The International Society for the Study of the Lumbar Spine

45th Annual Meeting
Banff, Canada • May 14–18, 2018
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ISSLS 2019 Kyoto JAPAN

Please join us for the 46th ISSLS Annual Meeting June 3-7, 2019 • Kyoto, Japan
Dear Members and Guests,

It is our great honor to welcome you on behalf of the Local Organizing Committee to this 45th Annual Meeting of the International Society for the Study of the Lumbar Spine (ISSLS) in Banff, Canada.

After the very first annual meeting of ISSLS in 1974 in Montreal, it fills us with pride that this year marks the 5th time that our country is hosting this prestigious meeting with delegates traveling from all over the globe.

Banff is one of the most precious and protected places in this world. Visitors can experience the landscape of breathtaking Canadian Rocky Mountains, glacier-fed lakes and, with some luck, wildlife at its best. Our Half-Day Excursion will bring us to Lake Louise. Its mesmerizing emerald water comes from the melt-water of nearby glaciers. When back at the Fairmont Banff Springs hotel, the luscious spa facilities and heated outdoor pool will permit you to rest well. For the Banquet we will spend an unforgettable evening at Brewster’s Mountain Lodge, with everyone entrenched in a Canadian style rodeo theme, spoiled with a hearty traditional Canadian barbeque.

The Fairmont Banff Springs hotel is an UNESCO World Heritage site and stands as a landmark in the picturesque alpine town of Banff. The hotel is sometimes called the “Castle of the Rockies”. You will understand why the very second when entering its premises! It will lend itself well to a spectacular coulisse for the very reputed Scientific Meeting with its respected International Faculty. For a contribution outside our comfort zone of spinal sciences, we have invited three inspiring guest speakers that will speak on topics including happiness, arctic exploration and overcoming obstacles. We have also added two exciting symposia this year focusing on digital health and precision medicine for spine providers. Last but not least, we welcome the Spine Section of the Orthopaedic Research Society (ORS), who will join us this year with a co-hosted superb workshop on Monday afternoon entitled “Novel Therapeutics for Spinal Disorders and Low Back Pain: from Bench to the Bedside”.

We look forward to welcoming you at the 45th Annual Meeting of ISSLS in Banff!

Sincerely,

Christy Tomkins-Lane
Thomas Steffen
(local co-hosts)

WI-FI AND SOCIAL MEDIA

Name of Wi-Fi: Fairmont_Meeting
Log-in: ISSLS2018

Twitter: https://twitter.com/ISSLS_Society
Instagram: @ISSLS_2018 (ISSLS Banff 2018)
Hashtag for conference: #issls2018
Dear friends and colleagues,

On behalf of the ISSLS Executive Committee it gives me great pleasure to welcome you all to our 45th Annual Meeting at the historic town of Banff high in the Canadian Rockies. Our local hosts Drs Christy Tomkins-Lane and Thomas Steffen together with the local organizing committee have worked hard to ensure an unforgettable experience in Banff. I would also like to express our thanks to the Program Committee under the leadership of Dr Serena Hu and the many volunteer abstract reviewers for a comprehensive program based on scientific presentations and symposia.

Once again, we will have the opportunity to learn from high-quality research and active discussions.

The award ceremony on May 17th will honor one of our respected senior members with the Wiltse Lifetime Achievement Award. The prestigious ISSLS Prizes will be presented at a special session on the same day.

Invited Lectures have always been the highlights of our Annual Meeting, and this year makes no exception. We are honored to have three excellent invited speakers who will share with us their expertise on empowering Inuit girls and young women, on the power of happiness, and on overcoming obstacles to reach our full potential. The variety of topics promises exciting presentations that nobody should miss.

The traditional ISSLS outing will give us an opportunity to explore the Banff National Park, a UNESCO World Heritage Site since 1985, which has been described as one of the world’s most awe-inspiring mountain destinations. We will end the tour with an evening in true Canadian style at Wild Bills Legendary Saloon in downtown Banff.

On the afternoon prior to the ISSLS Annual Meeting, a workshop organized by the Spine Section of the Orthopaedic Research Society will focus on “Novel Therapeutics for Spinal Disorders and Low Back Pain: from Bench to the Bedside”. Please join us for this exciting symposium.

Looking forward to seeing you all in Banff.

Teija Lund
President ISSLS 2017-2018
**FELLOWSHIPS AND AWARDS**

**Young Investigator Travel Award sponsored by Eisai Co.**
Prize ceremony for the recipients will be during the Fellowship Award Ceremony, Thursday May 17, at 09:30

**Clinical Traveling Fellowship sponsored by Seoul Chuk Hospital**
The winner will be announced during the Fellowship Award Ceremony, Thursday May 17, at 09:30

**ISSLS Research Grant sponsored by Taisho Pharmaceutical Co.**
The winner will be announced during the Fellowship Award Ceremony, Thursday May 17, at 09:30

**ISSLS Wiltse Lifetime Achievement Award**
A yearly award for exceptional achievement in the spinal field. This award will be announced at Fellowship Award Ceremony, Thursday May 17, at 09:30

**The ISSLS Prize for Lumbar Spine Research sponsored by European Spine Journal**
The ISSLS Prize winning papers will be presented on Thursday, May 17, at 10:20

**Best Paper and Poster Award sponsored by Ono Pharmaceutical Co.**
The two best paper and poster presentations will be announced during Closing Remarks on Friday May 18, at 12:00

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**UPCOMING MEETINGS**

- **2019, June 3 - 7, Kyoto, Japan**
- **2020, April 27 - May 1, Melbourne Australia**
- **2021, Milan, Italy (dates not decided yet)**
SOCIAL PROGRAM

(Included in registration fee for all fully registered delegates/accompanying persons. Additional tickets may be purchased at the registration desk, pending availability)

WELCOME RECEPTION

The Welcome Reception will be held at the Fairmont Banff Springs Hotel.
Time: Monday May 14, at 18:00
- Passed Canapés & Drinks
- Live music for all to enjoy!
Dress code: Formal

AFTERNOON OUTING – LAKE LOUISE TOUR

Enjoy a half day tour and travel the scenic route to Lake Louise – the most famous glacial lake in the Canadian Rockies

Time: Wednesday May 16, buses depart at 13:00
Lunch: A boxed lunch will be served
Wear casual, comfortable shoes, possibly warm jacket/coat

At the end of the tour guests will be dropped off at Wild Bills Legendary Saloon in downtown Banff to enjoy an assortment of food stations, drinks and a ride on Ebenezer the mechanical bull! Bring your boots and cowboy hat for a fun ride. Yeehaw!

There will be buses from Wild Bills to the Fairmont, the first shuttle will depart at 19:15 and the last will depart at 22:00.

GALA DINNER AT MOUNT VIEW BARBECUE

Time: Thursday May 17, First bus departs at 18:30
Dress code: Smart casual
The Gala Dinner will be at Mount View Barbecue, a venue that offers a truly unique, Western Canadian experience! This event at Mount View Barbecue will be an unforgettable evening, and a highlight of your visit to the mountains!

- Buffet Dinner & Drinks
- Whiskey Tasting Bar
- Live band with Line Dancing
- Photo Opportunities with Royal Canadian Mounties
COLUMBIA ICEFIELD & GLACIER SKYWALK

Day: Tuesday May 15, Bus departs at 08:00 (9-10 hours)
Lunch: Buffet Lunch at the Icefield Chalet
Be sure to bring warm clothes, gloves, toques, warm jacket and durable footwear.

Spend the day exploring one of the most scenic highways in the world. The Icefield Parkway offers an ever-changing view of waterfalls, turquoise lakes, alpine meadows, snow-capped peaks and glaciers. Getting to the Columbia Icefield is a remarkable attraction in itself!

The Columbia Icefield is the largest sub-polar body of ice in North America and is one of the reasons why the United Nations declared Canada’s four Rocky Mountain Parks a World Heritage Site. It covers an area of nearly 325 square kilometers, sometimes reaching a depth of 300-360 meters (1150 feet) deep. The Ice Explorer Glacier Tour takes you onto the surface of the Athabasca Glacier in a unique, specially designed Ice Explorer. This Ice Age adventure is a once in a lifetime experience! Caution is advised – the ice surface may be wet and slippery.

WORLD HERITAGE SITE

Day: Thursday May 17, Bus departs at 08:00 (5 hours)
Lunch: Light Lunch at Toque Canada
Be sure to bring warm clothes, gloves, toques, warm jacket and durable footwear.

The tour begins with a trip to Cave and Basin National Historic Site. This historic site preserves the stories of the hot springs that have drawn visitors to Banff since three railroad workers stumbled across them in 1883. The classic bath houses, sulphuric mineral springs, and interactive displays will transport you back in time to relive the origin of Banff and Lake Louise and Canada’s National Park system.

Guests will be treated to a stop at Bankhead, the abandoned mining town, a relic of Banff’s industrial past!
INVITED SPEAKERS

(more information about the speakers can be found in the ISSLS meeting app)

JENNIFER MOSS - TUESDAY MAY 15, 11:30 – 12:15
Title of Lecture: How to Energize Healthcare Professionals for Better Patient Care
In a provocative and illuminating new talk, bestselling author and researcher, Jennifer Moss, shares ground-breaking and novel research on issues facing healthcare professionals today. Jennifer will discuss the serious impact of empathy fatigue, burnout, depletion and anxiety on health professionals and how that influences patient care. Jennifer's talk includes real-world case studies from her first-hand experience working with administrators and front-line staff in hospitals, and government agencies.
Twitter: @jenleighmoss
LinkedIn: https://www.linkedin.com/in/jenleighmoss/

SUSAN EASTON - WEDNESDAY MAY 16, 11:40 – 12:20
Harry Farfan Presidential Lecture
Title of Lecture: Empowering the Next Generation of Inuit Woman Leaders in Canada's Arctic
The Sedna Epic Expedition is comprised of an international team of women ocean explorers, scientists, journalists, movie-makers, photographers, artists, educators, and medical and scuba diving professionals.
Twitter: @SusanREaton_Geo
LinkedIn: https://www.linkedin.com/in/susan-r-eaton-13037a7/
Website: http://www.susanreaton.com/

MARTIN PARNELL - THURSDAY MAY 17, 11:30 – 12:15
Title of Lecture: Ordinary to Extraordinary - One Step at a Time
Martin shares his message of having a “Finish the Race Attitude – Setting goals and overcoming obstacles to unlock your potential”. Martin's first book "MARATHON QUEST" was published by Rocky Mountain Books and CBC Radio listed him as one of Alberta's top five authors, for 2014. His second book, "RUNNING TO THE EDGE", was released in November 2016.
Face book: @MarathonQuest250
Twitter: @MartinJParnell
LinkedIn: https://www.linkedin.com/in/martinparnell/
Website: www.martinparnell.com
Organized by: The Spine Section of the Orthopaedic Research Society

Day and Time: Monday May 14, 14:00-17:00
Separate registration: fee $50
Organizers: Lisbet Haglund, Ph.D. – McGill University, Canada & Lachlan Smith, Ph.D. – University of Pennsylvania, USA

Novel Therapeutics for Spinal Disorders and Low Back Pain: from Bench to the Bedside
14:00-14:05 Welcome and introduction

