



# EUROSPINE 2013

## Preliminary Scientific Program - oral presentations

### Tuesday, October 1, 2013

- 17:00–19:00 on-site Registration
- 10:00-18:00 **Pre-Meeting Day Program** (separate Registration needed)

### Wednesday, October 2, 2013

- 07:30 – 20:00 on-site Registration
- 08:30 **OPENING** **PLENARY HALL**  
Local Hosts Liverpool
- 08:33 **WELCOME ADDRESS**  
EuroSpine President
- 08:36 **INTRODUCTION TO THE SCIENTIFIC PROGRAM**  
The blinded peer review process of the program committee  
Chair Program Committee 2013

### GENERAL SESSION

#### 08:40 – 10:00 **Adult Lumbar Spine, degenerative I**

Room: Plenary Hall

- 1** A COMPARISON OF BENEFIT FROM LUMBAR MICRODISCECTOMY FOR PRIMARY DISC DISEASE IN OBESE AND NON-OBESE PATIENTS  
*Matthew George Stovell, Jon Ellenbogen, Tim Pigott, Chris Barrett*  
*Neurosurgery, Liverpool, United Kingdom*
- 2** DIAGNOSTIC VALUE OF MAGNETIC RESONANCE IMAGING IN FOLLOW-UP ASSESSMENT OF SCIATICA  
*Abdelilah El Barzouhi, Carmen Vleggeert-Lankamp, Geert Lycklama à Nijeholt, Bas Van der Kallen, Wilbert van den Hout, Wilco Jacobs, Bart Koes, Wilco Peul*  
*Neurosurgery, Leiden, Netherlands*
- 3** INFLUENCE OF PREVIOUS CONSERVATIVE TREATMENT INTERVAL ON OUTCOMES FOLLOWING DECOMPRESSIVE SURGERY FOR LUMBAR DISC HERNIATION  
*Thomas Zweig, YH Yau, Brain J C Freeman, Markus Melloh, Emin Aghayev, Christoph Röder, On behalf of the EuroSpine registry group*  
*1Department of Spinal Surgery, Discipline of Orthopaedics and Trauma, Adelaide, Australia*
- 4** THE POTENTIAL OF EPIGALLOCATECHIN-3-GALLATE FOR THE TREATMENT OF PAINFUL INTERVERTEBRAL DISC DEGENERATION  
*Olga Krupkova, Juergen Klasen, Stephen J Ferguson, Karin Wuertz*  
*Department of Health Science and Technology, ETH Zurich, Zurich, Switzerland*
- 5** PEDICLE HEIGHT TO VERTEBRAL HEIGHT RATIO: AN ANATOMICAL PREDISPOSITION TO SYMPTOMATIC LUMBAR FORAMINAL STENOSIS?  
*Sophie Merckaert, Katarzyna Pierzchala, Gerit Kulik, Constantin Schizas*  
*Orthopedics, Neurosurgery, Centre Hospitalier Universitaire Vaudois and the University of Lausanne, Lausanne, Switzerland*
- 6** TRANSPORT OF A MRI CONTRAST AGENT IN AGEING AND DEGENERATED INTERVERTEBRAL DISCS  
*Marta Tibiletti, Fabio Galbusera, Cristina Ciavarrò, Marco Brayda-Bruno*  
*Laboratory of Biological Structure Mechanics, Milan, Italy*
- 7** INTRAOPERATIVE EVALUATION OF THE EFFECT OF VARIOUS MEDICATIONS ON THE MICROCIRCULATION OF THE NERVE ROOT IN PATIENTS WITH DEGENERATIVE DISK DISEASE  
*Alexander Kuleshov, Alexander Krupatkin, Vladimir Shvets, Sergey Makarov, Marchel Vetrile*  
*Spine Surgery, Moscow, Russia*
- 8** PROGRESSION OF LUMBAR DISC HERNIATIONS OVER AN EIGHT YEAR PERIOD IN A GROUP OF ADULT DANES FROM THE GENERAL POPULATION; A LONGITUDINAL MRI-STUDY USING QUANTITATIVE MEASURES AND DEFINITIONS  
*Andreas Tunset, Tue Secher Jensen, Eleanor Boyle, Per Kjaer*  
*Institute of Sports Science and Clinical Biomechanics, University of Southern Denmark, Odense M, Denmark*

#### 10:00-10:30 **BREAK**

#### 10:30 **Debate: Spinal Cord Monitoring is a waste of Resources** **tbd**

Room: Plenary Hall

11:15 **Debate: Whiplash, an Insurance driven Disease?**  
 tbd  
 Room: Plenary Hall

12:00-14:00 **EUROSPINE LUNCH SYMPOSIUM, Wednesday, October 2**

12:00 **EUROSPINE LUNCH SYMPOSIA**

14:00 – 15:20 **Cervical Spine**

Room: Plenary Hall

- 9 FUNCTIONAL CORRELATIONS BETWEEN THE PRIMARY MOTOR CORTEX AND SPINAL MOTOR NEURONS DURING MOTOR TASKS USING A DEVELOPED SIMULTANEOUS RECORDING TECHNIQUE OF THE CEREBROSPINAL FUNCTIONAL MAGNETIC RESONANCE IMAGING  
*Eiji Takasawa, Takashi Hanakawa, Hitoshi Shitara, Yoichi Iizuka, Haku Iizuka, Kenji Takagishi*  
 Department of Orthopaedic Surgery, Gunma University Graduate School of Medicine, Maebashi, Japan
- 10 INCREASED MORTALITY OF CONSERVATIVELY TREATED C2 FRACTURES IN THE ELDERLY POPULATION  
*Anna-Lena Raninen, Claes Olerud, Yohan Robinson*  
 Orthopaedic Department Uppsala, Uppsala, Sweden
- 11 RELIABILITY OF AXIS FRACTURE CLASSIFICATIONS EMPLOYING COMPUTED TOMOGRAPHY  
*Takui Ito, Kimihiko Sawakami, Seiichi Ishikawa*  
 Dept of Orthopaedic Surgery, Niigata City, Japan
- 12 BLUNT CEREBROVASCULAR INJURIES IN ASSOCIATION WITH CRANIOCERVICAL DISSOCIATION  
*Richard Bransford, Carlo Bellabarba*  
 Department of Orthopaedics and Sports Medicine, Seattle, USA
- 13 IS CENTRAL CORD SYNDROME REALLY DIFFERENT THAN OTHER SPINAL CORD INJURIES?  
*Sean D. Christie, David Brandman, Ayoub Dakson, Ginette Thibault-Halman*  
 Surgery (Neurosurgery), Halifax, NS, Canada
- 14 THE RELATIONSHIP BETWEEN INTRAMEDULLARY HIGH SIGNAL INTENSITY AND THE CLINICAL OUTCOME IN ATLANTO-AXIAL SUBLUXATION DUE TO RHEUMATOID ARTHRITIS  
*Haku Iizuka, Yoichi Iizuka, Ryoichi Kobayashi, Tokue Mieda, Kenji Takagishi*  
 Orthopaedic Surgery, Maebashi, Japan
- 15 CERVICAL SPONDYLOTIC MYELOPATHY: THE OUTCOME FOLLOWING SURGICAL INTERVENTION  
*Khalid Salem, Tamer Sherief, Rajendra Bommireddy, Zdenek Klezl*  
 The Department of Trauma and Orthopaedic Surgery, Derby, United Kingdom
- 16 A COMPARATIVE EFFECTIVENESS STUDY OF PATIENT-RATED AND RADIOGRAPHIC OUTCOME AFTER TWO TYPES OF DECOMPRESSION WITH FUSION FOR SPONDYLOTIC MYELOPATHY: ANTERIOR CERVICAL DISCECTOMY (ACDF) VERSUS CORPECTOMY (ACCF)  
*Anne F Mannion, Serge Marbacher, Patrick A Dolp, Tamas F Fekete, Deszö J Jeszenszky, François Porchet*  
 Spine Center, Department of Neurosurgery, Zurich, Switzerland
- 17 A RETROSPECTIVE REVIEW OF PATIENTS WITH CERVICAL SPINAL EPIDURAL ABSCESES: RISK FACTORS, OUTCOMES OF SURGICAL VS MEDICAL MANAGEMENT, AND PREDICTIVE INDICATORS OF TREATMENT FAILURE  
*Richard Bransford, Timothy Alton*  
 Department of Orthopaedics and Sports Medicine, Seattle, USA
- 18 COMPLICATIONS AFTER LONG POSTERIOR INSTRUMENTATION PATIENTS WITH CERVICOTHORACIC FRACTURES RELATED TO ANKYLOSING SPINE DISEASE -- A PROSPECTIVE STUDY IN 41 CONSECUTIVE PATIENTS  
*Yohan Robinson, Anna-Lena Robinson, Claes Olerud*  
 Uppsala University Hospital, Uppsala, Sweden

