



# Preliminary program

## ISSLS Annual Meeting

### Kyoto, Japan June 3-7, 2019

#### MONDAY JUNE 3

- 07:00-08:00      Program Committee Meeting
- 08:00-09:00      Membership Committee Meeting
- 09:00-12:00      Focus Group #1 - Degenerative Spinal Phenotypes - Creating a common language to advance knowledge  
*Josef Assheuer, Michele Battié, Dino Samartzis & Bradley Weiner*
- 09:30-11:30      Strategy Group Meeting
- 12:00-15:00      Executive Committee Meeting
- 13:00-16:00      Focus Group #2 - International Taskforce on Diagnosis and Management of Lumbar Spinal Stenosis  
*Markus Melloh and Christy Tomkins-Lane*
- 17:00-18:00      Women's ISSLS
- 18:00- 20:00      Opening Ceremony & Welcome Reception

## TUESDAY JUNE 4

07:45-07:50 Welcome – Shinichi Konno and Miho Sekiguchi

07:50-08:00 Program chairman report - Scott Blumenthal

### SESSION #1 - STENOSIS

*Chairs: Tom Oxland and Kazuhiro Chiba*

08:00-08:05 Multi-level decompression/fusions are as effective as single level lumbar spinal stenosis operations *id# 2390*

**Charles G Fisher**, H. Ahn, H. Hall, G. McIntosh, E. Abraham, A. Soroceanu, J. Paquet, Y.R. Rampersaud, M. Johnson, C.S. Bailey, A. Nataraj, G. Hogan, P. Jarzem, R.A. Glennie, E. Wai, P. Phan, A. Yee, K. Thomas, N. Manson, Canada

08:07-08:12 Does the concomitant presence of lumbar scoliosis or spondylolisthesis affect clinical outcomes following decompression surgery in patients with spinal stenosis? *id# 2403*

**Philip K Louie**, B.A. Basques, J.M. Khan, M.T. Nolte, J.C. Paul, A.G. Varthi, D. Samartzis, E.J. Goldberg, H.S. An, US

08:14-08:19 Early surgery vs prolonged conservative treatment for sciatica - 10-year results of a randomized controlled trial *id# 2245*

**Gijsbert M Overvest** W.C. Peul, W.A. Moojen, B. Koes, R.H. Bartels, The Netherlands

08:21-08:30 *Discussion*

08:30-08:35 Mood disorders predict poor outcome of lumbar disc surgery - results from a clinical trial *id# 2429*

**Gijsbert M Overvest** N.A. van der Gaag, W.M. Moojen, W. Peul, M.P. Arts, The Netherlands

08:37-08:42 The indirect decompression effect of oblique lateral interbody fusion in the treatment of degenerative lumbar stenosis *id# 2057*

**Zhi-Jun Hu** X. Fang, F. Zhao, J. Zhang, X. Zhao, S. Fan, China

08:44-08:49 Efficacy of decompression surgery on walking ability and health-related quality of life in lumbar spinal stenosis patients with gluteus medius muscle weakness *id# 2145*

**Satoshi Suzuki** N. Fujita, A. Miyamoto, O. Tsuji, N. Nagoshi, E. Okada, M. Yagi, T. Tsuji, H. Kono, M. Nakamura, M. Matsumoto, K. Watanabe, Japan

08:51-09:00 *Discussion*

## SESSION #2 - DISC DEGENERATION

*Chairs:*

- 09:00-09:05 Nucleus pulposus-derived stem cells encapsulated in BMP7-based functionalized self-assembling peptide for alleviation of intervertebral disc degeneration in a rabbit model *id# 1759*  
**Dike Ruan** J. Ying, L. Su, S. Pei, T. Wen, China
- 09:07-09:12 Expression of TRPV4 in human IVDs and its relevance in stretch-induced inflammation *id# 2317*  
**Karin Wuertz-Kozak** E. Cambria, A. Sadowska, L. Halgund, P. Jaszczuk, F. Passini, W. Hitzl, J. Snedeker, O.N. Hausmann, Switzerland
- 09:14-09:19 Pathological effects of cortisol on intervertebral disc cells and mesenchymal stem cells from low back pain patients. *id# 1600*  
**Daphne Hingert**, J. Nilsson, H. Barreto Henriksson , A. Baranto, H. Brisby, Sweden
- 09:21-09:30 *Discussion*
- 09:30-09:35 Genetic lineage tracing of intervertebral disc cells in a neonatal regeneration model *id# 2397*  
**James C Iatridis** O. Torre, V. Mroz, A.R. Martinez Benitez, A.H. Huang, US
- 09:37-09:42 A new rabbit model of intervertebral disc degeneration induced by intradiscal injection of monosodium iodoacetate *id# 1814*  
**Takao Sudo** K. Akeda, T. Iwasaki, N. Takegami, J. Yamada, K. Masuda, N. Inoue, A. Sudo, Japan
- 09:44-09:49 Identification of two natural compounds as new senolytics in intervertebral disc degeneration and back pain. *id# 1667*  
**Lisbet LH Haglund** H.H. Cherif, D.D. Bisson, S.S. Kocabas, Canada
- 09:51-10:00 *Discussion*
- 10:00-10:30 **COFFEE**

## SESSION #3 - REHABILITATION

*Chairs:*

- 10:30-10:35 Identification through movement analysis of chronic low back pain pathological spinal movements patterns and their sensibility to change during exercise treatment *id# 2304*  
**Stefano Negrini** B. Piovanelli, C. Amici, S. Donzelli, F. Zaina, Italy

- 10:37-10:42 Male gender and initial job demand predict successful re-integration and return to work: results from 20-years of experience with a multidisciplinary programme for rehabilitation of chronic low back pain *id# 1678*  
**Jason Pui Yin Cheung** G. Leung, P. Cheung, G. Lau, S. Lau, K. Luk, Y. Wong, K. Cheung, P. Koljonen, Hong Kong
- 10:44-10:49 Exercise for the intervertebral disc: a 6-month RCT *id# 2223*  
**Daniel L Belavy** C. Miller, A. Hahne, S. Tagliaferri, K. Simson, D. Connell, G. Trudel, T. Rantalainen, J. Ford, Australia
- 10:51-11:00 *Discussion*
- 11:00-11:05 Can preoperative rehabilitation improve the surgical outcome in the patients with adult spinal deformity?; A retrospective cohort study *id# 2384*  
**Tatsuya Endo** T. Ito, M. Iwabuchi, O. Shirado, Japan
- 11:07-11:12 What factors differ between individuals with either good or poor outcome following microdiscectomy for lumbar disc herniation: an investigation of inflammatory and muscle regeneration markers in the lumbar multifidus muscle *id# 2444*  
**Xiaolong Chen** P. Hodges, G. James, J. Umali, U. Chamoli, K. Sheldrick, J. TU, W. Li, A. Diwan, Australia
- 11:14-11:19 The tasks effect in low back pain movement patterns *id# 1812*  
**Enrica Papi** A.M. Bull, A.H. McGregor, UK
- 11:21-11:30 *Discussion*

## **DEBATE - Prehabilitation and postoperative rehabilitation – what do we really know? – A debate built on the ISSLS memberships’ knowledge**

