments for the past 13 years. We have been established under the brand name JAYON , a popular company situated in Kerala with an excellent track record for the best customer satisfaction. We have never compromised on the quality and the services provided to the customer. Also providing them with the products at very competent price.



## Exhibitors

## Joimax

Amalienbadstr. 41  
Raumfabrik 61  
DE-76227 Karlsruhe  
Germany

Tel.: +49 (0) 721 255 14 0  
nataliya.koch@joimax.com  
www.joimax.com



Founded in Karlsruhe, Germany in 2001, joimax® is one of the leading medical device companies in minimally invasive spinal surgery ("joined minimal access"). The company is primarily focused on the development, production and marketing of technologies and methods for minimally invasive endoscopic spinal surgery. joimax® is active in 40 countries around the globe and its methods have been successfully employed in approximately 130,000 surgeries. With a special focus on education, the company provides surgeons with specialized technique training through the three-step joimax® CM3 programme. This programme includes visitations, cadaver workshops and live-surgery support.

## K2M Inc.

751 Miller Drive  
20175 Leesburg  
United States

Tel.: +1 703-777-3155  
kgrabner@k2m.com  
www.k2m.com



K2M Group Holdings, Inc. is a global medical device company focused on designing, developing and commercializing innovative complex spine and minimally invasive spine technologies and techniques used by spine surgeons to treat some of the most difficult and challenging spinal pathologies. K2M has leveraged these core competencies to bring to market an increasing number of products for patients suffering from degenerative spinal conditions. These technologies and techniques, in combination with a robust product pipeline, enables the company to favorably compete in the global spinal surgery market.

## KASIOS

18 chemin de la Violette  
31240 L'Union  
France

Tel.: +33 5 34 27 33 23  
sylvie.zaccarelli@kasios.com  
kasios.com



Kasios specialises in the development, manufacture and sales of synthetic bone substitutes for use in orthopaedics and dental surgery. The company's expertise in biomaterials comes from its scientific team of calcium phosphate specialists, recognized for their success and experience in developing novel products tailored to this fast growing market. They work within the standards of quality and under a controlled environment that satisfies the unified regulatory requirements of all their clients and their target markets.

## Hoogland Spine Products GmbH

Feringastr. 4  
D-85774 Unterföhring  
Germany

Tel.: +49 (0)89 957 606 50  
J.Hoogland@max-more.com  
www.max-more.com



The Hoogland Spine Products GmbH company is built upon over 35 years of experience in the field of arthroscopy, endoscopy, spine surgery and instrument engineering. The Company has a strong management team who play a vital role in the operation, business and product development as well as customer support. Our global exclusive distribution network shares in our passion and commitment to build the maxmore spine® brand, support our customers, and facilitate better patient outcomes.

## KLS Martin Group

KLS Martin Platz 1  
78532 Tuttlingen  
Germany

Tel.: +49 7461 706 194  
frederic.franchi@klsmartin.com  
www.klsmartin.com



KLS Martin – Surgical Innovation is our Passion The KLS Martin Group is a global, medium-sized, family-owned medical equipment company based in Tuttlingen. Abiding by the corporate philosophy "Surgical Innovation is our Passion," KLS Martin develops comprehensive medical technology solutions that are highly practice-oriented. With over 1,000 employees throughout the world the Group accounts for about 75 percent of sales by value in foreign markets. KLS Martin has its own subsidiaries and partner companies in the USA, Brazil, Great Britain, France, Italy, the Netherlands, Australia, Malaysia, and Japan. Its products are distributed in over 140 countries worldwide.

## L&K Biomed Co., Ltd.

17F, 159-1, Mokdongseo-ro  
Yangchungu  
07997 Seoul  
Korea

Tel.: +49 36628-661000  
vincent@lnkbiomed.com  
www.lnkbiomed.com



L&K Biomed is a physician centric company dedicated to bringing innovation to the spinal medical market place with a focus on exceptional customer service. L&K Biomed offers a wide range of solutions for surgical indications over the entire spinal column. We are where the inspiration for spine innovation is delivered. The goal of L&K Biomed is to be a leading force for innovative technology. It will do this by reaching out and working with the worldwide spinal physician community by engaging their ideas and needs to create compelling solutions.



## Exhibitors



## Exhibitors

**LDR Asia Pacific**

Suite 1001,  
Great Eagle Centre, 23  
Harbour Road, Wanchai  
Hong Kong

Tel.: +85 239551843  
connie.ng@ldrasia.com  
www.ldr.com



LDR, with a passion of innovation, is dedicated to the development of innovative technology for spinal procedures. We design and manufacture novel implantable spine devices and instrumentation to support the clinical goals of surgery and to improve patient outcomes. With headquarter locations in Troyes, France and Austin, USA, LDR has experienced rapid growth through product portfolio expansion and an increasingly global presence. LDR is present in nearly thirty countries worldwide and maintains offices on four continents. We are committed to providing the highest quality products and finest service to the global spine surgeon community.

**Mahe Medical GmbH**

Friedrich-Woehler-Str.10  
78576 Emmingen  
Germany

Tel.: +49 746592750  
ralf.rotter@mahe-med.de  
www.mahe-med.de



Mahe Medical is a German manufacturer of high-quality Spine instruments and implants, incl. PERFECT SPINE Pedicle Screws, Cervical Plates and Cages. Long-term cooperations with national and international partners ensure that Mahe Medical has the ability to develop innovative systems in regard to the above product portfolio. Mahe Medical has successfully combined organic growth, acquisitions and long-term partner cooperations to develop into a modern international medical enterprise that focuses on meeting its customers' current and future requirements.