15:20-15:50 **BREAK**

15:50 – 17:30 **ThoracoLumbar Spine, non degenerative**

Room: Plenary Hall

- 19 HUMAN HEPATOCYTE GROWTH FACTOR PROMOTES FUNCTIONAL RECOVERY IN PRIMATES AFTER SPINAL CORD INJURY: PAST ACHIEVEMENTS AND PERSPECTIVE FOR CLINICAL TRIAL  
*Kazuya Kitamura, Kanehiro Fujiyoshi, Jun-ichi Yamane, Akio Iwanami, Hideyuki Okano, Yoshiaki Toyama, Masaya Nakamura*  
 Department of Orthopedic Surgery, Hiratsuka City Hospital, Kanagawa, Japan
- 20 THE RASPUTINE PILOT STUDY -A PROSPECTIVE RANDOMISED CONTROLLED EVALUATION OF TWO STABILISATION PROCEDURES FOR INCOMPLETE CRANIAL BURST FRACTURES OF THE THORACOLUMBAR JUNCTION  
*Michael Kremer, Matti Scholz, Tina Tschauder, Stavros Stavridis, Klaus Schnake, Frank Kandziara*  
 Berufsgenossenschaftliche Unfallklinik Frankfurt am Main, Frankfurt, Germany
- 21 TEMPORARY PERCUTANEOUS INSTRUMENTATION AND SELECTIVE ANTERIOR FUSION FOR THORACOLUMBAR FRACTURES  
*Yann Philippe Charles, Axel Walter, Sébastien Schuller, Jean-Paul Steib*

Service de Chirurgie du Rachis, Strasbourg, France

- 22** COMPARATIVE RANDOMIZED STUDY OF TWO DIFFERENT AUGMENTATION TECHNIQUES FOR TREATMENT OF OSTEOPOROTIC VERTEBRAL BODY FRACTURES  
*Panagiotis Korovessis, Thomas Repantis, Konstantinos Vardakastanis*  
*Orthopaedic, General Hospital "Agios Andreas", Patras, Greece*
- 23** HOW MUCH CEMENT IS NECESSARY FOR VERTEBRAL BODY AUGMENTATION? A BIOMECHANICAL IN VITRO INVESTIGATION OF SPINE JACK COMPARED TO BALLOON KYPHOPLASTY FOCUSING ON THE CEMENT VOLUME.  
*Robert Rotter, Lena Schmitt, Philip Gierer, Klaus-Peter Schmitz, Thomas Mittlmeier, Heiner Martin*  
*Department of Trauma, Hand and Reconstructive Surgery, University of Rostock, Rostock, Germany*
- 24** MULTICENTER EVALUATION OF THE ACTUAL THERAPY OF INPATIENTS WITH OSTEOPOROTIC VERTEBRAL FRACTURES IN GERMANY  
*Klaus Schnake, Patrick Hahn, Bernhard Ullrich, Michael Müller, Alexander Franck, Sebastian Katscher, Frank Hartmann, Alexander Hölzl, Thomas Blattert, AG Osteoporotische Frakturen Sektion Wirbelsäule DGOU*  
*Center for Spinal Surgery and Neurotraumatology, Frankfurt, Germany*
- 25** NOVEL TECHNIQUE OF TOTAL EN BLOC SPONDYLECTOMY ENHANCING ANTITUMOR IMMUNITY FOR SPINAL TUMORS  
*Hideki Murakami, Satoru Demura, Satoshi Kato, Katsuhito Yoshioka, Hiroyuki Hayashi, Takashi Ota, Kazuya Shinmura, Noriaki Yokogawa, Xiang Fang, Hiroyuki Tsuchiya*  
*Department of Orthopaedic Surgery, Kanazawa University, Kanazawa, Japan*
- 26** DECISION MAKING PROCESS ON THE TREATMENT OF SPINAL METASTASES  
*Daniela Issa, Ferran Pellisé, Antonia Matamalas, Laura Frascheri, Ramona Vergès, Joan Pijoan, Ana Garcia de Frutos, Joan Bagó, Enric Cáceres*  
*Spine Research, Barcelona, Spain*
- 27** EXTERNAL VALIDATION OF THE TOKUHASHI SCORE IN PATIENTS UNDERGOING SURGERY FOR THE TREATMENT OF SPINAL METASTASIS : 125 CONSECUTIVE PATIENTS SERIES FROM 2006 TO 2012  
*SeJun Park, ChongSuh Lee, SungSoo Chung, JongHo Park, KookHee Cho, KeunHo Lee, YangTae Kim*  
*Orthopedic surgery, Seoul, Korea (ROK / South Korea)*
- 28** MANAGEMENT OF INTRADURAL SPINAL TUMOURS: A REVIEW OF 217 CASES OVER 22 YEARS  
*David Garwood, Saif Haddad, Rafid Al-Mahfoudh, Nisaharan Srikandarajah, Robin Pillay, Tim Pigott*  
*Neurosurgery, liverpool, United Kingdom*
- 29** FLUORESCENCE DIAGNOSIS AND LASER SPECTROSCOPY WITH 5-ALA IN SURGERY OF SPINAL CORD: INTERIM RESULTS OF A PHASE II STUDY  
*Petr Zelenkov, Nikolay Konovalov, Viacheslav Nazarov, Sergey Kisariyev, Viktor Loshenov, Pavel Grachev, Daniil Rotin, Tatiana Saveljeva, Aleksandr Potapov, Ivan Shevelev*  
*Burdenko neurosurgical institute, Moscow, Russia*
- 30** MEAN 34 YEARS FOLLOW-UP OF SEVERE ANGULAR KYPHOSIS FROM TUBERCULOSIS OF THE SPINE: BAD PROGNOSIS FOR PARAPARESIS OF LATE DISEASE  
*Keith Luk, Yat-wa Wong, Kenneth Cheung, Dino Samartzis*  
*Orthopaedics and Traumatology, Pokfulam, Hong Kong*

17:30

## WELCOME RECEPTION

Exhibition Area

Thursday, October 3, 2013

## CONCURRENT SESSIONS (SHORT COMMUNICATIONS)

08:30	Basic Science
<b>QF1</b>	MULTIMODAL IMAGING OF THE COLLAGEN AND ELASTIC FIBRE NETWORKS IN THE BOVINE INTERVERTEBRAL DISC <i>Clayton ADAM, Philippe Rouch, Wafa SKALLI</i> <i>Laboratoire de Biomecanique, Paris, France</i>
<b>QF2</b>	MANIPULATION OF ANABOLIC AND CATABOLIC RESPONSES WITH BONE MORPHOGENETIC PROTEIN AND ZOLEDRONIC ACID IN A RAT SPINAL FUSION MODEL <i>Masashi Miyazaki, Toyomi Yoshiwa, Ryuzo Kadera, Hiroshi Tsumura</i> <i>Department of Orthopaedic Surgery, Oita University, Yufu-shi, Japan</i>
<b>QF3</b>	INTRAVENOUS MORPHINE VERSUS MORPHINE-PROMETHAZINE REGIMEN FOR ACUTE LOW BACK PAIN RELIEF IN THE EMERGENCY DEPARTMENT: A PROSPECTIVE RANDOMIZED TRIAL <i>Eyal Behrbalk, Ofir Uri, Bronek Boszczyk, Ruth Parks, Matthias König</i> <i>Queen's Medical Centre, The Spine Unit, Nottingham, United Kingdom</i>
<b>QF4</b>	INTRAOPERATIVE NEUROMONITORING IN EXPERIMENTALLY-INDUCED SPINAL CORD INJURIES <i>Jesús Burgos, Lidia Cabañes, Gema de Blas, Javier Cervera, Eduardo Hevia, Carlos Barrios, Carlos Correa</i> <i>Institute for Research on Musculoskeletal Disorders, Valencia Catholic University, Valencia, Spain</i>
<b>QF5</b>	INFLAMMATORY CHARACTERISTICS AND COMPARISON OF RHBMP7 TO RHBMP2: IN VITRO AND IN VIVO RODENT MODELS <i>Myeong-Jae Yoo, Do-Yeon Kim, Jong-Hyun Ko, Kwang-Bok Lee, Jeffrey Wang</i> <i>Orthopedic Surgery, Jeonju, Korea (ROK / South Korea)</i>
<b>QF6</b>	INFLUENCE OF PERIOPERATIVE PROTOCOL TO REDUCE POSTOPERATIVE INFECTION RATES IN SPINE SURGERY. PRELIMINARY STUDY <i>Manuel González Murillo, Patricia Álvarez, Carolina Moreno Gomila, Felisa Sánchez-Mariscal, Javier Pizones, Lorenzo Zúñiga, Enrique Izquierdo</i> <i>SPINE UNIT, GETAFE, Spain</i>
<b>QF7</b>	LONG-TERM RESULTS IN PATIENTS WITH VERTEBRAL METASTASES <i>Simone Colangeli, Alessandro Gasbarrini, Lisa Babbi, Stefano Bandiera, Giovanni Barbanti Brodano, Luca Boriani, Riccardo Ghermandi, Silvia Terzi, Cristiana Griffoni, Stefano Boriani</i> <i>Department of Oncological and Degenerative Spine Surgery, Bologna, Italy</i>