*Chairs: Helena Brisby and Kristin Archer*

- 11:30-12:15 *Kristin Archer  
Mari Lundberg*

12:15-13:30 **LUNCH**

## **SESSION #4 - BEST PAPER AWARD SESSION**

*Chairs:*

- 13:30-13:35 In vitro biomechanical testing of an innovative antero-posterior fixation for A3 lumbar fracture *id# 1659*  
**Marc-Antoine Rousseau** L. Simon, S. Persohn, A. Nerot, W. Skalli, France

- 13:37-13:42 Enhanced spinal fusion by combination of NELL-1 and ultra-low dose of BMP-2 in a rat model *id# 2297*  
**Ling Liu** W. Lam, M. Wang, R. Kumarsing, M. Naidu, K. Ting, CHJ. Goh, H. Wong, Singapore
- 13:44-13:49 Remaining systemic treatment options: a valuable predictor of survival and functional outcomes after surgical treatment for spinal metastasis. *id# 1731*  
**Sam Yeol Chang** H. Kim, C. Lee, B. Chang, South Korea
- 13:51-14:00 *Discussion*
- 14:00-14:05 Cervical epidural steroid injections: incidence and determinants of subsequent surgery *id#*  
**John P Kleimeyer** J.C. Koltsov, S.S. Hu, US
- 14:07-14:12 A study on sports activities of non-union adolescent lumbar spondylolysis patients *id# 2196*  
**Kenji Hatakeyama** M. Urushibara, A. Kojima, J. Ouchi, S. Ohtori, Japan
- 14:14-14:19 Quantitative evaluation of motor function of the lower extremity using the foot tapping test: Part 2. Five-year follow-up. *id# 2208*  
**Hiroshi Kobayashi** K. Otani, T. Nikaido, K. Watanabe, K. Kato, S. Yabuki, S. Konno, Japan
- 14:21-14:30 *Discussion*
- 14:30-14:35 Is the terminal complement complex a possible target for therapeutic intervention in intervertebral disc degeneration? *id# 2233*  
**Graciosa Q Teixeira** Z. Yong, R.M. Goncalves, A. Kuhn, M. Ruf, A. Nerlich, U.M. Mauer, A. Ignatius, R. Brenner, C. Neidlinger-Wilke, Germany
- 14:37-14:42 Endplate damage is heritable, is independently associated with low back pain and may trigger intervertebral disc degeneration: a longitudinal study from TwinsUK *id# 2438*  
**Marinko Rade** S. Munir, M.B. Freidin, J.H. Määttä, G. Livshits, F.M. Williams, UK
- 14:44-14:49 Causes of low back pain in different populations –The Wakayama Spine Study *id# 2104*  
**Hiroshi Hashizume** H. Yamada, H. Oka, S. Tsutsui, M. Teraguchi, Y. Ishimoto, K. Nagata, T. Sasaki, H. Iwahashi, Y. Asai, K. Matsudaira, S. Tanaka, N. Yoshimura, M. Yoshida, Japan
- 14:51-15:00 *Discussion*

15:00-15:30      **COFFEE**

## **SESSION #5 -AGING SPINE**

*Chairs:*

- 15:30-15:35      Cost-effectiveness of balloon kyphoplasty for patients with acute osteoporotic vertebral fractures in a super-aging society. *id# 178*  
**Shinji Takahashi** M. Hoshino, H. Yasuda, Y. Hori, S. Ohyama, H. Terai, T. Tsujio, H. Toyoda, A. Suzuki, K. Tamai, R. Sasaoka, H. Nakamura, Japan
- 15:37-15:42      Teriparatide neoadjuvant therapy targeting the osteoporotic spine: influence of administration period from the perspective of bone histomorphometry *id# 2101*  
**Kimihiko Sawakami** K. Watanabe, N. Yamamoto, K. Hasegawa, T. Shimakura, M. Yahata, K. Minato, S. Ishikawa, T. Hirano, H. Takahashi, N. Endo, Japan
- 15:44-15:49      Do osteoporosis and spinal degenerative disorders affect low back pain and related disorders? The Wakayama Spine Study *id# 2339*  
**Shoei Iwata** H. Hashizume, N. Yoshimura, H. Oka, H. Iwahashi, Y. Ishimoto, K. Nagata, M. Teraguchi, R. Kagotani, T. Sasaki, A. Minamide, Y. Nakagawa, Y. Yukawa, S. Tanaka, M. Yoshida, H. Yamada, Japan
- 15:51-16:00      *Discussion*
- 16:00-16:05      Local mechanical environment plays a role in spinal bone mineral density measured by quantitative computed tomography: A study on lumbar lordosis *id# 1742*  
**Ichiro Okano** B.B. Carlson, F. Winter, S.N. Salzman, T. Shirahata, C. Ortiz Miller, C. Rentenberger, J. Shue, J.A. Carrino, A.A. Sama, F.P. Cammisa, F.P. Girardi, A.P. Hughes, USA
- 16:07-16:12      An effect comparison of denosumab and serm on spinal instrumentation in patients with osteoporosis *id# 2155*  
**Koji Ishikawa** Y. Kudo, S. Tani, A. Matsuoka, H. Emori, R. Yamamura, C. Hayakawa, M. Sekimizu, K. Tsuchiya, Y. Dodo, K. Shiga, Y. Oshita, T. Ozawa, K. Inagaki, K. Kanzaki, T. Toyone, Japan
- 16:14-16:19      Clinical and radiological impact of adjacent vertebral fracture after balloon kyphoplasty: Development of a scoring system for predicting adjacent vertebral fracture occurrence *id# 1769*  
**Shinji Takahashi** M. Hoshino, Y. Hori, H. Yasuda, S. Ohyama, H. Terai, T. Tsujio, A. Suzuki, H. Toyoda, K. Tamai, S. Dohzono, H. Nakamura, Japan

16:21-16:30                      *Discussion*

## **SYMPOSIUM - Aging spine: toward a comprehensive understanding of low back pain in the elderly**

*Chairs: Hans-Joachim Wilke and Hiroaki Nakamura*

16:30-16:40                      The Patho-mechanism of Pain due to Aging Intervertebral Disc and Muscle

**Masayuki Miyagi**, M.D., Ph.D, Department of Orthopaedic Surgery, Kitasato University, School of Medicine.

16:40-16:50                      From Bench to Bedside: The Osteoporosis-Related Pain.

**Miyako Suzuki**, M.D., Ph.D, Department of Orthopaedic Surgery, Graduate School of Medicine, Chiba University

16:50-17:00                      Aging Spine and Low Back Pain: Analysis of Cohort Studies