**Medix International, LLC**

2109 E Grant Rd  
85719 Tucson  
United States

Tel.: +00852-65632775  
jsamaha@medix.com  
www.medix.com



Our goal was clear: We would seek, find, and provide to our customers alternatives for the devices and supplies they needed. We knew quality must not be compromised, but could not lose sight of the importance of affordable equipment.

**Medi GmbH & Co. KG**

Medicusstr. 1  
95448 Bayreuth  
Germany

Tel.: +49 921 9120  
c.lacher@medi.de  
www.medi.de



Founded in Germany in 1951, Medi GmbH & Co. KG has become one of the world's leading manufacturers of medical aids. Thanks to the dedication of our international distribution partners and 1700 employees, the company exports to over 90 countries worldwide. Our orthopaedic assortment consists of supports and braces for the treatment of joint conditions and injuries for all parts of the human body such as back, shoulder/spine, hip, knee, ankle, wrist, elbow or foot. Our full range of premium-quality products are the first choice of many renowned healthcare professionals all across the globe.

**Medicrea International**

14 porte du Grand Lyon  
01700 Neyron  
France

Tel.: +33 472018787  
ssallamand@medicrea.com  
www.medicrea.com



Company that specializes in the development of innovative surgical technologies for the treatment of complex spinal pathologies.

**Meditech Implant**

Suite 1001,  
hocaalizade mah.  
yeniceler sk. Petek  
opt. Bblok no1-2 Osangazi  
1600 Bursa  
Turkey

Tel.: +90 2242215242  
info@meditechimplant.com  
www.meditechimplant.com



Meditech Implant is a fastly growing manufacturer Company of Spinal surgery Implants. Meditech Implant is very competitive in global market with its high standard quality, low prices and patented specialized products. We hope to meet you in SpineWeek..

**Exhibitors****Medtronic**

2600 Sofamor Danek Drive  
38132 Memphis  
United States

Tel.: +1 800-633-8766  
dawn.sadler@medtronic.com  
www.medtronic.com



As a global leader in medical technology, services and solutions, Medtronic improves the lives and health of millions of people each year. We use our deep clinical, therapeutic, and economic expertise to address the complex challenges faced by healthcare systems today. Let's take healthcare further. Together. Visit booth #D01 to learn more about how our innovative solutions are being used to treat spine surgery patients worldwide. Learn more at Medtronic.com.

**Medyssey**

129, Hangbang Expo-ro,  
27116 Jecheon-si  
Chungcheongbuk-do  
Korea

Tel.: +82-31-879-0414  
isabel@medyssey.com  
www.medyssey.co.kr



Medyssey designs, develops, manufactures and markets products for the surgical treatment of spine disorders through novel instrumentation and advanced orthobiologic solutions designed to improve spinal fusion rates, preservation of mobility and clinical outcomes. In the Company's quest to become a market leader, Medyssey is committed to generating, developing, and commercializing intellectual property that improve the quality of patients' lives while designed under the mantra of simple and reproducible.

**Misonix**

1938 New Highway  
11735 Farmingdale  
United States

Tel.: +16319279149  
adehlow@misonix.com  
www.misonix.com



Located in Farmingdale, New York, Misonix, Inc. specializes in the development and commercialization of ultrasonic surgical devices for neurosurgical, spinal, advanced wound care, and general surgery procedures. Our portfolio of products are all based upon the unique properties of ultrasound and its ability to differentiate hard and soft tissue for different clinical requirements. A fast growing global business, Misonix, Inc. operates in over 45 countries and is a recognized leader in advanced surgical tools offering unprecedented safety, speed, and precision.

**Mizuho Medical Co., Ltd.**

Hongo Shintoku Building 7F  
3-38-1 Hongo, Bunkyo-ku  
113-0033 Tokyo

Tel.: +81-3-3818-1705  
yao@mizuhoomedical.co.jp  
mizuhomedical.co.jp



Mizuho Group started the operation in 1919 in Japan and offers General & Specialty surgical tables. Mizuho OSI, a subsidiary of Mizuho in US offers the most comprehensive line of spine tables. proAXIS enables intraoperative flex of spine with its advanced computerized radiolucent hinged technology. STS is designed for broad range of spinal procedures, proving functionality and reliability for over 25 years. Trios, a new edition of STS accommodates 650lbs patients with a focus on enhanced safety and precision. MOI-5701 is a universally versatile surgical table providing excellent imaging flexibility, clinical versatility. Which table is best for you?

**Naton Medical Group**

9-1-902 Yuanyang  
Fengjing, No.15  
Deshengmen West  
St, Haidian Dist, Beijing, China

Tel.: +86 139 1149 0315  
Chris.y@natongroup.com  
www.natongroup.com



Naton Medical was established in 1996, since when we have been dedicating ourselves to orthopaedic business. Guided by our abiding faith of "being the career partner of orthopaedic surgeons, and helping patients regain health at minimum cost", Naton has developed from a pure selling company to a Group of Companies that set foot into every part of the value chain of orthopaedic industry, including R&D, legal manufacturing, contract manufacturing, sales and distribution, medical services, medical media services, and continuous medical education.