- QF8** SERUM INTERLEUKINE-6, HIGH SENSITIVE C-REACTIVE PROTEIN, TESTOSTERONE, GROWTH HORMONE AND CORTISOL LEVELS IN PATIENTS UNDERGOING LUMBAR SPINE FUSION  
*Tuukka Porkka, Marko Neva, Keijo Häkkinen, Ilkka Marttinen, Kimmo Vihtonen, Seija Rautiainen, Arja Häkkinen*  
*Orthopaedis, Tampere, Finland*
- QF9** THE EFFECTS OF SIMULATED MICROGRAVITY ON HUMAN INTERVERTEBRAL DISC CELLS  
*Karin Wuertz, Hiroshi Kobayashi, Alfredo Franco-Obregón, Krzysztof Krawczyk, Juergen Klasen, Marcel Egli, Miho Sekiguchi, Shin-ichi Konno, Stephen J Ferguson*  
*Institute for Biomechanics, ETH zurich, Zurich, Switzerland*
- QF10** A NEW PREDICTIVE INDEX FOR BACK MUSCLE DEGENERATION AND SAGITTAL ALIGNMENT ASSOCIATED WITH AGING  
*Kazushi Takayama, Teruo Kita, Hiroaki Nakamura, Fumiaki Kanematsu, Toshiya Yasunami, Shigehiro Ikeda, Kohei Yamamoto, Hiroyuki Gotani, Hideki Sakanaka, Yoshiaki Yamano*  
*Seikeikai Hospital, Osaka, Japan*
- QF11** NOVEL TWO-COMPONENT INTERBODY DEVICE, IN A 360 FUSION MODEL, IMPROVES BONE-IMPLANT INTERFACE WITHOUT COMPROMISING STABILITY: A CADAVER STUDY  
*Finn B. Christensen, David Volkheimer, Bruce Robie, Hans-Joachim Wilke*  
*Orthopedic Research Lab., Aarhus C, Denmark*
- QF12** EPIDEMIOLOGIC STUDY ON BACK PAIN IN RUNNERS  
*Iago Garreta Català, Federico Balagué Gea, Frederic Font Vila, Paloma Bustos Bedoya, David Pereira, Daniel Cuadras Pallejà, Lluís González Cañas*  
*Orthopaedic Surgery, Barcelona, Spain*
- QF13** MOTION PATH MEASUREMENT OF SEMI-CONSTRAINED AND UNCONSTRAINED TOTAL DISC REPLACEMENTS  
*Philip Hyde, John Fisher, Todd Stewart, Richard Hall*  
*Mechanical Engineering, Leeds, United Kingdom*
- QF14** BODY MASS INDEX ASSOCIATES WITH LOW BACK PAIN IN CHILDHOOD AND ADOLESCENCE: A BIRTH COHORT STUDY OF 6-YEAR FOLLOW UP IN NIIGATA CITY, JAPAN  
*Atsuki Sano, Toru Hirano, Kei Watanabe, Naoto Endo, Takui Ito, Tsuyoshi Sato, Ren Kikuchi, Tomohiro Izumi, Naohito Tanabe*  
*Department of orthopaedic surgery, Shibata city, Japan*
- QF15** LUMBAR ARTHROPLASTY FOR SYMPTOMATIC DISC DISEASE 12 MONTHS PRELIMINARY RESULTS OF AN INTERNATIONAL MULTICENTER PROSPECTIVE OBSERVATIONAL STUDY.  
*Richard Assaker, Jean-Charles Le Huec, Dominique Vardon, Karsten Ritter-Lang*  
*Neurosurgery, Lille, France*

**08:30****Cervical Spine**

- QF16** TRANS-OSSEOUS CERVICAL NEULECTOMY IN 100 PATIENTS WITH ANTERIOR CERVICAL DISC PROLASE  
*Joseph Iskander*  
*Spine center -Westpfalzlinik Kusel, Kaiserslautern, Germany*
- QF17** EFFECT OF GLOBAL CERVICAL SAGITTAL IMBALANCE ON POSTURAL COMPENSATION AND CERVICAL MECHANICS  
*Avinash Patwardhan, Robert Havey, Muturi Muriuki, Ngoc-lam Nguyen, Leonard Voronov, Alpesh Patel, Michael Zindrick, Gerard Carandang, Dale Schuit, Alexander Ghanayem*  
*Orthopaedic Surgery and Rehabilitation, Maywood, USA*
- QF18** A COMPARISON OF THE EFFECT OF AGING ON THE PRESENTATION AND MANAGEMENT OF ACUTE FRACTURES OF THE CERVICAL SPINE  
*Osa Ernohare, Alison Dittmer, Robert Morgan, Julie Switzer*  
*Department of Orthopaedics, St Paul, USA*
- QF19** WHAT ARE THE RISK FACTORS FOR VOLUME INCREASE OF CERVICAL OPLL AFTER LAMINOPLASTY?  
*Toru Hirano, Akiyoshi Yamazaki, Kei Watanabe, Keiichi Katsumi, Hirokazu Shoji, Yu Sato, Tatsuki Mizouchi, Naoto Endo*  
*Spine Center, Orthopedic Department, Niigata Central Hospital, Niigata, Japan*
- QF20** DEGENERATIVE CERVICAL SPONDYLOLISTHESIS : TREATMENT&OUTCOMES  
*Tapanut Chuntarapas, Samuel Romero-Vargas, Lukas P. Zebala, Han Jo Kim, Addisu Mesfin, Chaiwat Piyaskulkaew, Hyun Seung-Jae, Daniel K. Riew*  
*Neurosurgery, Bangkok, Thailand*
- QF21** ADJACENT LEVEL CERVICAL DISC DEGENERATION AFTER FUSION &#8211; PROSPECTIVE STUDY FOR 5YEARS  
*SANDIP CHATTERJEE*  
*NEUROSURGERY, KOLKATA, India*
- QF22** UTILIZATION OF COMPUTER DIGITIZED AXIAL FORCE DISTRIBUTION STUDIES TO DESIGN THE IDEAL CERVICAL INTERBODY COMPOSITE ALLOGRAFT  
*John Finkenberg*  
*Alvarado Orthopedic Medical Group, San Diego, California, USA*
- QF23** LONG-TERM OUTCOMES OF C3-6 LAMINOPLASTY FOR CERVICAL SPONDYLOTIC MYELOPATHY-A PROSPECTIVE STUDY-  
*Hironobu Sakaura, Noboru Hosono, Yoshihiro Mukai, Motoki Iwasaki, Hideki Yoshikawa*  
*Orthopaedic Surgery, Kansai Rosai Hospital, Amagasaki, Japan*
- QF24** ANTERIOR CERVICAL FUSION WITH TANTALUM IMPLANT: PROSPECTIVE RANDOMIZED CONTROLLED STUDY, FIVE YEARS FOLLOW UP RESULTS  
*ANA TORRES, MARIANO FERNANDEZ-FAIREN, GONZALO ACEBAL, ANTONIO MURCIA-MAZON*  
*ORTHOPAEDICS AND TRAUMATOLOGY SURGERY, CARTAGENA-MURCIA, Spain*
- QF25** EVALUATION OF EFFICACY AND SAFETY OF SPINAL NAVIGATION IN CERVICAL PEDICLE SCREW INSERTION: NEVER ELIMINATE POTENTIAL DEFICITS IN SURGICAL SKILLS  
*Tokumi Kanemura, Akiyuki Matsumoto, Hidetoshi Yamaguchi, Yoshimoto Ishikawa, Kotaro Satake, Hiroki Matsui, Tomohiro Matsumoto, Akio Muramoto, Zenya Ito, Shiro Imagama*  
*Konan Kosei Hospital. Spine Center, Konan, Japan*
- QF26** THE PROSPECTIVE SELF-CONTROLLED STUDY OF TRANS-POSTERIOR ARCH LATERAL MASS SCREW AND LATERAL MASS SCREW ON ATLAS FOR TREATMENT OF ATLANTOAXIAL INSTABILITY  
*Baorong He, Liang Yan, Dingjun Hao*  
*spine surgery, Xi'an, China*
- QF27** NONRECURRENT INFERIOR LARYNGEAL NERVE IS A RISK FACTOR FOR THE LARYNGEAL NERVE INJURY DURING CERVICAL SPINE SURGERY WITH RIGHT-SIDED ANTERIOR APPROACH  
*Yuichiro Abe, Shigenobu Sato, Hiroyuki Yasuda*  
*Eniwa Hospital, Eniwa, Japan*
- QF28** MANUAL THERAPY EFFICACY FOR NECK PAIN: A SYSTEMATIC REVIEW  
*Benjamin Hidalgo, Laurent Pitance*  
*Faculty of Motor Sciences, Brussels, Belgium*
- QF29** CERVICAL MULTIFIDUS CONTRACTION IS ASSOCIATED WITH ISOMETRIC CONTRACTION OF SHOULDER MUSCLES  
*Leila Rahnama, Asghar Rezasoltani, Farhang Noorikochi, Minoo Khalkhali, Alireza Akbarzadeh Baghban*  
*Physiotherapy, Tehran, Iran*

- QF30** CERVICAL SPONDYLOTIC MYELOPATHY: A CORRELATION BETWEEN NEUROIMAGING AND CLINICAL FINDINGS BEFORE AND AFTER DECOMPRESSIVE SURGERY  
*Marat Iusupov, Yury Shulev, Alexander Trashin*  
*neurosurgery, Saint-Petersburg, Russia*