**Shinji Takahashi**, M.D., Ph.D, Department of Orthopaedic Surgery, Osaka City University Graduate School of Medicine

17:00-17:10                      *Discussion*

## **FIRST BUSINESS MEETING**

17:10-18:10                      *Chair: Tom Oxland (for members only)*

## WEDNESDAY JUNE 5

### 07:45-08:45 SPECIAL POSTER SESSION #1

#### 1A – BIOLOGY

#### 1B – BIOMECHANICS

#### 1C - REHABILITATION

#### 1D - DEFORMITY

#### 1E - SURGERY OUTCOMES

### SESSION #6 - POPULATION STUDIES

#### Chairs:

- 09:00-09:05 Factors related to low back pain among elderly population in suburban area Japan -The Shiraniwa Study- *id# 1760*  
**Shoichiro Ohyama** M. Hoshino, S. Takahashi, Y. Hori, T. Tsujio, H. Nakamura, Japan
- 09:07-09:12 Pelvic compensation accompanying spinal malalignment and back pain-related factors -The Wakayama Spine Study *id# 2110*  
**Hiroshi Hashizume** H. Yamada, H. Oka, S. Tsutsui, M. Teraguchi, Y. Ishimoto, K. Nagata, T. Sasaki, H. Iwahashi, M. Okada, M. Takami, H. Iwasaki, A. Minamide, Y. Yukawa, N. Yoshimura, M. Yoshida, Japan
- 09:14-09:19 Association of vertebral bone marrow edema with low back pain in degenerative lumbar scoliosis in the elderly *id# 1676*  
**Toshio Nakamae** Y. Fujimoto, K. Yamada, K. Nakanishi, N. Kamei, Y. Tsuchikawa, T. Morisako, T. Harada, N. Adachi, Japan
- 09:21-09:30 *Discussion*
- 09:30-09:35 Lifestyle and lifetime occupational exposures may not play a role in the pathogenesis of Modic Changes on the lumbar spine MRIs *id# 1902*  
**Jialong Wu** J. Huang, M.C. Battié, Y. Wang, China
- 09:37-09:42 Results of conservative protocol in management of 403 patients of Lumbar Disc Herniation: Are we operating more than we should? *id# 2349*  
**Harvinder Chhabra** A. Pedaballe, M. Gupta, India
- 09:44-09:49 Range of motion and local sagittal alignment of lumbar spine in 627 healthy volunteers - Age-related changes and gender difference - *id# 1710*



**Yasutsugu Yukawa** T. Matsumoto, A. Minamide, H. Hashizume, H. Yamada, F. Kato, Japan

09:51-10:00 Discussion

10:00-10:30 **COFFEE**

## **SESSION #7- SURGICAL OUTCOMES**

*Chairs:*

10:30-10:35 Differences in surgical practices between salaried and fee-for-service surgeons for degenerative lumbar conditions in a universal health payer system *id# 2394*

**Charles G Fisher** D. Banaszek, H. Hall, G. McIntosh, T. Inglis, R. Charest-Morin, N. Manson, Y.R. Rampersaud, K. Thomas, N. Dea, Canada

10:37-10:42 Can minimally invasive spinal fusion surgery provide the better surgical outcome than conventional one in the treatment of degenerative lumbar spinal diseases? A minimum of one-year follow-up study *id# 2332*

**Masumi Iwabuchi** H. Fukuda, R. Tominaga, Y. Hanyu, O. Shirado, Japan

10:44-10:49 Application study of ERAS in perioperative period of fusion surgery of patients with degenerative lumbar diseases *id# 1569*

**Xueyu Hu** Z. Yang, Z. Luo, China

10:51-11:00 Discussion

## **PRESIDENTIAL ADDRESS**

*Introduction – Kazuhiro Chiba*

11:00-11:40 Title:  
Tom Oxland, The University of British Columbia, Vancouver BC Canada

## **HARRY FARFAN PRESIDENTIAL LECTURE**

*Introduction: Tom Oxland*

11:40-12:20 Title:  
Dr. Eric Grant, Radiation Effects Research Foundation of Hiroshima and Nagasaki

13:00- **AFTERNOON OUTING**

## THURSDAY JUNE 6

### SESSION #8 - SURGERY FUSION

*Chairs:*

- 07:30-07:35 Effects of restoration of sagittal balance on adjacent segment degeneration in instrumented lumbar fusions *id# 2021*  
**Young-Hoon Kim** K. Ha, S. Kim, H. Min, H. Park, *South Korea*
- 07:37-07:42 Open versus minimally invasive transforaminal lumbar interbody fusion in obese patients. A systematic review and meta-analysis *id# 2406*  
**Avani Vaishnav** A. Alhammoud, O. Aldahamsheh, Y. Othman, C. Gang, S. Qureshi, *Qatar*
- 07:44-07:49 Risk factors for readmission and complications in obese and severely obese patients undergoing elective posterior lumbar spine fusion *id# 1875*  
**Deeptee Jain** J. Shaw, V. Deviren, A.L. Zhang, S. Berven, *USA*
- 07:51-08:00 *Discussion*
- 08:00-08:05 One-third of postoperative scoliosis patients pursue a career path in a healthcare-related field. *id# 2328*  
**Toshiaki Kotani** T. Sakuma, K. Nakayama, Y. Iijima, K. Watanabe, N. Isogai, T. Akazawa, T. Asada, S. Minami, K. Inage, S. Ohtori, *Japan*
- 08:07-08:12 Impact of previous lumbar spine surgery on outcome of lumbar total disc replacement: Analysis of prospective 5-year follow-up study data *id# 2089*  
**Scott L Blumenthal** D.D. Ohnmeiss, J.E. Zigler, R.D. Guyer, *USA*
- 08:14-08:19 Adjacent segment degeneration versus disease after lumbar spine fusion for degenerative pathology: A Meta-analysis of the Literature *id# 1745*  
**Chao Zhang** D. Ruan, *China*
- 08:21-08:30 *Discussion*

### SESSION #9 - DISC DEGENERATION

*Chairs:*

- 08:30-08:35 Nucleus replacement gets a new chance with annulus sealing *id# 1664*  
**Laura Zengerle** A. Köhler, C. Hackenbrock, H. Wilke, *Germany*
- 08:37-08:42 Low-intensity pulsed ultrasound far-field exposure increases matrix synthesis in annulus fibrosus cells *id# 2399*

**Devante A Horne** P. Jones, M. Adams, C. Diederich, J.C. Lotz,  
USA

08:44-08:49 Osteomacs: may be a key factor in the development of Modic changes *id# 2048*

**Fengdong Zhao** J. Wang, China

08:51-09:00 *Discussion*

09:00-09:05 Autophagy plays protective roles against human disc cellular apoptosis and senescence, but not affect extracellular matrix degradation *id# 1965*

**Takashi Yurube** M. Ito, K. Kakutani, Z. Zhang, S. Miyazaki, T. Takada, Y. Kakiuchi, Y. Takeoka, Y. Kanda, R. Tujimoto, R. Kuroda, K. Nishida, Japan

09:07-09:12 Viable allograft as a supplemental therapeutic for disc regeneration *id# 1985*

**Douglas Beall** G. Wilson, R. Bishop, W. Tally, T. Temple, T. Ganey, USA

09:14-09:19 Safety of intradiscal condoliase in the treatment of lumbar disc herniation *id# 2098*

**Kazuhiro Chiba** Y. Matsuyama, T. Seo, Japan

09:21-09:30 *Discussion*

## FELLOWSHIP AWARD CEREMONY

*Chairs: Kazuhiro Chiba and Christopher Bono*

09:30-10:00 **Young Investigator Travel Award** - Prize Ceremony for the recipients

**Clinical Traveling Fellowship** - announcement for this year's recipient and report from last year's recipient

**ISSLS Research Grant** - announcement of this year's winner and report from last year's winner

**Young investigators Award SPINE** - announcement of winner

**Best Paper and poster Award** – announcement of winners

**Wiltse Lifetime Achievement Award Ceremony** – announcement of winner

10:00-10:30 **COFFEE**

## ISSLS PRIZE INTRODUCTION AND AWARD CEREMONY

10:30-10:40 *Chairman: Björn Rydevik - introduction*

10:40-10:50 Clinical importance of trunk muscle mass for low back pain, spinal balance, and quality of life: A multicenter cross-sectional study *id# 1837*

