Elegantly simple. Level 1 data. The 1st comparative effectiveness study in spinal stenosis.

Visit the Paradigm Spine booth today

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## MEETING AT A GLANCE

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COMMITTEES

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Second Vice President       Robert Gunzburg
Secretary                   Tom Oxland
Treasurer                   James Kang

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Asia/Pacific                 Ashish Diwan (2012-2015)
Canada                       Richard Hu (2010-2013)
Europe                       Helena Brisby (2010-2013)
United Kingdom               Patricia Dolan (2011-2014)
Japan                        Osamu Shirado (2010-2013)
Central U.S.                 Donna Ohnmeiss (2010-2013)

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Program Chairperson          Kazuhiro Chiba
Membership Chairperson       Shinichi Konno
Instructional Course Chairman Michael Mayer
Scientific Representatives   Serena Hu
                            Paul Hodges
                            Jaro Karppinen

By-Laws Chairman             Dr Gunnar Andersson

ISSLS Program Committee 2012-2013
Kazuhiro Chiba
David Wong
Peter Robertson

Secretariat
ISSLS E-mail: katarina.olinder@gu.se
c/o Katarina Olinder Eriksson Phone: + 46 31 786 44 36
Institute of Clinical Sciences
at the Sahlgrenska Academy
University of Gothenburg
PO Box 426
SE 405 30 Gothenburg Sweden
Dear President Takahashi, ISSLS Executives, Members, and Guests ...

It is with great pleasure that we welcome you to Scottsdale, Arizona for our 40th Annual Meeting of the International Society for the Study of the Lumbar Spine. Here in the Sonoran Desert this time of year, the sunny warm days are balanced by cooler evening temperatures. We hope you enjoy the venue and take the time to take in the beauty of our surroundings.

Our program committee has assembled an impressive scientific program showcasing the latest research in lumbar spine, along with thought-provoking plenary, guest lectures and debates that are sure to inspire our delegates. We are grateful to Dr. Kazuhiro Chiba, our program committee chairman, who did a wonderful job in organizing this fine program.

We have a number of opportunities for you to also enjoy each other’s company during our ISSLS social events, where friendships are ignited or rekindled, and new collaborations are sparked.

Our administrator, Ms. Katarina Olinder Eriksson, together with our Secretary, Dr. Tom Oxland, Dr. Chiba and the program committee have put in a tremendous amount of effort to make this year’s meeting a success, and we owe them a debt of gratitude for their dedication and service. I would also like to thank our conference organizer, Ms. Pat Curl, who has done a stellar job in collaborating to make sure everything goes smoothly.

Enjoy the 40th Annual Meeting of ISSLS and welcome to Scottsdale!

Sincerely,

Christopher J. Colloca, D.C.
Local Host
FELLOWSHIPS AND AWARDS

ISSLS Wiltse Lifetime Achievement Award
Sponsored by NuVasive, Speed of Innovation
A yearly award for exceptional achievement in the spinal field. This award will be announced at the banquet dinner on May 16

The ISSLS Prize for Lumbar Spine Research
Sponsored by DePuy Synthes Spine
The ISSLS Prize winning papers will be presented on May 16 at 11.00

The ISSLS Clinical Travelling Fellowship
Sponsored by Globus Medical, to be announced during the Fellowship ceremony, May 16 at 10.30

The ISSLS MacNab/LaRocca Research Fellowship Award
Sponsored by Ono Pharmaceutical Co., Ltd to be announced during the Fellowship ceremony, Thursday May 16 at 10.30

The International ISSLS Fellowship
Sponsored by the Eisai Co Ltd of Tokyo, Japan, to be announced during the Fellowship ceremony, Thursday May 16 at 10.30

Best Paper and Poster Award
sponsored by Medtronic
The two best papers and poster presentations will be announced during Closing Remarks on Friday, May 17 at 12.00

Welcome to next year’s ISSLS annual meeting in South Korea
SOCIAL PROGRAMS

Included in registration fee for all; (meeting badge to be worn for entry)

**Welcome Reception**

**Time:** Monday, May 13, 6:00 pm – 8:00 pm  
**Venue:** East Pool of the resort  
**Dress code:** Smart casual

Join your colleagues for a Welcome Reception. Drinks and Hors D’oeuvres will be served.

**Banquet**

**Time:** Thursday, May 16, 7:00 pm - 10:00 pm  
**Venue:** Hacienda Plaza and Trellis at the resort  
**Dress code:** Business attire

Join all conference delegates for the 40th Anniversary ISSLS Banquet at the resort’s Hacienda Plaza and Trellis. Drinks will be served at 7:00 pm with dinner and entertainment Alfresco to follow.

---

**Afternoon Outing to Los Cedros**

**Time:** Wednesday, May 15, 1:00 pm - 6:00 pm  
**Dress code:** Casual

Coaches will depart promptly at 1:00 pm from the conference circle drive outside the main entrance to the hotel. Please be sure to be on time and to wear your conference name badge for inclusion.

Los Cedros is an ancient citadel in the high desert of Scottsdale AZ, a premier breeding and training facility for some of the finest horses in America. Lunch will be served upon arrival and you’ll experience the magnificent architecture of the property prior to enjoying a private horse show. Docents are available, and the entire facility is open to us for touring.
ACCOMPANYING PERSONS TOURS

Tuesday, May 14, 2013
Day Trip to Sedona. ($160, lunch included)

Transportation will leave promptly at 8:00 a.m. from the conference circle drive outside the main entrance to the hotel.

There are few sights as stirring and inspiring as Sedona's spectacular red rock formations. Experience the stunning, high country beauty of Northern Arizona to discover the softer side of our desert state. Climb 3,000 feet from the desert floor to cooler climates, paying a visit to Montezuma Castle, a five story, twenty-room cliff dwelling carved into the side of the mountain by the Sinagua Indians more than 800 years ago.

As you near Sedona, towering, vibrant red rock formations form one of the most captivating horizons you’ve ever witnessed. The town of Sedona is nestled between these monumental formations, and is the state's second most visited attraction. Awesome natural beauty is paired with small town charm, as visitors stroll walkways in search of art, artifacts and keepsakes of their visit to this inspired place. A gourmet lunch will be relished in one of Sedona’s favorite restaurants.

Afterwards, shop and browse amidst the shade trees of the Spanish arts and crafts village called Tlaquepaque (pronounced: ta-LAH-kee-PAH-kee). Just to the north of Sedona, take in the beauty of Oak Creek Canyon, where spirited waters flow at the foot of dense evergreen forests. It's a red rock rendezvous that will leave every guest breathless.

Schedule

8:00am  Depart Resort (drive time)
10:00am  Visit Montezuma’s Castle
11:00am  Depart to Sedona (drive time)
11:30am  Arrive and Shop in Tlaquepaque
12:30pm  Lunch at Rene’s in Tlaquepaque
1:30pm  Depart for Downtown Sedona
1:45pm  Arrive and Shop
2:00pm  Depart Sedona (drive time)
3:30pm  Stop at Sunset Point for Photograph Opportunity
4:30pm-5pm  Arrive to back at the Scottsdale Princess Resort

NOTE

We recommend comfortable walking shoes and sunglasses for this tour.
Badges
Each delegate and registered accompanying person will receive a name badge at registration. For security reasons and for entry to all events included in registration, delegates are requested to wear or bring their badge during all the congress activities.

Meeting Venue
Fairmont Scottsdale Princess
7575 East Princess Drive
Scottsdale, Arizona, US 85255
TEL + +480 585 4848
FAX + +480 585 0091

Internet
ISSLS has arranged “resort wide” internet access for the entire meeting; the access code will be provided to you upon meeting registration check-in.

Electricity
The United States uses 120V AC 60Hz. They use a Type A electrical plug, or two flat parallel blades are used.

Conference Registration Desk
The registration desk and conference secretariat is located in the main foyer of the ballroom. On-site registration will start on Monday, May 13 at 3:00 pm

Opening Hours of the Registration Desk
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<td>Monday, May 13</td>
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Tipping
15-20% of the bill in restaurants or of taxi fare is the usual and customary in the USA. Tipping for special services provided by hotel staff is fine, but is not expected and is simply a matter of personal preference.

Tourist Information
For further information about Scottsdale and what the city has to offer, please visit: http://www.experiencescottsdale.com/

Weather
The climate in Scottsdale is one of its greatest assets. In the month of May, the average temperature ranges from 64.4 - 88.1 °F (17.8 - 30.9 °C) with 93% sunshine.