## 08:30 Growing Spine

- QF31** SEGMENTAL SELF GROWING ROD CONSTRUCTS FOR THE MANAGEMENT OF EARLY ONSET NEUROMUSCULAR SCOLIOSIS  
*Hossein Mehdian, Georgios Arealis, Sherief Elsayed, Nasir Quraishi*  
*Centre for Spinal studies and Surgery , Queens Medical Centre, NOTTINGHAM, United Kingdom*
- QF32** GROWING SPINAL SYSTEMS AND EARLY ONSET DEFORMITIES: IS HYPERKYPHOSIS A CONTRAINDICATION?  
*Tiziana Greggi, Francesco Lolli, Francesco Vommario, Kostantinos Martikos, Elena Maredi, Andrea Baioni, Stefano Giacomini*  
*Spine Surgery Division - Rizzoli Orthopaedic Institute, Bologna, Italy*
- QF33** CASTING AND BRACING IS EFFECTIVE IN SEVERE INFANTILE AND JUVENILE IDIOPATHIC SCOLIOSIS  
*Janneke Schimmel, Lotte van Hessem, Marinus de Kleuver*  
*Research, Nijmegen, Netherlands*
- QF34** INTERNATIONAL GROWTH STANDARDS IN UK CHILDREN: ARE THEY SUITABLE FOR CHILDREN WITH SCOLIOSIS?  
*Anna Price, Adrian Gardner, Fiona Berryman, Delia Baker, Paul Pynsent*  
*Spine, Birmingham, United Kingdom*
- QF35** A PROSPECTIVE SINGLE CENTER STUDY OF SURGICAL CORRECTION OF ADOLESCENT IDIOPATHIC SCOLIOSIS- OUR RESULTS AND OUTCOME  
*Sriram Harish Srinivasan, Cheryl Honeyman, Raman Kalyan*  
*Orthopaedics, Leicester, United Kingdom*
- QF36** POSTERIOR VERTEBRAL COLUMN RESECTION (PVC) IN CONGENITAL THORACIC LORDOSCOLIOSIS  
*Meric Enercan, Cagatay Ozturk, Mehmet Fethi Ceylan, Alaa Zakout, Gurkan Gumussuyu, Tunay Sanli, Ahmet Alanay, Azmi Hamzaoglu, Meric Enercan*  
*Istanbul Spine Center, Istanbul, Turkey*
- QF37** IS INTERVAL HALO-FEMORAL TRACTION SAFE AND OF MEASURABLE BENEFIT IN STAGED SCOLIOSIS CORRECTION SURGERY?  
*Sean Grannum, Adrian Gardner, Jonathan Spilsbury, David Marks, jonathan spilsbury*  
*Spinal Surgery, Frenchay Hospital, Bristol, United Kingdom*
- QF38** CORRELATION ANALYSIS BETWEEN DIGITAL PHOTOGRAPHY MEASUREMENT OF TRUNK DEFORMITY AND RADIOLOGICAL MEASUREMENT IN PATIENTS WITH IDIOPATHIC SCOLIOSIS  
*Antonia Matamalas, Elisabetta D'Agata, Ferran Pellise, Juan Bago, Enric Caceres*  
*Orthopaedic Surgery, Barcelona, Spain*
- QF39** DOES THE INCREASED STIFFNESS OF COBALT CHROME ALLOY RODS LEAD TO SIGNIFICANTLY BETTER CORRECTION COMPARED TO TITANIUM ALLOY RODS IN ADOLESCENT IDIOPATHIC SCOLIOSIS?  
*Andrew Miller, Sean Grannum, John Hutchinson, Ian Nelson*  
*Spinal Surgery, Frenchay Hospital, Bristol, United Kingdom*
- QF40** POSTURAL BALANCE IN ADOLESCENT IDIOPATHIC SCOLIOSIS DOES NOT IMPROVE AFTER CORRECTIVE POSTERIOR SPINAL FUSION  
*Janneke Schimmel, Vivian Weerdesteijn, Marinus de Kleuver*  
*Research, Nijmegen, Netherlands*
- QF41** RISK FACTORS OF CURVE PROGRESSION IN CHILDREN WITH SPINAL MUSCULAR ATROPHY (SMA) TYPES II AND IIIA.  
*Tomasz Potaczek, Daniel Zarzycki, Maciej Tesiorowski*  
*Department of Orthopedic Surgery and Rehabilitation, Zakopane, Poland*
- QF42** A COMPARISON OF THE SOMATOMETRIC MEASUREMENTS OF ADOLESCENT MALES WITH AND WITHOUT IDIOPATHIC SCOLIOSIS  
*Chang Hyun Oh, Seung Hwan Yoon*  
*Department of Neurosurgery, Guro Teun Teun Hospital, Seoul, Korea (ROK / South Korea)*
- QF43** EVALUATION OF IMPLANT LOOSENING FOLLOWING SEGMENTAL PEDICLE SCREW FIXATION IN ADOLESCENT IDIOPATHIC SCOLIOSIS: A 2 YEAR FOLLOW UP WITH LOW-DOSE CT  
*Kasim Abul-Kasim*  
*Orthopedic department, Malmö, Sweden*
- QF44** NEW MEASUREMENTS OF TRUNK ASYMMETRY SCORE RATHER THAN COBB ANGLE FOR THE COSMETIC ASPECT OF SCOLIOSIS.  
*chin-yi Chuo*  
*orthopaedic surgery, Kaohsiung, Taiwan*
- QF45** COMPARISON OF CURVE TYPES BETWEEN PATIENTS WITH DIFFERENT TYPES OF NEUROMUSCULAR SCOLIOSIS  
*Tomasz Potaczek, Maciej Tesiorowski, Barbara Jasiewicz*  
*Department of Orthopedic Surgery and Rehabilitation, Zakopane, Poland*

## 08:30 Adult Thoracolumbar Spine, non-degenerative

- QF46** IS POSTERIOR PERCUTANEOUS INSTRUMENTATION A SAFE AND EFFECTIVE ALTERNATIVE APPROACH TO TLSO RIGID BRACING FOR SINGLE LEVEL THORACOLUMBAR SPONDYLODISCITIS?  
*Luigi Aurelio Nasto, Debora Colangelo, Eugenia Dimeco, Enrico Pola*  
*Division of Spine Surgery, Department of Orthopaedic Surgery, Catholic University of Rome, Rome, Italy*
- QF47** ADJACENT SEGMENT INFECTION AFTER STERILE SPINAL SURGERY. A SERIES OF 23 CASES AND REVIEW OF LITERATURE.  
*Ahmed Ezzat Siam, Heinrich Boehm, Hamdan Ahmed, Hossam Sad Addin, Hassan Allouch*  
*Spinal Surgery, Bad Berka, Germany*
- QF48** PYOGENIC SPINAL INFECTION IN PATIENTS OLDER THAN 80 YEARS. A REVIEW OF 107 CASES.  
*Hamdan Abdelrahman, Ahmed Ezzat Siam, Mohammed Elmeshtawi, heinrich boehm*  
*spine surgery department, bad berka, Germany*
- QF49** SPINAL INSTABILITY NEOPLASTIC SCORE: AN ANALYSIS OF RELIABILITY AND VALIDITY IN RADIOLOGISTS  
*Jeremy Reynolds, Charles Fisher, Stefano Boriani, Peter P. Varga, Laurence Rhines, Norio Kawahara, Daryl Fournery, Michael Fehlings, Rowan Schouten, Ziya Gokaslan*  
*Orthopaedics, Vancouver, Canada*
- QF50** FACTORS AFFECTING THE POSTOPERATIVE SURVIVAL RATE IN PATIENTS WITH METASTATIC SPINAL TUMOR : 253 CONSECUTIVE PATIENTS SERIES  
*JongHo Park, ChongSuh Lee, SungSoo Chung, SeJun Park, KookHee Cho, KeunHo Lee, YangTae Kim*  
*Orthopedic surgery, Seoul, Korea (ROK / South Korea)*
- QF51** BONE LESIONS IN MULTIPLE MYELOMA; A DESCRIPTIVE STUDY USING INFORMATION FROM TOTAL BODY CT-SCANS  
*Anne Versteeg, Jorrit-Jan Verlaan, Monique Minnema, Cümhur Oner*  
*Department of Orthopaedics, Utrecht, Netherlands*
- QF52** IMPLANTATION OF TUMOR TISSUE FROZEN BY LIQUID NITROGEN AFTER POSTERIOR DECOMPRESSION AND STABILIZATION FOR METASTATIC SPINAL TUMORS

Kazuya Shinmura, Hideki Murakami, Satoru Demura, Satoshi Kato, Katsuhito Yoshioka, Hiroyuki Hayashi, Takashi Ota, Noriaki Yokogawa, Xiang Fang, Hiroyuki Tsuchiya

Department of Orthopaedic Surgery, Graduate School of Medical Sciences, Kanazawa University, Kanazawa city Ishikawa, Japan

**QF53** MOTOR FUNCTION OF UPPER-EXTREMITY AFTER SACRIFICE OF T2 NERVE ROOTS DURING UPPER THORACIC TOTAL SPONDYLECTOMY  
Hideki Murakami, Satoru Demura, Satoshi Kato, Katsuhito Yoshioka, Hiroyuki Hayashi, Takashi Ota, Kazuya Shinmura, Xiang Fang, Hiroyuki Tsuchiya

Department of Orthopaedic Surgery, Graduate School of Medical Sciences, Kanazawa University, Kanazawa, Japan

**QF54** NEOPLASTIC LYTC VERTEBRAL LESIONS WITH EROSION OF POSTERIOR WALL AND EPIDURAL MASS: AN ABSOLUTE CONTRAINDICATION TO VERTEBROPLASTY?