Session 1: Novel Therapeutic Approaches and Preclinical Translation
Moderators: Lisbet Haglund, Ph.D. McGill University, Can & James Kang, M.D. – Harvard University, USA

14:05-14:25 Treating discogenic pain with intravertebral electrothermal nerve ablation
Jeffrey Lotz, Ph.D. – University of California San Francisco, USA

14:25-14:45 Annulus fibrosus repair using adhesive biomaterials
James Iatridis, Ph.D. – Icahn School of Medicine at Mt Sinai, USA

14:45-15:05 Preclinical optimization of an injectable hydrogel and stem cell therapy for moderate severity disc degeneration
Lachlan Smith, Ph.D. – University of Pennsylvania, USA

15:05-15:25 Panel Discussion

15:25-15:40 COFFEE

Session 2: Clinical Translation
Moderators: Cornelia Neidlinger-Wilke, Ph.D. – University of Ulm, Germany & Ashish Diwan, M.D. University of New South Wales, Australia

15:40-16:00 Diagnosis and pain management of Modic changes
Jaro Karppinen, M.D. Ph.D. – University of Oulu, Finland

16:00-16:20 Intradiscal stem cell injection to treat patients with discogenic low back pain: overview and preliminary results from the RESPINE clinical trial
Gianluca Vadala, M.D. – Campus Bio-Medico University of Rome, Italy

16:20-16:40 Designing and executing a first-in-human clinical trial to evaluate IDCT, a cell therapy to treat lumbar degenerative disc disease
Lara Silverman, Ph.D. – Discgenics Inc, USA

16:40-17:00 Panel Discussion
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Chairpersons/Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>07:00–08:00</td>
<td><strong>Program Committee Meeting</strong> <em>(for program committee only)</em></td>
<td>Chair: Serena Hu Location: Oak Room</td>
</tr>
<tr>
<td>08:00-09:00</td>
<td><strong>Membership Committee Meeting</strong> <em>(for membership committee only)</em></td>
<td>Chair: Kazuhiro Chiba Location: Oak Room</td>
</tr>
<tr>
<td>09:00-12:00</td>
<td><strong>Focus Group #1: Degenerative Spinal Phenotypes Focus Group</strong></td>
<td>Chairpersons: Michele C. Battie, Dino Samartzis, Josef Assheuer, Bradley Weiner Location: Ivor Petrak</td>
</tr>
<tr>
<td>09:30-11:30</td>
<td><strong>Strategy Group Meeting</strong></td>
<td>Chairperson: James D Kang Location: Oak Room</td>
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<tr>
<td>12:00-15:00</td>
<td><strong>Executive Committee Meeting</strong></td>
<td>Chairperson: Teija Lund Location: Oak Room</td>
</tr>
<tr>
<td>13:00-16:00</td>
<td><strong>Focus Group #2: International Taskforce on Diagnosis and Management of Lumbar Spinal Stenosis</strong></td>
<td>Chairpersons: Christy Tomkins-Lane and Markus Melloh Location: Ivor Petrak</td>
</tr>
<tr>
<td>14:00-17:00</td>
<td><strong>ORS Spine Section/ISSLS Workshop - Novel Therapeutics for Spinal Disorders and Low Back Pain: from Bench to the Bedside</strong></td>
<td>Chairpersons: Lisbet Haglund and Lachlan Smith Location: Cascade Ballroom</td>
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<td>15:00</td>
<td><strong>Registration opens</strong></td>
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<tr>
<td>17:00-18:00</td>
<td><strong>Women's ISSLS</strong></td>
<td>Chairpersons: Gwendolyn Sowa and Grace O'Connell Location: Ivor Petrak</td>
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<tr>
<td>18:00–20:00</td>
<td><strong>Welcome Reception</strong></td>
<td>Location: Alberta/New Brunswick/Riverview</td>
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</tbody>
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TUESDAY MAY 15

OPENING CEREMONY
07:45 - 07:50 WELCOME - Thomas Steffen & Christy Tomkins Lane
07:50 - 08:00 PROGRAM CHAIRMAN - Serena Hu

SESSION #1 DISC DEGENERATION/HERNIATION
Chairs: Teija Lund & Kazuhiro Chiba

08:00-08:05 1 Normalization of spinal cord displacement during the straight leg raise with resolution of sciatica in patients with lumbar intervertebral disc herniation: a 1.5 year follow-up study
J Pesonsn, M. Rade, M. Könönen, J. Marttila, M. Shacklock, R. Vanninen, M. Kankaanpää, O. Airaksinen, Finland

08:07-08:12 2 Neonatal mouse intervertebral discs restore function following herniation injury
O.M. Torre, R. Das, R.E. Berenblum, A.H. Huang, J.C. Iatridis, USA

08:14-08:19 3 Does inflammatory stimulation and mechanical loading weaken the anulus fibrosus? Preliminary investigations in a bovine AF-organ-culture approach

08:21-08:26 4 Macrophage-derived inflammatory cytokines promote upregulation of pain-related molecules in degenerated human intervertebral discs

08:28-08:33 5 Age-related molecular changes in the intervertebral disc of natural aging rabbits
Z. Wang, W. Hutton, S. Presciutti, T. Yoon, USA

08:35-08:40 6 Wnt5a suppresses inflammation-driven intervertebral disc degeneration via a TNF-α-Wnt5a negative-feedback loop
H. Liu, Z. Li, J. Wang, X. Li, Z. Zheng, China

08:42-09:00 Discussion

SESSION #2 DISC DEGENERATION/HERNIATION
Chairs: Gianluca Vadalà & Nam Vo

09:00-09:05 7 Spine-on-a-chip; Human annulus fibrosus degeneration model for simulating the severity of IVD
M. Hwang, J.H. Kim, H. Moon, H. Choi, South Korea

09:07-09:12 8 Ingrowth of nerves and blood vessels into degenerated intervertebral discs requires free surfaces
P. Lama, C. Le Maitre, I. Harding, P. Dolan, M. Adams, UK
Traceability of mesenchymal stromal cells after transplantation into degenerated discs in patients with low back pain
HBH Barreto Henriksson, N.N. Papadimitriou, D.D. Hingert, H.H. Brisby, Sweden

Dietary advanced glycation end products cause murine intervertebral disc stiffening
D. Krishnamoorthy, R. Hoy, O.M. Torre, D. Natelson, J.C. Iatridis, S. Illien-Junger, USA

Comparison of inflammaging in cervical and lumbar degenerated intervertebral discs: analysis of proinflammatory cytokine and TRP channel expression
A. Sadowska, E. Touli, W. Hitzl, H. Greutert, S. Ferguson, K. Wuertz-Kozak, O. Hausmann, Switzerland, Austria, Germany

Human Wharton’s jelly cells activate degenerative nucleus pulposus cells in vitro
Z. Han, Y. Zhang, D. Ruan, China

Ex vivo biomechanical evaluation of a combined annulus fibrosus and nucleus pulposus hydrogel repair in a large animal model of severe intervertebral disc herniation injury

Regenerative potential of the intervertebral disc by using the Low Adhesive Scaffold Collagen (LASCol)

Effective disc height restoration following hydrogel injection is dependent on degeneration severity

Blunting age-associated intervertebral disc degeneration in old mice by exposure to young circulatory factors
Patil, P, Wang, D, Dong, Q, Ngo, K, Li, V, Lei, C, Colangelo D² Niedenhofer, L, Robbins P.D., Wyss-Coray, T, Lee, J, Sowa, G Vo N., USA

Autologous nucleus pulposus cell-seeded hydrogel implantation to isolated human intervertebral discs promotes tissue repair during physiological culture.
Therapeutic effects of cell therapy with neonatal human dermal fibroblasts and rabbit dermal fibroblasts on disc degeneration and inflammation
P. Shi, W. Liu, P. Chou, H.S. An, A. Chee, USA

INVITED LECTURE #1 - JENNIFER MOSS
Chair: Christy Tomkins-Lane
11:30-12:15 How to Energize Healthcare Professionals for Better Patient Care

SESSION #4 MRI PHENOTYPES
Chair: Dawn Elliott & Gwendolyn Sowa
13:30-13:35 L. Chen, M.C. Battié, G. Yang, Y. Yuan, Z. Chen, Y. Wang, China
13:51-13:56 N. Shaikh, H. Zhang, J. Street, D. Wilson, T. Oxland, Canada
13:58-14:03 D. Samartzis, J. Yu, C. Bow, K. Luk, J. Cheung, USA, Hong Kong

SESSION #5 LOW BACK PAIN
Chair: Mamoru Kawakami & Dilip Sengupta
14:20-14:25 V. Abdollah, E. Parent, A. Su, K. Wachowicz, M. Battle, Canada
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>15:02-15:20</td>
<td>30</td>
<td>Discussion</td>
</tr>
<tr>
<td>15:20-15:50</td>
<td>31</td>
<td>COFFEE</td>
</tr>
</tbody>
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**SESSION #6 BASIC SCIENCE**

*Chairs: Koichi Sairyo & Jill Urban*

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Description</th>
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<tbody>
<tr>
<td>16:04-16:09</td>
<td>32</td>
<td>Melatonin antagonizes intervertebral disc degeneration by promoting mitophagy through the NF-κB signaling pathway. <em>J. Wang, H. Liu, Z. Li</em>, China</td>
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<tr>
<td>16:18-16:30</td>
<td>34</td>
<td>Discussion</td>
</tr>
</tbody>
</table>
SYMPOSIUM #1 - DIGITAL HEALTH FOR SPINE PROVIDERS
Chairs: Matthew Smuck and Markus Melloh
16:30-17:30 How Digital Health Technologies are Changing Clinical Practice - Matthew Smuck, MD
   In-Clinic Diagnostic Motion Analysis - Jeffrey Lotz, PhD
   Intervention with Wearables - Christy Tomkins-Lane, PhD
   Intervention with Mobile Apps - Patricia Zheng, MD
   Discussion, Question and Answer

FIRST BUSINESS MEETING (For members only)
17:30 Chair: Teija Lund
07:45-08:45 SPECIAL POSTER SESSION #1
1A Disc Biology (1-6) - Ivor Petrak Room
1B Disc Degeneration/Herniation (7-12) - Oval Room
1C Spinal Deformity (13-18) – Frontenac
1D Spinal Stenosis (19-24) – Champlain
1E Lumbar Spine Surgery (25-30) - Conservatory

SESSION #7 RANDOMIZED AND COHORT STUDIES
Chairs: Brook Martin & Shoji Yabuki

09:00-09:05 34 The spinal stenosis pedometer and nutrition lifestyle intervention (SSPANLI): results of a randomized trial
C. Tomkins-Lane, R. Hu, Y. Andreas, L. Lafave, Canada

09:07-09:12 35 Smoking is associated with increased development of musculoskeletal burden: a longitudinal cohort study from the midlife development in the U.S. (MIDUS) study
P. Tamer, J. Du, K. Goon, U. Ahn, N. Ahn, USA

09:14-09:19 36 Type II Diabetes is associated with development of musculoskeletal pathology: a cohort study from the Midlife Development in the U.S. (MIDUS) database

09:21-09:26 37 Post-operative single-shot epidural fentanyl and bupivacaine for postoperative analgesia after lumbar decompression: a prospective, double-blind randomized study
M.F.B. Alican, R. Ver, M.D. Ramos, Philippines