**Yusuke Hori** M. Hoshino, K. Inage, M. Miyagi, S. Takahashi, S. Ohyama, A. Suzuki, T. Tsujio, H. Terai, S. Dohzono, R. Sasaoka, H. Toyoda, M. Kato, A. Matsumura, T. Namikawa, M. Seki, K. Yamada, H. Habibi, H. Salimi, M. Yamashita, T. Yamauchi, T. Furuya, S. Orita, S. Maki, Y. Shiga, M. Inoue, G. Inoue, H. Fujimaki, K. Murata, A. Kawakubo, D. Kabata, A. Shintani, S. Ohtori, M. Takaso, H. Nakamura, Japan

10:50-11:00

*Discussion*

11:00-11:10

Physical activity attenuates fibrotic alterations to the multifidus muscle associated with intervertebral disc degeneration id# 2428

**Greg James** P. Hodges, D. Klyne, M. Millecamps, L. Stone, Australia

11:10-11:20

*Discussion*

11:20-11:30

Biomechanical changes in dynamic sagittal balance and lower limb compensatory strategies following realignment surgery in adult spinal deformity patients id# 2482

**Jeannie Bailey** R.P. Matthew, S. Seko, P. Curran, L. Chu, S.H. Berven, V. Deviren, S. Burch, J. Lotz, USA

11:30-11:40

*Discussion*

## INVITED LECTURE

*Chairman:*

11:40-12:20

Cell therapy for spinal cord injury

Prof. **Osamu Honmou**: Molecular Medicine, and Neural Repair and Therapeutics, Sapporo Medical University School of Medicine

12:20-13:30

**LUNCH**

## SESSION #10 - BASIC SCIENCE, IMAGING

*Chairs:*

13:30-13:35

Ultrasound measurement of the skin as a potential marker of bone quality: A prospective pilot study of patients undergoing lumbar spinal fusion id# 1674

**Stephan N Salzmann** I. Okano, C. Rentenberger, C. Ortiz Miller, P. Schadler, O.C. Sax, T.T. Miller, J. Shue, A.L. Boskey, A.A. Sama, F.P. Cammisa, F.P. Girardi, A.P. Hughes, USA

13:37-13:42

Enhance long-term stability of alginate-based polyelectrolyte complex BMP-2 carrier by freeze-drying in spinal fusion id# 2457

**Ling Liu** W. Lam, M. Wang, J. Li, C. Goh, H. Wong, Singapore

13:44-13:49

The impact of obesity, diabetes, and epidural steroid injections on regional bone mineral density (BMD) measured by

Quantitative Computed Tomography (QCT) in the lumbosacral spine *id# 1833*

**Ichiro Okano** C. Jones, S.N. Salzmann, C. Ortiz Miller, T. Shirahata, C. Rentenberger, J. Shue, J.A. Carrino, A.A. Sama, F.P. Cammisa, F.P. Girardi, A.P. Hughes, USA

13:51-14:00 *Discussion*

14:00-14:05 The importance of lumbar level stratification for quantitative MR studies of lumbar intervertebral discs: a cross-sectional analysis of 101 healthy adults *id# 1750*

**Hanna Hebelka** K. Lagerstrand, H. Brisby, P. Owen, D. Belavy, Sweden

14:07-14:12 Feasibility of lumbar disc lamellar measurement with in-vivo ultrasonography *id# 1602*

**Claudio Vergari** T. Langlais, P. desprairies, P. Rohan, R. Pietton, J. Dubousset, J. Meakin, C. Winlove, r. vialle, W. Skalli, France

14:14-14:19 Symptomatic implant/construct failure after metastatic spine tumour surgery *id# 2148*

**Naresh Kumar** R.S. Patel, D. Sonawane, J. Song, A.P. Singla, H. Milavec, N. Ravikumar, J. Ruiz, H. Hey, H. Wong, Singapore

14:21-14:30 *Discussion*

## GENERAL POSTER SESSION

14:30-15:30 *Coffee and Refreshments will be served*

## SESSION #11 - STENOSIS

*Chairs:*

15:30-15:35 Intraspinal diffusion tensor imaging parameters in quantitative assessment of patients with lumbar spinal canal stenosis *id# 1562*

**Masaki Norimoto** Y. Eguchi, H. Kanamoto, Y. Oikawa, T. Furuya, S. Orita, K. Inage, Y. Shiga, S. Maki, M. Inoue, T. Umimura, T. Sato, M. Sato, m. suzuki, K. Enomoto, S. Ohtori, Japan

15:37-15:42 Lumbar spinal stenosis (LSS) is frequent comorbidity in familial idiopathic normal pressure hydrocephalus (iNPH) *id# 2215*

**Ville Leinonen** J.A. Räsänen, J. Huovinen, Finland

15:44-15:49 How does lumbosacral multi-level spondylolytic spondylolisthesis differ from mono-level spondylolytic spondylolisthesis in spino-pelvic sagittal alignment? *id# 2281*

**Sun Xun** Z. Qingshuang, C. Xi, X. Liang, L. Song, D. Changzhi, Q. Bangping, Z. Zhezhang, Y. Yang, W. Bin, Q. Yong, China

15:51-16:00

*Discussion*

16:00-16:05

Facet joint capsular laxity in degenerative lumbar spondylolisthesis associated with the increased expression of fractalkine CX3CL1/CX3CR1 chemokine *id# 2080*

**In-Soo Oh** S. Kim, K. Ha, K. Rhyu, South Korea

16:07-16:12

Association of hypertrophy of the ligamentum flavum with an increase in myofibroblasts in the dorsal layer of the ligament in lumbar spinal canal stenosis *id# 2237*

**Fumio Hayashi** K. Higashino, M. Morimoto, Y. Goda, N. Sato, Y. Morimoto, T. Sakai, Y. Takata, F. Tezuka, K. Sairyo, Japan

16:14-16:19

Automation of MRI gradings to aid longitudinal studies of lumbar spinal stenosis in the Wakayama Spine Study *id# 1966*

**Yuyu Ishimoto** A. Jamaludin, C. Cooper, k. Walker-Bone, H. Yamada, H. Hashizume, H. Oka, S. Tanaka, N. Yoshimura, M. Yoshida, J. Urban, T. Kadir, J. Fairbank, Japan

16:21-16:30

*Discussion*

## **DEBATE - Blended learning vs conventional education for spine specialists and research**

*Chairs: Tom Oxland*

16:30-17:30

*Ashish Diwan*

*Dino Samartzis*

## **SECOND BUSINESS MEETING**

17:30-18:00

*Chair: Tom Oxland*

19:00

**BANQUET**

## FRIDAY JUNE 7

07:45-08:45      **SPECIAL POSTER SESSION #2**

**2F - BIOLOGY**

**2G - BIOMECHANICS, BIOLOGY**

**2H - NON-SURGERY**

**2I - SURGERY TECHNIQUES**

**2J - INFECTION/OSTEOPOROSIS**

## REPORT FROM FOCUS GROUPS

09:00-09:10      *Chairman: Kazuhiro Chiba*

## SESSION # 12 - INFECTION

*Chairs:*

09:10-09:15      Hypoalbuminemia and elevated CRP as predictors for superficial, deep, and urinary tract infections *id# 2290*  
**Zorica Buser** B. Yoshida, A. Nguyen, B. Formanek, M. Alam, J. Wang, USA

09:17-09:22      Clinical features and treatments of pyogenic spondylodiscitis with severe paralysis *id# 2068*  
**Teppe Hayashi** M. Kato, Japan

09:24-09:29      Avoiding infection and screw loosening due to biofilm at bone-screw interface: periop measures *id# 1977*  
**Aakash Agarwal** B. Lin, C. Schultz, V. Goel, D. McGowan, A. Agarwal, H. Elgafy, C. Karas, J. Wang, S. Garfin, N. Anand, USA

09:31-09:40      *Discussion*

09:40-10:10      **COFFEE**

## SESSION #13 - BASIC SCIENCE, BIOMECHANICS

*Chairs:*

10:10-10:15      Immuno-stimulatory capacity of decorin in the intervertebral disc and the mechanical consequence of resultant inflammation *id# 2234*  
**Diane Gregory** M. Guerreiro, D. Zwambag, S. DeWitte-Orr, Canada

- 10:17-10:22 810nm low level laser therapy regulating polarization of M1/M2 macrophages and its mechanism *id# 1557*  
**Xueyu Hu** J. Zhang, J. Sun, Q. Zheng, Z. Wang, China
- 10:24-10:29 Mechanical characterization of lumbar annulus fibrosus in adolescent idiopathic scoliosis before and after surgical intervention *id# 1588*  
**Claudio Vergari** L. Chanteux, R. Pietton, T. Langlais, R. Vialle, W. Skalli, France
- 10:31-10:40 *Discussion*
- 10:40-10:45 Cortical trajectory pedicle screws versus traditional trajectory: differences in fatigue loading conditions *id# 2299*  
**Steven T Swinford** T.R. Johnston, A.W. Behn, T.F. Alamin, USA
- 10:47-10:52 Dysregulated bone marrow stromal cells in Modic type 1 changes *id# 2322*  
**Stefan Dudli** D. Hänni, A. Jüngel, M. Betz, J. Spirig, F. Brunner, M. Farshad, O. Distler, Switzerland
- 10:54-10:59 High fat diet and leptin receptor deficiency have sex-dependent effects on spinal structures in a type 2 diabetes mouse model *id# 1998*  
**Svenja Illien-Junger** D.M. Natelson, D. Krishnamoorthy, J. Iatridis, USA
- 11:01-11:10 *Discussion*

## SESSION # 14 - SURGERY

### *Chairs:*

- 11:10-11:15 Effect of spinal surgery on prognosis in patients with symptomatic spinal metastasis: a prospective cohort study *id# 2078*  
**Kenichiro Kakutani** Y. Sakai, T. Yurube, T. Takada, Z. Zhang, S. Miyazaki, Y. Kakiuchi, Y. Takeoka, Y. Kanda, R. Tsujimoto, T. Iguchi, R. Kuroda, K. Nishida, Japan
- 11:17-11:22 Prognostic factors for drop foot due to lumbar degenerative diseases: the impact of surgical timing on postoperative recovery. *id# 1820*  
**Soichiro Masuda** Y. Kanba, J. Kawai, N. Ikeda, Japan
- 11:24-11:29 Predictive factors related with recovery of bowel and bladder function and ambulatory capacity in surgically treated traumatic conus medullaris syndrome with thoracolumbar fracture *id# 2260*



**Chang-Hoon Jeon** N. Chung, H. Lee, S. Moon, South Korea

11:31-11:40

*Discussion*

11:40-11:45

No long-time benefit from fusion in decompressive surgery for lumbar spinal stenosis. 5 year-clinical results and 2-year MRI follow-up from the Swedish Spinal Stenosis Study, a multicenter RCT of 233 patients. *id# 1847*

**Thomas Karlsson** P. Försth, M. Skorpil, K. Pazarlis, P. Öhagen, K. Michaelsson, B. Sanden, Sweden

11:47-11:52

A comparison of functional and quality of life improvement in six different types of lumbar surgery in a Pan Canadian database. *id# 2159*

**Mina Aziz** A. Kelly, M. Weber, G. McIntosh, P. Jarzem, Canada

11:54-11:59

Association between the definition of unfavorable surgical outcomes and their risk factors after spine surgery for lumbar spinal stenosis *id# 2072*

**Ho-Joong Kim** D. Shin, J. Yeom, C. Lee, B. Chang, South Korea

12:01-12:10

*Discussion*

## **CLOSING REMARKS - MAMORU KAWAKAMI**

12:10-12:20

## SPECIAL POSTER SESSION #1

07:45-08:45 WEDNESDAY JUNE 5

### 1A - BIOLOGY

#### LOCATION:

Chairs:

Signaling peptides from human mesenchymal stem cells including connective tissue growth factor enhance chondrogenesis in disc cells. *id# 1941*

**Daphne Hingert** *P. Nawilajaroen, J. Aldridge, A. Baranto, H. Brisby, Sweden*

Nutrient supply and nucleus pulposus cell function: effects of the transport properties of the cartilage endplate and potential implications for intradiscal biologic therapy *id# 2087*

**Aaron J Fields** *J. Wong, S.L. Sampson, H. Bell-Briones, A. Ouyang, J.C. Lotz, USA*

The role of integrin $\alpha$ 5 $\beta$ 1 in the alteration of notochordal cell induced by dynamic loading *id# 1974*

**Yutaro Kanda** *K. Kakutani, Y. Morita, T. Yurube, Z. Zhang, S. Miyazaki, Y. Kakiuchi, Y. Takeoka, R. Tsujimoto, T. Kurakawa, T. Takada, R. Kuroda, K. Nishida, Japan*

MSC homing into intervertebral discs enhances the Tie2 positive progenitor cell population, prevents cell death and induces a proliferative response *id# 2336*

**Sebastian Wangler** *M. Peroglio, U. Menzel, L. Benneker, L. Haglund, D. Sakai, M. Alini, S. Grad, Switzerland*

Potential involvement of oxidative stress/inflammatory cytokines cascade in ligamentum flavum hypertrophy *id# 2049*

**Satoshi Suzuki** *E. Okada, O. Tsuji, N. Nagoshi, M. Yagi, T. Tsuji, T. Miyamoto, K. Watanabe, M. Matsumoto, M. Nakamura, N. Fujita, Japan*

Genome-wide DNA methylation analysis identifies a differentially methylated profile associated with human intervertebral disc degeneration *id# 2269*

**Koji Akeda** *I. Akihiro, M. Shimaoka, K. Okumura, S. Takbayashi, N. Takegami, T. Sudo, T. Iwasaki, A. Sudo, Japan*

### 1B – BIOMECHANICS

#### LOCATION:

Chairs:

Diurnal variation of vertebral T2-time investigated with T2 mapping *id# 2206*

**Hanna Hebelka** *M. Khalil, K. Lagerstrand, H. Brisby, Sweden*

Disc degeneration – more than an aging process *id# 2180*

**Amir Jamaludin** T. Kadir, A. Zisserman, C. Pereira, F. Williams, J. Urban, J. Fairbank, UK

Is the lumbar spinous process a reliable sagittal plane reference landmark? id# 2088

**Alejandro A Espinoza** F. Mukhtar, G.B. Andersson, H.S. An, N. Inoue, USA

Is the anatomy of failure in lumbar disc herniation clinically relevant?: a prospective study id# 2309

**Harvinder Chhabra** M. Gupta, A. Pedaballe, India

Lumbar spine slenderness in adolescent idiopathic scoliosis id# 1563

**Claudio Vergari** M. Karam, R. Pietton, R. Vialle, I. Ghanem, W. Skalli, A. Assi, France

Does body mass index affect spinal alignment and low back pain in patients with primary osteoporosis? id# 2268