Alessandro Cianfoni, Giuseppe Bonaldi

Neuroradiology, Lugano, Switzerland

**QF55** PROSPECTIVE ANALYSIS OF THE VALIDITY OF MAGNETIC RESONANCE (MR) IMAGING IN THE DIAGNOSIS OF TRAUMATIC INJURY OF THE POSTERIOR LIGAMENT COMPLEX (PLC)

Javier Pizones, Felisa Sánchez-Mariscal, Lorenzo Zúñiga, Patricia Álvarez-González, Enrique Izquierdo

Spine Unit, Department of Orthopaedic Surgery, Hospital Universitario de Getafe, Madrid, Spain

**QF56** RISK FACTORS AFFECTING PROGRESSIVE COLLAPSE OF ACUTE OSTEOPOROTIC SPINAL FRACTURE

Kee-Yong Ha, Jang-Woon Kim

Orthopedic surgery, Seoul, Korea (ROK / South Korea)

**QF57** DOES PEDIGUARD (ELECTRICAL CONDUCTIVITY DEVICE) ASSIST WITH THE ACCURACY OF PEDICLE SCREW PLACEMENT IN THE THORACIC SPINE? A PROSPECTIVE RANDOMIZED STUDY

Patrick Tropiano, Benjamin Blondel

Orthopedics, Marseille, France

**QF58** INFECTION AS A CAUSE OF LUMBAR DISC HERNIATION: COLONIZATION OR SAMPLE CONTAMINATION?

Miguel Lecaros, Vicente Ballesteros, Javier Lecaros, Sebastián Abusleme, Juan Zamorano, Francesca Truffa, Alejandro Urzúa, Francisco Ilabaca

, Ratko Yurac, José Fleiderman

Traumatología, Santiago, Chile

**QF59** CAUTION! NATIONAL GUIDELINES

William Singleton, Tim Germon

Department of Neurosurgery, Frenchay Hospital, Bristol, United Kingdom

**QF60** THE EFFECT OF AGE ON THE FREQUENCY OF HYPOTHYROIDISM IN PATIENTS PRESENTING WITH ACUTE FRACTURES OF THE THORACIC AND LUMBAR SPINE

Osa Emohare, Alison Dittmer, David Wright, Charles Ledonio, Robert Morgan, David Polly, Julie Switzer

Department of Orthopaedic Surgery, University of Minnesota, St Paul, USA

## 08:30 Adult Thoracolumbar Spine degenerative I

**QF61** ANATOMIC RISK FACTORS FOR MOBILE DEGENERATIVE SPONDYLOLISTHESIS AT L4/5

Sean Grannum, Andrew Miller, Ian Harding

Spinal Surgery, Frenchay Hospital, Bristol, United Kingdom

**QF62** IS NUCLEAR TISSUE INFECTED WITH BACTERIA FOLLOWING DISC HERNIATIONS WHICH LEADS TO MODIC CHANGES IN THE ADJACENT VERTEBRAE?

Hanne B. Albert

The Research Department, Spine Center Southern Denmark, University of Southern Denmark, Middelfart, Denmark

**QF63** APPROACHES TO THORACIC SPINE FOR THORACIC DISC HERNIATIONS: A SYSTEMATIC REVIEW

Sujay Dheerendra, Antonino Russo, Bronek Boszczyk

Royal Liverpool University Hospital, Liverpool, United Kingdom

**QF64** TO EVALUATE THE EFFECTIVENESS OF HYALURONIDASE IN THE SELECTIVE NERVE ROOT BLOCK OF RADICULOPATHY. &#8211; DOUBLE BLIND, RANDOMIZED CONTROLLED STUDY

Jaebum Kwon, Sangwook Lee

Orthopaedic Surgery, Cherry Hill, NJ, USA

**QF65** COMPARISON OF SMITH-PETERSEN, PEDICLE SUBTRACTION OSTEOTOMY AND VERTEBRAL COLUMN RESECTION FOR THE CORRECTION OF SAGGITAL IMBALANCE.

Morales Codina Ana María, Valverde Belda Diego, Muñoz Donat Sonia, Sanchez Monzó Carlos, Aguirre García Rafael, Molina Aguilar María Jesus,

Martín Benlloch Juan Antonio

Orthopaedic and Traumatology Department, Valencia, Spain

**QF66** LUMBAR INSTABILITY CLINICAL TESTS, PAIN AND DISABILITY IN SUBJECTS WITH SYMPTOMATIC SPONDYLOLISTHESIS. A CROSS-SECTIONAL DIAGNOSTIC TEST STUDY

Silvano Ferrari, Carla Vanti, Simona Ferrante, Marco Monticone

Padova University, Italy, Sesto San Giovanni, Italy

**QF67** LONG TERM FAILURE OF PERCUTANEOUS INTERSPINOUS SPACERS FOR THE TREATMENT OF NEUROGENIC CLAUDICATION.

Patrick Fransen

Department of Neurosurgery, Brussels, Belgium

**QF68** CLINICAL AND RADIOLOGICAL PREDICTIVE FACTORS TO BE RELATED WITH THE DEGREE OF LUMBAR BACK MUSCLE DEGENERATION : DIFFERENCE BY GENDER

Jae Hwan Cho, Woo Dong Nam

Orthopedic Surgery, Chuncheon, Korea (ROK / South Korea)

**QF69** INTERSPINOUS SPACERS IN SWISSPINE: INFLUENCE OF FIXATION TYPE AND DECOMPRESSION ON CLINICAL OUTCOMES AND COMPLICATIONS

Emin Aghayev

Inst. for Evaluative Research in Orthopaedics, Bern, Switzerland

**QF70** ANTIBIOTIC TREATMENT IN PATIENTS WITH CHRONIC LOW BACK PAIN AND VERTEBRAL BONE EDEMA (MODIC TYPE 1 CHANGES): A DOUBLE-BLIND RANDOMIZED CLINICAL CONTROLLED TRIAL OF EFFICACY.

Hanne B Albert, Joan S. Sorensen

The Research Department, Spinecenter of Southern Denmark, University of Southern Denmark, Middelfart, Denmark

**QF71** THE EFFECTS ON VALIDATED CLINICAL OUTCOME MEASURES IN PATIENTS UNDERGOING DYNAMIC STABILIZATION FOR DEGENERATIVE LUMBAR SPONDYLOLISTHESIS (SYSTEMATIC REVIEW)

Razvan Taranu, Josette Bettany-Saltikov

Orthopaedics Department, Wansbeck General Hospital, Ashington, United Kingdom

**QF72** CLINICAL OUTCOMES AND IMPLANT-RELATED COMPLICATIONS AFTER PEDICLE-ANCHORED DYNAMIC OR HYBRID LUMBAR SPINE STABILIZATION: A SYSTEMATIC REVIEW.

Carlos Barrios, Marion Prud'homme, Philippe Rouch, Yann Philippe Charles, Jean-Paul Steib, Wafa Skalli

Institute for Research on Musculoskeletal Disorders, Valencia Catholic University, Valencia, Spain

**QF73** ACCURACY AND SAFETY OF PEDICLE SCREW PLACEMENT IN ADULT LUMBAR SPINE WITH AND WITHOUT SCOLIOSIS: A CASE-CONTROL STUDY

SUN Xu, XU Leilei, ZHU Feng, ZHU Zezhang, WANG Bin, QIAN Bang-ping, YU Yang, QIU Yong

Spine Surgery, Nanjing, China



- QF74** DEVELOPMENT OF A RISK SCORING SYSTEM TO PREDICT A RISK OF OSTEOPOROTIC VERTEBRAL FRACTURES IN POSTMENOPAUSAL WOMEN  
*Debora Colangelo, Luigi Aurelio Nasto, Marilda Mormando, Enrico Pola*  
*Division of Spine Surgery, Department of Orthopaedic Surgery, Catholic University of Rome, Rome, Italy*
- QF75** MINIMIZING IONIZING RADIATION IN PATIENTS THAT REQUIRES CT SCAN EXAMINATION AFTER SPINAL INSTRUMENTATION.  
*Eduardo Hevia, Jesus Burgos, Carlos Barrios, Alberto Caballero, Miguel Antón, Ignacio Sanpera*  
*Spine Unit. Hospital La Fraternidad., Madrid, Spain*

<b>08:30</b>	<b>Adult Thoracolumbar Spine degenerative I</b>
<b>QF76</b>	PREDICTORS FOR QUALITY OF LIFE IMPROVEMENT AND PAIN RELIEF IN LUMBAR SPINAL STENOSIS RELATIVE TO PATIENT AGE: A SPINE TANGO REGISTRY BASED STUDY <i>Rolf Sobottke, Jan Siewe, Thomas Kaulhausen, Peer Eysel, Christoph Röder, Emin Aghayev</i> <i>Orthopedics and Trauma surgery, Würselen, Germany</i>
<b>QF77</b>	WHAT IS THE MAXIMUM LEVEL OF DISABILITY ON THE OSWESTRY DISABILITY INDEX THAT MOST PATIENTS COULD LIVE WITH? <i>Jeremy C Fairbank, Miranda van Hooff, Anne F Mannion</i> <i>Spine Center, Schulthess Klinik, Zürich, Switzerland</i>
<b>QF78</b>	PATIENT-ORIENTED OUTCOMES AFTER MUSCLE-PRESERVING INTERLAMINAR DECOMPRESSION FOR PATIENTS WITH LUMBAR SPINAL CANAL STENOSIS: MULTI-CENTER STUDY TO IDENTIFY RISK FACTORS FOR POOR OUTCOMES. <i>Sunao Tanaka, Toru Yokoyama, Kazunari Takeuchi, Kan-ichiro Wada, Toshihiro Tanaka, Shuichi Aburakawa, Gentaro Kumagai, Toru Asari, Atsushi Ono, Yasuyuki Ishibashi</i> <i>Orthopaedic surgery, Odate, Akita, Japan</i>
<b>QF79</b>	INCIDENCE OF THE LEVEL/ SIDE OF LUMBAR DISC HERNIATION AND COMPLICATIONS - IS THERE A DIFFERENCE BETWEEN CONSULTANTS AND THEIR TRAINEES? <i>Hoda Mohajer-Bastami, Carlotta Martini, George Arealis, Masood Shafafy, Nasir A Quraishi, Hossein Mehdian</i> <i>QMC, London, United Kingdom</i>
<b>QF80</b>	ANALYSIS OF THE MASTERS-D STUDY: A PROSPECTIVE MULTI-CENTER OBSERVATIONAL DATA-MONITORED STUDY OF MINIMALLY INVASIVE FUSION TO TREAT DEGENERATIVE LUMBAR DISORDERS <i>Kai-Michael Scheufler, David Buzek, Neil Manson, Paulo Pereira, Wolfgang Senker, Joerg Franke</i> <i>Spine Center, Hospital Kempen, Academic Teaching Hospital, University of Düsseldorf,, Kempen, Germany</i>
<b>QF81</b>	DEGENERATIVE CHANGES IN THE LUMBAR SPINE CORRELATE WITH SPINO-PELVIC ALIGNMENT IN PATIENTS WITH LOW BACK PAIN <i>Dominique A Rothenfluh, Kan Min, Esin Rothenfluh</i> <i>The Centre for Spinal Studies and Surgery, Nottingham, United Kingdom</i>
<b>QF82</b>	IS THERE A CORRELATION BETWEEN PLASMINOGEN ACTIVATOR INHIBITOR-1, C-REACTIVE PROTEIN AND PAIN IN PATIENTS WITH LUMBAR DISC HERNIATION? <i>Peter Elkan, Margareta Sten-Linder, Rune Hedlund, Ulric Willers, Sari Ponzer, Paul Gerdhem</i> <i>Dept of Orthopedics, Södersjukhuset, Stockholm, Sweden</i>
<b>QF83</b>	MEDIUM AND LONG TERM SURGICAL OUTCOMES OF THORACIC SPONDYLOTIC MYELOPATHY CAUSED BY OSSIFICATION OF SPINAL LIGAMENTS. - MORE THAN 5 YEARS FOLLOW-UP - <i>Kazuhiro Takeuchi, Shinnosuke Nakahara</i> <i>Orthopaedic Surgery, National Okayama Medical Center, Okayama, Japan</i>
<b>QF84</b>	MULTIPLE REGRESSION ANALYSIS OF FACTORS AFFECTING HRQL IN ADULT SPINAL DEFORMITY (ASD) <i>Emre Acaroglu, Umit Ozgur Guler, Ferran Pellise, Montse Domingo-Sabat, Sule Yakici, Ahmet Alanay, Francesco Sanchez Perez-Grueso, Yalcin Yavuz, Yasemin Genc</i> <i>Orthopaedic &amp; Traumatology, Ankara, Turkey</i>
<b>QF85</b>	A STUDY EXPLORING THE POTENTIAL ROLE OF THE BIOPSYCHOSOCIAL ASSESSMENT IN THE MANAGEMENT OF PATIENTS WITH CHRONIC LOW BACK PAIN ATTENDING A PAIN CLINIC. <i>Caroline Treanor, Alison Kearon, Amy Anslow, Tom Burke, Valerie Pollard, Josh Keaveny, Louise Keating</i> <i>Physiotherapy, Dublin, Ireland</i>
<b>QF86</b>	TLIF SURGERY RESULTS IN SLIGHTLY HIGHER RISK OF NEUROGENIC LEG PAIN 2 YEARS AFTER SURGERY COMPARED TO STANDARD INSTRUMENTED POSTEROLATERAL FUSION. RESULTS FROM A RANDOMIZED CLINICAL TRIAL. <i>Kristian Høy, Blazej Grycel, Thomas Andersen, Bent Niedermann, Peter Helmig, Ebbe Stender Hansen, Haisheng Li, Cody Büniger</i> <i>Spine Section, Department of orthopaedic surgery, Aarhus C, Denmark</i>
<b>QF87</b>	Withdrawn: ADIPOKINES AND THE INTERVERTEBRAL DISC: A BIOCHEMICAL LINK BETWEEN OBESITY AND DISC DEGENERATION <i>Anand Segar, Jeremy Fairbank, Jill Urban</i> <i>Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, Oxford, United Kingdom</i>
<b>QF88</b>	V-Y VERTEBRAL BODY OSTEOSTOMY FOR THE TREATMENT OF FIXED FLEXION DEFORMITY OF THE SPINE <i>Hossein Mehdian, Sherief Elsayed, Georgios Arealis, Nasir Quraishi</i> <i>Centre for Spinal studies and Surgery , Queens Medical Centre, NOTTINGHAM, United Kingdom</i>
<b>QF89</b>	SAFETY AND SHORT-TERM EFFECTS OF POSTOPERATIVE 12-WEEK LUMBAR STABILIZING EXERCISE AFTER POSTERIOR LUMBAR INTERBODY FUSION <i>ChongSuh Lee, KyungChung Kang, DongEun Shin, SeJun Park</i> <i>Orthopedic surgery, Seongnam, Korea (ROK / South Korea)</i>
<b>QF90</b>	STAGED SURGICAL CORRECTION OF THORACIC KYPHOSIS IN SEVERE OSTEOPOROTIC PATIENTS - RADIOGRAPHIC OUTCOME <i>Eyal Behrbalk, Ofir Uri, Matthias König, Bronek Boszczyk</i> <i>Queen's Medical Centre, The Spine Unit, Nottingham, United Kingdom</i>

10:00-10:30 **BREAK**

10:30 **Presidential Address, Medal and Awards Lectures**  
Room: Plenary Hall

12:00-14:00 **EUROSPINE LUNCH SYMPOSIA, Thursday October 3**

**GENERAL SESSION**

**14:00 – 15:20 Lumbar Degenerative****Room: Plenary Hall**

- 31** LIFE QUALITY IMPROVEMENT AND PATIENT SATISFACTION AFTER CORRECTION OF THORACOLUMBAR FIXED SAGITTAL PLANE DEFORMITY IN PATIENTS SEVENTY YEARS OLD OR OLDER. DOES IT WORTH IT?  
*Luis Alvarez, Angel R Piñera, Felix Tome, Carmen Duran, Belen Lopez San Roman, Daniela Vlad, Ignacio Mahillo*  
*Fundación Jiménez Díaz. Spine Unit, Madrid, Spain*
- 32** BIOMECHANICAL EVALUATION OF S2 ALAR ILIAC SCREWS: THE EFFECT OF LENGTH AND QUAD-CORTICAL PURCHASE AS COMPARED TO ILIAC FIXATION  
*Joseph O'Brien, Warren Yu, Manasa Gudipally, Brandon Bucklen, Saif Khalil*  
*Orthopaedic Surgery, Washington, USA*
- 33** COMPARATIVE STUDY OF LUMBOPELVIC SAGITTAL ALIGNMENT BETWEEN THE PATIENTS WITH AND WITHOUT SACROILIAC JOINT PAIN AFTER LUMBAR INTERBODY FUSION  
*Myung-Hoon Shin, Kyeong-Sik Ryu, Chun-Kun Park*  
*Departments of Neurosurgery, Seoul St Mary's Hospital, The Catholic University, Seoul, South Korea, Seoul, Korea (ROK / South Korea)*
- 34** SHORT VERSUS LONG POSTERIOR SPINAL FUSION AND DECOMPRESSION FOR DEGENERATIVE SCOLIOSIS ASSOCIATED WITH NEUROLOGIC SYMPTOMS.  
*Marco Teli, Federico Valli, Domenico Prestamburgo*  
*Orthopaedics Legnano Hospital, Legnano, Italy*
- 35** SACROPELVIC FIXATION IN ADULT SPINAL DEFORMITY (ASD); A VERY HIGH RATE OF MECHANICAL FAILURE  
*Emre Acaroglu, Onur Yaman, Umit Ozgur Guler, Ferran Pellise, Alba Villa-Casademunt, Montse Domingo, Ahmet Alanay*  
*Orthopaedic & Traumatology, Ankara, Turkey*
- 36** COMPLICATIONS AND OUTCOMES AFTER 106 PEDICLE SUBTRACTION OSTEOTOMIES FOR SAGITTAL PLANE DEFORMITY ACCORDING TO DIAGNOSIS  
*Vamsi Varma, Christer Johansson, Pavel Neumann, Rune Hedlund*  
*Department of Orthopedics, Gothenburg, Sweden*
- 37** LUMBAR CURVE TYPE CORRELATES WITH INCIDENCE OF SYMPTOMATIC LUMBAR DISK HERNIATION IN YOUNG PATIENTS  
*Adad Baranto, Klas Halldin, Olof Thoreson, Helena Brisby*  
*Dep of Orthopaedics, Gothenburg, Sweden*
- 38** MORTALITY AFTER SURGERY FOR DEGENERATIVE LUMBAR SPINE  
*Jyrki Salmenkivi, reijo Sund, Mika Paavola, Iiris Ruuth, Antti Malmivaara*  
*Helsinki University Central Hospital(HUCH), Espoo, Finland*
- 39** SPINOPELVIC MALALIGNMENT LEADS TO INCREASED SEGMENTAL JOINT LOADS AND PREDISPOSES TO ADJACENT SEGMENT DEGENERATION AFTER LUMBAR SPINAL FUSION  
*Dominique A Rothenfluh, Esin Rothenfluh, Kan Min, Marco Senteler*  
*Centre for Spinal Studies and Surgery, Nottingham, United Kingdom*
- 40** FEMORAL NERVE STRAIN AT L4-5 IS MINIMIZED BY HIP FLEXION AND INCREASED BY TABLE BREAK WHEN PERFORMING LATERAL TRANSPOAS INTERBODY FUSION  
*Joseph O'Brien, Alexander Turner*  
*Orthopaedic Surgery, Washington, USA*

**15:20-15:50 BREAK****15:00 – 17:30 Lumbar non-degenerative I****Room: Plenary Hall**

- 15:00 Debate: Sagittal Balance – a French Conspiracy?**  
tbd  
**Room: Plenary Hall**
- 11:15 Hot Topic: Quality Control in the Treatment of Spinal Disorders**  
tbd  
**Room: Plenary Hall**
- 17:30 EUROSPINE GENERAL ASSEMBLY**  
Plenary Hall - Members only
- 20:00 GALA EVENING**  
Attire: formal

**Friday, October 4, 2013****08:30 – 10:00 Growing Spine**



**Room: Plenary Hall**

- 41** DIRECT REPAIR FOR TREATMENT OF ISTHMIC SPONDYLOLYSIS AND SPONDYLOLISTHESIS : CLINICAL AND RADIOGRAPHIC RESULTS AT LEAST 10 YEARS FOLLOW-UP  
*Laura Scaramuzzo, Fabrizio Giudici, Leone Minoia, Marino Archetti, Antonino Zagra*  
*I.R.C.C.S. Galeazzi Orthopedic Institute Spine Surgery Division 1 , Milano, Italy*
- 42** THE EVOLUTION OF SAGITTAL ALIGNMENT OF THE SPINE ON SITTING POSITION DURING CHILDHOOD  
*Halil Gokhan Demirkiran, Saygin Kamaci, Altug Yucekul, Muharrem Yazici*  
*HACETTEPE UNIVERSITY ORTHOPAEDICS AND TRAUMATOLOGY DEPARTMENT, ANKARA, Turkey*
- 43** SAGITTAL PARAMETERS IN FAILED PAEDIATRIC SPINAL DEFORMITY OPERATIONS  
*Julian Leong, Nitin Shetty, Tejas Yarashi, Alexa Offen, Stewart Tucker*  
*Spine, Middlesex, United Kingdom*
- 44** VARIATIONS IN THE CERVICAL SAGITTAL ALIGNMENT AFTER SURGICAL CORRECTION OF ADOLESCENT IDIOPATHIC SCOLIOSIS.  
 A COMPARATIVE STUDY OF CONCAVE DEROTATION AND VERTEBRAL COPLANAR ALIGNMENT TECHNIQUES  
*Carlos Barrios, Juan M. Reviriego, Carlos Legarreta, José I. Maruenda, Jesús Burgos, Eduardo Hevia*  
*Institute for Research on Musculoskeletal Disorders, Valencia Catholic University, Valencia, Spain*
- 45** POSTERIOR ONLY SURGICAL CORRECTION OF SCHEUERMANN KYPHOSIS - IS BILATERAL ALL-LEVEL PEDICULAR SCREW FIXATION REQUIRED?  
*Eyal Behrbalk, Ofir Uri, Matthias König, Bronek Boszczyk*  
*Queen's Medical Centre, The Spine Unit, Nottingham, United Kingdom*
- 46** THORACIC AND LUMBAR SELECTIVE FUSION IN ADOLESCENT IDIOPATHIC SCOLIOSIS : CLINICAL AND RADIOGRAPHIC ANALYSIS AT 11 YEARS MEDIAN FOLLOW-UP  
*Laura Scaramuzzo, Fabrizio Giudici, Marino Archetti, Leone Minoia, Antonino Zagra*  
*I.R.C.C.S. Galeazzi Orthopedic Institute Spine Surgery Division 1 , Milano, Italy*
- 47** TREATMENT OF LENKE TYPE 5C ADOLESCENT IDIOPATHIC SCOLIOSIS WITH SELECTIVE POSTERIOR FUSION (COBB TO COBB)  
*Meric Enercan, Cagatay Ozturk, Bekir Yavuz Ucar, Wael Al-kasem, Gurkan Gumussuyu, Tunay Sanli, Ahmet Alanay, Azmi Hamzaoglu*  
*Istanbul Spine Center, Istanbul, Turkey*
- 48** UN-COUPLED CORRECTION OF VERTEBRAL TRANSLATION WITH ROTATION: A NEGLECTED RISK FACTOR FOR POSTOPERATIVE AGGRAVATION OF ANTERIOR CHEST WALL DEFORMITY IN THORACIC IDIOPATHIC SCOLIOSIS  
*QIU Yong, MAO Sai-hu, ZHU Ze-zhang, QIAN Bang-ping, ZHU Feng, LIU Zhen, WANG BIN, YU Yang*  
*Spine Surgery, Nanjing, China*
- 49** IS THERE A BETTER DEROTATION MANOEUVRE IN POSTERIOR CORRECTION OF THORACIC ADOLESCENT IDIOPATHIC SCOLIOSIS?  
*Mario Di Silvestre, Francesco Lolli, Francesco Vommaro, Kostantinos Martikos, Andrea Baioni, Elena Maredi, Tiziana Greggi*  
*Spine Surgery Division - Rizzoli Orthopaedic Institute, Bologna, Italy*
- 50** RIB DEFORMITIES IN CONGENITAL SCOLIOSIS  
*Jianxiong Shen, Xuhong Xue*  
*Department of Orthopedics, Peking Union Medical College Hospital, Chinese Academy of Medical Science, Peking Union Medical College, Beijing, China*
- 51** SCORING RISK FACTORS TO EARLY WOUND DEHISCENCE AND PROGRESSION TO METALWORK INFECTIONS AFTER INSTRUMENTED SPINAL FUSION IN CHILDREN WITH NEUROMUSCULAR SCOLIOSIS  
*Muhammad Amer Bashir, Michael Athanassacopoulos, Rachel Hunt, Julian Leong, Tom ember, Jonathan lucas, Ramesh Nadarajah*  
*Paediatric Spinal Surgery, London, United Kingdom*

10:00-10:30 **BREAK****10:30 – 12:00 The 'Best of Show' papers. The highest scoring abstract submissions****Room: Plenary Hall**

- 52** IS THERE A GLOBAL CONSENSUS ON OPTIMAL SURGICAL CARE FOR ADOLESCENT IDIOPATHIC SCOLIOSIS? A DELPHI STUDY  
*Marinus de Kleuver, Stephen Lewis, Ahmet Alanay, Sigurd Berven, Kenneth Cheung, Lawrence Lenke, David Polly, Yong Qiu, Christopher Shaffrey, Manabu Ito, Steven J Kamper, Maurits van Tulder, Niccole M Gernscheid*  
*Research, Davos, Switzerland*
- 53** THE PRIMARY TUMOR MORTALITY SCORE: NEW TOOL FOR THE ESTIMATION OF SURVIVAL IN PRIMARY SPINE TUMOR PATIENTS  
*Zsolt Szoverfi, Aron Lazary, Arpad Bozsodi, Peter Pal Varga*  
*National Center for Spinal Disorders, Budapest, Hungary*
- 54** SPINAL CORD BIOCHEMISTRY PREDICTS SURGICAL OUTCOME IN CERVICAL SPONDYLOTIC MYELOPATHY  
*Sorin C. Craciunas, Mircea R. Gorgan, Carmen M. Cirste*  
*NEUROSURGERY DEPARTMENT, BUCHAREST, Romania*
- 55** PATIENT OUTCOMES AFTER LAMINOTOMY, HEMI-LAMINECTOMY, LAMINECTOMY AND LAMINECTOMY WITH INSTRUMENTED FUSION FOR SPINAL CANAL STENOSIS OR DEGENERATIVE SPONDYLOLISTHESIS  
*Everard Munting, Christoph Röder, Rolf Sobottke, Emin Aghayev*  
*Institute for Evaluative Research in Medicine, Bern, Switzerland*
- 56** LONG-TERM (11-YEAR) FOLLOW-UP OF THREE RANDOMISED CONTROLLED TRIALS COMPARING SPINAL FUSION AND NON-OPERATIVE TREATMENT IN PATIENTS WITH CHRONIC LOW BACK PAIN.  
*Anne F Mannion, Jens Ivar Brox, Jeremy C Fairbank*  
*Spine Center, Schulthess Klinik, Zürich, Switzerland*
- 57** CT-GRAPHIC EVOLUTION OF ADVERSE EVENTS AFTER USE OF RHBMP-2 IN PLIF SURGERY.

Jan Sys, Jef Michielsen, Antoon Rigaux  
Orthopaedic Surgery, Dendermonde, Belgium

- 58** ASSOCIATION BETWEEN VERTEBRAL ENDPLATE SIGNAL CHANGES AND LOW BACK PAIN IN PATIENTS WITH CURRENT OR PREVIOUS SYMPTOMS OF SCIATICA  
Carmen Vleggeert-Lankamp, Bas Van der Kallen, Geert Lycklama à Nijeholt, Wilbert Van den Hout, Bart Koes, Wilco Peul  
Neurosurgery, Leiden, Netherlands
- 59** IN VIVO BIOFUNCTIONAL EVALUATION OF HYDROGELS FOR DISC REGENERATION STRATEGIES  
Sandra Reitmaier, Ludwika Kreja, Katharina Gruchenberg, Britta Kanter, Miguel Oliveira, Rui Reis, Joana Silva-Correia, Anita Ignatius, Hans-Joachim Wilke  
Institute of Orthopaedic Research and Biomechanics, Ulm, Germany

**12:00-14:00 EUROSPINE LUNCH SYMPOSIA, Friday October 4**

**14:00 – 15:20 Combined**

**Room: Plenary Hall**

- 60** MOLECULAR INTERACTIONS BETWEEN HUMAN CARTILAGINOUS ENDPLATES AND NUCLEUS PULPOSUS CELLS  
Cornelia Neidlinger-Wilke<sup>1</sup>, Antje Boldt<sup>1</sup>, Fabio Galbusera<sup>1</sup>, Claus Carstens<sup>2</sup>, Christoph Brochhausen<sup>3</sup>, Aron Lazary<sup>4</sup>, Marco Brayda-Bruno<sup>5</sup>, Anita Ignatius<sup>1</sup>, Hans-Joachim Wilke<sup>1</sup>  
Institute of Orthopaedic Research and Biomechanics, Ulm, Germany
- 61** RELATION BETWEEN LUMBAR STENOSIS SEVERITY AND REDUNDANT NERVE ROOT SIGN.  
Gerit Kulik, Katarzyna Pierzchala, Constantin Schizas  
<sup>1</sup>Orthopedics, Centre Hospitalier Universitaire Vaudois and the University of Lausanne, Lausanne, Switzerland
- 62** TRANSPLANTATION OF MESENCHYMAL STEM CELLS FOR ACUTE SPINAL CORD INJURY IN RATS; COMPARATIVE STUDY BETWEEN INTRALESIONAL INJECTION AND SCAFFOLD BASED TRANSPLANTATION.  
Yoon-Chung Kim, Kee-Yong Ha, Jang-Woon Kim  
Department of Orthopedic Surgery, Seoul St. Mary's Hospital, College of Medicine, , Seoul, Korea (ROK / South Korea)
- 63** DECREASING VOLUMEN OF MODIC TYPE I CHANGES (BONE EDEMA) AFTER ANTIBIOTIC TREATMENT IN PATIENTS WITH CHRONIC LOW BACK PAIN, A DOUBLE-BLIND RANDOMIZED CLINICAL CONTROLLEDE TRIAL OF EFFICACY.  
Joan Solgaard Sorensen, Hanne Birgit Albert  
Research Department, Spine Centre of Southern Denmark, Gudme, Denmark
- 64** DEVELOPMENT OF A METHOD FOR QUANTITATIVE MEASURES OF LUMBAR INTERVERTEBRAL DISC STRUCTURES: AN INTRA- AND INTER-RATER AGREEMENT STUDY  
Andreas Tunset, Per Kjaer, Shadi Samir Chreiteh, Tue Secher Jensen  
Institute of Sports Science and Clinical Biomechanics, University of Southern Denmark, Odense M, Denmark
- 65** TREATMENT OF THORACIC OR LUMBAR BURST FRACTURES WITH BALLOON ASSISTED ENDPLATE REDUCTION USING TRICALCIUM PHOSPHATE CEMENT: HISTOLOGICAL AND RADIOLOGICAL EVALUATION.  
Joep Kitzen, Martijn Schotanus, Pieter Tilman  
Department of Orthopaedic Surgery, Orbis Medisch Centrum, Sittard, Netherlands
- 66** ROBOTIC GUIDANCE SYSTEM IN SPINE SURGERY; INITIAL RESULTS IN TERMS OF SAFETY AND ACCURACY OF SCREW PLACEMENT IN THE FIRST 50 CASES.  
Vamsi Krishna Varma Penumatsa, Raghavendra Rao Dharmavaram, Appaji Krishnan, Sajan Hegde  
spine surgery, Chennai, India
- 67** RELIABILITY OF SAGITTAL PELVIC PARAMETERS; MEASUREMENT USING THE NEW SRS COMPUTERIZED TOOL. THE EFFECT OF LUMBOSACRAL INSTRUMENTATION AND MEASUREMENT EXPERIENCE.  
Ferran Pellisé, Alba Vila-Casademunt, Emre Acaroglu, Francisco J S Pérez-Grueso, Mar Pérez, Tunay Sanly, Sule Yakici, Ana García de Frutos, Antonia Matamalas, Jose Miguel Sánchez, Ibrahim Obeid, Joan Bagó, ESSG Jose Miguel Sánchez, Ibrahim Obeid, Joan Bagó, ESSG  
Spine Unit Vall d'Hebron Hospital, Barcelona, Spain
- 68** OPTIMAL SCHEDULE OF PREOPERATIVE EMBOLIZATION FOR SPINAL METASTASIS SURGERY  
So Kato, Takahiro Hozumi, Kiyofumi Yamakawa, Takahiro Goto, Taiji Kondo  
Department of Orthopaedic Surgery and Musculoskeletal Oncology, Tokyo Metropolitan Komagome Hospital, Tokyo, Japan
- 69** A NOVEL SCIENTIFIC MODEL FOR RARE AND OFTEN NEGLECTED NEOPLASTIC CONDITIONS  
Jeremy Reynolds, Charles Fisher, Stefano Boriani, Peter P. Varga, Michael Fehlings, Mark Bilsky, Mark Dekutoski, Laurence Rhines, Chetan Bettgowda, Ziya Gokaslan  
Orthopaedics, Vancouver, Canada

**15:20-15:50 BREAK**

**15:50 – 17:30 Lumbar Spine, degenerative**

**Room: Plenary Hall**

- 70** ALLOGRAFT ALONE VERSUS ALLOGRAFT WITH BONE MARROW CONCENTRATE FOR THE HEALING OF THE INSTRUMENTED POSTEROLATERAL LUMBAR FUSION  
Martin Komzák, Radek Hart, David Náhlík, Pavel Jajtner, Milo Puskeiler  
Department of Orthopaedics and Traumatology, Znojmo, Czech Republic
- 71** RADIOLOGICAL PREDICTORS OF PERMANENT PSEUDARTHROSIS AFTER PLIF USING INTERBODY CAGES  
Tokumi Kanemura, Akiyuki Matsumoto, Yoshimoto Ishikawa, Hidetoshi Yamaguchi, Kotaro Satake, Zenya Ito, Shiro Imagama  
Konan Kosei Hospital. Spine Center, Konan, Japan

- 72** SURGICAL OUTCOME OF POSTERIOR LUMBAR INTERBODY FUSION FOR LUMBAR LESION IN RHEUMATOID ARTHRITIS  
*Hiroyasu Fujiwara, Takashi Kaito, Takahiro Makino, Takahiro Ishii, Kazuo Yonenobu*  
*Orthopaedic surgery, Kawachinagano, Osaka, Japan*
- 73** FEMORAL STRUT ALLOGRAFTS HELP TO CLOSE LAMINECTOMY DEFECTS AND PREVENT ITS POTENTIAL COMPLICATIONS  
*Meric Enercan, Cagatay Ozturk, Sinan Kahraman, Ayhan Mutlu, Gurkan Gumussuyu, Azmi Hamzaoglu, Ahmet Alanay*  
*Istanbul Spine Center, Istanbul, Turkey*
- 74** SIGNIFICANCE OF SERUM INTACT PROCOLLAGEN TYPE 1 AMINOTERMINAL PROPEPTIDE LEVEL MEASURED IN PATIENT WITH SPINAL OSTEOPOROSIS.  
*Tokio Kasai, Ami Inui*  
*Orthopaedic Surgery, Takamatsu, Japan*
- 75** ISTHMIC SPONDYLOLISTHESIS; ONE-AND TWO YEAR OUTCOME AFTER SURGERY - AN ANALYSIS OF 2227 PATIENTS IN THE SWEDISH SPINE REGISTER, SWESPINE  
*Peter Fritzell, Björn Strömqvist, Björn Knutsson, Bengt Sanden, Olle Hägg*  
*Neuro-orthopedic department, Jönköping, Sweden*
- 76** PARS INTERARTICULARIS REPAIR WITH PERCUTANEOUS COMPRESSION SCREW FIXATION  
*Lester Wilson*  
*Spinal Surgical Unit, Stanmore, United Kingdom*
- 77** ADJACENT SEGMENT DEGENERATION 15-YEARS AFTER SINGLE LEVEL ANTERIOR LUMBAR INTERBODY FUSION WITH ADDITIONAL POSTERIOR STABILISATION  
*Philip Horsting, Janneke Schimmel, Marina Obradov, Marinus de Kleuver*  
*Orthopedic Surgery, Nijmegen, Netherlands*
- 78** STOP THE X-STOP, A DEVICE WITH UNACCEPTABLE RESULTS  
*Philip Sell, Ben Boreham*  
*Department of Orthopaedics, Leicester, United Kingdom*
- 79** EFFICACY OF LUMBAR FACET NERVE BLOCKS IN TREATING CHRONIC LUMBAR FACET ARTHRITIS PAIN.  
*Georgios Mouzopoulos, Ioannis Skevofilax, Aggeliki Paragi, Mihalīs Sideratos, Georgios Nomikos, Vasilios Vasiliadis*  
*Orthopaedic Department of Chios Hospital, Chios, Greece., Chios, Greece*
- 80** AGING-ASSOCIATED CHANGES IN PARASPINAL MUSCLES AND PSOAS MUSCLES  
*Kazushi Takayama, Hiroaki Nakamura, Fumiaki Kanematsu, Toshiya Yasunami, Shigehiro Ikeda, Kohei Yamamoto, Hiroyuki Gotani, Hideki Sakanaka, Yoshiki Yamano*  
*Orthopaedic surgery, Osaka, Japan*
- 81** HYPERTROPHY OF THE LIGAMENT FLAVUM IN DEGENERATIVE LUMBAR STENOSIS ASSOCIATED WITH THE INCREASED EXPRESSION OF FRACTALKINE (CX3CL1)/CX3CR1 CHEMOKINE (CX3CL1)/CX3CR1  
*In-Soo Oh, Jin-Hyung Im, Kee-Yong Ha*  
*Orthopaedic Surgery, Seoul, Korea (ROK / South Korea)*

17:30

CLOSING REMARKS – END