09:28-09:33 38 Association of degenerative lumbar scoliosis with the susceptibility genes for adolescent idiopathic scoliosis and disc degeneration

09:35-09:40 39 A prospective randomized controlled trial of posterolateral lumbar fusion in combination with Platelet-Rich Plasma (PRP)

09:42-10:00 Discussion
10:00-10:30 COFFEE
SESSION #8 LOW BACK PAIN
Chairs: Miho Sekiguchi & Fabio Zaina

10:30-10:35  40  Sagittal imbalance of the spine-pelvis-lower extremity axis is associated with back-related disability in inhabitant volunteers  
M. Teraguchi, M. Kawakami, Y. Ishimoto, K. Nagata, R. Kagotani, M. Nakagawa, M. Minetama, H. Yamada, Japan

10:37-10:42  41  Variability in self-reported pain score on the same-day in different lumbar degenerative disorders  
D. Sengupta, P. Huang, USA

10:44-10:49  42  Integrating multidisciplinary knowledge of low back pain through collaborative modeling  
J. Cholewicki, P. Aminpour, J.M. Popovich, Jr., P.W. Hodges, S. Gray, USA

10:51-11:00  Discussion

PRESIDENTIAL ADDRESS – TEIJA LUND
11:00-11:40  Introduction - Kazuhiro Chiba

HARRY FARFAN PRESIDENTIAL LECTURE - SUSAN EATON
11:40-12:20  Introduction: Teija Lund

AFTERNOON OUTING – LAKE LOUISE TOUR
13:00  Buses depart
SESSION #9 BIOMECHANICS
Chairs: Grace O’Connell & Hans-Joachim Wilke

07:30-07:35  43  In vivo measurement of 3d disc strain and degenerative variation using MRI
J.M. Peloquin, K.D. Meadows, E.J. Vresilovic, D.M. Elliott, USA

07:37-07:42  44  Evaluation of the effects of loading and disc degeneration on lumbar intervertebral
discs and motion segments
V. Abdollah, E. Parent, A. Su, K. Wachowicz, M. Battie, Canada

07:44-07:49  45  The biomechanics of the inter-lamellar matrix and the lamella during lumbar disc
herniation: which is the weakest link?
J. Tavakoli, D. Amin, B.J. Freeman, J.J. Costi, Australia

07:51-07:56  46  Axial loading during MRI provides new insights into IVD biomechanics in low back
pain patients
H. Hebelka, L. Torén, H. Brisby, K.M. Lagerstrand, Sweden

07:58-08:03  47  Altered multifidus muscle quality following long-duration spaceflight affects lumbar
lordosis and compression on the intervertebral disc
A.R. Hargens, J.C. Lotz, USA

08:05-08:10  48  Analysis of internal disc strains during simulation of repetitive lifting motions
D. Amin, C. Moawad, J.J. Costi, Australia

08:12-08:30  Discussion

SESSION #10 ENDPLATE
Chairs: John Costi & Dino Samartzis

08:30-08:35  49  Can nerves and blood vessels grow through the cartilage endplate in degenerated
discs?
U. Zehra, I. Harding, M.A. Adams, P. Dolan, UK

08:37-08:42  50  Characterisation of bone marrow pathologies across the spectrum of modic
changes in the human lumbar spine
J.S. Kuliwaba, A. Mulaibrahimovic, B. Freeman, K. Kantar, P. Brown, O.L. Osti,
Australia

08:44-08:49  51  Cartilage endplate damage strongly associates with chronic low back pain,
independent of modic changes
A.J. Fields, A. Ballatori, M. Han, P.E. Larson, J.F. Bailey, A. Rochette, D. Jain, Z.
McCormick, C. O'Neill, S. Deviren, R. Krug, J.C. Lotz, USA

08:51-08:56  52  Impacts of vertebra and endplate fractures on the adjacent disc and vertebral
trabeculae: a retrospective MR follow-up study
X. Lu, Z. Zhu, J. Pan, Z. Feng, X. Lv, Y. Wang, China
08:58-09:03 53 New evidence for structural integration across the cartilage-vertebral endplate junction

N.H. Sapiee, A. Thambyah, P. Robertson, N. Broom, New Zealand

09:05-09:10 54 Spinopelvic alignment and the development of vertebral endplate abnormalities: the "missing link"

U. Zehra, J. Cheung, C. Bow, P. Cheung, D. Samartzis, Hong Kong

09:12-09:30 Discussion

FELLOWSHIP AWARD CEREMONY

Chair: Kazuhiro Chiba and Shinichi Konno

09:30-09:50 Young Investigator Travel Award - Shinichi Konno

Prize Ceremony for the recipients

Clinical Traveling Fellowship - Shinichi Konno

Report from last year - Gianluca Vadala

Announcement of this year’s recipient

ISSLS Research Grant - Kazuhiro Chiba

Announcement of this year’s recipient

Wiltse Lifetime Achievement Award

Introduction: Nominator - The winner gives a short speech

09:50-10:20 COFFEE

ISSLS PRIZE AWARD CEREMONY AND PRESENTATIONS

10:20-10:30 Introduction – Robert Gunzburg

10:30-10:50 55 Growth differentiation factor-6 attenuated pro-inflammatory molecular changes in the rabbit annular-puncture model and degenerated disc-induced pain generation in the rat xenograft radiculopathy model


10:40-10:50 Discussion

10:50-11:00 56 Dynamic imaging of degenerative spondylolisthesis reveals mid-range dynamic lumbar instability not evident on static clinical radiographs


11:00-11:10 Discussion

11:10-11:20 57 Longitudinal analysis of inflammatory, psychological and sleep-related factors following an acute low back pain episode: the good, the bad and the ugly

D. Klyne, M. Barbe, W. Van den Hoorn, P.W. Hodges, Australia

11:20-11:30 Discussion
INVITED LECTURE #2 – MARTIN PARNELL
Chair: Thomas Steffen

11:30-12:15  Ordinary to Extraordinary - One Step at a Time

12:15-13:30  LUNCH

SESSION #11 SURGERY FOR DDD
Chairs: Kotaro Nishida & Jan Van Meirhaeghe

13:30-13:35  58  Opioids delay healing of spinal fusion: a rabbit posterolateral lumbar fusion model  
                N. Jain, K.Y. Himed, J.M. Toth, K.C. Briley, F.M. Phillips, S.N. Khan, USA

13:37-13:42  59  Pre-operative chronic opioid therapy: a risk factor for complications, readmission,  
                 continued opioid use and increased costs after one and two level posterior lumbar  
                 fusion  
                 N. Jain, F.M. Phillips, T. Weaver, S.N. Khan, USA

13:44-13:49  60  Predicting likelihood of surgery prior to first visit in patients with back and  
                 lower extremity symptoms: a simple mathematical model based on over 8000 patients  
                 L.M. Boden, S.A. Boden, A. Premkumar, M.B. Gottschalk, S.D. Boden, USA

13:51-14:00  Discussion

SESSION #12 SURGICAL COMPLICATIONS
Chairs: Daisuke Sakai & David Wong

14:00-14:05  61  Outcome after degenerative spine surgery - Do we need longer follow-up than 1  
                year?  
                C. Parai, O. Hägg, B. Lind, H. Brisby, Sweden

14:07-14:12  62  The influence of preoperative opioid use on hospital length of stay and patient  
                 reported outcomes following elective spine surgery.  
                Y. R. Rampersaud, J. Murray, M. Canizares, J.D. Powers, A.V. Perruccio, Canada

14:14-14:19  63  Lumbar surgery within two weeks of epidural steroid injection is associated with  
                 increased 90-day complications  
                J. Koltsov, M. Smuck, T. Alamin, K. Wood, I. Cheng, S.S. Hu, USA

14:21-14:26  64  Effect of HbA1c and Perioperative Blood Glucose Control on the Occurrence of  
                 Postoperative Infection in Lumbar Instrumentation Surgery  
                Hyakkan, T.T. Hashimoto, K.K. Kaneko, Japan

14:28-14:33  65  A multicenter prospective investigation of thoracolumbar/lumbar perioperative  
                 complications in patients aged 80 years or older  
                Hojo, T. Kajino, N. Iwasaki, Japan
Retrospective multicenter study of perioperative complications in 1,015 patients who underwent oblique lateral interbody fusion surgery


Discussion

Coffee and refreshments will be served

Lumbar epidural steroid injections for herniation and stenosis: incidence and risk factors of subsequent surgery

JC.B. Koltsov, M.W. Smuck, A. Zagel, T. Alamin, K. Wood, I. Cheng, S.S. Hu, USA

Supervised physical therapy versus unsupervised exercise for patients with lumbar spinal stenosis: a randomized controlled trial


Associations among natural history, conservative treatment and health-related quality of life among patients with symptomatic lumbar spinal stenosis: Locomotive Syndrome and Health Outcomes in Aizu Cohort Study (LOHAS)


A study on the difference of bone union between unilateral and bilateral lumbar spondylolysis in adolescent patients

K. Hatekayama, M. Urushibara, A. Kojima, Japan

Discussion

Molecular Biomarkers - Gwen Sowa
Genetic Biomarkers - Michelle Crites Battié
Digital Biomarkers - Matthew Smuck
Imaging Biomarkers - Dino Samartzis
Discussion, Question and Answer - all speakers

SECOND BUSINESS MEETING (For members only)

BANQUET
FRIDAY MAY 18

SPECIAL POSTER SESSION #2
07:45-08:45  2F Muscle, Disc, Lbp (31-36) - Ivor Petrak Room
             2G Mis, Complication, Miscellaneous (37-42) - Oval Room
             2H Operative Outcomes (43-48) – Frontenac
             2I Spinal Stenosis, Tumor Infection (49-54) – Champlain
             2J Spinal Alignment (55-30) - Conservatory

REPORT FROM FOCUS GROUP
09:00-09:30  Chair: Kazuhiro Chiba

SESSION #14 TUMOR, OSTEOPOROSIS
Chairs: Jeremy Fairbank & Shinichi Konno

09:30-09:35  71 Risk factors and score for recollapse of the augmented vertebrae after percutaneous vertebroplasty in osteoporotic vertebral compression fractures
            J. Wang, W. Yu, China

09:37-09:42  72 Is it feasible to manage osteoporotic vertebral fracture with pharmacologic therapy?: a comparative study with subcutaneously injected weekly teriparatide, daily teriparatide and denosumab
            M. Iwabuchi, J. Komatsu, H. Fukuda, K. Kusano, O. Shirado, Japan

09:44-09:49  73 Prognostic factors and survival after surgical resection of spinal metastases from renal cell carcinomas with a minimum 3-year follow-up

09:51-10:00  Discussion

10:00-10:20  COFFEE

SESSION #15 SPINAL ALIGNMENT
Chairs: Samuel Bederman & Kazuyuki Watanabe

10:20-10:25  74 Spinopelvic alignment predicts disc stiffness, herniation, and Modic changes: evidence of an evolutionary etiology for clinically-relevant spinal phenotypes
            U. Zehra, J. Cheung, C. Bow, R.J. Crawford, K. Luk, W. Lu, D. Samartzis, Hong Kong, Australia