**Sho Inoue** M. Miyagi, K. Murata, T. Koyama, Y. Otake, A. Kuroda, A. Kawakubo, S. Ohtori, K. Inage, K. Uchida, G. Inoue, M. Takaso, Japan

## SP #1C – REHABILITATION

### LOCATION:

Chairs:

A network meta-analysis of effectiveness of specific modes of exercise for chronic low back pain id# 2219

**Daniel L Belavy** P.J. Owen, C. Miller, N. Mundell, S.J. Verswijveren, S. Tagliaferri, H. Brisby, S. Bowe, Australia

Optimising conservative management of chronic low back pain: a randomised trial of general strength and conditioning versus motor control manual therapy. id# 2258

**Scott D Tagliaferri** C.T. Miller, J.J. Ford, A.J. Hahne, L.C. Main, P.J. Owen, K.J. Simson, D.L. Belavy, Australia

Voluntary physical activity reinforces the efficacy of acute non-steroidal anti-inflammatory drug treatment for osteoporosis-related pain in a mouse model of ovariectomy-induced osteoporosis id# 2226

**Miyako Suzuki** M. Millecamps, S. Ohtori, L.S. Stone, Japan

Statistical morphometric analysis of lumbar paraspinal muscles in patients with lumbar pathology id# 2231

**Yiming Xiao** M. Fortin, J. Ahn, H. Rivaz, M. Battié, T. Peters, Canada

Analysis of skeletal muscle mass in women over 40 with degenerative lumbar scoliosis id# 1841

**Masaki Norimoto** Y. Eguchi, T. Toyoguchi, K. Inage, K. Fujimoto, T. Furuya, S. Orita, Y. Shiga, S. Maki, M. Inoue, T. Umimura, T. Sato, M. Sato, m. suzuki, K. Enomoto, S. Ohtori, Japan

Bony stress in the lumbar spine is associated with disc degeneration and pain in the lower back. A retrospective case-control MRI study of patients under 25-years of age. *id# 1687*

**Daniel Chepurin** *U. Chamoli, K. Sheldrick, S. Lapkin, D. Scott, J. Kuan, A.D. Diwan, Australia*

## SP #1D - DEFORMITY

### LOCATION:

#### Chairs:

Prevention of adjacent segmental disease after fusion in degenerative spinal disorder: correlation between segmental lumbar lordosis ratio and PI-LL mismatch for a minimum 5-year follow-up *id# 2293*

**Whoan Jeang Kim** *C. Ma, J. Lee, D. Song, K. Park, W. Choy, South Korea*

What factors affect low back pain of patients with Adolescent Idiopathic Scoliosis average 35 years after surgery? *id# 2217*

**Takehide Katogi** *T. Akazawa, T. Kotani, Y. Iijima, K. Nakayama, T. Sakuma, S. Minami, Japan*

Spinal alignments of non-fused lumbar curve affect the disc degenerations after selective thoracic fusion in the patients with adolescent idiopathic scoliosis with a minimum 5-year follow-up *id# 1652*

**Tsutomu Akazawa** *T. Umehara, M. Iinuma, K. Asano, Y. Torii, S. Kuroya, H. Niki, T. Kotani, T. Sakuma, S. Minami, S. Orita, K. Inage, Y. Shiga, K. Takahashi, S. Ohtori, Japan*

What made differences between best and worst clinical results for adult spinal deformity patients: 2-year follow-up *id# 2212*

**Daisuke Togawa** *S. Oe, T. Hasegawa, Y. Yamato, G. Yoshida, T. Banno, H. Arima, Y. Mihara, H. Ushirozako, Y. Matsuyama, Japan*

Multimodal analyses were required to understand the complaints of adult spinal deformity patients *id# 2323*

**Daisuke Togawa** *S. Oe, T. Hasegawa, Y. Yamato, G. Yoshida, T. Banno, H. Arima, Y. Mihara, H. Ushirozako, T. Yamada, Y. Matsuyama, Japan*

Impact of correction surgery on activities of daily living related to Oriental life-style in adult spinal deformity patients. Survey with original ADL questionnaire. *id# 2094*

**Naobumi Hosogane** *H. Kono, M. Yagi, N. Fujita, H. Sano, M. Takahashi, M. Hasegawa, S. Ichimura, M. Nakamura, M. Matsumoto, K. Watanabe, Japan*

## SP #1E - SURGERY OUTCOMES

### LOCATION:

#### Chairs:

Performance-based tests as predictors of patient-reported outcomes at 1-year following lumbar spine surgery *id# 1848*

**Kristin R Archer** *R.A. Coronado, J.S. Pennings, A.L. Henry, M.T. O'Brien, R.L. Skolasky, C.M. Haug, L.H. Riley III, B.J. Neuman, J.S. Cheng, O.S. Aaronson, C.J. Devin, S.T. Wegener, USA*

Physical capacity tasks assessing functional status in patients scheduled for lumbar fusion surgery were not associated with depression, pain catastrophizing, and fear of movement *id# 2382*

**Max Jakobsson** *H. Brisby, A. Gutke, M. Lundberg, R. Smeets, Sweden*

Predictors of poor global alignment and proportion score after surgery for adult spinal deformity *id# 1696*

**Tetsuro Ohba** *S. Ebata, H. Oba, K. Koyama, H. Haro, Japan*

The influence of developmental spinal stenosis on reoperation risk at the adjacent segment after decompression surgery for lumbar spinal stenosis *id# 1681*

**Jason Pui Yin Cheung** *P. Cheung, Hong Kong*

The spatial and temporal expression of sclerostin and canonical wnt signaling factors in the maturing posterolateral spine fusion *id# 1912*

**Steven M Presciutti** *T. Doan, M. Teklemariam, S. Sangadala, S.D. Boden, H. Drissi, USA*

Intraoperative real-time stress analysis using EEG and heart rate over 800 surgeries; multi-center prospective study among 12 orthopedic surgeons *id# 2116*

**Ji-Won Kwon** *J. Lee, J. Yang, K. Suk, H. Kim, S. Moon, H. Lee, B. Lee, South Korea*

## SPECIAL POSTER SESSION #2

07:45-08:45 FRIDAY JUNE 7

### #2F - BIOLOGY

Chairs:

Paraoxonase 1 (PON1) was negatively associated with intervertebral disc degeneration (IVDD). *id# 1962*

**Jianru Wang** F. Chen, Z. Zheng, China

Notochord-like cell clusters may retard the progression of disc degeneration *id# 2063*

**Bao Huang** X. Zhang, J. Liu, J. Chen, China

Sestrins inhibits stress-induced intervertebral disc degradation by enhancing autophagy *id# 1584*

**Ji Tu** W. Li, Australia

Sex differences in the interaction between biomechanical tissue properties of rat intervertebral discs and mechanical pain following annular puncture injury *id# 1849*

**Grace E Mosley** P. Nasser, A. Lai, D. Charen, T.W. Evashwick-Rogler, J.C. Iatridis, USA

Cellularity and matrix homeostasis during intervertebral disc degeneration is regulated via phlpp1 *id# 1996*

**Svenja Illien-Junger** M.P. Smith, G.K. Zhou, E. Chen, O.M. Torre, D.M. Laudier, E.W. Bradley, J.J. Westendorf, J.C. Iatridis, USA

Injectable RADA16-I hydrogel conjugated with a bioactive short peptide from BMP-7 attenuates intervertebral disc degeneration in canine *id# 2114*

**Jinwei Ying** D. Ruan, S. Pei, L. Su, T. Wen, C. Xu, China

### #2G - BIOMECHANICS, BIOLOGY

Chairs:

Understanding the impact of repetitive lifting towards lumbar disc herniation: A clinically relevant biomechanical cadaveric study *id# 2106*

**Dhara B Amin** J. Tavakoli, B.J. Freeman, J.J. Costi, Australia

Subsidence risk of vertebral body replacements using a new biomechanical in vitro test method *id# 1665*

**Laura Zengerle** C. Fleege, T. Theodor Di Pauli von Treuheim, D. Vogele, M. Rauschmann, H. Wilke, Germany

Complex reorganization of the nociceptive withdrawal reflexes of the trunk in people with chronic low back pain *id# 1775*

**Hugo Massé-Alarie** S.E. Salomoni, P.W. Hodges, Canada

Inter-Level and intra-pedicle bone mineral density distribution in the lumbar spine pedicle cortex *id# 2391*

**Alejandro Espinoza** T. Irie, T. Irie, K. Segami, H. An, N. Iwasaki, G.B. Andersson, N. Inoue, USA

A novel small compound prevented intervertebral disc degeneration via PI3K/AKT pathway. *id# 2040*

**Junichi Kushioka** T. Kaito, R. Chijimatsu, F. Yano, R. Okada, H. Ishiguro, Z. Bal, J. Kodama, Y. Ukon, D. Tateiwa, Y. Sakai, T. Makino, S. Takenaka, T. Saito, U. Chung, H. Yoshikawa, Japan

Lactate as a carbon biofuel for annulus fibrosus cells *id# 2415*

**Nam Vo** D. Wang, R. Hartman, C. Han, M. Jurczak, J. Kang, J. Lee, G. Sowa, USA

## #2H - NON SURGERY

### Chairs:

Clinical differences of each item of Oswestry Disability Index between the patients with lumbar spinal stenosis and lumbar disc herniation *id# 2263*

**Chang-Hoon Jeon** S. Kim, N. Chung, H. Lee, South Korea

Therapeutic advantages of frequent physical therapy sessions for patients with lumbar spinal stenosis *id# 1641*

**Masakazu Minetama** M. Kawakami, M. Teraguchi, R. Kagotani, Y. Mera, T. Sumiya, T. Kitano, M. Nakagawa, Y. Yamamoto, S. Matsuo, Y. Koike, N. Sakon, T. Nakatani, Y. Nakagawa, Japan

Advanced glycolysation end products (ages) in hypertrophied ligamentum flavum of diabetes mellitus and non diabetes mellitus *id# 2107*

**Maruf Mohammad Hasib** A. Suzuki, K. Hayashi, H. Hasibullah, S. Hamidullah, S. Ohyama, K. Tamai, K. Yamada, H. Terai, H. Nakamura, Japan

Risk factors for occurrence of lumbar lesion in patients with rheumatoid arthritis *id# 1961*

**Kentaro Yamada** A. Suzuki, S. Takahashi, K. Tamai, H. Toyoda, M. Hoshino, H. Terai, H. Nakamura, Japan

Comparison of analgesic effects between chimera decoy oligodeoxynucleotide and corticosteroid in the rat thrombin-induced facet joint pain model *id# 2310*

**Junichi Yamada** S. Miyazaki, K. Kakutani, K. Cheng, S. Reyes, E. Linn, E. Abarad, T. Nakazawa, K. Akeda, A. Sudo, K. Masuda, USA

Effects of exogenously administered basic fibroblast growth factor and Heme oxygenase-1 in a rat sciatic nerve injury model *id# 2344*

**Michiaki Mukai** K. Utida, Y. Shiga, K. Inage, S. Orita, N. Hirose, K. Murakami, Y. Eguchi, Y. Matsuura, M. Takaso, S. Ohtori, Japan

## #2I - SURGERY TECHNIQUES

Chairs:

Comparative effectiveness of expandable versus static lateral lumbar interbody fusion devices: two year clinical and radiographic outcomes *id# 1772*

**Richard Frisch** T. Shirk, J. Riggelman, I.Y. Luna, D. Brooks, G. Joshua, C. Ledonio, USA

Virtual / mixed reality simulation for the spine surgery -now and in the future- *id# 1858*

**Wataru Narita** R. Takatori, M. Nagae, H. Tonomura, Y. Arai, T. Ogura, T. Kubo, Japan

Fusion technique does not affect short-term patient-reported outcomes for lumbar degenerative disease *id# 2420*

**Srikanth N Divi** D.K. Goyal, M.S. Galetta, C.K. Kepler, A.R. Vaccaro, G.D. Schroeder, USA

Effect of cage type on immediate post-operative radiographic outcomes in single-level minimally invasive transforaminal lumbar interbody fusion (MI-TLIF) *id# 2271*

**Steven McAnany** A. Vaishnav, J. Wright-Chisem, M. Steinhaus, T. Albert, S. Iyer, C. Gang, S. Qureshi, USA

The factor lowering the cost-utility of surgical treatment for patients with metastatic spinal tumor *id# 2050*

**Shingo Miyazaki** K. Kakutani, Y. Sakai, T. Takada, T. Yurube, Z. Zhang, Y. Kakiuchi, Y. Kanda, R. Tsujimoto, R. Kuroda, K. Nishida, Japan

Correlation of automated lumbar MRI grading with microdecompression surgical level *id# 2347*

**Brandon L. Roller**, Z.O. Knio, T.J. O'Gara, J. Tan, L. Lenchik, R.D. Boutin, T. Kadir, A. Jamaludin USA

## 2J - INFECTION/OSTEOPOROSIS

Chairs:

Exploration of the recurrence of spinal tuberculosis: A clinical analysis of 38 cases *id# 1580*

**Liang Yan** B. He, D. Hao, China

Epidemiology and risk factors of multidrug-resistant pyogenic spondylitis in thoraco-lumbar spine *id# 1940*

**Katsuhisa Yamada** M. Takahata, K. Nagahama, A. Iwata, T. Endo, T. Onishi, H. Sudo, M. Ito, N. Iwasaki, Japan



Is the sandwich vertebra at a higher risk of further fracture? -A retrospective analysis of 1,347 patients undergoing cement augmentation for osteoporotic vertebral compression fracture in a single medical center in Taiwan *id# 1691*

**Ping-Yeh Chiu** *K. Kao, M. Hsieh, T. Tsai, Taiwan*

Iodine-supported spinal instruments reduce surgical site infection in total en bloc spondylectomy for spinal tumors. *id# 2446*

**Ryo Kitagawa** *H. Murakami, S. Demura, S. Kato, K. Shinmura, T. Shimizu, N. Oku, M. Handa, H. Tsuchiya, Japan*

The effect of peri-operative adverse events on long-term patient reported outcomes after lumbar spine surgery *id# 2407*

**Charles Fisher** *O. Ayling, Canada*

The regional effect of lumbar fusion surgery on volumetric bone mineral density measured by quantitative computed tomography in adjacent vertebrae: a longitudinal cohort study *id# 1704*

**Ichiro Okano** *C. Jones, S. Salzmann, C. Ortiz Miller, C. Rentenberger, J. Shue, J.A. Carrino, A.A. Sama, F.P. Cammisa, F.P. Girardi, A.P. Hughes, USA*