**NuVasive**

Grutterrij 14  
1185ZV Amsterdam  
Netherlands

Tel.: +31 858-909-1937  
ldelbo@nuvasive.com  
www.nuvasive.com



NuVasive is an innovative global medical device company that is transforming spine surgery with minimally disruptive surgical products and procedurally-integrated solutions for the spine. NuVasive has emerged from a small startup to become the #3 player in the \$9 billion global spine market and remains focused on market share-taking strategies as the Company continues on its path to become the industry's leading spine company. NuVasive offers a comprehensive spine portfolio of more than 90 unique products developed to improve spine surgery and patient outcomes. The Company's principal procedural solution is its Maximum Access Surgery, or MAS®, platform for lateral spine fusion.

**Exhibitors****Exhibitors**

## Open Operating Theatre (OOT)

MEM Media Foundation  
Stauffacherstrasse 72  
3014 Bern

Tel.: +41 315371000  
craig.mosek@memmedia.ch  
www.oot-esj.com



The OOT is a video platform for spine surgeons, where advanced surgical procedures are performed by internationally known spine surgeons. These surgical films are produced in a standardized format, are indexed and published in partnership with the European Spine Journal. eLearning is an online platform for the European Postgraduate Education Program for Spine Surgery Specialists and related disciplines and equally presented in partnership with the European Spine Journal. The European Spine Journal of Springer Publisher is one of the three leading peer reviewed spine specialist journals worldwide, covering clinical, outcome and basic spine sciences.

## Orthobion GmbH

Gottlieb-Daimlerstrasse 5  
78567 Konstanz  
Germany

Tel.: +32 479 94 18 13  
geert.gijsels@orthobion.com  
www.orthobion.com



Orthobion is a privately funded start-up, founded in 2009, located in the Southwest of Germany, in the city of Konstanz. Our expertise lies in spinal treatment options, particularly spinal fusion devices. We are an innovative pioneer in the field of coated biomaterials and various surface treatment options for spinal fusion implants, working towards the most optimal Biomimetic devices possible and resulting in Award Winning Technology.

## OrthoAix

3451 Plano Parkway  
75056 Lewisville, Texas  
United States

Tel.: +1 214-937-2205  
kimberlysmith@orthoaix.com  
www.orthoaix.com



OrthoAix International N.V. is a diversified, global medical device company focused on improving patients' lives by providing superior reconstructive and regenerative orthopedic and spine solutions to physicians worldwide. Headquartered in Lewisville TX, the company has four strategic business units that are widely distributed via the company's sales representatives, distributors and its subsidiaries. For more information, please visit [www.orthoaix.com](http://www.orthoaix.com).

## Orthopaedic & Spine Development OSD

Technopole Agroparc  
BP 11211  
84911 Avignon Cedex 9  
France

Tel.: +33 432 74 01 10  
export@osdevelopment.fr  
www.osdevelopment.fr



OSD is a French private company created in 2005 specialized in the design, development and the distribution of implants for spine and extremities. OSD is committed to develop innovative range of implants with leading surgeons in France. OSD is now distributed in 27 countries with long term partnership to complete the distribution of its products in France in direct. All products are made in France and fully ISO 13485 & CE marked. OSD is now looking to expand its distribution in Asia. We organize training courses in France and overseas, with our network of spinal surgeons experts

## OrthoPediatrics

2850 Frontier Drive  
46582 Warsaw  
United States

Tel.: +1 574-268-6379  
amort@orthopediatrics.com  
www.orthopediatrics.com



OrthoPediatrics is improving the lives of children with orthopedic conditions as the only global medical device company focused exclusively on pediatric orthopedics. With innovative surgical systems for Trauma, Limb Deformity, Spine, and Sports Medicine, OrthoPediatrics is dedicated to delivering quality products and superior professional education initiatives globally.

## Paradigm Spine

Eisenbahnstrasse 84  
78573 Wurmlingen  
Germany

Tel.: +49 7461 96359917  
tanja.gleichauf@paradigmsspine.de  
www.paradigmsspine.com



Paradigm Spine, LLC was founded in 2005 to be a leader in the field of non-fusion spinal implant technology. The company has offices in New York and Germany, and sells its six core medical device products in more than 45 countries worldwide. Paradigm Spine, LLC has successfully received FDA PMA approval of the coflex® interlaminar stabilization device in the United States in October of 2012. The coflex® technology has been implanted in more than 100,000 patients, and is selling in over 45 countries. The core market for coflex® is lumbar spinal stenosis patients.



## Exhibitors



## Exhibitors

## PHACON GmbH

Karl-Heine-Strasse 15  
04229 Leipzig  
Germany

Tel.: +49 (0) 341-47839732  
felix.antenbrink@phacon.de  
www.phacon.de



PHACON real trained - virtual assisted PHACON is specialised in surgical simulation systems and 3D printed anatomical models. Worldwide, PHACON systems with their included artificial specimen are in service as an economic extension or alternative to human specimen. In surgical training courses, congresses or fairs, the systems are immediately ready for use without complex handling or special storing, which makes them to uncomplicated training units for hands-on courses and effective marketing tools for producers of medical devices.

## Premia Spine Ltd.

P.O. Box 8630,  
7 Giborey Israel Str,  
Ramat Poleg 4250407  
Netania, Israel

Tel.: +972 54 4626602  
ronsacher@premiaspine.com  
www.premiaspine.com



The TOPS™ System from Premia Spine is an alternative to lumbar decompression and fixation for spondylolisthesis and spinal stenosis. The TOPS™ System is designed to stabilize the diseased vertebral level following decompression surgery to alleviate pain stemming from spinal stenosis and/or spondylolisthesis. It allows for the physiologic motion in flexion, extension, lateral bending and axial rotation. The TOPS™ System effectively replaces the anatomical structures that are removed from the vertebrae during the decompression treatment. The TOPS System is anchored to the spine with four standard polyaxial pedicle screws via a traditional posterior surgical approach.

## ResearchBooks Asia

10 Sinaran Drive  
#03-22 Square 2 Shopping Centre  
Singapore 307506

Tel.: +65 6252 5575  
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ResearchBooks Asia is Singapore's largest Scientific and Medical bookstore. We stock over 10,000 professional scientific and medical reference books in very specialised subjects. Corporate and special orders are welcome – we are your best source of specialty books and resources. Email us at [info@ResearchBooksAsia.com.sg](mailto:info@ResearchBooksAsia.com.sg) or visit us at Square2 store today!

## RTI Surgical

Voorveste 7  
3992 DC Houten  
Netherlands

Tel.: +31 (0)306934720  
rterbeek@rtix.com  
www.rtix.com



RTI Surgical is a leading global surgical implant company providing surgeons with biologic, metal and synthetic implants. Committed to advancing science, safety and innovation, RTI's implants are used in sports medicine, general surgery, spine, orthopedic, trauma and cardiothoracic procedures. RTI Surgical is Headquartered in Alachua, Fla., and has additional locations in the US, Europe, and Asia.

## S14 Implants

33 avenue de Canteranne  
33600 Pessac  
France

Tel.: +33(0)556152801  
torlin.tredenc@s14implants.eu  
www.s14-implants.com



S14 IMPLANTS is specialized in the design, manufacture and distribution of spinal implants. We design medical devices intended to treat degenerative diseases and congenital deformities of the spine. As experts in dynamic stabilization, specializing in spine biomechanics and polymer materials science, we develop successfully, concepts that combine flexible and rigid components.

## Safe Orthopaedics

Allee Rosa Luxemburg  
Batiment Californie  
95610 Eragny sur Oise

Tel.: +33 1 34 21 50 00  
k.fraisse@safeortho.com  
www.safeorthopaedics.com



Safe Orthopaedics is a medical device company focused on the development and commercialization of innovative products for spinal surgery. The company breaks the path in offering the first model of single use, sterile, and fully traceable instrumentation systems for spine surgery. Associated to a full range of implants, instrument kits are delivered ready to use, enhancing the safety and efficiency for patients and practitioners.



## Exhibitors



## Exhibitors

**Sawbones Worldwide****SAWBONES** WORLDWIDE

Krossverksgatan 3 and  
102211, W 188th Street  
214 16 / WA98070  
Malmoe / Vashon

Tel.: + 46 406507000  
louis@sawbones.se  
www.sawbones.com

Sawbones is the market leader and is the largest manufacturer and provider of orthopaedic and anatomical models for medical education, new product demonstration, sales training and patient awareness in the world. Capabilities – Sawbones develops over 300 customer-requested products each year with full onsite engineering and design capabilities, including CAD, 4-axis milling, 3-D printing and rapid prototyping. Sawbones maintains outstanding customer service and a satisfaction guarantee\* on all products and services.

**SeaSpine****SeaSpine**

Immeuble Séquoia 2  
97 Allée Alexandre Borodine  
69800 Saint-Priest  
France

Tel.: +33 4 37 47 59 00  
elise.dubroca@seaspine.com  
www.seaspine.com

At SeaSpine, we believe spine surgery patients should easily benefit from the most advanced scientific knowledge and technology available. That's why our expert team collaborates closely with leading spine surgeons, global distributors and other partners on the cutting edge of spinal solutions. From research and development, to product design and engineering, to commercialization and distribution – SeaSpine's product portfolio is dedicated to restoring mobility and quality of life to patients.

**Shanghai Bojin Electric Instrument & Device Co., Ltd****Bojin**

Room606, No.3388  
Gonghe Xin Road, Zhabei District  
200436 Shanghai  
China

Tel.: +86 -21-66308077  
bfix01@aikesh.com  
www.bojin-medical.com

Bojin is specialized in manufacturing orthopedic power tools for more than 20 years and has been granted with CE, ISO13485, ISO9001, FDA etc.

**Shanghai Kinetic Medical Co., Ltd.****Knetic**

BLDG 23, #528 Ruiqing Road  
Zhangjiang Hi-Tech Park East  
201201 Shanghai  
China

Tel.: +86-21-50720558  
dannyfverpool@yeah.net  
www.kineticmedinc.com.cn

Shanghai Kinetic Medical Co., Ltd. (KMC) a listed company in Shenzhen Stock market. (Stock # 300326.SZ) Currently, KMC is the leading developer, manufacturer and distributor of orthopaedic and spinal devices in China. The company's mission is to provide top quality products and the best value to the needs of the doctors and patients.

**Showa Ika Kohgyo Co., Ltd.****SHOWA IKA**

8-7 Haneishimachi  
441-8026 Toyohashi, Aichi  
Japan

Tel.: +81-532-32-1543  
kataoka@showaika.co.jp  
www.showaika.com

Showa Ika is Japan's leading spinal device producer, creating innovative, safe, easy-to use instruments and implants for use in spine surgery. Our products are globally recognized by leading physicians for their outstanding quality and clinical efficacy.