10:27-10:32  75 Dynamic sagittal balance associates with patient-reported disability in adult spinal deformity population
            J.F. Bailey, P.F. Curran, D. Beckerman, J.C. Lotz, S. Burch, USA

10:34-10:39  76 Impact of paraspinal muscle degeneration on fatigue of spinopelvic compensatory mechanism in sagittal plane adult spinal deformity: quantitative assessment of MRI and sagittal parameters after 10 minutes walking
            J Bae, S. Lee, V. Deviren, South Korea, USA

The relationship of spino-pelvic parameters between static radiograph and motion analysis in adult spinal deformity patients with positive sagittal imbalance

H-J. Kim, S. Kim, J. Park, South Korea

The sex and age distribution of indices for muscle evaluation and their association with spinal sagittal alignment: The Wakayama Spine Study


Spinal alignment and additional surgery after short fusion for degenerative lumbar scoliosis

Y. Shimamura, M. Kanayama, F. Oha, T. Watanabe, H. Hara, R. Hyakkan, T. Hashimoto, K. Kaneko, Japn

SESSION #16 SPINAL ALIGNMENT

Chair: Drew Bednar & Jon Lurie

Clinical outcomes of minimally invasive spinal decompression surgery for lumbar spinal stenosis with I grade degenerative spondylolisthesis: A 4-year Follow-up Study


Distribution and determinants of 90-day payments for multi-level posterior lumbar fusion: a medicare analysis

N. Jain, F.M. Phillips, S.N. Khan, USA

Recovery rate of sensory symptoms following decompression of nerve root in cervical vs lumbar radiculopathy – a prospective, self-reported, computerized pain drawing study

D. Sengupta, USA

Patients' expectations for spine surgery: what are they, are we meeting them and does it correlate to one year postoperative satisfaction

M. Canizares, A. Glennie, K. Thomas, S. Christie, E. Wai, C. Fisher, A.V. Perruccio, Y.R. Rampersaud, Canada

Discussion

ANNOUNCEMENT - BEST PAPER AND POSTER AWARDS

Chairman: Kazuhiro Chiba

CLOSING REMARKS - TOM OXLAND

12:10-12:20
SP #1A DISC BIOLOGY - Ivor Petrak Room
Chairs: Koji Akeda & James Iatridis

SP01  **Amir Jamaludin** T. Kadir, A. Zisserman, J. Urban, J. Fairbank, F.M. Williams
Adapting a deep learning model to a different grading system in a new dataset

SP02  **Daisuke Fukui** M. Kawakami, M. Naiki, T. Okada, K. Sawada, H. Yamada
A possible mechanism underlying pain-related behavior induced by lumbar facetectomy and repeated cold stress in rats — DNA microarray analysis

SP03  **Jianru Wang** Z. Zheng, F. Chen
Melatonin breakdown the vicious circle of IL-1 β induced intervertebral disc degeneration by NLRP3 inflammasome inhibition

SP04  **Yuji Kakiuchi** T. Yurube, Y. Takeoka, M. Ito, Y. Kanda, K. Kikutani, T. Takada, R. Kuroda, K. Nishida
Temsirolimus is a candidate of the optimal mTOR inhibitor to protect human disc cells depending on Akt and autophagy induction

SP05  **Sibylle Grad** Z. Li, F. Heizmann, Y. Liu, J. Gerdes, D.C. Kubosch, N. Suedkamp, M. Alini, G.M. Lang
Validation of anti-inflammatory and regenerative drug therapy in a bioreactor-guided intervertebral disc organ culture model

Role of PHLPP1 in cell proliferation an apoptosis in intervertebral disc and vertebrae

SP#1B DISC DEGENERATION/HERNIATION - Oval Room
Chairs: Howard An & Keith DK Luk

SP07  **Hans-Joachim Wilke** K. Wade, M. Josipovic, N. Berger-Roscher, V. Rasche
How does transition zone structure influence the herniation process?

SP08  **Yasuchika Aoki** H. Fukuchi, G. Kubota, T. Sakai, S. Ohtori, K. Takahashi, N. Yanagawa
Incidence of intervertebral vacuum phenomenon in the general population and in patients with lumbar spondylolysis.

SP09  **Kazuhiro Chiba** Y. Matsuyama
Follow-up study of condoliase treatment in patients with lumbar disc herniation

SP10  **Vishal Deshmukh** C. Barroga, S. KC, L. Dellamary, J. Stewart, H. Hu, J. Hood, Y. Yazici
A small molecule inhibitor of the Wnt pathway (SM04690) as a potential treatment for degenerative disc disease
SP11 Kerstin Lagerstrand C. Waldenberg, H. Hebelka, H. Brisby
Detailed T2-mapping analysis reveal differences in IVD characteristics between low back patients and controls

SP12 Mengge Sun W. Lu, S. Peng
MicroRNA-19b with special expression profile in osteoporotic patients regulates osteogenic differentiation

SP#1C SPINAL DEFORMITY – Frontenac Room
Chairs: Masayuki Miyagi & Tim S Yoon

SP13 Sang-II Kim Y. Kim, J. Ahn, H. Park, H. Min, K. Ha
Clinical and radiographic features of subtypes of proximal junctional failures following correction surgery for degenerative adult spinal deformity

Relationship between spinopelvic parameters and baseline pain, function, or health related quality of life in degenerative lumbar spondylolisthesis.

SP15 Haddas Ram L.H. Isador
Surgical realignment in adult deformity patients increased balance within the cone of economy

SP16 Greg McIntosh A. Stratton, E. Wai, D. Roffey, S. Kingwell, P. Phan, H. Hall
Narcotic use trends in elective thoracolumbar spinal surgery patients

SP17 Hyung-Youl Park K. Ha, y. Kim, D. Chang, S. Kim, H. Min, A. Mohammed
Risk factors and clinical outcomes of proximal junctional kyphosis following iliac screw fixation for degenerative adult spinal deformity

SP18 Arnold YL Wong D. Samartzis, P.W. Cheung, J.P. Cheung
The prevalence and risk factors of back pain in patients with adolescent idiopathic scoliosis - a large-scale cross-sectional study

SP#1D SPINAL STENOSIS – Champlain Room
Chairs: William Donaldson & Hiroshi Hashizume

Influence of skeletal muscle mass and spinal alignment on surgical outcomes for lumbar spinal stenosis

Epidural fat accumulation affects the surgical outcome in patients with lumbar spinal stenosis

SP21 Andree-Anne Marchand J. O'Shaughnessy, C. Châtillon, V. Cantin, M. Descarreaux
The feasibility and efficacy of an active prehabilitation program on the postoperative recovery of patients following surgery for spinal stenosis

SP22 Kyoung Tae Kim I. Han, W. Bang, J. Sung, D. Cho, B.K. Kwon, J. Yang
Relationships between Vitamin D and paraspinal muscle: human data and experimental rat model analysis
Heavy manual work is associated with an increased risk of severe lumbar spinal stenosis on MRI scans |
Diabetes mellitus and lower ABI are associated with symptomatic lumbar spinal stenosis: The Wakayama Spine Study |

**SP#1E LUMBAR SPINE SURGERY – Conservatory Room**  
*Chairs: Kazuhiro Hasegawa & Dietrich Schlenzka*

| SP25 | **Steven M Presciutti** S. Sangadala, T. Doan, G. Beck, H. Drissi, S. Boden  
Novel small molecule inhibitors of sclerostin with the potential to enhance spinal fusions |
| SP26 | **Scott L. Blumenthal** D.D. Ohnmeiss, R.D. Guyer, J.E. Zigler  
Analysis of lumbar total disc replacement removals and revisions: a 17-year experience |
| SP27 | **Eric Ledet** J.M. Peterson, C. Chlebek, A.M. Clough, A.K. Wells, K.E. Batzinger, K. Kradinova, J.C. Glennon, D.J. DiRisio  
Stiffness matters: PART II - the effects of plate stiffness on load-sharing and the progression of fusion in vivo |
Cost-effectiveness of psychologically informed physical therapy in patients after lumbar spine surgery |
| SP29 | **Norihiko Takegami** K. Akeda, K. Takegami, T. Kondo, T. Fujiwara, T. Imanishi, A. Sudo  
Incidence and characteristics of clinical L5/S1 adjacent segment disease following L5 floating lumbar fusion |
| SP30 | **A. Simone Maybin** K.R. Archer, S. Chotai, J. Pennings, C.J. Devin  
The impact of postoperative physical therapy on patient-reported outcomes in patients undergoing spine surgery |
SPECIAL POSTER SESSION #2

FRIDAY MAY 18, 07:45-08:45

**SP #2F MUSCLE, DISC, LBP - Ivor Petrak Room**

*Chairs: John Costi & Todd Alamin*

**SP31**  
Jacques JA Abboud M.M. Descarreaux, J.J. Blouin  
Organization of the motor units in the longissimus

**SP32**  
Regional patterns of lumbar paraspinal muscle degeneration in astronauts after long-duration spaceflight on the international space station

**SP33**  
Dawn Elliott J. DeLucca, J. Peloquin, E. Vresilovic  
Incorporation of residual stresses from swelling and fiber tension in a disc finite element model

**SP34**  
Y. Raja Rampersaud  
Ontario inter-professional spine assessment and education clinics (ISAEC): patient, provider and system impact of an integrated model of care for the management of low back pain (LBP)

**SP35**  
Preliminary findings from an active surveillance reporting system for spinal manipulative therapy regulated providers and low back pain patients

**SP36**  
Hans-Joachim Wilke B. Schlager, F. Niemeyer, F. Galbusera, D. Volkheimer, R. Jonas  
Which material properties and which morphology parameters are most important for numerical models of the lumbar spine?

**SP#2G MIS, COMPLICATION, MISCELLANEOUS - Oval Room**

*Chairs: Donna Ohnmeiss & Edward Vresilovic*

**SP37**  
Kyoung Tae Kim J. Sung, D. Cho, M. Park, B.K. Kwon, J. Yang  
Risk factors for cage migration and cage retropulsion following transforaminal lumbar interbody fusion: does osteoporosis carry higher risk?

**SP38**  
Older age is independently associated with increased hospital charges and resource utilization in degenerative lumbar surgery: an analysis of 2,010 cases at a single institution

**SP39**  
The evaluation of brain activity in patients with chronic low back pain using a non-contact brain activity detection sensor

**SP40**  
Obesity is associated with increased OR time, hospital stay, and postoperative wound complications in lumbar fusion surgery: analysis of 1,196 cases at a single institution

**SP41**  
Is diffuse idiopathic skeletal hyperostosis associated for lumbar spinal stenosis
Risk factors for kyphotic recurrence after temporary short-segment fixation for thoracolumbar burst fractures

SP#2H OPERATIVE OUTCOMES – Frontenac Room
Chairs: Scott Boden & Dike Ruan

Haddas Ram L. Isador
The utility of gait analysis in patients with symptomatic adult degenerative scoliosis

Associations between sarcopenia and degenerative lumbar scoliosis in Japanese older women

Nikhil Jain F.M. Phillips, S.N. Khan, E. Yu
Early healthcare utilization after primary lumbar decompression/discectomy predicts revision surgery at two years

Features and problems of corrective long spinal fusion for adult spinal deformity with multiple vertebral fractures due to severe osteoporosis

Modic changes and disc degeneration 27 to 45 years after spinal fusion for adolescent idiopathic scoliosis

Haddas Ram L. Isador
The correlation of biomechanical parameters measured by balance analysis with the functional parameters measured by self-reported questionnaires in patients with adult degenerative scoliosis

SP#2I SPINAL STENOSIS, TUMOR INFECTION – Champlain Room
Chairs: Robert Gunzburg & Masatoshi Teraguchi

Yong Hai P. Yin, Q. Ji, Q. Su, Y. Wang, Z. Li, Y. Wu, S. Zhu
Percutaneous kyphoplasty for osteoporotic vertebral compression fractures via unilateral versus bilateral approach: a meta-analysis

Low virulence bacteria in degenerative intervertebral discs: A cross-sectional study with comparisons between cervical and lumbar spine

Junseok Bae J. Seo, S. Lee, S. Shin, S. Eun, H. Keum
Does propionibacterium acnes presence in intervertebral disc which is acquired in percutaenous endoscopic lumbar discectomy?