## GENERAL POSTERS

The association between pre-operative MRI findings and surgical revision within three years after surgery for lumbar disc herniation *id# 1554*

**Dorthe Schoeler Ziegler** *L. Carreon, M. Andersen, R. Jensen, Singapore*

Systemic Diclofenac Reduces Post-Operative rhBMP-2 Induced Neuroinflammation at Lumbar Nerve Root in a Rodent Model *id# 1559*

**Zi Qiang, Glen Liao** *J. Liu, W. Lam, H. Wong, China*

The influence of the intervertebral disc height and intervertebral disc height index in the single segmental lumbar fusion on the radiographic adjacent segment degeneration (rASD) *id# 1572*

**Xueyu Hu** *Z. Luo, P. Huang, Z. Tu, F. Xie, China*

Risk factors for vertebral, hip, and femoral fractures among patients with Parkinson disease: A 5-year follow-up in Korea *id# 1575*

**Sungbae Park** *Seoul*

Structural bone graft versus morselized bone graft in instrumented lumbar facet joint fusion: a prospective, randomized, self-controlled, and blinded study *id# 1581*

**Liang Yan** *B. He, D. Hao, China*

Tubular Discectomy vs Conventional Microdiscectomy for the treatment of lumbar disk herniation – Long-term results of a Randomized Controlled Trial *id# 1595*

**Mark Arts** *G. Overdeest, R. Bartels, W. Peul, The Netherlands*

Psychological factors affect physical activity in patients with lumbar spinal stenosis *id# 1642*

**Masakazu Minetama** *M. Kawakami, M. Teraguchi, R. Kagotani, Y. Mera, T. Sumiya, T. Kitano, M. Nakagawa, Y. Yamamoto, S. Matsuo, Y. Koike, N. Sakon, T. Nakatani, Y. Nakagawa, Japan*

Serum oxidative stress reflects the severity of neurological damage in patients with lumbar canal stenosis: a pilot cross-sectional human study *id# 1648*

**Hiroshi Takahashi** *Y. Aoki, J. Saito, A. Nakajima, M. Sonobe, Y. Akatsu, M. Yamada, K. Koyama, Y. Akiyama, T. Iwai, S. Nakano, K. Yanagisawa, T. Furuya, S. Ohtori, K. Nakagawa, Japan*

Clinical characteristics and risk factors for subsequent vertebral body fractures in patients with lumbar degenerative disease treated with transforaminal lumbar interbody fusion. *id# 1653*

**Yasuchika YA Aoki** *H.H. Takahashi, G.G. Kubota, A.A. Watanabe, T.T. Nakajima, T.T. Sakai, M.M. Inoue, K.K. Takahashi, S.S. Ohtori, Japan*

A novel therapeutic strategy for 3' untranslated region of neuropathic pain target genes *id# 1697*

**Takashi TH Hirai** T.T. Yoshii, T. Yokoyama, A. Okawa, Japan

The Impact of Degenerative Disc Disease on Regional Volumetric Bone Mineral Density (vBMD) measured by Quantitative Computed Tomography *id# 1703*

**Ichiro Okano** S. Salzmann, C. Ortiz Miller, C. Rentenberger, J. Shue, J.A. Carrino, A.A. Sama, F.P. Cammisa, F.P. Girardi, A.P. Hughes, USA

Remaining of endplate is a risk factor of delayed osseous union after posterior lumbar interbody fusion: a multicenter, prospective, randomized study. *id# 1723*

**Hiroki Ushirozako** T. Hasegawa, S. Ebata, T. Ohba, K. Mukaiyama, H. Oba, J. Takahashi, H. Haro, Y. Matsuyama, Japan

Does L4/5 Pose Additional Neurologic Risk in Lateral Lumbar Interbody Fusion? *id# 1726*

**Stephan N Salzmann** T. Shirahata, O.C. Sax, J. Yang, J. Shue, A.A. Sama, F.P. Cammisa, F.P. Girardi, A.P. Hughes, USA

Cost-effectiveness of lumbar surgery in the Japanese universal health insurance system *id# 1794*

**Takahito Fujimori** T. Miwa, M. Iwasaki, T. Oda, Japan

Clinical outcomes and union rate of 2-level PLIF ~Comparison between the lumbar segments and the lumbosacral segments~ *id# 1796*

**Takahito Fujimori**

H. Sakaura, T. Sugiura, D. Ikegami, K. Tateishi, Y. Mukai, N. Hosono, T. Fuji, Japan

Psychologically Informed Physical Therapy for Patients Following Lumbar Spine Surgery: A Randomized Clinical Trial *id# 1809*

**Kristin R Archer** R.L. Skolasky, R.A. Coronado, C.M. Haug, J.S. Pennings, S.W. Vanston, L.H. Riley III, B.J. Neuman, J.S. Cheng, O.S. Aaronson, C.J. Devin, S.T. Wegner, USA

Initial single-institution experience with a novel robotic-guided system for thoracolumbar pedicle screw and pelvic screw placement with 643 screws *id# 1850*

**Deeptee Jain** J. Manning, E. Lord, T. Protopsaltis, A. Buckland, J. Bendo, C. Fischer, J. Goldstein, USA

Autologous mesenchymal stromal cells labeled with iron used for transplantation to intervertebral discs in patients with chronic low back pain. *id# 1864*

**Nikolaos Papadimitriou** H. Hebelka, A. Baranto, H. Barreto Henriksson, A. Lindahl, H. Brisby, Sweden

A validated preoperative score for predicting 30-day readmission after 1-2 level elective posterior lumbar fusion. *id# 1873*

**Deeptee Jain** P. Singh, M. Kardile, S. Berven, USA

Machine learning for predictive modeling of 90-day readmission, major medical complication, and discharge to a facility in patients undergoing surgery for adult spinal deformity: logistic regression vs. random forest *id# 1874*

**Deeptee Jain** *W. Durand, A.H. Daniels, S.H. Berven, USA*

Risk factors and progression rate of sacroiliac joint degeneration in asymptomatic subjects *id# 1931*

**Yusuke Sato** *Y. Oshima, K. Kashiwabara, Y. Taniguchi, Y. Matsubayashi, S. Kato, S. Hirai, N. Tachibana, H. Hasebe, S. Tanaka, Japan*

Improvement of the sagittal alignment and balance of the spine through a “locomotion training” rehabilitation program in patients with locomotive syndrome *id# 1960*

**Takashi Yurube** *T. Takeoka, N. Watanabe, H. Inaoka, K. Kakutani, T. Takada, Y. Kakiuchi, Y. Takeoka, Y. Kanda, R. Tsujimoto, S. Miyazaki, Z. Zhang, R. Kuroda, K. Nishida, Japan*

Low-Grade Isthmic L5-Spondylolisthesis in Patients with Adolescent Idiopathic Scoliosis (AIS): Any Additional Problem? *id# 1971*

**Dietrich Schlenzka** *M. Ylikoski, M. Poussa, T. Yrjönen, L. Ristolainen, Helsinki*

Investigation of the 3D vascular network in vertebral end plates using micro-computed tomography *id# 1979*

**Sheen Gurrib** *R. Cameron, S. Bes, UK*

Comparing different chronic preoperative opioid use definitions on outcomes after spine surgery *id# 1987*

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**Akihiko Hiyama** *D. Sakai, M. Tanaka, T. Nukaga, M. Sato, M. Watanabe, Japan*

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