**Siemens Healthcare GmbH****SIEMENS**

Henkestrasse 127  
91052 Erlangen  
Germany

Tel.: +49 9131 84-0  
contact.healthcare@siemens.com  
www.healthcare.siemens.com

Siemens Healthcare is one of the world's largest suppliers of technology to the healthcare industry and a leader in medical imaging, laboratory diagnostics and healthcare IT. All supported by a comprehensive portfolio of clinical consulting, training, and services available across the globe and tailored to customers' needs. In fiscal 2014, Siemens Healthcare had around 43,000 employees worldwide and posted a revenue worth 11.7 billion euros, and profits of more than 2 billion euros. Further information is available on the Internet at <http://www.healthcare.siemens.com/>


[www.spineweek.org](http://www.spineweek.org)

Exhibitors


[www.spineweek.org](http://www.spineweek.org)

Exhibitors

**SIGNUS Medizintechnik GmbH****SIGNUS**  
The Spine Sign

Industriestraße 2  
63755 Alzenau  
Germany

Tel.: + 004960239166117  
j.staab@signus.com  
www.signus.com

SIGNUS Medizintechnik GmbH has been developing products and services for the treatment of spinal disorders since 1994 - for optimal patient mobility in everyday situations. Due to our many years of experience and extensive expertise, we fully understand the needs of medical experts and patients and can turn new requirements into reliable products quickly and to the highest standards of quality. Our goal is to offer a full range of products for the spine that support neurosurgeons and orthopedic specialists when performing spinal surgery.

**Solco Biomedical Co. (I) PVT. LTD.****SOLCO**  
LIFE & SCIENCE

5 & 6 B Jadhav Chamber 3Rd Floor  
Above Sales India Ashram Road  
380009 Ahmedabad  
India

Tel.: +91 990 999 6727  
sales@solco.co.in  
www.solco.co.in

We, Solco Biomedical, are the manufacturer of Spine & Trauma Products. We have conventional open-typed spinal fixation system including TLIF, PLIF & Cervical Peek Cage system, along with MIS spine fixation system. Furthermore we've been exporting several Trauma system such as "Anatomical plate & Various nail systems including locking screws system to European countries like German and Arab region. Main motto is "To serve the customers with Quality-proven products". "Gold products with Silver price." We started work for "OEM" since 6 months with the concept of "Lets go for the world".

**Söring GmbH****Söring**  
INNOVATIVE SURGERY

Justus-von-Liebig-Ring 2  
25451 Quickborn  
Germany

Tel.: +49 41066100209  
lars.hoepfner@soering.com  
www.soering.com

Söring, one of the pioneers in ultrasonic technology, has been providing the international market with innovative products for ultrasonic and high-frequency surgery for 30 years. Customized solutions for neurosurgery and spine surgery include ultrasonic surgical devices for highly selective tumor dissection and precise bone instruments for microsurgery as well as endoscopic techniques. Globally recognized quality and high reliability of our products hinge on the close cooperation with surgeons combined with an uncompromising quality assurance concept. You share our vision of taking medical technology yet another step further? Then get in touch with us!

**SpineGuard****SpineGuard**  
Making spine surgery safer

10 cours Louis Lumière  
94300 Vincennes  
France

Tel.: +33 185530029  
a.saint-hilaire-delmas@spineguard.com  
www.spineguard.com

SpineGuard provides tools equipped with Dynamic Surgical Guidance (DSG) technology to enhance spinal surgery. Devices built with DSG technology give real-time audio and visual feedback to improve the accuracy of pedicle screw placement, without the need for ancillary equipment. The PediGuard probes are the only devices with built-in DSG capability. These devices have assisted spine surgeons in accurately placing pedicle screws in over 42,000 spinal procedures around the world. Please visit [www.spineguard.com](http://www.spineguard.com) for more information.

**SpineWay****SPINWAY**

7 Allée Moulin Berger  
69130 Ecully  
France

Tel.: +33 478655690  
mkt.thf@spineway.com  
www.spineway.com

Spineway is dedicated to improving treatments in instrumented spine surgery, for the benefits of surgeons and patients, based on 20 years experience in the industry. Our range of arthrodesis solutions for adult and paediatrics is now completed with MCNT BLANC 3D+, a new direct global correction system to treat spinal deformities. Distributed in 50+ countries, Spineway becomes a significant player in the spine sector. With our experience in international development and a dynamic R&D team, we achieve high added-value products with short time-to-market.

**Surgaid Medical (Xiamen) Co., LTD****SURGAID MEDICAL**  
Dedicated to Minimal Invention

No. 218 Houxiang Road,  
Haicang Dist., Xiamen 361022,  
China

Tel.: +86 15960395124  
louis@double-engine.com  
www.double-medical.com

Surgaid Medical is part of Double Medical Company Families. Double Medical is a class leading company who is dedicated to developing and marketing Spine, Trauma, Ex-fix, Neuro/CMF, Trocar, etc.


[www.spineweek.org](http://www.spineweek.org)

Exhibitors


[www.spineweek.org](http://www.spineweek.org)

Exhibitors

**Tecres Spa**

via A. Doria 6  
37066 Sommacampagna (VR)  
Italy

Tel.: +39 0459217311  
alesandra.pietropoli@tecres.it  
www.tecres.it



Tecres has got over thirty years of experience in orthopaedics and is also active in minimal invasive surgery. Mendec Spine HV System, the unique all in one closed mixing device specifically developed for the preparation of high density acrylic resin to be used for vertebroplasty, Mendec Spine is our acrylic resin specifically developed for the filling of vertebral cavities, that goes with a complete kit for the vertebroplasty procedures with Mendec Spine Kit.

**TeDan Surgical Innovations**

12615 W. Airport Blvd.  
Ste. 200, 77478 Sugar Land  
United States

Tel.: +1 7137260886  
msteffen@tedansurgical.com  
www.tedansurgical.com



TeDan Surgical Innovations (TSI) designs and manufactures specialty surgical products for use in orthopedic, neuro, cardiothoracic and spine surgeries. TSI offers cervical and lumbar retractor systems for ACDF and minimally invasive lumbar fusion procedures. All of our retractor systems have patented ergonomically designed blade locking mechanism which simplifies their use in surgery.

**TEKNIMED**

11 rue apollo  
31240 L'Union  
+ (33)534251060  
India

Tel.: +(33)534251060  
s.thomas@teknimed.com  
www.teknimed.com



TEKNIMED is recognized as the reference in BIOMATERIALS devices for Orthopaedics and Spine. TEKNIMED designs, develops and manufactures more than 100 items, including: Resorbable synthetic Bone Substitutes, Orthopaedic & Cranioplasty cements, Verlebrobiasty & Kyphoplasty cements, Biodegradable polymers and textile. TEKNIMED's innovative and patented medical devices have provided numerous, scientifically proven, surgical solutions for Orthopaedics, Spinal, Dental, Trauma and CMF. As a leading designer and manufacturer of biomaterials, TEKNIMED has a worldwide network of more than 120 distributors generating over 85% of its revenue as export sales.

**Thompson Surgical Instruments, Inc.**

10170 East Cherry Bend Road  
49684 Traverse City  
United States

Tel.: +1 2319220177  
Chelsea.Dennis@thompsonsurgical.com  
www.thompsonsurgical.com



Thompson Surgical Instruments delivers uncompromised exposure to a variety of surgical specialties with the Thompson Retractor. In use for over fifty years, the Thompson Retractor is the only mechanical retractor to offer one frame for all exposure needs, multi-planed retraction, and unlimited customization. The key to designing retractor systems is surgeon input. In Spine, Thompson collaborates with worldwide opinion-leaders to design access systems for a range of approaches and leads the way in providing the visibility surgeons need to not only be successful but to give the confidence to try new, improved procedures.

**Tsunami**

XXV Aprile 22  
41037 Mirandola  
Italy

Tel.: +39 3289835231  
greg.moczko@tsunamimed.com  
www.tsunamimed.com

TSUNAMI MEDICAL

Tsunami Medical is Italy based Company focusing on highly innovated products in medical industry. Manufacturer of spinal implants with advanced BoneInGrow Technology, BoneInGrow Technology gives surgeons complete solution and best possible biomechanical conditions to achieve spinal fusion. Tsunami offers spinal systems in Minimal Invasive and Open approaches.

**Vertebral Technologies, Inc.**

5909 Baker Road, Suite 550  
55345 Minnetonka  
United States

Tel.: +1 -952-979-1809  
bwascher@vti-spine.com  
www.vti-spine.com



VTI's proprietary InterFuse intra-operative (modular) assembly technology was designed to enable spine surgeons to achieve a large, customized and anatomical implant while utilizing a familiar, less-invasive posterior implant approach. This device can benefit all patients, but is particularly helpful in the higher risk patient categories. Large footprint ensures less chance of subsidence and reduces risk of migration. The stability provided also reduces risk of hardware loosening.



Exhibitors

**Vexim SA**

8, Rue de Vidallhan  
Hills Plaza - Bât. B - 1er étage  
31130 BALMA  
France

Tel.: +33 664747340  
e.bello@vexim.com  
www.vexim.com



Vexim is a French company dedicated to providing clinically and scientifically proven solutions for minimally invasive procedures for patients suffering from Vertebral Compression Fractures.

**Waston Medical Appliance**

9 Xihu Road  
213000 Chang Zhou  
China

Tel.: +86 18661214778  
waston.jason@gmail.com  
www.wastonmedical.com



A Leading manufacturer in China for Orthopedic, Spine and instruments. Focus on new products' development, education and after-sale service.

**Xtant Medical**

452 Alexandersville Road  
45342 Miamisburg  
United States

Tel.: +1 9378478400  
adunham@x-spine.com  
www.x-spine.com



Xtant Medical, formed by the combination of Bacterin International, Inc., and X-spine Systems, Inc., is a comprehensive supplier of orthobiologics and spine surgery products. This union creates an extensive portfolio of highly complementary products that serve the needs of orthopedic surgeons, neurosurgeons and their patients. Xtant's goal is to provide the highest quality products and service for successful outcomes for surgeons' patients.



Exhibitors

**Ziehm Imaging GmbH**

Donausfrasse 31  
90451 Nuremberg  
Germany

Tel.: +49 (0) 911 2172 0  
hui-min.eng@ziehm-eu.com  
www.ziehm.com



Founded in 1972, Ziehm Imaging has stood for the development, manufacturing and worldwide marketing of mobile X-ray-based imaging solutions for more than 40 years. The company is the recognized innovation leader in the mobile C-arm industry and a market-leader in Germany and Europe. The Nuremberg-based manufacturer received the prestigious IF Design Award 2016 for Ziehm Vision RFD 3D in the category medicine/healthcare. Ziehm Vision RFD 3D is the world's only mobile 3D C-arm with flat-panel technology that provides a 16 cm edge length per scan volume, combining 2D and 3D functionality and maximum ease-of-use. For more information, please visit: www.ziehm.com

**Zimmer Biomet**

310 Interlocken Pkwy #120  
80021 Broomfield  
United States

Tel.: +1 3035018477  
savanah.sporer.extemail@zimmerbiomet.com  
www.zimmerbiomet.com



Zimmer Biomet was created to redefine musculoskeletal healthcare, and to help improve the lives of those we serve. Our singular goal is to help achieve exceptional outcomes for patients, healthcare professionals, investors, our Team Members, and the communities in which we work. By focusing the strengths of two great companies, Zimmer Biomet is uniquely positioned to accelerate the pace of innovation and to drive growth. This simple but powerful philosophy is summarized by our tagline, "Your progress. Our promise." It reminds us that, together, we can achieve more when we work together in pursuit of our shared goals.