Hanna Lotzke M. Jakobsson, H. Brisby, A. Gutke, O. Hägg, R. Smeets, M. Hagströmer, M. Lundberg
Low levels of physical activity among patients with degenerative disc disease who are to undergo spinal fusion surgery

Wouter A. Moojen C.D. Schenck, C. Talhi, C.L. Vleggeert-Lankamp, M.P. Arts, W.C. Peul
The influence of an interspinous distraction device on the foraminal size in the follow-up after surgery
Differences in clinical and radiological outcomes depending on timing of balloon kyphoplasty for osteoporotic vertebral fracture

SP#2J SPINAL ALIGNMENT – Conservatory Room
Chairs: Paul Licina & Koji Otani

John P Kleimeyer N. Liu, K.B. Wood
The association of radiculopathy with lateral lumbar listhesis?

Gang-Un Kim H. Kim, N. Lee, J. Park
Relationship between short-term and long-term outcomes following spine surgery for lumbar spinal stenosis

Conor ONeil S. Burch, M. Callahan
Population level analysis of health-related quality of life in patients with spinal disorders

Masahiro Kanayama T. Hashimoto, F. Oha, Y. Shimamura, T. Watanabe, H. Hara, R. Hyakkan, N. Iwasaki
Does lumbar spinal surgery extend healthy life expectancy in the elderly?

Daisuke Togawa T. Hasegawa, Y. Yamato, G. Yoshida, S. Oe, T. Banno, H. Arima, Y. Matsuyama
Impacts of postoperative symptom improvement and disabilities on health related quality of life (HRQOL) and treatment satisfaction in the adult spinal deformity patients treated by corrective long fusion

Greg McIntosh O. Ayling, C. Fisher, N. Dea, T. Ailon, H. Hall
Clinical outcomes research in lumbar spine surgery: Are 2 year follow-ups necessary?
THURSDAY MAY 17, 15:00-16:00

Long-term evaluation of a Canadian back pain mass media campaign

GP2  **Wouter Moojen**  R. Goes, I. Muskens, T. Smith, R. Mekary, M. Broekman
Risk of aspirin continuation in spinal surgery: a systematic review and meta-analysis

GP3  **Takahiro Makino**  Y. Sakai, S. Takenaka, H. Yoshikawa, T. Kaito
Bioactivity of a titanium-coated peek cage in posterior lumbar interbody fusion assessed by CT Hounsfield unit

GP4  **Masaru Tanaka**  R. Momomura, A. Itoi, K. Kaneko
Clinical outcomes of thoracic and lumbar fractures in patients with diffuse idiopathic skeletal hyperostosis

GP5  **Dike Ruan**  S. Cheng, X. Li, I. Lin, J. Ying, T. Wen, D. Wang
The inflammatory cytokine TNF-α regulates the biological behavior of nucleus pulposus mesenchymal stem cells through the NF-κB signaling pathway in a rat model in vitro

Five-year postoperative good clinical outcomes after facet fusion using a percutaneous pedicle screw system for degenerative lumbar spondylolisthesis

Good clinical outcomes and fusion rate after facet fusion with cortical bone trajectory screws for degenerative lumbar spondylolisthesis

GP8  **Andrew Schoenfeld**
Outpatient spine clinic utilization reduces emergency department visits following spine surgery

GP9  **Andrew Schoenfeld**  C. Bono, J. Kang
Changes in the use of preference sensitive surgery within accountable care organizations: the case of lumbar fusion procedures

GP10  **Joo Han Kim**  W. Park
The reverse knot X-shape suture for annular repair during microscopic lumbar discectomy; technical note and clinical outcomes

GP11  **Junseok Bae**  J. Lee, S. Lee
Which clinical and radiological variables could predict clinical outcomes of percutaneous endoscopic lumbar discectomy for treatment of patients with lumbosacral disc herniation?

GP12  **Dike Ruan**  T. Wen, S. Cheng, J. Ying
The two important UPR pathway in Intervertebral Disk Degeneration: PERK and IRE1-α

GP13  **Nathan Wanderman**  W. Robinson, B. Carlson, M. Bydon, B. Currier, P. Huddleston, A. Nassr, B. Freedman
Tranexamic Acid in thoracic and lumbar fusions and perioperative blood loss

GP14  **Jae Hwan Cho**  C. Hwang, D. Lee, C. Lee
The effect of osteoporosis on clinical and radiological outcomes following one-level posterior lumbar fusion
Positive effect on bone regeneration by platelet-rich plasma combined with gelatin beta-tricalcium phosphate sponges: a study using a bone defect model of vertebral body in ovariectomized rats

GP16 Kentaro Yamada S. Satoh, Y. Abe, H. Nakamura
Diffuse idiopathic skeletal hyperostosis extended to the lumbar segment is a risk factor of reoperation in patients treated surgically for lumbar stenosis

GP17 Maryse Fortin Y. Xiao, M.C. Battle, H. Rivaz
Building unbiased population-averaged MRI atlases for image processing and assessment of lumbar paraspinal muscle morphometry

GP18 Barend Van Royen S. Faraj, T. Haanstra, M. De Kleuver
Functional outcome of non-surgical and surgical management for de novo degenerative lumbar scoliosis: a mean follow-up of 10 years

A novel method for the prediction of the pedicle screw stability: regional bone mineral density around the screw

Early reduction of ligamentum flavum 2 weeks after in situ posterior fusion without neural decompression for unstable degenerative lumbar spondylolisthesis

Morphological analysis of the intervertebral foramen and the lumbar facet joint

GP22 Raghu Natarajan K. Hasegawa, K. Watanabe
Posterior bone graft in lumbar fusion surgery reduces the stress in the screw-rod system ~ a finite element study

GP23 Naohiro Kawamura J. Kunogi, Y. Hirao
Dynamic stabilization for prevention of proximal junctional failure in thoracolumbar long fusion

GP24 Joo-Hyun Ahn Y. Kim, K. Ha, S. Kim, H. Park, H. Min
Clinical outcomes of pathologic vertebral fractures in patients with multiple myeloma: comparison of reconstruction surgery with adjuvant radiotherapy and radiotherapy alone

Assessment of minimal clinically important differences after microendoscopic laminectomy in patients with lumbar canal stenosis

GP26 Hidekazu Tobimatsu M. Furuya, H. Aono
SSI (Surgical Site Infection) after spinal surgery and nasal MRSA (Methicillin-Resistant Staphylococcus Aureus) colonization

An outcomes calculator for informed decision making in spine surgery

GP28 Haddas Ram L. Isador
The correlation of Scoliosis Research Society questionnaires with biomechanical parameters measured by with gait and balance analyses in patients with adult degenerative scoliosis

GP29 Hanna Hebelka C. Molinder, H. Brisby, A. Baranto
Axial loading during MRI reveal insufficient effect of percutaneous interspinous implants on spinal canal area

29
GP30  **Paul J Slosar**, J.B. Reynolds, S.L. Slosar, S. Martineck  
BMP vs. alternatives: Cost savings and clinical outcomes data in 137 ALIF patients with 2 yr. Follow-up

Impaired glucose metabolism is a significant associated factor for radiographic lumbar spinal stenosis

Long-term outcome of targeted therapy for low back pain in elderly *de novo* degenerative lumbar scoliosis


Relationship between cage design and retropulsion after posterior lumbar interbody fusion

GP35  **Eric H Ledet**, G.P. Sanders, D.J. DiRisio, J.C. Glennon  
Load-sharing through elastic micro-motion accelerates bone formation and interbody fusion

Microendoscopic foramotomy for the lumbosacral junction: two year’s outcome and risk factors for poor results

GP37  **Hyung-Youl Park**, K. Ha, Y. Kim, D. Chang, S. Kim, H. Min, A. Mohammed  
Two different type of stooping posture after iliac screw fixation for degenerative adult spinal deformity

Spinal correction surgery enables long-term relief of gastroesophageal reflux disease symptoms in adult spinal deformity

GP39  **Magali Millecamps**, D. Foster, S. Lee, A.P. Mathieu, L.S. Stone  
Behavioural, radiologic and morphologic long-term consequences of an acute single lumbar intervertebral disc injury in mice

Low back pain prognostic factors for time receiving wage replacement benefits

GP41  **Dilip Sengupta**  
Health related quality of life improvement after spinal fusion for degenerative low back pain vs adult spine deformity

Effect of peri-operative adverse events on long-term patient reported outcomes after lumbar spine surgery

GP43  **Greg McIntosh**, F.E. Nares, A. Soroceanu, H. Hall, K.C. Thomas  
Lumbar surgery in octogenarians. Really?

Spinopelvic sagittal alignment after minimally invasive decompression surgery without fusion in patients with lumbar degenerative spondylolisthesis
Do preoperative psychological factors affect patient satisfaction with surgery for lumbar spinal stenosis?

Beneficial effects of regular exercise prior to thoracolumbar spinal surgery

Accuracy of two major scoring systems for prediction of metastatic spine tumor prognosis: analysis of revised Tokuhashi and Katagiri scores

Sagittal spinopelvic alignment in patients with hip osteoarthritis

Postoperative loss of lumbar lordosis affects clinical outcomes in patients with pseudoarthrosis after PLIF using cortical bone trajectory screw fixation

Prospective multicenter surveillance and risk factor analysis of surgical site infection after lumbar laminectomy and/or hemirotomy in adults

Risk factors for incidental durotomy during posterior spine surgery for degenerative diseases in adults: a prospective single-center observational study

Discrepancy of clinical outcome and postoperative magnetic resonance imaging after percutaneous endoscopic lumbar discectomy

Actual state of surgical site infection after spine surgery in our department - what seen from the data in recent 16 years -

Stand-alone lateral lumbar interbody fusion is an effective intervention for adjacent segment disease following previous lumbar fusion surgery

Does persistent back pain in patients with delayed vertebral collapse differ with methods of surgical treatment?