Disclaimer
ISSLS, its Organizing Committee and Professional Meeting Consultants, and the Fairmont Scottsdale Princess accept no liability for any injuries/losses incurred by participants and/or accompanying persons, nor loss of, or damage to, any luggage and/or personal belongings. Delegates are advised to take out their own insurance to cover personal possessions, travel and cancellation as the Congress does not cover individuals against cancellation of bookings, theft or damage to belongings.
MONDAY MAY 13

08:00  Membership Committee Meeting
       Location: Sonoran Room

09.30  Strategy Group Meeting
       Location: Sonoran Room

12.00  Executive Committee – Lunch
       Location: Sonoran Room

15:00  Registration

18:00  Opening Ceremony & Welcome Reception
       Location: East Pool

TUESDAY MAY 14

07.45-07.50  Welcome – Chris Colloca, Local Host

07.50-08.00  Program Chairman – Kazuhiro Chiba

SESSION # 1  TOPIC: LOW BACK PAIN
Moderators: Kazuhisa Takahashi and Tom Oxland

08.00-08.05  1. Intradiscal administration of tumor necrosis factor-alpha inhibitor, etanercept,
clinically improves intractable discogenic low back pain: A prospective
randomized study
Sainoh T, Orita S, Yamauchi K, Suzuki M, Sakuma Y, Kubota G,
Oikawa Y, Inage K, Sato J, Takahashi K, Ohtori S; Chiba Japan

08.07-08.12  2. Does underlying spinal pathology affect the outcome of clinical practice guideline-
based treatment for acute lower back pain? A subgroup analysis of the chiro study outcomes:
Bishop PB, Quon JA, Arthur B; Vancouver, Canada

08.14-08.19  3. Does lumbar paraspinal muscle fatty degeneration correlate with aerobic index
and Oswestry disability index?
Prasarn ML, Konstantinos V, Coyne E, MS, Rechtine GR; Texas and Rochester USA

08.21-08.30  Discussion
08.30-08.35 4. Enhanced therapeutic alliance modulates pain intensity and muscle pain sensitivity in patients with chronic low back pain: A randomized double-blind controlled trial

08.37-08.42 5. Indicators predicting successful clinical outcome one year after an intensive pain management program for chronic low back pain
   van Hooff ML, Spruit M, O’Dowd JK, Fairbank JCT, van Limbeek J; Nijmegen, The Netherlands; London, UK; Oxford UK, Halsteren, The Netherlands

08.44-08.49 6. The importance of context when evaluating patient satisfaction
   Spratt KF; Lebanon NH, USA

08.51-09.00 Discussion

09.00-09.05 7. Validation of administrative coding algorithm to identify back-related degenerative diagnoses.
   Martin BI, Mirza SK, Lurie JD, Tosteson ANA, Deyo RA; Dartmouth, USA

09.07-09.12 8. Lumbar facet joint subchondral bone density is higher in low-back pain patients
   Pan CC, Simon P, Espinoza Orías AA, Takatori R, An HS, Andersson GBJ, Inoue N; Chicago, IL, USA

09.14-09.19 9. Does cumulative loading of the spine contribute to low back impairment?
   Marras WS, Ferguson SA, Splittstoesser R, Lavender SA, Mendel E; Columbus, Ohio, USA

09.21-09.30 Discussion

9.30-10.00 COFFEE

SESSION #2  TOPIC: DISC DEGENERATION
Moderators: Steven Garfin and Björn Rydevik

10.00-10.05 10. Comparison of lumbar disc degeneration characteristics between patients with low back pain and sciatica results of clinico-radiological analysis of 224 patients
   Kanna RM, Shetty AP, Shetty JY, Rajasekaran S; Tamil Nadu, India
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<td>Jung NS, Jeon CH, Chung NS, Park JU, Kim JJ; Suwon, Republic of Korea</td>
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<td>10.14-10.19</td>
<td>12. Lumbar discs and vertebrae change in concert: A 15-year follow-up</td>
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<td>Videman T, Battié MC, Gibbons L, Gill K; Alberta, Canada; Seattle, WA, USA</td>
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<td>13. Pressure increase in adjacent discs during clinical discography;</td>
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<td>Hebelka H, Nilsson A, Hansson T; Gothenburg Sweden</td>
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<td>Kim HY, Mcclincy M, Vo NV, Sowa GA, Kang JD, Bai M; Pittsburgh, PA USA</td>
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<td>10.44-10.49</td>
<td>15. Morphological classification of intervertebral disc rupture -</td>
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<td>association with degenerative lumbar diseases-</td>
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<td>Murata K, Akeda K, Sudo A; Mie, Japan</td>
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<td>16. Serum metabolomic biomarkers and lumbar disc degeneration</td>
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<td>Samartzis D, Karppinen J, Ala-Korpela M, Soininen P, Kangas AJ, Chan D,</td>
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<td>Luk KDK, Cheung KMC; Hong Kong, SAR China, Oulu, Finland, Kuopio, Finland</td>
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<td>17. Evaluation of lumbar intervertebral disc degeneration using T1RHO</td>
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<td>mapping and T2 mapping in a rabbit disc injury model</td>
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<td>Ishikawa T, Watanabe A, Hiroto K, Miyagi M, Sakuma Y, Oikawa Y, Ohtori S,</td>
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<td>Ka; Chiba, Japan</td>
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<td>11.14-11.19</td>
<td>18. An interview study of patients’ experience of health after a</td>
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<td>Limbäck Svensson G, Kjellby Wendt G, Thomeé R, Danielson E; Gothenburg,</td>
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### SESSION #3  
**TOPIC: BIOLOGY**  
**Moderators: Jaro Karppinen and Jeffrey Lotz**

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| 13.00-13.05 | 19. Adamts-5 mediates tobacco smoking-induced disc aggrecanolysis  
Sakai D, Nakamura K, Nakai T, Grad S, Alini M, Chan D, Risbud M, Masuda K, Ando K, Mochida J; San Diego CA, USA, Kanagawa Japan |
Fujiwara T, Yamaguchi T, Pichika R, Bae WC, Taborek A, He J, Shieh I, Tan K, Lenz ME, Masuda K; San Diego CA, USA, Kanagawa Japan |
| 13.21-13.30 | Discussion |
| 13.30-13.35 | 22. The relationship between vitamin D status and successful fusion  
Metzger M, Kanim L, Zhao L, Robinson S, Delamarter RB; Los Angeles, CA, USA |
Nakao S, Kawakami M, Fukui D; Wakayama Japan |
| 13.51-14.00 | Discussion |

### SESSION #4  
**TOPIC: BIOMECHANICS**  
**Moderators: Michael Adams and Hans-Joachim Wilke**

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| 14.00-14.05 | 25. The effect of disc degeneration on anterior shear flexibility in the lumbar spine  
Melnyk AD, Wen TL, Chak JD, Kelly A, Cripton PA, Fisher CG, Dvorak MF, Oxland TR; Vancouver BC Canada, Beijing China |
14.07-14.12 26 15 days microgravity condition induced disc height loss and bone morphological changes of the mouse lumbar spine
Yamaguchi T, Bae WC, He J, Inoue N, Hargens AR, Lotz J, Sah RL, Asahara H, Masuda K; San Diego, CA USA, Kyoto, Japan. San Francisco, CA, USA., Tokyo, Japan

14.14-14.19 27 The pathogenesis of thoracolumbar vertebral wedge fractures
Landham PR, Baker H, Gilbert S, Pollintine P, Robson-Brown K, Adams MA, Dolan P; Bristol, UK

14.21-14.30 Discussion

14.30-14.35 28 The effect of pedicle screw redirection following lateral wall breach – a biomechanical study using human lumbar vertebrae
Stauff MP, Freedman BA, Kim JH, Hamasaki T, Yoon ST, Hutton WC; Atlanta, GA, USA

14.37-14.42 29 The effects of strain and displacement rate on nerve root injury tolerance to stretch
Cavanaugh JM, Chen CY, Virk GS, Yaldo J, Gurusprakash DK, Tanimoto K, Kallakuri S; Detroit, MI USA, Sapporo, Japan

14.44-14.49 30 Male spine motion during coitus: Implications for the low back pain patient
Sidorkewicz N, Cambridge EDJ, McGill SM; Waterloo, Canada

14.51-15.00 Discussion

15.00-15.30 COFFEE

SESSION #5 INVITED LECTURE # 1
Moderators: Kazuhiro Chiba and Hwan Mo Lee

15.30-15.55 Title: Pain Genetics
Inna Belfer, MD, PhD
Department of Anesthesiology and Human Genetics
The University of Pittsburgh/UPMCPA, USA

15.55-16.00 Discussion

SESSION #6 TOPIC: FUSION
Moderators: Howard An and Robert Gunzburg

16.00-16.05 31 Fusion did not improve outcome in decompressive surgery for lumbar spinal stenosis a 2-year follow-up study of 5390 patients from Swespine
Försth P, Michaëlsson K, Sandén B; Uppsala, Sweden
16.07-16.12  32  Five-year outcomes following minimally invasive transforaminal lumbar interbody fusion for spondylolisthesis and degenerative lumbar disease  
Park Y, Ha JW, Lee YT, Sung NY; Goyang, South Korea

16.14-16.19  33  MIS-TLIF reduces an incidence of adjacent disc disease in the patient with degenerative spondylolysthesis – Comparative study with conventional TLIF  
Ishii K, Hosogane N, Ishihara S, Kaneko Y, Hikata T, Iwanami A, Watanabe K, Nakamura M, Toyama Y, Matsumoto M; Tokyo, Japan, Kanagawa, Japan

16.21-16.30  Discussion

16.30-16.35  34  Short-segment fixations without fusion for thoracolumbar burst fractures with neurological deficit can preserve thoracolumbar motion without resulting in post-traumatic disc degeneration. A 10-year follow-up study  

16.37-16.42  35  A systematic review of lumbar fusion rates with and without the use of RHBMP-2  
Healy AT, Galimberti F, Lubelski D, Wang T, Abdullah KG, Benzel EC, Mroz TE; Cleveland, Ohio, Durham, North Carolina, USA

16.44-16.49  36  Early versus late initiation of rehabilitation after lumbar spinal fusion – economic evaluation alongside a RCT  
Oestergaard LG, Christensen FB, Nielsen CV, Bünger CE, Fruensgaard S, Sogaard R; Aarhus, Denmark, Silkeborg, Denmark, Odense, Denmark

16.51-17.00  Discussion

17:00  FIRST BUSINESS MEETING
SESSION #7
07.45-08.45

SPECIAL POSTER SESSION #1

SESSION #8
TOPIC: EPIDEMIOLOGY/STATISTICS
Moderators: Federico Balagué and Anne Mannion

09.00-09.05  37 Epidemiology of lumbar canal stenosis: a population-based study in Japan
Yabuki S, Fukumori N, Sekiguchi M, Takegami M, Otani K, Wakita T, Kikuchi S, Onishi Y,
Fukuhara S, Konno S; Fukushima Japan, Kyoto Japan, Kansai Japan

09.07-09.12  38 The prevalence of radiographic lumbar spinal stenosis and its associated clinical
symptoms in a population-based cohort: the Wakayama Spine Study
Ishimoto Y, Yoshimura N, Muraki S, Yamada H, Nagata K, Hashizume H, Takiguchi N,
Minamide A, Oka H, Akune T, Yoshida M; Wakayama, Japan

09.14-09.19  39 Prevalence and distribution of intervertebral disc degeneration in the spine in a
population-based cohort: the Wakayama Spine Study
Teraguchi M, Hashizume H, Yamada H, Muraki S, Yoshimura N, Yoshida M;
Wakayama, Japan

09.21-09.30 Discussion

09.30-09.35  40 The prevalence of concomitant osteoporosis and lumbar spinal stenosis and its
association with low back pain and health-related quality of life
Hashizume H, Yoshimura N, Ishimoto Y, Nagata K, Akune T, Oka H, Muraki S,
Takiguchi N, Yamada H, Yoshida M; Wakayama, Japan, Tokyo, Japan

09.37-09.42  41 The fate of prospective spine studies posted on www.clinicaltrials.gov
Ohnmeiss DD; Texas, Dallas, USA

09.44-09.49  42 What score on the Oswestry Disability Index indicates a satisfactory
symptom state?
Fairbank JC, Van Hooff ML, Mannion AF; Oxford, UK, Nijmegen, The Netherlands,
Zürich, Switzerland

09.51-10:00  Discussion

10.00-10.30 COFFEE
SESSION #9

INVITED LECTURE # 2
Moderators: Michelle Battie and Peter Robertson

10.30-10.55 Basic statistics for clinical research
Kevin Spratt, Lebanon NH, USA

10.55-11.00 Discussion

11.00-11.40 HARRY FARFAN PRESIDENTIAL LECTURE

Introduction – Kazuhisa Takahashi

Title: Molecular Mechanism of Pain
Guest Speaker: Professor Koichi Noguchi, MD, PhD,
Hyogo College of Medicine, Japan

11.40-12.20 Presidential Address – Kazuhisa Takahashi

Introduction – Tom Oxland

13:00 AFTERNOON OUTING

THURSDAY MAY 16

SESSION #10

TOPIC: COMPLICATIONS
Moderators: Richard Deyo and Shin-ichi Kikuchi

07.30-07.35 43 Adverse events in spine surgery: A 9 month prospective analysis
Zhou H, Egge N, Harrigan M, Lari H, Eck J, Connolly P, Dipaola C; Massachusetts, USA

07.37-07.42 44 Analysis of prospective multicenter surveillance data on spine surgery surgical site infection

07.44-07.49 45 Venous thromboembolism after spine surgery
Schairer W, Pedtke A, Hu S; San Francisco, CA, USA

07.51-08.00 Discussion
08.00-08.05   46  Is surgical specialty associated with 90-day re-operations following lumbar spine fusion? Findings from Medicare  
Keeney BJ, Martin BI, Mirza SK; Dartmouth, USA

08.07-08.12   47  Complications of anterior and posterior lumbar fusion with bone morphogenic proteins  
Fineberg S, Oglesby M, Patel A, Pelton M, Singh K; Chicago, IL, USA  
Maywood, IL, USA

08.14-08.19   48  Post-traumatic stress symptoms following elective lumbar arthrodesis are associated with reduced clinical benefit  
Hart R, Perry E, Hiratzka Sm Kane M, Desserth K; Portland, OR, USA

08.21-08.30   Discussion

08.30-08.35   49  Adjacent segment disease after instrumented posterolateral fusion for single level degenerative lumbar spondylolisthesis: Is local sagittal alignment associated with its development?  
Ataka H, Tanno T, Miyashita T; Chiba, Japan

08.37-08.42   50  A comparison of biofilm formation in various metal materials  

08.44-08.49   51  Predictors of failure of nonoperative management of spinal epidural abscesses  
Harris MB, Kim S; Boston, MA  USA

08.51-09.00   Discussion

SESSION #11   GENERAL POSTER SESSION, ODD NUMBERS  
09.00-09.30

SESSION #12   GENERAL POSTER SESSION, EVEN NUMBERS  
09.30-10.00

10.00-10.30   COFFEE
SESSION #13  Fellowship Award Ceremony

10.30-11.00  Moderator : Tom Oxland
Introduction of Fellowships – Tommy Hansson

Announcement MacNab/LaRocca Fellowship for 2013
MacNab LaRocca Fellowship Report 2012 by Pedro Henrique Isoldi Pohl

Announcement of Globus Fellowship for 2013
Globus Fellowship Report 2012 by Taopheeq Rabiu

Introduction of International Fellow for 2013

Presentation of Spine Young Investigators Award by Scott Boden
Title: How Safe is Lateral Lumbar Interbody Fusion for the Surgeon?
A Prospective in-vivo Radiation Exposure Study

Fadi Taher

SESSION #14  THE ISSLS PRIZE PAPERS
Sponsored by DePuy Synthes Spine

11.00-11.10  Introduction and Award Ceremony
Moderator - Dr Gunnar Andersson

11.10-11.20  52 ISSLS PRIZE – BIOLOGY
Link Protein Peptide (LPP) stimulates chondrocyte matrix synthesis by human intervertebral disc cells with minimal effect on osteogenic genes
Wang Z, Hutton WC, Yoon ST; Atlanta, GA, USA

11.20-11.30  Discussion

11.30-11.40  53 ISSLS PRIZE – CLINICAL/BIOMECHANICS
The anatomy of failure in lumbar disc herniation - an in-vivo, multi-modal, prospective study of 181 subjects
Rajasekaran R, Bajaj N, Tubaki V, Kanna R, Shetty AP; Tamil Nadu, India

11.40-11.50  Discussion

11.50-13.10  LUNCH
### SESSION #15  TOPIC: SURGERY

**Moderators:** James Kang and S Rajasekaran

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentations</th>
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| 13.10-13.15 | A comparison of spinal fusion and non-operative treatment in patients with chronic low back pain: an average 11-year follow-up of three randomized controlled trials  
Mannion AF, Brox JI, Fairbank JC; Zürich, Switzerland, Oslo, Norway, Oxford, UK |
| 13.17-13.22 | Nutritional status in patients undergoing elective spine procedures  
Zhou H, Eck J, Lapinsky A, Connolly P, DiPaola C; Massachusetts, USA |
| 13.24-13.29 | Long-term evaluation of re-operation rates for lumbar total disc replacement and fusion: analysis of 1,237 patients  
Blumenthal SL, Guyer RD, Ohnmeiss DD, Zigler JE; Dallas, Texas USA |
| 13.31-13.36 | The impact of different health dimensions on overall quality of life related to kyphoplasty and non-surgical management  
Borgstrom F, Strom O, Boonen S, Wardlaw D, Miltenburger C; Stockholm, Sweden, Leuven, Belgium, Aberdeen, UK, Switzerland |
| 13.38-13.50 | **Discussion** |
| 13.50-13.55 | The appropriateness of surgery for lumbar degenerative spondylolisthesis  
Porchet F, Pittet V, Becker H-J, Steiger F, Vader J-P, Mannion AF and the Zurich Appropriateness of Spine Surgery (ZASS) Group; Zürich, Switzerland, Lausanne, Switzerland |
| 13.57-14.02 | Five-year follow-up of a prospective, randomized FDA IDE trial comparing two lumbar total disc replacements: clinical outcome and serum ION level analysis for a metal-on-metal device  
Guyer RD, Blumenthal SL, Pettine K, Dimmig T, Coric D, Cappuccino A, Roh J; Plano, TX, Loveland, CO; Durham, NC, Charlotte, NC, Lockport, NY, Seattle, WA |
| 14.04-14.09 | 7-10 year follow-up of 2-level Prodisc-L vs. fusion at one institution  
Balderston RA, McIntosh TC; Philadelphia, PA, USA |
| 14.11-14.20 | **Discussion** |
SESSION #16        TOPIC: PSYCHOSOCIAL
Moderators: Margareta Nordin and Gwendolyn Sowa

14.20-14.25  61  Potential risk factors of persistent low back pain developing from mild low back pain in Japanese workers
*Matsudaira K, Kikuchi N, Inuzuka K, Arisaka M, Miyoshi K, Konishi H; Japan*

14.27-14.32  62  Relationship between depression and acute low back pain at first medical consultation, three, and six weeks of primary care
*Melloh M, Käser A, Elfering A; Nedlands, Australia, Berne, Switzerland*

14.34-14.39  63  The relationship of workers compensation status, psychological profiles, and clinical outcome: Results of a prospective, multicenter study
*Block AR, Ben-Porath Y, Marek R, Ohnmeiss DD, Guyer RD; Plano, TX, Kent, OH, USA*

14.41-14.50  Discussion

14.50-14.55  64  Psychosocial stress is associated with onset of low back pain with disability in college students: a longitudinal study before and after the disaster in Fukushima
*Kato K, Sekiguchi M, Nikaido T, Otoshi K, Matsuo Y, Kikuchi S, Konno S; Fukushima, Japan*

14.57-15.02  65  Effect of preoperative fear avoidance beliefs (FABQ) on two-year postoperative outcome in lumbar spinal stenosis (LSS).
*Vanhanen S, Sinikallio S, Aalto T, Pakarinen M, Lehto S, Viinamäki H, Airaksinen O; Kuopio, Finland*

15.04-15.09  66  Depression as a prognostic factor of lumbar spinal stenosis: A systematic review
*McKillop AB, Battié MC, Carroll LJ; Edmonton, AB, Canada*

15.11-15.20  Discussion

15.20-15.50  COFFEE
SESION #17  DEBATE

Moderators: Scott Boden and Jeremy Fairbank

Title: Physical Rehabilitation for Low Back Pain disorders has FAILED to deliver on its promise of improved outcomes for these patients.