Exhibitors



Exhibitors

### Download SpineWeek on your mobile phone

and have the most relevant and up-to-date conference information at hand:

Program  
 General and practical information  
 Bookmark your favorite sessions  
 Abstracts of invited talks & oral presentations  
 Info on speakers & exhibitors  
 Floor plan  
 Twitter feed  
 Survey  
 ...

The SpineWeek 2016 App will be available in the App Store & Google Play.



## General Information



[www.spineweek.org](http://www.spineweek.org)

### General

#### Registration Desk

The registration desk of SpineWeek 2016 is located on Level 3 of the Marina Bay Sands Convention Centre.

#### Onsite Registration Opening Times

Sunday, May 15 16.00 - 19.00  
 Monday May 16 - Friday May 20 07.00 - 18.30

#### Registration Fees

On-site registration: Full period**	Euro
Member*	€ 800.00
Non-Member	€ 950.00
Student/Trainee/Nurse & other Allied Health Professionals***	€ 500.00
Visitor Exhibition Only	€ 350.00

#### Social Events

	Euro
Welcome Reception for partners, Monday, May 16	€ 50.00
All Societies Get-Together, Wednesday, May 18	€ 100.00
Society Dinner	€ 100.00

(See Social Program for more details)

#### ISSLS Social Program

(Not included in registration fee)

	Euro
Partner Program Includes: Welcome Reception, ISSLS Dinner, Outing and Excursion	€ 500.00
ISSLS Outing, Thursday, May 19	€ 150.00
ISSLS Dinner, Thursday, May 19	€ 100.00

\*AFRICASPINE/AOSPINE/APSS/ASSI/Bangladesh Spine Society/CAOS/F-MARC/F-MARC/ICSG/ISASS/ISSLS/KSSS/NASS/NSpine/PASS/SBC/SILACO/SMSS/SOLAS

+ 10 Member countries of the Association of South East Asian Nations (ASEAN)

\*\* Day Registration is not possible

\*\*\* Certificate or proof of status will be asked during the registration process.

#### The registration fee includes

- Access to all scientific sessions
- Access to the industrial exhibition
- Meeting bag with program, tourist and other information
- Abstracts available online
- Welcome Reception on Monday, May 16
- Daily lunches and coffee breaks as announced in the program



[www.spineweek.org](http://www.spineweek.org)



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### General

#### Badges

Participants are obliged to wear the official SpineWeek 2016 badges on all occasions. There will be rigorous badge controls.

#### Lost Badges

Participants who lost their badge will have to register and pay anew.

#### Language

The official language of SpineWeek will be English.

#### Abstracts of invited lectures and oral presentations

The abstracts of invited lectures and oral presentations can be consulted via the mobile App or on the SpineWeek website. Registered participants have received a password to access these abstracts.

#### ePosters

ePosters (electronic posters) are on display in the eSpine Area on Level 3 for the duration of SpineWeek 2016. An easy to use search engine allows you to search by author, university, topic, keywords, etc...

#### Special ePosters

5 ePoster corners are installed in the eSpine Area on Level 3 for the special ePoster sessions. These special ePosters will be on display on large touch screens allowing discussion in front of a small audience. Comfortable chairs will be installed in front of the screens.

#### Speaker Room

Speakers with oral presentations are requested to upload their PowerPoints onto the central server system at least 2 hours prior to their scheduled presentations. The Speaker Room is located in the eSpine Area on Level 3.

Professional technicians will assist you in uploading your presentations onto the system.

#### Industry Workshops and Satellite Symposia

Presentations for Industry Workshops and Satellite Symposia are to be uploaded in the Workshop rooms.

#### Venue

Marina Bay Sands Convention Centre  
 10 Bayfront Avenue  
 Singapore 018956  
[www.marinabaysands.com](http://www.marinabaysands.com)

#### Coffee and Lunch

Coffee will be served in the exhibition area on Level 1 during the breaks between sessions. Lunch is included in the registration fee and a number of Lunch Workshops will be organized by the industry. Moreover, there are several restaurants and cafés on the premises of the Marina Bay Sands Convention Centre where participants can buy food and drinks.

#### Accreditation

SpineWeek 2016 has been granted 30 European CME credits (ECMEC) by the European Accreditation Council for Continuing Medical Education (EACCME). Participants will receive a certificate of attendance with accreditation details via email after SpineWeek 2016.

#### Disabled Persons

Participants with disabilities are kindly requested to contact the congress organizers for assistance when entering the Marina Bay Sands Convention Centre.

#### Cloakroom

A guarded pay cloakroom is available on Level 3. Luggage can also be stored here.



[www.spineweek.org](http://www.spineweek.org)

Liability

In registering for SpineWeek, participants agree that neither the SpineWeek Committee nor the Organizing Secretariat assume any liability whatsoever, Participants should therefore organize their own health, travel and personal insurances.

Hotel Accommodation & Tours

East West Planners will have a desk on Level 3. Their collaborators can assist you to book city trips and answer questions regarding your hotel booking.

Introduction to Singapore

Singapore is a bustling cosmopolitan city populated with high-rise buildings and landscape gardens. Brimming with a harmonious blend of culture, cuisine, arts and architecture, Singapore is a dynamic city that is rich in contrast and colour. In fact, you can even say that Singapore embodies the finest of both East and West.