Establishment of a novel measurement technique for pedicle screw stability -LASER resonance frequency analysis–

Relationship between facet joint osteoarthritis and spinal segmental motion in degenerative spondylolisthesis

Risk factor analysis of surgical site infections after posterior instrumentation fusion surgery for spinal trauma, prospective multicenter study

Investigation of the combinations of loading and facet joint contributions to lumbar disc herniation
**GP60**  
**Greg McIntosh**  F. Jiang, M.H. Weber, H. Hall, Y. Rampersaud  
Prediction rule for determining discharge destination post posterior thoracolumbar spinal fusion procedures using the Canadian spine outcomes and research network

**GP61**  
**Toshihiro Nagai**  D. Sakai, Y. Yamamoto, M. Sato, M. Watanabe  
The effect of cage geometry on segmental lordosis in posterior lumbar interbody fusion: hyper-lordotic box cages versus boomerang cages

**GP62**  
**Douglas P. Gross**  A. Suman, G.P. Bostick, F.G. Schaafsma, J.R. Anema  
Associations between determinants of socioeconomic status, beliefs about back pain, and exposure to a mass media back pain campaign

**GP63**  
**Donna D. Ohnmeiss**  R.D. Guyer  
Supine vs. upright weight bearing MRI in the evaluation of patients with lumbar spondylolisthesis

**GP64**  
**Kazuhiro Hasegawa**  M. Okamoto, S. Hatsushikano, G. Caseiro, K. Watanabe  
Lumbo-sacral alignment and deformity in patients with adult spine deformity deteriorate in standing compared with supine position

**GP65**  
**Hiromitsu Takaoka**  H. Ataka, T. Miyashita, K. Kato, T. Tanno  
Clinical results of facet fusion using a ligamentum flavum floating method for degenerative lumbar spondylolisthesis

**GP66**  
**Diane Gregory**  C. Snow, M. Harvey-Burgess, B. Laird, S. Brown  
Pressure-induced end-plate fracture in the porcine spine: is the annulus fibrosus susceptible to damage?

**GP67**  
**Keishi Maruo**  T. Tachibana, F. Arizumi, K. Kushuyama, k. kishima, S. Yoshiya  
The relationship between compensatory mechanisms of residual kyphotic deformity after osteoporotic vertebral fractures and health-related quality of life

**GP68**  
**Fumihiro Arizumi**  K. Maruo, T. Tachibana, K. Kusuyama, k. kishima, S. Yoshiya  
Efficacy of prevention program using delirium risk scoring system for postoperative delirium after spine surgery

**GP69**  
**Takao Sudo**  K. Akeda, T. Sano, N. Takegami, A. Sudo  
5-hydroxytryptamine (serotonin) in human intervertebral disc: preliminary in vitro study

**GP70**  
**Takashi Chikawa**  F. Tezuka, Y. Takata, T. Sakai, K. Sairyo  
Clinical outcomes and prognosis after spinal surgery for patients on hemodialysis

**GP71**  
**Su Hun Lee**  D. Son, J. Lee, G. Song  
Variation of C-reactive protein and white blood cell counts in spinal operation: primary fusion surgery versus revision fusion surgery

**GP72**  
Spinal deformity and depression symptoms - locomotive syndrome and health outcomes in aizu cohort study (LOHAS)

**GP73**  
**Zhi-Jun Hu**  Z. Shan, B. Huang, J. Wang, Z. Zheng, X. Zhang, J. Liu, F. Zhao  
Functional role of mechanosensitive ion channel Piezo1 in Modic changes, and the effect of Propionibacterium acne

**GP74**  
**Howard S An**  E.P. Moyer, K. Segami, J. He, A.A. Espinoza Orías, N. Inoue  
Validation of clinical CT against µCT to measure lumbar facet joint width

**GP75**  
**Ki-Hyun Kwon**  S. Kim, K. Ha, H. Park, J. Ahn, H. Min, y. Kim  
Simple predictor of postoperative neurologic status in patients with metastatic spinal cord compression - Cord compression ratio on MRI
**Skeletal muscle cell oxidative stress as a possible therapeutic target for denervation-induced sarcopenia**


**The characteristics of endplate fractures in the thoracolumbar fracture with fixation**

Chang-Hoon Jeon, N. Chung, H. Lee, K. Kim

**Psychological factors are central to understanding chronic low back pain**

John M. Popovich, Jr., P. Aminpour, J. Cholewicki, P.W. Hodges, S.A. Gray

**Comparison of intraoperative fluoroscopic and postoperative radiographic measurement of lumbar lordosis in flatback syndrome**

Sho Kobayashi, K. Khanna, T. Grace, M.A. Aksekili, Y. Matsuyama, V. Deviren

**Quantitative MRI correlates with histological grade in a percutaneous needle injury mouse model of disc degeneration**


**The effect of nicotine on human bone marrow stem cell proliferation and differentiation**

Zorica Buser, K. Tamai, R. Chamnan, K. Chantarasirirat, B. Formanek, P. Paholpak, J.C. Wang

**Mild (and not severe) disc degeneration is implicated in the progression of L5 spondylolysis to spondylolisthesis**

Ashish Diwan, V. Ramakrishna, U. Chamoli, L. Viglione, N. Tsafnat

**Fulcrum backward bending as a basis for surgical planning in adult spinal deformity**

Sho Kobayashi, K. Khanna, T. Grace, M.A. Aksekili, Y. Matsuyama, V. Deviren

**Back endurance test -application for elderly population with spinal deformity-**

Masaru Kanda, N. Sato, T. Kitamura, I. Konishi

**Intermittent claudication due to low back pain in the community: the Minami Aizu Study**


**The fate of notochordal cell in intervertebral disc degeneration induced by dynamic compressive load through integrin alpha5/beta1 mechanotransduction.**


**Regional bone mineral density differences measured by QCT: is the clinically used L1/L2 average representative of the entire lumbarosacral spine?**


**Prevalence of low bone mineral density measured by quantitative computed tomography (QCT) in 296 consecutive lumbar fusion patients**


**Does lumbar spine pathology affect bone mineral density measurement by quantitative computed tomography (QCT)?**


**Pre-operative education and rehabilitation prior to surgery for lumbar spinal stenosis: patient and physical therapist perspectives**

Michael J Schneider, S.R. Piva, A. Bove, A. McCarthy, L. Person Mecca
PREVALENCE OF FRgiatan in Patients with Osteoprototic Vertebral Compression Fracture and Its Association with Fracture Severity

What motivates engagement in work and other valued social roles despite persistent back pain?

Validation of a coding algorithm based on version 10 of the international classification of disease for classifying spinal surgery patient diagnosis

Transosseous intradiscal screw fixation in lumbar reconstruction; clinical experience with an alternative in osteoporosis fixation

Comparing the incidence of lumbar spondylolysis between a general population and patients with lumbar degenerative disease who underwent lumbar spine surgery

A comparative study of early fusion status after PLIF with cortical bone trajectory screw fixation between carbon peak cages and titanium-coated peak cages

Is bone non-union, vertebral deformity, or spinopelvic malalignment the best therapeutic target for amelioration of low back pain after osteoporotic vertebral fracture?

Debridgment and indwelling irrigation with diluted gentamicin solution for postoperative spinal infection

Disruption of erector spinae aponeurosis and facet injury do not alter the passive mechanics of spine muscles after four weeks of recovery in a rat

Intraoperative navigation decreases the risk of reoperation for implant-related complication following spinal fusion surgery

A novel quantitative computed tomography bone mineral density assessment of the sacrum does not predict sacral fractures following instrumented spinal fusion

Evaluation of physical activity before and after lumbar surgery using wearable activity trackers

The prevalence of diffuse idiopathic skeletal hyperostosis (DISH) of the whole spinal computed tomography for the 1189 subjects

Inhibitory effect of anti-human RANKL antibody on pro-inflammatory responses by human intervertebral disc cells

Protective effects of “locomotion training” exercise against the sagittal malalignment of the spine-pelvis-lower extremity axis in patients with the locomotive syndrome
**GP107** Nikhil Jain, J.L. Brock, F.M. Phillips, S.N. Khan

30-day emergency department visits after primary lumbar fusion: incidence, reasons, risk factors, and costs


Association between epidural fat accumulation and metabolic conditions

**GP109** Nikhil Jain, N. Adapa, Y. Gussous, R. Chandawarkar, S.N. Khan, E. Yu

Prophylactic muscle flap reconstruction in complex degenerative spine surgery


Efficacy of balloon kyphoplasty for fresh osteoporotic vertebral fractures with poor prognostic factors - a propensity-score-matched analysis using data from the multicenter prospective study

**GP111** Dong-Eun Shin, Y. Lee

Cranio-caudal biostuctural asymmetries of vertebral bodies - why vertebral fractures usually involve the superior end plate?

**GP112** Howard S An, B.A. Aliaga Crespo, A.A. Espinoza Orías, G.B. Andersson, N. Inoue

*In vivo* 3D characterization of the lumbar transverse process orientation and symmetry in healthy and low back pain subjects

**GP113** Chang-Hoon Jeon, N. Chung, H. Lee, K. Kim

Which are the risk factors for implant failures in long-level fixation for thoracolumbar fracture?

**GP114** Byung Hak Oh, T. Kim, S. Kim, C. Hong, H. Cho

Inter-rater and intra-rater repeatability and reliability of EOS 3-dimensional imaging analysis in comparison with manual methods

**GP115** Takaomi Kobayashi, T. Morimoto, M. Sonohata, M. Mawatari

Relationship between sagittal spino-pelvic alignment and the acetabular anteversion angle on computed tomography in patients with hip osteoarthritis


Use of MRI muscle cross-sectional area to determine whether lumbar muscle atrophy occurs after long-term brace therapy in early-stage spondylolysis patients


The need to improve prediction of responders and non-responders in elective spine, hip, and knee surgery: a health-economic argument


Does lumbar spinal stenosis induce fall? A prospective one-year follow-up

**GP119** Zorica Buser, P. Patoholpak, C. Wang, N. Jain, K. Tamai, J.C. Wang

Bipolar and anxiety disorders increased the incidence of infection and wound complications after posterior lumbar spine surgery

**GP120** Hiroshi Kobayashi, K. Otani, T. Nikaido, K. Watanabe, K. Kato, R. Tominaga, S. Yabuki, S. Kikuchi, S. Konno

Population-based study of medical resource usage by patients with lumbar spinal stenosis

**GP121** Tatsuya Endo, T. Ito, J. Omata, M. Iwabuchi, O. Shirado

What is an appropriate rehabilitation program for the symptomatic patients with adult spinal deformity before and after surgery?
GP122 Makoto Takeuchi T. Chikawa, T. Sakai, F. Tezuka, K. Saiyo
Analysis of surgical site infection surveillance in spinal surgery

Analgesic efficacy of Tramadol/Acetaminophen combination tablets in postoperative patients following spinal surgery

GP124 Tadao Tsujio M. Hoshino, H. Nakamura
Early postoperative magnetic resonance imaging after surgery for lumbar disc herniation

GP125 Hong Joo Moon W. Kwon, J. Kim
The mechanism of adhesion in human dura mater cells: the roles of increased affinity to collagen through integrin α2β1 and matrix metalloproteinase

GP126 Seung-Hwan Lee M. Millecamps, D. Foster, L. Stone
Progression of pathological disc degeneration, innervation, immune cell infiltration and spinal cord plasticity following single lumbar disc puncture in mice: a one year multiple-cohort study

Determinants of low bone mineral density in patients undergoing lumbar spinal fusion

GP128 Lisbet Haglund E. Krock, M. Millecamps, B. Currie, L. Stone
Disc degeneration and chronic back pain are decreased by chronic toll-like receptor 4 inhibition in an animal model

GP129 Kee-Yong Ha D. Chang, S. Suk, J. Kim, J. Lee, S. Suh, J. Yang, H. Park, S. Kim, y. Kim
Effect of direct vertebral rotation in single thoracic adolescent idiopathic scoliosis

GP130 John Ibrahim S. Lee, P. Singh, S. Burch, S. Berven
Appropriate use of surgery for adult spine deformity: a multidisciplinary perspective

GP131 Vahid Abdollah E. Parent, M. Beketskaia, M. Battie, J. Dunn
Do participants with and without chronic low back pain present different phenotypes illustrated by texture analysis of disc degeneration on MR T2-map images?