15.50-16.05 Proposer: Tommy Hansson
16.05-16.20 Opposer: Hamilton Hall
16.20-16.30 Discussion

Title: BMP is the new gold standard for spine fusion

16.30-16.45 Second Proposer: Harry Herkowitz
16.45-17.00 Second Opposer: Brian Freeman
17.00-17.10 Discussion

17.10 SECOND BUSINESS MEETING

ISSLS BANQUET

FRIDAY MAY 17

SESSION #18  SPECIAL POSTER SESSION # 2

07.45-08.45

SESSION #19  TOPIC: OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURE

Moderators: Helena Brisby and Serena Hu

09.00-09.05  67 Mortality and morbidity for operated and non-operated vertebral compression fracture patients (osteoporotic and non-osteoporotic) in the U.S. medicare population
Ong KL, Edidin AA, Lau E, Kurtz SM; Philadelphia, PA; Sunnyvale, CA; Menlo Park, CA USA

09.07-09.12  68 Survival and cost comparison of balloon kyphoplasty (BKP) and vertebroplasty (PVP) using German claims data
Lange A, Alvares L, Sauermann S, Kasperk C, Braun S; Hannover, Germany; Switzerland; Heidelberg, Germany; Hannover, Germany
09.14-09.19  69  Differences between cases with bone union and cases with intravertebral cleft following osteoporotic vertebral fractures
Yasuda H, Hoshino M, Tsujio T, Terai H, Toyoda H, Suzuki A, Dohzono S, Matsumoto T, Nakamura H; Osaka, Japan

09.21-09.30  Discussion

09.30-09.35  70  Comparison of pedicle screw loosening in lumbar spinal fusion surgery in postmenopausal women with osteoporosis among treatment of teriparatide, bisphosphonate and control. aspect form bone quality

09.37-09.42  71  Role of weekly administered teriparatide in bony union enhancement after posterior lumbar interbody fusion for osteoporosis-associated lumbar degenerative disorders:
A prospective, randomized multicenter study
Haro H, Ebata S, Takahashi J, Hasegawa T, Hirabayashi H, Matsuyama Y; Japan

09.44-09.49  72  Effect of RH-PTH 1-34 versus bisphosphonate on the union rate of osteoporotic vertebral fractures
Iwata A, Kanayama M, Hashimoto T, Shigenobu K, Oha F, Onishi T, Tanaka M; Japan

09.51-10:00  Discussion

10.00-10.30  COFFEE

SESSION #20  INVITED LECTURE #3
Moderators: Tommy Hansson and David Wong

10.30-10:55  General overview of treatments for osteoporotic VCF with the reviews of the literature
Douglas Wardlaw

10:55-11:00  Discussion
SESSION #21  TOPIC: LUMBAR SPINAL STENOSIS
Moderators: Mohammed Mossaad and Tim Yoon

11.00-11.05  73  The impact of pain on function and Health Related Quality of Life in Spinal Stenosis Syndromes. A Register Study of 14,821 patients.
Sigmundsson FG, Jönsson B, Strömqvist B; Malmö, Sweden

11.07-11.12  74  Is the sedimentation sign associated with spinal stenosis surgical treatment effect in sport?
Moses RA, Zhao W, Staub L, Melloh M, Barz T, Lurie JD; Lebanon, NH; Camperdown NSW, Australia; Nedlands, Australia; Schwedt, Germany

Sandella DE, Haig AJ, Yamakawa KSJ, Tomkins-Lane CC; Michigan, USA Mount Royal, Canada

11.21-11.30  Discussion

11.30-11.35  76  Exposure of the paravertebral muscles affects clinical outcomes in patients with multi-levels lumbar spinal stenosis
Kawakami M, Nakao S, Fukui D, Miyamoto E, Kinoshita Y, Matsuoka T; Wakayama, Japan

11.37-11.42  77  Interspinous spacers compared to decompression or fusion for lumbar stenosis: Complications and repeat operations in the medicare population
Deyo RA, Martin BI, Ching A, Tosteson ANA, Jarvik JG, Kreuter W, Mirza SK; Washington and Dartmouth, USA

11.44-11.49  78  X-stop versus decompressive surgery for lumbar neurogenic claudication - a randomized controlled trial with two-years follow-up
Strömqvist B, Berg S, Gerdhem P Johnsson R, Möller A, Sahlibrand T, Soliman A, Tullberg T; Lund Sweden

11.51-12.00  Discussion

12.00-12.20  Announcement – Best Paper and Poster Awards
Moderator: Kazuhiro Chiba

Closing Remarks – Jeremy Fairbank
**SPECIAL POSTER SESSION #1**

**WEDNESDAY, MAY 15, 2013 AT 07:45 - 08:45**

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**A. LOW BACK PAIN**

**Moderators: Finn Bjarke Christensen and Shin-ichi Konno**

**SP1.** Outcomes: Just ask the right question to hear what you want to hear!  
*Mannion AF, Fairbank JC; Zürich, Switzerland, Oxford UK*

**SP2.** Dynamic surface electromyography topography: A new assessment tool for low back pain rehabilitation  
*Hu Y, Kwok JWL, Tse JYH, Luk KDK; Hong Kong*

**SP3.** Change in pain rating between post-operative and non-operative patients seeking rehabilitation  
*McIntosh G, Hall H, Carter T; Toronto, Canada*

**SP4.** Correlation between low back pain intensity in lumbar spinal stenosis measured using the Japanese Orthopedic Association score and the Visual Analogue Scale  

**SP5.** Biomechanical impact of a positioning intervention: carousel platform for palletizing  
*Ramsey T, Davis K, Kotowski S, Marras W; Cincinnati OH, USA*

**SP6.** Incidence of disc degeneration of the thoracic spine and its effect on the spinal canal and the motion unit in symptomatic patients  
*Suzuki A, Daubs MD, Hayashi T, Aghdasi B, Montgomery SR, Phan K, Scott TP, Nakamura H, Wang JC; Los Angeles, CA*

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**B. BIOMECHANICS**

**Moderators: Keith Luk and Jill Urban**

**SP7.** Intervertebral disc decompression following endplate damage: Implications for disc degeneration depend on spinal level and age  
*Dolan P, Luo J, Pollintine P, Landham PR, Stefanakis M, Adams MA; Bristol UK, Roehampton UK, Cyprus*

**SP8.** A new numerical method based on contrast-enhanced MRI to investigate the transport properties of healthy and degenerated vertebral endplates  
*Galbusera F, Tibiletti M, Brayda-Bruno M, Neidlinger-Wilke, Wilke H-J; Ulm Germany, Milan Italy*
C. DISC DEGENERATION

Moderators: Seiji Ohtori and Nam Vo

SP13. Assessment of the neurocentral synchondrosis in pediatric spines and the “developmental” etiology of Schmorl’s nodes
Luk K, Law T, Khong PL, Portia-Anthony M, Samartzis D; Hong Kong, SAR China

SP14. How far into a degenerated annulus can blood vessels and nerves penetrate?
Lama P, Stefanakis M, Sychev I, Summers B, Harding IJ, Dolan P, Adams MA; Bristol UK

SP15. COX-2 inhibitor inhibit axonal growth of rat sensory neurons cocultured with injured intervertebral disc in vitro

SP16. The role of diabetes type I in intervertebral disc degeneration
Russo F, Ngo K, Yurube T, Vadala G, Dong Q, Fan Y, Massimo T, Sowa G, Kang J, Vo N; Rome Italy, Pittsburgh USA

SP17. Loss of notochordal cells triggers extracellular matrix degradation in a rat tail temporary static compression-induced disc degeneration model
Hirata H, Yurube T, Kakutani K, Maeno K, Takada T, Yamamoto J, Kurakawa T, Miyazaki S, Kurosaka M, Nishida K; Kobe, Japan

SP18. Tissue-engineered allograft intervertebral disc transplantation for the treatment of degenerative disc disease: experimental study in a beagle model
Ruan DK, Xin HK, Zhang C, Wang D, Shi Z, Gu T, Wang CF, Wu J, Zhang Y, He Q; Beijing, P R. China
D. PAIN MECHANICS
Moderators: Mamoru Kawakami and Dino Samartzis

SP19. Local placement of clonidine pellet reduced neuropathic pain in a rat facet joint arthritis model
Yamaguchi T, Fujiwara T, Lenz ME, Marx J, Wilsey JT, McKay WF, Masuda K; San Diego, CA, USA, Kyoto, Japan

SP20. Mechanistic assessment of allodynia and gait disturbance in a nicotine-induced intervertebral disc degenerative rat model; An approach using various pharmacological agents
Okada T, Shoji S, Abe K, Numazawa T, Masuda K, Naiki M; Hyogo, Japan, San Diego, La Jolla, USA

SP21. Activation of astrocytes and microglia in the C3–T4 dorsal horn by lower trunk avulsion in a rat model of neuropathic pain
Iwasaki R, Matsuura Y, Ohtori S, Suzuki T, Kuniyoshi K, Takahashi K; Chiba, Japan

SP22. Therapeutic efficacy of pregabalin in patients with leg symptoms due to lumbar spinal stenosis second report: One-year follow-up
Takahashi N, Arai I, Kayama S, Ichiji K, Fukuda H, Handa J, Munakata Y, Konno S; Koriyama City, Japan, Fukushima City, Japan

SP23. Gender difference of symptom severity in lumbar spinal stenosis: role of pain sensitivity
Kim HJ, Chang BS, Lee CK, Yeom JS; Seoul, Korea

SP24. Attempting to understand the temporal relationship between lumbar muscle inflammation and perceived low back pain
Kotowski S, Davis K, Lemen L; Cincinnati USA

E. DIAGNOSIS/IMAGING
Moderators: Josef Assheuer and Marek Szpalski

SP25. Predictors of dynamic instability in degenerative spondylolisthesis
Lee JYB, Slikker III W, Siemionow K, Espinoza Orías AA, An HS; Chicago, Illinois USA

SP26. Hip-spine syndrome (complex, misdiagnosed): underdiagnosed hip osteoarthritis
Morimoto T, Tsukamoto M, Shiraki M, Yoshihara T, Sonohata M, Mawatari M; Saga Japan

SP27. Improved diagnostic accuracy of lumbar foraminal stenosis by use of three dimensional MR imaging: Comparison with conventional MR imaging

SP28. In vivo MRI measurement of spinal cord displacement in the thoracolumbar region: Part 1 - Straight Leg Raise Test
Rade M, Könönen M, Vanninen R, Shacklock M, Kankaanpää; Kuopio, Finland, Adelaide, Australia, Tampere, Finland
SP29. Improved diagnostic accuracy of lumbar foraminal stenosis by use of three dimensional MR imaging: Comparison with conventional MR imaging

SP30. In vivo MRI measurement of spinal cord displacement in the thoracolumbar region: Part 1 - Straight Leg Raise Test
Rade M, Könönen M, Vanninen R, Shacklock M, Kankaanpää; Kuopio, Finland, Adelaide, Australia, Tampere, Finland
F. FUSION
Moderators: Osamu Shirado and Douglas Wardlaw

SP31. Should the presence of back pain be considered when making surgical decisions for lumbar spinal fusion?
Aoki Y, Nakagawa K, Nakajima A, Shibata Y, Sonobe M, Takahashi H, Taniguchi S, Furufu T, Ohtori S, Takahashi K; Chiba, Japan

SP32. Indication of fusion using the intraoperative segmental motion measurement system for lumbar canal stenosis ~ a prospective study ~
Hasegawa K, Shimoda H, Ishii K, Homma T; Niigata Japan

SP33. Acceleration of lumbar posterolateral fusion using a collagen-binding domain fused with BFGF and allografting in a rat model

SP34. Radiological assessment of lumbar spinal fusion: Radio-stereometric assessment versus computed tomography in a large animal model
Humadi AH, Freeman BJC, Callary S, Moore R, Haldin K, Hall DJ, Fraser RD; Adelaide, Australia

SP35. The effect of platelet-rich plasma (PRP) on posterolateral fusion (PLF) in a rat model

SP36. Surgical management of degenerative lumbar spondylolisthesis: A comparative study of 5-year outcomes following decompression with fusion and microendoscopic decompression
Aihara T, Hatakeyama K, Urushibara M, Ouchi J; Funabashi-city, Japan

G. RISK FACTORS
Moderators: Cody Bünger and Koichi Sairyo

SP37. Risk factors for severity of symptoms in patients with lumbar spinal stenosis
Takeshita K, Takebayashi T, Kimiaki SK, Hara N, Fujii T, Yamashita T, Nagata K, Takahashi K
SP38. Scoliosis is a risk factor for gastroesophageal reflux disease in adult spinal deformity

SP39. Decompressive surgery reduced risk of falling more significantly in patients with lumbar spinal stenosis compared with conservative treatment
Lee BH, Lee SH, Lee HM, Kim HS, Moon SH

SP40. Depressive burden is associated with a poorer 5-year surgical outcome in lumbar spinal stenosis
Pakarinen M, Vanhanen S, Sinikallio S, Aalto T, Lehto S, Viinamäki H, Airaksinen O; Kuopio, Finland

SP41. Suboptimal vitamin D increases risk for infection after spine surgery
Metzger MF, Kanim LA, Zhao L, Robinson ST, Delarmarter RB; Los Angeles, CA, USA

SP42. Propionibacterium acnes causes delayed surgical site infection only in the presence of implant

H. SURGERY
Moderators: Hiroaki Nakamura and Jong-Beom Park

SP43. Implementation and impact of pre-operative peer case review in a spine practice
Guyer RD, Shivers J, Ohnmeiss DD, Zigler JE; Plano, TX, USA

SP44. Outcomes following transforaminal endoscopic surgery – two year RCT results
Arthur C and Gibson JNA; Edinburgh, Scotland

SP45. Clinical and radiographic long-term results of peek-non-fusion spine implants
Melloh M, Barz T, Staub LP, Buller C, Lord SJ, Merk HR; Nedlands, Australia, Schwedt/Oder, Germany, Sydney, Australia, Greifswald, Germany

SP46. Outcomes of anterior, posterior, and circumferential lumbar fusions
Fineberg S, Oglesby M, Patel A, Pelton M, Singh K; Chicago, IL, Maywood, IL, USA
SP47. Curve progression after decompression surgery in patients with mild degenerative lumbar scoliosis
Hosogane N, Watanabe K, Kono H, Saito M, Toyama Y, Matsumoto M; Tokyo, Japan, Gunma, Japan

SP48. Prospective, randomized, multicenter study comparing the clinical outcomes of two minimally invasive interspinous devices for the treatment of lumbar spinal stenosis
Bradley W, Whang PG; Denton, TX, New Haven, CT, USA

I. OSTEOPOROSIS/AGING SPINE
Moderators: David Hall and Yoshiharu Kawaguchi

SP49. Foraminal stenosis caused by osteoporotic vertebral compression fracture of the lumbar spine
Toki S, Nagamachi A, Takahashi Y; Mitoyo, Japan

SP50. Effect of prevalent vertebral fractures on the occurrence pattern of new vertebral fractures - A population-based cohort study-
Akeda A, Kato T, Nishimura A, Murata K, Sudo A; Mie, Japan

SP51. Teriparatide accelerates lumbar posterolateral fusion in women with postmenopausal osteoporosis: Prospective study

SP52. Acute vertebral fracture at the fused segment after lumbar fusion surgery in elderly patients with osteoporosis
Sainoh T, Nobukiyo M, Aoki M, Orita S, Ohtori S, Takahashi K, Kawaguchi Y; Chiba, Japan

SP53. Incidence rate and primary diagnostic accuracy of occult vertebral fracture in aged women complaining of acute low back pain
Terakado A, Orita S, Kubota G, Kanzaki T, Mori H, Shinohara Y, Ohtori S, Takahashi K; Chiba, Japan

SP54. Aging-associated changes in paraspinal muscles and psoas muscles
Kita T, Takayama K, Kanematsu F, Yasunami T, Ikeda S, Kyo Y, Skanaka H, Yamano Y; Osaka, Japan
J. LUMBAR SPINAL STENOSIS
Moderators: Yong Hai and Björn Strömqvist

SP55. Fall and lumbar spinal stenosis in the communitys
Otani K, Kikuchi S, Yabuki S, Nikaido T, Watanabe K, Kato K, Konno S; Fukushima City, Japan

SP56. Visually assessed severity of lumbar spinal canal stenosis is paradoxically associated with leg pain and objective walking ability

SP57. Prevalence of vitamin D deficiency in patients with lumbar spinal stenosis and its relationship with pain
Kim TH, Lee SH, Lee BH, Park JO, Kim HS, Lee HM, Moon SH; Korea

SP58. Conservative and surgical treatment improves pain and ankle-brachial index in patients with lumbar spinal stenosis

SP59. Surgical decompression of lumbar spinal stenosis normalizes impairment in objective measures of physical activity: a case-control study
Smuck M, Matthew P, Buman MP, Martinez A, Haskell WL, Kao MCI; Redwood City CA, Phoenix AZ, Palo Alto CA, Redwood City CA, USA

SP60. The effect of decompression surgery on low back pain with lumbar spinal stenosis: Analysis from the symptom caused by gait-loading test
Nikaido T, Kikuchi S, Yabuki S, Otani K, Watanabe K, Kato K, Konno S; Fukushima, Japan
GP1  Suitability evaluation of restoring the intervertebral disc mechanics in treating osteoporotic vertebral fracture using kyphoplasty with PMMA or Calcium-P based cement
Lo HJ, Chen HM; Taipei City, Taiwan

GP2  Assessment of pain behavior in a rat model of intervertebral disk injury using the catwalk gait analysis system

GP3  Hypertrophy of the ligament flavum in degenerative lumbar stenosis associated with the increased expression of fractalkine (CX3CL1)/CX3CR1 chemokine
Oh IS, Sur DW, Ha KY; Seoul, Korea

GP4  Comparative study of lumbar intervertebral disc biomechanical characteristics with or without hydrogel injection after nucleus discectomy
Manman G, Zhiyu Z, Wenbin D, Xuejun D, Xuenong Z; Sun Yat-sen, China

GP5  Spino-pelvic-rhythm in normal subjects and high-class athletes who overcame chronic low back pain
Hasebe K, Sairyo K, Hada Y, Dezawa A, Okubo Y, Kaneoka K, Nakamura Y; Kawasaki Japan, Waseda Japan, Kawasaki Japan, Saitama Japan

GP6  Novel two-component interbody fusion device improves bone-implant interface without compromising stability: a cadaver study
Wilke H-J, Volkheimer D, Robie B, Christensen FB; Ulm Germany, Risskov Denmark, Aarhus Denmark

GP7  Biomechanical characterization of a novel low-stiffness posterior spinal implant under anterior shear loading in a degenerative spinal model
Melnyk AD, Chak JD, Singh V, Kelly A, Cripton PA, Fisher CG, Dvorak MF, Oxland TR; Vancouver BC Canada, Memphis TN USA

GP8  Effects of sequential unilateral facetectomy on cervical spinal stability
Mageswaran P, Tolhurst S, Colbrunn R, Bonner T, Techy F, McLain R; Cleveland OH USA, Chicago, IL, USA

GP9  Does head weight affect cervical spine stability? An in vitro robotic biomechanical study
Mageswaran P, Tolhurst S, Colbrunn R, Bonner T, Techy F, McLain R; Cleveland, OH, USA, Chicago, IL, USA

GP10 Do pedicle screws that have breached the pedicle wall provide stronger purchase as compared to smaller pedicle screws placed intra cortex?
Higashino K, Goda Y, Daisuke S, Kobayash T, Matsuura T, Fujimiya M, Hutton WC, Yasui N; Tokushima, Japan, Sapporo, Japan, Hokkaido, Japan, Atlanta, Georgia, USA
GP11 Biomechanical effect of the progression of disc degeneration at L5/S1 on adjacent discs in a lumbar spine  
Natarajan RN, Andersson GBJ; Chicago, IL, USA

GP12 Investigation of equivalent stress of adjacent vertebrae after balloon kyphoplasty by a CT-based finite element method  
Iwakura N, Matsuura M, Shiba M, Wada K, Murata Y, Kato Y; Tokyo, Japan, Chiba, Japan

GP13 Histomorphometric and radiographic changes after wallis implantation in rats  
Melloh M, Barz T, Lange J, Staub LP, Merk HR, Klöting I, Follak N; Nedlands, Australia, Schwedt/Oder, Germany, Greifswald, Germany, Sydney, Australia, Magdeburg, Germany

GP14 Biomechanical analysis of the thoracic spine following decompressive procedures  
Healy AT, Lubelski D, Mageswaran P, Mroz T; Cleveland, OH, USA;

GP15 3D-CT simulation study of the iliac screw for the firm fixation  
Otsuki B, Fujibayashi S, Takemoto M, Izeki M, Matsuda S; Kyoto, Japan

GP16 Is there an association between abdominal muscles and degenerative spondylolisthesis?  
Tcherveniakov P, Fraser R, Freeman BJC, Jones CF; Adelaide, Australia

GP17 Muscle injury in rats induces up-regulation of inflammatory cytokines in muscle and pain-related neuropeptides in dorsal root ganglia innervating muscle. -the pathological-mechanism of continuous muscle pain-  

GP18 Carbon nanotube-reinforced calcium phosphate cement for drug delivery in multiple myeloma bone disease treatment  
Lin B, Zhou H, Bhaduri S, Leaman D, Goel V, Agarwal A; Toledo, OH, USA

GP19 Biomechanical contribution of transverse connectors in the setting of a thoracic pedicle subtraction osteotomy  
Tracey RW, Paik H, Lehman Jr. RA, Kang DG, Cody JP, Cardoso MJ, Dmitriev AE; Bethesda, MD USA

GP20 The biomechanical consequences of rod reduction following thoracic ponte osteotomy and lumbar facetectomy  

GP21 Tapping insertional torque predicts better pedicle screw fixation and optimal screw size selection  
Tracey RW, Helgeson MD, Kang DG, Lehman Jr RA., Cody JP, Dmitriev AE; Bethesda, MD USA

GP22 A novel load sharing lumbar interbody fusion device (Interplate®) provides better stability compared to the pedicle screw system  
Palepu V, Kodigudla M, Aakash A, Dhanvin D, Goel VK, Moran J; Toledo, OH Cleveland, OH, USA

GP23 Initial results of a five-year in vivo longitudinal study on lumbar segmental axial motion and low back pain  
Oshita Y, Espinoza Orías AA, Andersson GBJ, An HS, Inoue N.; Chicago, IL. USA
GP24  Failure under cyclic loading in a lumbar disc shifts from inner annulus layers to peripheral annulus with increasing disc degeneration  
Qasim M, Natarajan RN, An H, Andersson GBJ; Chicago, IL, USA

GP25  In vivo characterization of the 3D lumbar foramen geometry  
Senoo I, Espinoza Orías AA, Park DK, Andersson GBJ, An HS, Inoue N; Chicago, IL, USA

GP26  Changes in nucleus pulposus MRI signal inhomogeneity show disc degeneration progress  
Yang S-H, Espinoza Orías AA, Pan C-C, Senoo I, Andersson GBJ, An HS, Inoue N; Chicago, IL, USA

GP27  The effect of difference in hamstrings flexibility on lumbo-pelvic rhythm  
Matsunaga N, Okubo Y, Kaneoka K; Waseda, Japan Saitama, Japan

GP28  Effect of mental stress on low back load while lifting an object  
Katsuhiro J, Matsudaira K, Iwakiri K, Maruyama H; Otawara Japan, Kanagawa Japan

GP29  Biomechanical analysis of fusion segment rigidity upon stress at both the fusion and adjacent segments - a comparison between unilateral and bilateral pedicle screw fixation  
Kim HJ, Kang KT, MSb, Park JH, Yeom JS, Chang BS, Lee CK; Seoul, Korea

GP30  In vivo response to a paraspinous tension band device with titanium coil. An ovine implantation study  
Ehrhart EJ, Fielding L, Santoni AL, Santoni BG, Puttlitz CM, Ruehlman DR, Seim III HB, Turner AS; Fort Collins, CO, San Carlos, CA, Tampa, FL

GP31  Instability of posterior vertebral wall causes canal encroachment in the elderly with vertebral pseudoarthrosis  
Hayashi T, Maeda T, Mori E, Ueta T, Yugue I, Kawano O, Takao T, Sakai H, Masuda M, Morishita Y, Shiba K; Fukuoka, Japan

GP32  Development of a novel percutaneous guide wire (S-Wire™) for percutaneous pedicle screw insertion –its efficacy and safety–  
Ishii K, Ishihara S, Kaneko Y, Iwanami A, Hikata T, Hosogane N, Watanabe K, Nakamura M, Toyama Y, Matsumoto M; Tokyo, Japan, Kanagawa, Japan

GP33  Finite element analysis for comparison of supraspinous osteotomies technique with conventional laminectomy  
Kim HJ, Kang KT, Lee CK, Chang BS, Yeom JS; Seoul Korea

GP34  Correlation between intradiscal pressure and disc height: effect of follower load and rotation  
Bell KM, Yan Y, Dugan T, Kang JD; Pittsburgh, USA

GP35  In vivo MRI measurement of spinal cord displacement in the thoracolumbar region: Part 2 - comparison between unilateral and bilateral straight leg raise tests  
Rade M, Könönen M, Vanninen R, Shacklock M, Kankaanpää M, Airaksinen O; Kuopio, Finland, Adelaide, Australia, Tampere, Finland

GP36  Three dimensional assessment of lumbar facet joint tropism in asymptomatic and low back pain subjects  
Huh J-S, Espinoza Orías AA, Otsuka Y, Simon P, An HS, Andersson GBJ, Inoue N; Chicago, IL, USA
GP37 Modic changes follow bone remodeling principles
Agarwal A, Kaul V, Goel VK, Agarwal AK; Toledo, OH, USA

GP38 Changes in endplate thickness after disc herniation – a biomechanical perspective
Agarwal A, Goel VK, Agarwal AK; Toledo, OH, USA

GP39 Effect of an interspinous implant on in vivo dynamic lumbar spine stiffness and biplanar intersegmental motion
Szpalski M, Fabeck LG, Gunzburg R, Colloca CJ, McAviney J, Afifi M, Moore RJ, Freeman BJ; Brussels, Belgium; Tempe, Arizona, USA; Sydney, Australia; Calgary, Alberta, Canada; Adelaide, Australia

GP40 T2 values of human lumbar discs: template-based segmentation and variations with age, sex and level
Bae WC, Yamaguchi T, Pichika R, Lenz ME, Fujiwara T, Bydder GM, Mausda K; San Diego, CA, USA; Kyoto, Japan

GP41 Shear stiffness of baboon intervertebral disc assessed by MR elastography
Ben-Abraham Ei, Chen J, Ehman RL; Rochester, Minnesota USA

GP42 Ex-vivo response of spinal cartilaginous tissues to flexion-extension of rabbit functional spinal unit
Hartman RA, Bell KM, Yurube T, Vo NV, Kang JD, Sowa GA; Pittsburgh, PA, USA

GP43 Empty

GP44 Static and dynamic compressive characterization of lumbar intervertebral discs of the adult New Zealand white rabbit following in vivo degeneration or ex vivo annular puncture
Taborek AP, Chen AC, Yamaguchi T, Nguyen QT, Inoue N, Sah RL, Masuda K; La Jolla, CA, USA, Kyoto, Japan

GP45 In vivo three-dimensional lumbar kinematics: differences between static and dynamic measurements
Anderst W, Aiyangar A, Zheng L, Kang J, Zhang X; Pittsburgh USA

GP46 Optical coherence tomographic elastography measures inhomogeneous strain in annulus fibrosus loaded in shear
Kuy Han SK, Chen CW, Chou CC, Chen Y, Hsieh A; College Park, MD, Baltimore, MD, USA

GP47 Directed vertebroplastic cement injection at lytic metastatic lesion restores strength with minimum cement volume
Truumees E, Kiapour AM, Goel VK, Demetropoulos CK; Austin, TX Toledo, OH, USA

GP48 Genome-wide pain-, nerve- and neurotrophin-related gene expression in the degenerating human annulus
Gruber HE, Hoelscher GL, Ingram JA, Hanley EN; Charlotte, NC USA

GP49 Matrix metalloproteinase-12, macrophage metalloelastase, is constitutively expressed and produced in the human intervertebral disc in vivo
Gruber HE, Hoelscher GL, Ingram JA, Zinchenko N, Bethea S, Hanley EN; Charlotte, NC USA
GP50  Feasibility of NP cell activity upregulation by HTERT gene transfection
Ruan DK, Xin HK, Zhang, C, Wang D, Shi Z, Gu T, Wang CF, Wu J, Zhang Y, He Q; Beijing, P R. China

GP51  Injection of Bupivacaine into disc space to detect painful nonunion after ALIF surgery in patients
with discogenic low back pain
Takahashi K.; Chiba, Japan

GP52  Molecular interactions between human cartilaginous endplates and nucleus pulposus cells: a
preliminary investigation
M, Ignatius A, Wilke HJ; Ulm, Germany, Stuttgart, Germany, Mainz, Germany, Budapest, Hungary,
Milano, Italy

GP53  Senescent disc cells exhibit severely perturbed matrix homeostasis
Ngo K, Nastol, Sowa G, Kang J, Vo N; Pittsburgh, USA

GP54  Prolyl Hydroxylase 3 (PHD3) modulates catabolic effects of tumor necrosis factor alpha on cells
of the nucleus pulposus through co-activation of nuclear factor kappa B/P65 signaling
Fujita N, Gogate S, Chiba K, Matsumoto M, Toyama Y, Shapiro I, Risbud M; Philadelphia, USA,
Tochigi, Japan, Tokyo, Japan

GP55  Vertebral cartilage endplate lesions: a morphological study to evaluate the effects of
osteoarthritis and disc degeneration in rats
Ding Y, Jiang J, Zhou J, Wu X, Huang Z, Chen J, Zhu Q; Guangzhou, China

GP56  Expression of the tissue renin-angiotensin system in rat and bovine intervertebral discs
Akeda K, Morimoto R, Iida R, Murata K, Sudo A; Mie, Japan

GP57  Signature mirna expression profile of spinal fusion using equine bone protein extract, RHBMP-2
and autograft during the process of anterior lumbar interbody fusion
Zhiyu Z, Chen D, Xuejun D, Gao M, Xuenong Z; Sun Yat-sen China

GP58  Canine notochordal cell-secreted factors protect murine and human nucleus pulposus cells from
apoptosis by inhibition of activated caspases -9, and -3/7
Mehrkens A, Hilario R, Kim S, Karim MZ, Fehlings M, Erwin MW; Toronto, Canada,
Basel, Switzerland

GP59  Ability of T2 mapping and T1 RHO mapping to evaluate lumbar intervertebral disc degeneration
and glycosaminoglycan content of the nucleus pulposus

GP60  The mechanism of the inflammatory responses in the intervertebral disc herniation explored by
coculture model in vitro
Yamamoto J, Maeno K, Takada T, Kakutani K, Yurube T, Zhang Z, Hirata H, Kurakawa T, Shingo M,
Sakai D, Mochida J, Doita M, Kurosaka M, Nishida K; Kobe, Japan, Kanagawa, Japan,
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GP62 The notochordal cell viability affected by dynamic mechanical loading via alpha5/beta1 integrins in rat IVDs

GP63 A quantitative proteomic analysis of the non-chondrodystrophic and chondrodystrophic canine nucleus pulposus
DeSouza L, Karim MZ, Masui O, Maedler M, Mehrkens A, Kim S, Hilario R, Erwin WM; Toronto, Canada

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GP65 Cervical intervertebral disc injury produces up-regulation of TRPV1 and neuropeptides in sensory disc-innervating nerves in rats

GP66 Early loading after thoracolumbar burst fracture aggravates disc degeneration in-vitro
Dudli S, Haschtmann D, Ferguson SJ; Zürich, Switzerland

GP67 Discogenic differentiation of human bone marrow mesenchymal stem cell using adenoviral-hypoxia inducible factor-1A
Kang YM, Kim HJ, Lee BH, Park JO, Lee HM, MOON SH; Seoul, Korea

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Sawaji Y, Alimasi W, Endo K, Suzuki H, Tanaka H, Yamamoto K; Tokyo Japan

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Henriksson HB, Lindahl A, Skioldebrand E, Tängemo C, Mattsson J, Brisby H; Gothenburg, Sweden
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Lama P, LeMaitre C, Spooner L, St Joseph JB, Dolan P, Harding IJ, Adams MA; Bristol UK, Sheffield, UK

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GP76 Pathogenesis of ossification of ligamentum flavum
Naresh-Babu J, Neelima G; Hyderabad, India

GP77 A novel nucleotomy model with intact anulus fibrosus to test intervertebral disc regeneration strategies
Vadalà G, Russo F, Patappa G, Peroglio M, Grad S, Stadelmann V, Alini M, Denaro V; Davos, Switzerland

GP78 The transpedicular approach as new route for intervertebral disc regeneration
Vadalà G, Russo F, Patappa G, Schiuma D, Peroglio M, Grad S, Benneker L, Alini M, Denaro V; Rome, Italy, Bern, Switzerland

GP79 The role of advanced glycation end-products in the degeneration of the intervertebral disc
Tang SY, Morse LJ, Chen L, Sharan AD; St Louis MO, San Francisco, CA, Bronx, NY, USA

GP80 Effect of the non-protein bioactive compound, Neurotropin® on interleukin-1Β-induced expression levels of cytokines, matrix enzymes and pain markers in human intervertebral disc explant cultures
Pichika R, Yamaguchi T, Fujiwara T, Bae WC, Lenz ME, Naiki M, Masuda K; San Diego, CA, Kyoto, Japan, Osaka, Japan

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GP82 Endplate roughness in human lumbar spines: variations with age, level and region
Bae WC, He J, Shieh I, Yamaguchi T, Inoue N, Masuda K; San Diego, CA, USA, Kyoto, Japan

GP83 Intervertebral disc repair using neonatal human dermal fibroblasts in the rabbit model
Chee A, Shi P, Peng C, Cha T, Kao TH, Yang SH, Zhang Y, An HS; Chicago, IL, USA, Boston, MA, USA, Taiwan, Republic of China

GP84 Intervertebral disc cells produce interleukin-8 (il-8) in response to inflammatory stimuli
Zhang Y, Chee A, Shi P, Markova D, Anderson G, Cs-Szabo G, Adams SL, PhD, An HS; Chicago, IL, Philadelphia, PA, USA

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Buchanan S, Gerard D, Zhang Y, Chee A, An HS, Andersson G, Cs-Szabo G; Chicago, IL, USA
GP86 The safety and efficacy of mesenchymal stem cells for prevention or regeneration of intervertebral disc degeneration: a systematic review
Yim RL, Lee J, Vavken P, Samartzis D; Hong Kong, SAR, China, Boston, USA

GP87 Effects of IL-1Beta on axonal outgrowth from adult rat lumbar dorsal root ganglia using a novel 3D culture system
Kim H, Shah SB, Hsieh AH; College Park, USA San Diego, Baltimore, USA

GP88 Novel insights into the hallmarks of human nucleus pulposus cells with particular reference to cell viability, phagocytic potential and long process formation

GP89 Evaluation of non-specific low back pain using a detailed visual analogue scale for patients in motion, standing and sitting: characterizing non-specific low back pain in elderly patients
Aoki Y, Sugiura S, Nakagawa K, Nakajima A, Takahashi H, Ohtori S, Takahashi Ka, Nishikawa S; Chiba, Japan

GP90 Lumbar scoliosis in rheumatoid arthritis -epidemiologic research with a DXA cohort-Makino T, Kaito T, Fujiwara H, Ishii T, Yonenobu K; Osaka, Japan

GP91 Comparison of image quality and radiation exposure from C-arm fluoroscopes when used for imaging the spine
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GP92 Stir MRI and spect bone scan in the evaluation of painful osteoporotic vertebral fractures
Lee LH, Beckingsale TB, Manoj-Thomas A, Sanderson PL; Newcastle, UK

GP93 Development of a computer-based clinical decision support tool for selecting appropriate rehabilitation interventions for injured workers
Gross DP, Zhang J, Steenstra I, Barnsley S, Haws C, Amel T, McIntosh G, Cooper J, Zaiane O; Alberta, Canada, Edmonton, Canada, Toronto, Canada, Calgary, Canada, Manitoba, Canada

GP94 Does performance-based functional capacity evaluation enhance return to work assessment?
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Deyo RA, Smith DHM, Johnson ES, Tillotson CJ, Donovan M, Yang X, Petrik A, Morasco BJ, Dobscha SK; Portland, OR, USA

GP96 Nocturnal pain and/or pain in recumbency of cauda equina tumor
Watanabe M, Sakai D, Nagai T, Hiyama A, Sato M, Mochida J; Tokai, Japan

GP97 Prevalence and characteristics of disk leaks
O’Neill C; San Francisco, CA, USA

GP98 Interspinous ligament lidocaine and steroid injections for the management of baastup’s disease
GP99 Painvision apparatus is effective for assessing low back pain

GP100 The efficacy of spinal nerve root infiltration for lumbar spinal canal stenosis with unilateral radicular symptoms
Tanno T, Ataka H, Miyashita T; Chiba, Japan

GP101 The treatment of nocturnal leg cramps by medial branch blockade of the deep peroneal nerve following lumbar surgery

GP102 Asymmetric Modic Type 1 change and its intradiscal treatment among high-class athletes with low back pain
Kitagawa Y, Sairyo K, Dezawa A; Kawasaki, Japan

GP103 Multi-detector CT-based analysis of pelvic incidence of patients with lumbar spondylolysis
Takata Y, Sakai T, Higashino K, Kato S, Sairyo K; Tokushima, Japan

GP104 Multimodal assessments of efficacy of physical therapy for patients with neurogenic claudication due to lumbar spinal stenosis
Minetama M, Miyake T, Moriki T, Sakon N, Kinoshita Y, Kadosaka Y, Matsuoka T, Nakao S, Fukui D, Kawakami M; Wakayama Japan

GP105 Neuroprotective effect of hypothermia following spinal cord injury in rats- comparative study between epidural and systemic hypothermia-
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GP106 Risk factors affecting progressive collapse of acute osteoporotic spinal fracture
Ha KY, Kim YH; Seoul, Korea

GP107 Classification for foraminal stenosis on a sagittal MRI

GP108 Impact of muscular tightness on lumbar spondylolysis in adolescent athletes
Ishigaki N, Aihara T; Funabashi-city, Japan

GP109 A study on pathogenesis of lumbar spondylolysis using MRI findings
Sakai T, Goda Y, Takata, Higashino K, Katoh S, Sairyo K; Tokushima, Japan, Kawasaki, Japan

GP110 Painvision apparatus is effective for assessing leg pain and numbness originated from lumbar disease

GP111 Lack of value in screening for fear of movement via the tampa scale for kinesiophobia
McIntosh G, Gregg C, Hall H, Hoffman C, Carter T; Wellington, New Zealand

GP112 Efficacy of diffusion-weighted imaging (DWI) based on MRI to evaluate hematological malignancies in lumbar spine
Yamashita M, Kikuchi K, Abe K, Yamashita K, Yamaoka A, Ohtori S, Takahashi K; Chiba, Japan
GP113 Pharmacological anxiolysis with promethazine as an adjunctive therapy for acute low back pain in the adult emergency department
Behrbalk E, Uri O, Boszczyk BM, Parks RM, Halpern P; UK