Located in Southeast Asia, Singapore has a land area of about 710 square kilometres, making her one of the smallest countries in the world and the smallest in the region – hence the moniker "The Little Red Dot". Although small in size, Singapore commands an enormous presence in the world today with its free trade economy and highly efficient workforce. Also, her strategic location in the region has enabled her to become a central sea port along major shipping routes.

Singapore's Population, Language and Culture

At present, Singapore's population stands at about five million people, with English as the main language of instruction, and a mother tongue for each major ethnicity. One of the distinctly Singaporean things you'll notice on our island is a ubiquitous collage of cultures. Coming together as a society and living in harmony, there are four major races – namely the Chinese (majority), Malays, Indians and Eurasians. Each community offers a different perspective of life in Singapore in terms of culture, religion, food and language.

Climate

Singapore is warm and humid all year round. The daily temperature averages around 28 degrees Celsius. Abundant rainfall can be expected during the monsoon seasons from December to March and from June to September.

Tipping

Tipping is not widely practiced in Singapore as most hotels and restaurants apply a default 10% service charge.

Smoking

Smoking is prohibited in all air-conditioned areas (e.g. shopping centres, restaurants, cinemas, public buses, MRT, taxis, lifts), common corridors, void decks, and staircases within residential buildings, outdoor hospital compounds, as well as a 5-metre radius from any entrance/exit and bus shelter.

Taxis

All Singapore taxis operate under a meter system with starting fees ranging from S\$3.00 to S\$3.90. City and peak hour surcharges apply. Pre-booking of taxis can be done via the official taxi hotline: +65 6-DIAL-CAB (63425222). Alternatively, you can SMS "Book<space>six-digit postal code" to 71222 or use a mobile phone app like Confort DelGro Taxi Booking App, SMART Book a Taxi or GrabTaxi. Charges are higher for advance bookings.

GST Refunds

To enjoy a refund on the 7% Goods and Services Tax (GST) paid on your purchases, you need to make at least S\$100 worth of purchases from participating outlets which display a "Tax Refund" logo or a Global Blue "Tax Free Shopping" logo. Request for a refund voucher upon purchase, which you should present with your purchases, receipts and passport at the Tax Refund Counter of the airport before you fly off. More information can be found at the Tourist Refund Scheme page on the Singapore Customs website at www.customs.gov.sg.

Singapore Visitors Centre

For queries, you're welcome to drop by any of the Singapore Visitors Centres at these locations:

Next to orchardgateway@emerald  
9.30am – 10.30pm daily

ION Orchard Level 1 Concierge  
10am – 10pm daily

Chinatown Visitor Centre @ Kreta Ayer Square  
9am – 9pm (weekdays)

For any queries related to your stay, do call the toll-free Touristline at 1800-736-2000. The hotline is open from Monday to Friday 9am – 6pm (excluding public holidays).

Useful Phone Numbers

Emergency (police, ambulance, re): 112  
Police (theft and other queries): 0900-8844 Touristdoctor (medical attention): (0031)-(0)-20-4275011

Official Carrier

The Airlines of Emirates, official carrier for SpineWeek 2016, offer attractive airfares for participants. To benefit from 10% discount on your flights, link up with www.emirates.com and use the promotion code EVE6MSW.



SpineWeek on your mobile phone!

Follow the conference on your smartphone! The SpineWeek 2016 App will be available in the App Store & Google Play.



Sponsored by Medtronic

Accompanying Persons

The partners of all SpineWeek participants can go to the desk of East West Planners on Level 3 to pick up their Pre-paid Mastercard to the value of 50.00 SGD, offered by the Singapore Tourism Board.



Official Organizer



MediCongress  
Noorwegenstraat 49  
9940 Evergem, Belgium  
www.medicongress.com  
info@medicongress.com

Social Media

Follow us on Social Media and share your information using the official hashtag #SpineWeek.

Notes

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Notes

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- Wednesday
- Thursday
- Friday
- Posters
- Meetings

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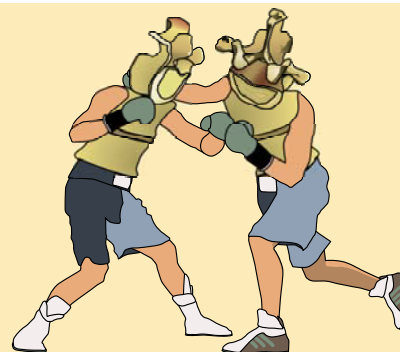


XXIIIrd Brussels International Spine Symposium

### Controversies in the Treatment of Spinal Disorders

Controversies in diagnosis, management and costs

November 18 & 19  
Brussels, Belgium



www.spinesymposium.com

ConAmed Faculty:

- |                          |                              |                         |                           |
|--------------------------|------------------------------|-------------------------|---------------------------|
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| M. Aebi (Bern)           | H. Brisby (Göteborg)         | C. Lamartina (Milano)   | F. Smith (Aberdeen)       |
| R. Assaker (Lille)       | R. Ceccinato (Milano)        | J.C. Le Huec (Bordeaux) | J.P. Steib (Strasbourg)   |
| M. Benoit (Paris)        | C. Colloca (Phoenix)         | C. Lamartina (Milano)   | A. Vaccaro (Philadelphia) |
| P. Berjano (Milano)      | R. Dunn (Plumstead)          | M. Mayer (Munich)       | F. Villarejo (Madrid)     |
| S. Blumenthal (Dallas)   | R. Guyer (Dallas)            | E. Muehlbauer (Chicago) | B. Weiner (Houston)       |
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