GP132 Fabio Zaina S. Donzelli, F. Di Felice, S. Negrini
Back pain in adolescents with spinal deformities

GP133 Tomohiko Hasegawa H. Haro, S. Ebata, J. Takahashi, Y. Isogai, Y. Matsuyama
Role of weekly teriparatide administration in bony union enhancement after posterior or transforaminal lumbar interbody fusion for osteoporosis-associated lumbar degenerative disorders: a multicenter, prospective, randomized study

GP134 Seung-Hwan Lee S. Lee, H. Lee, J. Yang
Relationship between lumbar disc degeneration and back muscle degeneration

GP135 Seung Deok Sun J. Eum
Clinical experiences of percutaneous biportal endoscopic spine surgery

Relationship between muscle strength after lateral interbody fusion using quantitative evaluation of leg strength and image findings of psoas muscle

GP137 Lunhao Chen Z. Feng, X. Hu, G. Yang, Y. Wang, Z. Chen
Vertebral augmentation can induce early signs of degeneration in the adjacent intervertebral disc: evidence from a rabbit model

Difference in the fusion rate and bone formation between the grafted materials inside cages in lateral interbody fusion in patients with adult spinal deformity – a comparison between porous hydroxyapatite/type 1 collagen composite and autologous iliac crest bone
GP139 Kentaro Fukuda, K. Kitamura
Utilization of minimally invasive lateral lumbar interbody fusion for lumbar spinal canal stenosis associated with osteoporotic vertebral collapse

Factors influencing instrumentation failure after total en bloc spondylectomy of the thoracolumbar junction and lumbar spine

Remodeling of the dome deformity in the immature rat lumbar spondylolisthesis model

DXA and BIA are useful measuring tools for trunk muscle mass

Effective graft materials for spinal fusion surgery: Combined use of bone allografts and platelet-rich plasma shortens the time to bone union

GP144 Paul J Slosar, A. Kranenburg, S. Martineck
Variances in opiate use between patients implanted with micron-textured titanium vs peek implants for TLIF procedures

GP145 David A Wong, O. Aguwa
Does spondylolisthesis develop or progress with microdecompression for stenosis?

Initiation of sedative use is associated with development of musculoskeletal pathology: a longitudinal cohort study from the midlife development in the U.S. (MIDUS) Study

Factors related to spinal sagittal imbalance among an elderly population in a suburban community: The Shiraniwa study

GP148 Kazuhiro Takeuchi, T. Hirose, K. Shinohara, S. Nakahara
Mini-open anterior lumbar interbody fusion (mini-ALIF) for degenerative spondylolisthesis

GP149 Junseok Bae, S. Lee
Endoscopic transfemoral thoracic discectomy on upper thoracic spine

The prospective cohort study for the predicting factor of symptomatic spinal metastasis

GP151 Jennifer Padwal, D. Berry, K. Raiszadeh, S. Johnson, S. Ward, B. Shahidi
Changes in paraspinal muscle characteristics assessed with MRI and functional outcomes following intensive exercise rehabilitation

GP152 Sibel Demir, H. Cil, Z.L. McCormick, S. Berven, J. Lotz
Type 1 Modic changes in degenerative disc disease are associated with increased fatty infiltration of the lumbar paraspinal muscles over time

Disc height changes of the fusion and adjacent segments – an in-vivo lumbar patient investigation
GP154  **Su Hun Lee** D. Son, J. Lee, G. Song  
Hemoglobin A1c as a predictor of surgical site infection following single level lumbar/lumbosacral posterior fusion in patients with diabetes

GP155  **Tadatsugu Morimoto** K. Maeda, M. Mawatari  
Skeletal hypoplasia (L5) and the anterior opening of the intervertebral disc caused lumbar hyperlordosis in patients with Crowe type 4 Completely Dislocated Hips

GP156  **Tomohiko Sano** K. Akeda, N. Takegami, J. Yamada, K. Nakase, T. Sudo, A. Sudo  
The RANK/RANKL/OPG system is expressed by human intervertebral disc cells

GP157  **Paul Sung**  
Postural adjustments following walk slip perturbation with a handheld task in subjects with recurrent low back pain

Significance of conservative treatment for lumbar spinal canal stenosis: surgical outcome for patients with recurrent symptoms after successful conservative treatment

GP159  **Daphne Hingert** H. Barreto Henriksson, H. Brisby  
BMP-3 growth factor stimulates stem cells and disc cells in 3D co-culture to a higher proteoglycan production

GP160  **In-Soo Oh** K. Ha, S. Kim  
Preemptive multimodal analgesia for postoperative pain management after lumbar fusion surgery - a randomized controlled trial

GP161  **In-Soo Oh** K. Ha, S. Kim  
Gender- and age-specific analgesia for early postoperative pain management after lumbar discectomy: A Randomized Clinical Trial

Efficacy of early intervention of balloon kyphoplasty for thoracolumbar osteoporotic vertebral fracture

GP163  **Yuichiro Mima** N. Fujita, S. Suzuki, T. Fujii, K. Watanabe, T. Tsuji, T. Miyamoto, M. Matsumoto, M. Nakamura  
Role of semaphorin 3A in intervertebral disc degeneration

GP164  **Atsushi Kojima** T. Aihara, K. Hatakeyama, M. Urushibara  
MRI examination of the L2-S1 level retroperitoneal oblique corridors in Japanese

GP165  **Takayuki Sakai** M. Yoneyama, Y. Aoki, G. Kubota, H. Fukuchi, N. Yanagawa  
Clinical assessment of simultaneous diffusion tensor imaging and T2 relaxometry of lumbar nerve roots in patients with low back pain

GP166  **Chang-Hoon Jeon** N. Chung, H. Lee, K. Kim  
The effect of one-level fusion on the occurrence of disc degeneration at the adjacent and skip level

GP167  **Soraya Nishimura** M. Takano, S. Kawabata, T. Fujii, Y. Ishimine, N. Fujita, M. Nakamura, M. Matsumoto, K. Watanabe, M. Kamata  
Comparison of different spinal cage materials and bone graft techniques for posterior lumbar interbody fusion

Correlation between lumbar spinal deformities and abdominal trunk muscle strength in the elderly women
Morphological evaluation of lumbar nerve root using diffusion-weighted MR neurography

GP170  **Xianfeng Lin** L. Song, S. Fan
The effect of combination pharmacotherapy on low back pain

GP171  **Megumi Ota** S. Ogata, K. Kaneoka
The movement of the transverse abdominal muscle and the muscles of the pelvic floor muscles during expiration

GP172  **Toshihiro Nonaka** T. Morimoto, S. Kawano, M. Kitajima, M. Sonohata, M. Mawatari
The influence of pelvic incidence on the lumbar lordosis in patients with hip osteoarthritis

GP173  **Lunhao Chen** G. Yang, Z. Gao, Y. Wang
Lumbar disc degeneration activates microglia in the spinal cord: CSF1/CSF1-receptor signaling may take a role

Immunohistochemical analysis of 5-Hydroxytryptamine receptors in human intervertebral discs

GP175  **Arnold YL Wong** L.L. Chan, M.H. Wang, K. Cheung, D. Samartzis
Prevalence and risk factors for low back pain in healthcare and non-healthcare university students: a large-scale, multi-center study

Signal intensity changes of the posterior elements of the lumbar spine in symptomatic adults

GP177  **Greg N Kawchuk** J. Aaskov, K. Hamaluik, P. Boulanger
Xray vision: the accuracy and reliability of a technology that allows clinicians to see spinal x-rays superimposed on a patient’s back

Low back pain related disability and MRI findings in the elderly: a cross-sectional and prospective one-year follow-up in the community

Evaluation of real neurologic intermittent claudication using accelerometer device in patients with lumbar spinal stenosis: pilot and feasibility study

GP180  **Ho-Joong Kim** N. Lee, B. Chang
Assessment of sleep quality in patients with degenerative lumbar spinal disease

GP181  **Haddas Ram** J. Cox, S. Kutz, R. Rashbaum
Neuromuscular activity during gait in patients with sacroiliac joint pain

Metabolic and musculoskeletal conditions correlated with lumbar intervertebral disc degeneration

GP183  **Luciana G Macedo** K. Weber, S. Mehrabkhani, S. Baskaran, T. Abbass
A systematic review of the effectiveness of weight loss programs in non-specific low back pain

GP184  **Kazuji Aoki** N. Sugimoto, N. Suzuki, T. Uehara, A. Inada
Plaster cast fixation for patients with osteoporotic compression fractures: comparison of two methods of reduction, standing posture and dorsal suspension reduction in a supine position

GP185  **Eijiro Okada** M. Yagi, N. Fujita, O. Tsuji, N. Nagoshi, M. Nakamura, M. Matsumoto, K. Watanabe
Lumbar spinal canal stenosis in patient with diffuse idiopathic skeletal hyperostosis. Surgical outcome of the spinous process – splitting laminectomy
GP186 **Kana Nishimoto** H. Takasaki
The effect of active knee extension in sitting on lumbopelvic curvature in individuals with clinically tight hamstring muscles: a cross-sectional reliability study

GP187 **Kazuya Kishima** K. Maruo, T. Tachibana, F. Arizumi, K. Kusuyama, S. Yoshiya
Impact of psychological problems on health-related quality of life in patients with residual kyphotic deformity after osteoporotic vertebral fractures

Trunk movement during gait in patients with knee osteoarthritis before and after total knee arthroplasty

GP189 **Whoan Jeang Kim** J. Lee, S. Chang, K. Park, K. Park, D. Song
Perioperative surgical complications related to oblique lumbar interbody fusion (OLIF) in adult spinal deformity

Effects of skill training versus strength and flexibility exercise on functional limitations and pain in people with chronic low back pain over a 6-month period

Lubricin expression in the lumbar endplate and its association with Modic changes (MCs)

GP192 **Hitoshi Tonomura** Y. Hatta, M. Nonomura, H. Koike, R. Takatori, M. Nagae, Y. Mikami, T. Kubo
Clinical and radiological outcome of muscle-preserving interlaminar decompression for lumbar spinal canal stenosis in patients with or without kissing spine

Inconsistence description of lumbar multifidus morphology and function. A systematic review

GP194 **Ashish Diwan** U. Chamoli, A. Sabnis
Is L5-S1 motion segment different from the rest? A radiographic kinematic assessment of 72 patients with chronic low back pain

GP195 **Eric H Ledet** J.M. Peterson, C. Chlebek, A.M. Clough, A.K. Wells
Stiffness matters: PART I - the effects of plate stiffness on the biomechanics of ACDF in vitro

GP196 **Greg McIntosh** H. Hall, T. Carter
Sociodemographic characteristics of distinct patterns of low back pain