GP114 A validation study of a symptom scale for lumbar spinal stenosis
Sekiguchi M, Wakita T, Otani K, Onishi Y, Fukuhara S, Kikuchi S, Konno S; Fukushima Japan, Kansai Japan, Kyoto Japan

GP115 Efficacy of zoledronic acid for chronic low back pain associated with modic changes in MRI: a randomized controlled trial
Koivisto K, Kyllönen E, Haapea M, Niinimäki J, Sundqvist K, Pehkonen T, Seitsalo S, Paldanius P, Tervonen O, Karppinen J; Oulu, Finland

GP116 Minimal clinical important improvement (MCII) and patient acceptable symptom state (PAAS) values of the dallas pain questionnaire (DPQ) in patients with low back pain

GP117 Quantitative evaluation of injured nerve with diffusion tensor imaging

GP118 Degenerative changes of facet joints in adults with lumbar spondylolysis
Gods Y, Sakai T, Harada T, Takao S, Harada M, Takata Y, Higashino K, Katoh , Yasui N, Sairyo K; Tokushima, Japan, Kawasaki, Japan

GP119 Proteomic analysis of ligamentum flavum from lumbar spinal canal stenosis

GP120 Spino-pelvic sagittal alignment in elderly patients with isthmic spondylolisthesis
Suzuki H, Endo K, Nishimura H, Tanaka H, Sakai S, Yamamoto K; Tokyo Japan

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Yamada K, Nakamura H, Takahashi S, Terai H, Toyoda H, Dohzono S, Matsumoto T, Hoshino M, Tsuji T; Osaka City Japan, Shiraniwa Japan

GP122 Establishment of a new paraspinal infection mouse model evaluated noninvasively and quantitatively using bio-imaging

GP123 Facet orientation in patients with lumbar degenerative spondylolisthesis
Miyamoto H, Suzuki H, Endo K, Alimasi W, Nishimura H, Tanaka H, Sakai S, Yamamoto K; Tokyo Japan

GP124 Empiric antibiotic therapy for pyrogenic spondylitis
Terayama S, Yamazaki T, Hayakawa K, Nakamura H; Musashino Japan

GP125 Thoracolumbar vertebral endplate lesions in young gymnasts
Urushibara M, Aihara T, Hatakeyama K; Funabashi Japan
GP126 Diagnosis of infective endocarditis with pyogenic spondylitis
Tukamoto M, Morimoto T, Yoshihara T, Kugisaki H, Furuichi I, Sonohata M, Mawatari M; Saga, Japan

GP127 Agonistic swimming in adolescence: risk factor for scoliosis and low back pain? Results of a cross-sectional study
Zaina F, Bonzanini B, Colli B, Negrini S; Milan, Italy

GP128 Is spino pelvic alignment associated with osteonecrosis after thoracolumbar vertebral compression fracture?
Onishi T, Kanayama M, Hashimoto T, Shigenobu K, Oha F, Iwata A, Tanaka M; Hakodate, Japan

GP129 Evaluation on the degeneration of facet joint in lumbar spine using T2 mapping
Yamabe D, Hideki M, Satoshi Y, Kikuchi T, Yamazaki K, Shimamura T; Iwate, Japan

GP130 Characteristics of low back pain in adolescent patients with early-stage spondylolysis evaluated by a detailed visual analog scale
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Sugiura S, Nishikawa S, Otsuki K, Toyooka T, Nakamura K, Obara H, Shiga T, Oyama T, Sakaida C, Aoki Y; Sakura Japan

GP132 T2 mapping evaluation of lumbar facet joints before and after spinal motions
Kikuchi T, Murakami H, Yoshida S, Yamabe D, Yamazaki K, Shimamura T; Iwate, Japan

GP133 Coronal alignment of the lumbar spine and pelvis in patients with an ankylosed hip
Yoshihara T, Morimoto T, Kugisaki H, Tsukamoto M, Shiraki M, Kitajima M, Sonohata M, Mawatari M; Saga city, Japan

GP134 Early stage MRI fat suppression image predict the prognosis of acute osteoporotic vertebral compression fracture treated by hard-corset treatment
Suzuki N, Fukuoka M, Mizutani J, Otsuka S, Otsuka T; Nagoya Japan

GP135 Epidemiology of lumbar spinal stenosis - multicenter cohort study -
Hara N, Takeshita K, Takebayashi T, Ida K, Yamashita T, Sato K, Nagata K; Tokyo, Japan, Sapporo, Japan, Kurume, Japan

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Tomkins-Lane CC, Lafave LZ, Parnell J, Rempel J, Rogerson M, Wilson P, Hu R, Moriarrey S; Mount Royal, Canada

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Chen AF, Farber NJ, Zammerilla LL, Nowicki AL, Kang JD, Lee JY, Donaldson WF; Pittsburgh USA

GP138 A new predictive index for back muscle degeneration and sagittal alignment associated with aging
Takayama K, Kita T, Kanematsu F, Yasunami T, Ikeda S, Kyo Y, Sakanaka H, Yamano Y; Osaka, Japan
Effect of worksite exercise on back and core muscular endurance in firefighters
Mayer JM, Quillen WS, Dagenais S; Florida, USA

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Matsuo Y, Kurata J, Yoshida K, Sekiguchi M, Nikaido T, Kikuchi S, Konno S; Fukushima Japan, Tokyo Japan

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Ezure T, Aihara T; Funabashi-city, Japan

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Kim HJ, Yeom JS, Lee DB, Park JH, Kang KT, Chang BS, Lee CK; Seoul, Korea

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Bishop PB, Quon JA, Arthur B; Vancouver, Canada

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Yuasa A, Kanayama M, Hashimoto T, Shigenobu K, Oha F, Iwata A, Onishi T, Tanaka M; Hakodate, Japan

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Mikami H, Ishigaki N, Aihara T; Funabashi-city, Japan

The efficacy of LP-Idope as a near-infrared probe in the management of pain caused by spinal metastasis
GP149 Health, social and economic consequences of neck injuries: a controlled national study evaluating societal effects on patients and their partners
Bendix T, Jennum P, Kjellberg J, Ibsen R; Copenhagen, Denmark, Aarhus, Denmark.

GP150 CT classification of vacuum phenomenon for the lumbar intervertebral disc
Nishida K, Maeno K, Kakutani K, Takada T, Yamamoto J, Hirata H, Kurakawa T, Miyazaki S, Yurube T, Iguchi T, Kurosaka M; Kobe, Japan

GP151 True positive conduction tests occur rarely in clinical practice
McIntosh G, Hall H, Carter T; Toronto, Canada

GP152 Analysis of the S1 sacral foraminal location using a three-dimensional ct rendering technique
Sato Y, Toshiaki K, Nemoto T, Akazawa T, Sakuma T, Kitamura M, Takahashi K, Minami S; Chiba, Japan

GP153 Clinical evaluation of pregabalin for lumbar canal stenosis patients with peripheral neuropathic pain

GP154 Epidemiology, determinants, and functional status of sciatica: a large-scale population-based study in Chinese
Samartzis D, Karppinen J, Luk KDK, Cheung KMC; Hong Kong, SAR China, Oulu, Finland

GP155 Changes in objectively measured walking capacity over a 2 year period in individuals with lumbar spinal stenosis
Tomkins-Lane CC, Battie MC; Calgary, Canada, Edmonton, Canada

GP156 Opioid sensitivity affects postoperative outcome in lumbar spine surgery

GP157 Characteristics of pain-related sensory innervation on osteoporotic lumbar vertebrae with ovariectomized rats

GP158 Severe scoliosis during adulthood: is surgery the only possible treatment?
Zaina F, Negrini A, Parzini S, Romano M, Atanasio S, Negrini S; Milan, Italy

GP159 A study on diffusion weighted imaging for lumbar diseases ~ its usefulness and limit ~
Hatakeyama K, Ato S, Aihara T, Urusibara M; Funabashi, Japan

GP160 Low back pain in young athletes and their examination findings
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GP161 Factors associated with paraspinal muscle asymmetry in a general population sample of men
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GP162 The USA fungal meningitis outbreak after epidural steroid injections: thoughts on epidemiology and future patient safety
Wong DA; USA
GP163 Reduction of surgical revision rates and economic analysis of using an intraoperative CT-based navigation system for pedicle screw placement
Hodges SD, Eck JC, Newton D, Center for Sports Medicine and Orthopaedics, Chattanooga, TN

GP164 Rod breakage after long construct fusion in spinal deformity: clinical and radiographic risk factors

GP165 Good fusion rate and clinical results of less invasive facet fusion with sextant pedicle screw system for degenerative lumbar spondylolisthesis
Miyashita T, Ataka H, Tanno T; Matsudo, Japan

GP166 Interobserver reliability of CT scans to assess radiographic fusion criteria with a novel titanium interbody device
Slosar PJ, Kaiser J, Marrero L, Sacco D; SpineCare Medical Group/ San Francisco Spine Institute

GP167 Microendoscopic discectomy for lumbar disc herniation: does the instability affect the low back pain?
Aihara T, Hatakeyama K, Urushibara M, Ouchi J; Funabashi-city, Japan

GP168 Infection rate and complications following associated with epidural steroid paste used in posterior lumbar surgery - a case-controlled review
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GP169 Epidemiological trends in the use of bone morphogenic protein in spinal fusions from 2002-2009
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GP170 Epidemiological trends in kyphoplasty procedures between 2004-2009
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GP171 Trends in complications after lumbar spine surgery FROM 2002-2009
Pelton M, Fineberg S, Patel A, Oglesby M, Singh K; Chicago, IL, Maywood, IL, USA

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Tracey RW, Bevevino AJ, Lehman RA, Kang DG, Cody JP; Bethesda, MD, USA

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Anand N, MD, Khandehroo B, Baron EM, Kahwaty S; Los Angeles, CA, USA

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Mehdian H, Arealis G, Elsayed S; Nottingham, UK

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