GP197 **Peter Jun** M. Funabashi, M. Erwin, G. Kawchuk
Use of hemivertebrae for in vitro motion segment testing: a feasibility study

GP198 **Kee-Yong Ha** D. Chang, J. Kim, Y. Kim
Telomerase activity after spinal cord injury

GP199 **Yolanda Casciaro** G.N. Kawchuk, N. Prasad
Spinal stiffness evaluation using latent class and functional data analyses

GP200 **Sibel Demir** H. Cil, Z.L. McCormick, J. Lotz, S. Berven
The association of type 1 Modic changes, paraspinal muscle atrophy, pain and function in individuals with lumbar disc herniation

GP201 **John Ibrahim** D. Beckerman, A. Tenorio, L. Racine, S. Burch, S. Berven
Infection as an etiology for pseudarthrosis in multilevel spinal fusions

Assessment of damage to the iliopsoas muscle from the oblique lateral interbody fusion approach
Lumbar epidural lipomatosis is associated with visceral fat and metabolic disorders

Presence of redundant nerve roots affects the balance ability in patients with lumbar canal stenosis

Prevalence of Postoperative Nausea and Vomiting in Patients Undergoing Spinal Surgery Under General Anesthesia

Serum metal levels after removal of spinal instrumentation

Risk factors of low back pain in male patients with osteoporosis

Reoperation rates after surgeries for degenerative lumbar diseases according to fusion procedures

Association Between Skeletal Muscle Mass And Bone Mineral Density In Women Over 40

Cage height in stand-alone lateral lumbar interbody fusion has biomechanical consequences: a finite element study

A cadaveric study for estimating the dose reduction when using pulsed and collimated x-ray beams in procedures

Reliability of a continous spinal stiffness measuring device

Midterm clinical results of temporary short-segment fixation without augmentation for thoracolumbar burst fractures

Evaluation of the presence and distribution of air on abdominal computed tomography after thoracolumbar LIF and conventional anterolateral surgeries

Pathology and anatomical features of lumbar discal cyst to improve the success of surgery

Impacts of gluteus medius muscle weakness on risk of falling and activities of daily living in patients with lumbar spinal canal stenosis
GP220  **Yu Toda**  T. Morimoto, T. Yoshihara, K. Maeda, M. Sonohata, M. Mawatari
A multidisciplinary approach to the treatment of metastatic spinal tumors

Retrospective review of short to mid-term outcome in oblique lateral lumbosacral fusion (OLIF51) surgery

Bony healing rate of stress fracture occurred in discontinuous lamina due to pars defect or spina bifida occulta

GP223  **Jun JK Komatsu**  M.M. Iwabuchi, H.H. Fukuda, K.K. Kusano, O.O. Shirado
Endoscopy-assisted tubular surgery improves the QOL in the patients with lumbar herniated nucleus pulposus; An analysis using JOA Back Pain Evaluation Questionnaire (JOABPEQ)

Perioperative adverse events in spine, hip, and knee surgery: impact on hospital cost and length of stay

GP225  **Ryohei Kagotani**  M. Takami, H. Hashizume, Y. Yukawa, A. Minamide, Y. Nakagawa, I. Hiroshi, S. Tutsui, H. Yamada
Impact of bicortical purchase on biomechanical strength of pedicle screw placement in the thoracolumbar spine for adult spinal deformity surgery

GP226  **Chang-Hoon Jeon**  N. Chung, H. Lee, K. Kim
The intra-discal vacuum phenomenon developed after thoracolumbar fractures; the natural history and risk factors

GP227  **Haddas Ram**  L. Isador
Muscular energy expenditure during dynamic balance test in adult degenerative scoliosis patients compared to controls

Surgical procedures affect clinical outcomes in patients with single level degenerative lumbar spondylolisthesis – a prospective, multicenter trial

GP229  **Kazuhiro Masuda**  Y. Kumanomido, Y. Onishi, T. Karita, T. Kondo
Povidone-iodine irrigation for prevention Surgical Site Infection following spinal instrumentation.

GP230  **Kyoung-Tae Kim**  J. Sung, D. Cho, J. Yang, I. Han, D.K. Riew, W. Bang
Development of neuro-monitoring pedicle screw: results of electrical resistance and neurophysiologic test in pig model

GP231  **Atsushi Fujiwara**  S. Fujiwara, M. Kugo, T. Koyama, K. Naeki
Serial changes in dimension and hardness of transversus abdominis muscle during an abdominal drawing-in maneuver in healthy subjects

GP232  **Jill Urban**  O. Boubriak, S. Lee, K. Blighe
Cell populations of the adult nucleus pulposus

GP233  **Paul Sung**
Trunk sway response to consecutive slip perturbations between subjects with and without low back pain.

GP234  **Yue Wang**  Y. Yuan, M. Battie
Prevalence of back pain in Chinese: preliminary data from the population-based Hangzhou Lumbar Spine Study

The characteristics of low back pain, muscle mass and bone quality in glucocorticoid-induced osteoporosis patients

GP236 **Kazushi Takayama** T. Kita, R. Sasaki, H. Taniwaki, H. Sakanaka, Y. Yamano, H. Nakamura

High prevalence of osteoporotic vertebral fracture in patients with proximal femoral fracture


Spinal cord stimulation therapy improves pain and walking ability, but the improvement in psychological disability according to JOABPEQ score is poor


Risk predictors of perioperative complications for the palliative surgical treatment of spinal metastasis

GP239 **Yue Wang** L. Chen, X. Hu, M.C. Battié, X. Lin

Modic changes in the lumbar spine are common aging related degenerative findings that parallel with disc degeneration


Percutaneous endoscopic discectomy for lumbar disc herniation in athletes

GP241 **Koji Akeda** E.S. Abarado, K. Cheng, N. Inoue, K. Masuda, A. Sudo

Morphological changes of the lumbar spine following extreme lateral interbody fusion: three-dimensional computerized tomography evaluation

GP242 **Fabio Zaina** S. Donzelli, F. Di Felice, A. Caronni, S. Minnella, S. Negrini

Pain and function in adult patients with scoliosis attending a rehabilitation center

GP243 **Hiroaki Matsumori** H. Shigematsu

The change of radiographic spinal alignment after using high angle cage in posterior lumbar interbody fusion surgery

GP244 **Morgan B Giers** L.A. Bardonova, E. Belykh, V.A. Byvaltsev, M.C. Preul

Intervertebral disc cells’ metabolic and synthetic activity under the influence of macrophage cocultivation in 3D cell culture

GP245 **Tomoyuki Ozawa** T. Toyone, M. Yamagata, S. Ohtori

Efforts toward achieving relief from refractory low back pain using Duloxetine —Experience on the use of Duloxetine—

GP246 **Hiroaki Manabe** T. Sakai, M. Morimoto, F. Tezuka, K. Yamashita, Y. Takata, T. Chikawa, K. Sairyo

Radiological outcomes of lumbar interbody fusion using titanium-coated peek cage


A population-based cohort study identifies an association of THBS2 with intervertebral disc degeneration
## ACKNOWLEDGEMENT

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<table>
<thead>
<tr>
<th>Alastair Gibson</th>
<th>Grace O'Connell</th>
<th>Moon Soo Park</th>
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<tbody>
<tr>
<td>Alex Vaccaro</td>
<td>Hans-Joachim Wilke</td>
<td>Odysseas Paxinos</td>
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<td>Alison McGregor</td>
<td>Haruki Funao</td>
<td>Orso Osti</td>
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<td>Anne F Mannion</td>
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<td>Atsushi Fujiwara</td>
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<td>Hiroyuki Aono</td>
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<td>Jaro Karpinnen</td>
<td>Robert McLain</td>
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<td>Samuel Bederman</td>
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<td>William Donaldson</td>
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<td>Zhaomin Zheng</td>
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<td>Miho Sekiguchi</td>
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# Program at a Glance

<table>
<thead>
<tr>
<th>Monday May 14</th>
<th>Tuesday May 15</th>
<th>Wednesday May 16</th>
<th>Thursday May 17</th>
<th>Friday May 18</th>
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<tr>
<td>07:00 – 08:00 Program Committee Meeting</td>
<td>07:00 – 07:45 BREAKFAST</td>
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</tr>
<tr>
<td>08:00 – 09:00 Membership Committee Meeting</td>
<td>07:45 – 08:00 Welcome by local hosts and program chair</td>
<td>07:45 – 08:45 Special poster session 1</td>
<td>07:30 – 09:30 Scientific</td>
<td>07:45 – 08:45 Special Poster Session II</td>
</tr>
<tr>
<td>09:00 – 12:00 Focus Group #1</td>
<td>08:00 – 10:00 Scientific</td>
<td>09:00 – 10:00 Scientific</td>
<td>09:30 – 09:50 Fellowships and Awards</td>
<td>09:00 – 09:30 Report of Focus Groups</td>
</tr>
<tr>
<td>09:30 – 11:30 Strategy Group Meeting</td>
<td>10:00 – 10:30 COFFEE</td>
<td>10:00 – 10:30 COFFEE</td>
<td>10:00 – 10:20 COFFEE</td>
<td>09:30 – 10:00 Scientific</td>
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<tr>
<td>12:00 – 15:00 ExCom Meeting</td>
<td>10:30 – 11:30 Scientific</td>
<td>10:30 – 11:00 Scientific</td>
<td>10:20 – 11:30 The ISSLS Prize</td>
<td>10:00 – 10:20 COFFEE</td>
</tr>
<tr>
<td>13:00 – 16:00 Focus Group #2</td>
<td>11:00 – 11:40 Presidential address</td>
<td>11:00 – 11:40 Invitation to lunch Jennifer Moss</td>
<td>11:30 – 12:15 Invited lecture Martin Parnell</td>
<td>10:20 – 12:00 Scientific</td>
</tr>
<tr>
<td>14:00 – 17:00 ORS Spine Section/ISSLS Workshop</td>
<td>12:00 – 13:30 LUNCH</td>
<td>11:40 – 12:20 Harry Farfan President Lecture Susan Eaton</td>
<td>12:15 – 13:30 LUNCH</td>
<td>12:00 – 12:20 Announcement: Best paper and poster awards</td>
</tr>
<tr>
<td>15:00 Registration opens</td>
<td>13:00 – 15:20 Scientific</td>
<td>13:00 Afternoon outing</td>
<td>12:00 – 12:20 Announcement: Best paper and poster awards</td>
<td>19:00 DINNERN BANQUET</td>
</tr>
<tr>
<td>16:30 – 17:30 Women’s ISSLS</td>
<td>15:20 – 15:50 COFFEE</td>
<td>16:00 – 16:40 Scientific</td>
<td>17:40 Second Business Meeting</td>
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<tr>
<td>18:00 – 20:00 WELCOME RECEPTION</td>
<td>15:50 – 16:30 Scientific</td>
<td>16:00 – 16:40 Scientific</td>
<td>19:00 DINNER BANQUET</td>
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<td></td>
<td>16:30 – 17:30 Symposium #1</td>
<td>16:40 – 17:40 Symposium #2</td>
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<td></td>
<td>17:30 – 18:10 First business meeting</td>
<td>17:40</td>
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</table>

We would like to thank our sponsors and exhibitors: