

## 1. BIOCHEMISTRY/CELL METABOLISM/GENE TRANSFER/GROWTH FACTORS

GP1.	Migrating prechondrocytic cells from stem cell niches supports growth and regeneration of the adult mammal intervertebral disc - A descriptive study in three species <b>Barreto Henriksson, H</b> , Svala, E, Skioldebrand, E, Junevik, K, Lindahl, A, Brisby, H: Uppsala, Sweden and Gothenburg, Sweden
GP2.	Mesenchymal stem cell homing is influenced by soluble mediators from stressed intervertebral discs with or without end-plate <b>Pattappa, G</b> , Illien-Jünger, S, Peroglio, M, Grad, S, Sakai, D, Mochida, J, Alini, M: Davos, Switzerland, New York, US and Kanagawa, Japan
GP3.	Cell viability and shape of nucleus pulposus and stromal cells in synthetic 3D PEG hydrogel-microspheres with and without RGD Chan, S, Chun W, Benneker, LM, <b>Gantenbein-Ritter, B</b> : Bern, Switzerland
GP4.	Induction of mesenchymal stem cells into discogenic phenotype under the hypoxia condition <b>Kang, Y-M</b> , Ji, H-W, Moon, E-S, Kim, H-J, Lee, B-H, Park, J-O, Lee, H-M, Moon, S-W: Seoul, Republic of Korea
GP5.	Pregabalin as a neuroprotector after spinal cord injury in rats: biochemical analysis and effect on glial cells Ha, KY, <b>Kim, YH</b> : Seoul, Republic of Korea and Incheon, Republic of Korea
GP6.	Inhibition of NF- $\kappa$ B in annulus fibrosus cells blocks the catabolic effects of both mechanical and inflammatory stimuli Sowa, G, <b>Vo, N</b> , Coelho, JP, Wang, D, Sherry, N, Dong, Q, Phillibert, D, Kang, J: Pittsburgh, US and Beijing, China
GP7.	Cell viability in the degenerate intervertebral disc <b>Freemont, A</b> , Lam, J, Hoyland, J, Richardson, S, Taube, M-A: Manchester, UK
GP8.	Proliferation of annulus fibrosus cells in platelet rich plasma – a natural 3D scaffold: an in vitro study Schroeder, J, <b>Grad, S</b> , Verrier, S, Peroglio, M, Kaplan, L, Hasharoni, A, Barzilay, Y, Liebergall, M, Richards, G, Alini, M: Jerusalem, Israel and Davos, Switzerland
GP9.	The effect of I $\kappa$ B kinase (IKK $\beta$ ) inhibition on lumbar vertebral disc herniation in a rat model <b>Hirosawa, N</b> , Ishikawa, T, Miyagi, M, Ohtori, S, Inoue, G, Eguchi, Y, Kamoda, H, Arai, G, Suzuki, M, Kubota, G, Sakuma, Y, Oikawa, Y, Takahashi, K: Chiba City, Japan
GP10.	Response of human IVD cells to TNF-alpha is dependent on the age of the donor and the anatomical location of the cell Cs-Szabo, G, Gerard, D, Park, S-Y, Pietryla, D, Andersson, G, <b>An, H</b> : Chicago, US
GP11.	Cell clusters isolated from the degenerate intervertebral disc: an analysis of growth compared to single cells Turner, S, Balain, B, Morgan-Hough, C, <b>Roberts, S</b> , Jones R, Hunt A: Oswestry, UK
GP12.	Injectable hydrogel repair of intervertebral disc degeneration <b>Bae, W</b> , Yoshikawa, T, Yamaguchi, T, Hemmad, A, Rana, S, Inoue, N, Moehlenbruck, J, Betre,

	H, Bydder, G, Masuda, K: La Jolla, US; Kyoto, Japan and Austin, US
GP13.	Nerve regeneration after application of nucleus pulposus onto the nerve root in rats <b>Yohei, M</b> , Sekiguchi, M, Katsuihiro, Y, Kikuchi, S, Konno, S: Fukushima, Japan
GP14.	Bioactive micro-structured scaffold for annulus fibrosus repair and regeneration <b>Vadalà, G</b> , Rainer, A, Loppini, M, Centola, M, Trombetta, M, Denaro, V: Rome, Italy
GP15.	Functional roles of the Wnt Signaling Pathway in intervertebral disc cells Based on analysis of the PKC pathway <b>Arai, F</b> , Hiyama, A, Sakai, D, Mochida, J: Kanagawa, Japan
GP16.	Prolonged aggrecanolytic activation of matrix metalloproteinases (MMPs) relative to aggrecanases in a rat tail compression loading-induced disc degeneration model Yurube, T, <b>Nishida, K</b> , Suzuki, T, Kakutani, K, Maeno, K, Takada, T, Kurosaka, M, Doita, M: Kobe, Japan
GP17.	Differentiation of mouse induced pluripotent stem cells (iPSCs) into nucleus pulposus-like cells in a laminin-rich pseudo-3D culture system Jing, L, Christoforou, N, Leong, K, <b>Setton, L</b> , Chen, J: Durham, US
GP18.	ATF3 and GAP43 immunoreactive DRG neurons innervate the vertebral body in a rat model of osteoporosis <b>Suzuki, M</b> , Ohtori, S, Inoue, G, Orita, S, Ishikawa, T, Miyagi, M, Kamoda, H, Eguchi, Y, Arai, G, Oikawa, Y, Kubota, G, Sakuma, Y, Takahashi, K: Chiba, Japan
GP19.	Functional integrin subunits regulating cell-matrix interactions in the nucleus pulposus of the human intervertebral disc Bridgen, D, Gilchrist, C, Richardson, W, Francisco, A, <b>Setton, L</b> : Durham, US
GP20.	Preliminary investigation of the fragmentation of small leucine-rich proteoglycans in pathological intervertebral disc Owen, S, Eisenstein, S, <b>Roberts, S</b> : Oswestry, UK
GP21.	Effects of a glycogen synthase Kinase 3 $\beta$ inhibitors (LiCl) on Wnt signaling pathway induced c-myc protein in intervertebral disc cells <b>Hiyama, A</b> , Sakai, D, Arai, F, Yokoyama, K, Mochida, J: Isehara, Japan
GP22.	Infrared radiation activated-nanostructured titania did not induce inflammatory responses in human cells Lin, B, Aboelzahab, A, Azad, A-M, Goel, V, Leaman, D, Biyani, A, Ebraheim, N, <b>Serhan, H</b> : Toledo, US and Waltham, US
GP23.	Transfection of rat cells with proopiomelanocortin gene using radial shock waves alleviates neuropathic pain <b>Ishikawa, T</b> , Yamashita, M, Miyagi, M, Ohtori, S, Inoue, G, Eguchi, Y, Kamoda, H, Arai, G, Suzuki, M, Kubota, G, Sakuma, Y, Oikawa, Y, Takahashi, K: Chiba City, Japan and Funabashi City, Japan
GP24.	Long-term adaption of NP cells to unphysiological oxygen environment alters responsivity to hypoxia in 3D culture Mietsch, A, Ignatius, A, Wilke, H-J, Carstens, C, Neidlinger-Wilke, C: Ulm, Germany and

	Stuttgart, Germany
GP25.	Microstructured Ti6Al4V surfaces increase osteoblast maturation and regulate BMP signaling pathway Olivares-Navarrete, R, Hyzy, S, Schneider, J, Haithcock, D, Gittens, R, <b>Ullrich, P</b> , Schwartz, Z, Boyan, B: Atlanta, US and Mequon, US
GP26.	The angiogenic capacity from ligament flavum subsequent to inflammation: a critical component of the pathomechanism of hypertrophy <b>Moon H-J</b> ; Kim, JH, Park Y-K: Seoul, Republic of Korea
GP27.	Morphological characteristics of trabecular bone in lumbar spine of osteoporotic sheep Zarrinkalam, MR, Mulaibrahimovic, A, <b>Moore, R</b> : Adelaide, Australia
GP28.	Micro-computed tomography of vertebral endplates to analyze vascular channels for disc nutrition - a comparison between subchondral bone of porcine and bovine endplates <b>Omlor, G</b> , Huettner, F, Lorenz, S, Holschbach, J, Richter, W, Guehring, T: Heidelberg, Germany
GP29.	Anti-inflammatory actions of low dose chondroitin sulfate in annulus fibrosus cells Sowa, G, Liggon, M, Moore, C, Coelho, JP, <b>Vo, N</b> , Balk, J, Preuss, H, Kang, J: Pittsburgh, US and Washington DC, US
GP30.	Good collagen! Bad collagen! It's all about the oxygen <b>Al-Abbasi, M</b> , Tarlton, J: Bristol, UK
GP31.	Correlation of thrombophilia and hypofibrinolysis with pulmonary embolism following spinal surgery Kotwal, S, <b>Pumberger, M</b> , Lebl, D, Girardi, F, Zhiang, K, Salvati, E, Taveras, N, James, M, Cammisia F: New York, US
GP32.	Upregulation of aggrecan and GLUT-1 expression in human intervertebral disc cells under hypoxic condition Ji, HW, Kang, YM, Lee, HM, Lee, BH, Kim, HJ, Park, JO, Moon, ES, Kim, <b>SH, Moon, SH</b> : Seoul, Republic of Korea
GP33.	Is the cell ratio of notochordal to nucleus pulposus cells equilibrated to an evolutionary optimum? <b>Gantenbein-Ritter, B</b> , Chan, S: Bern, Switzerland
GP34.	Porcine notochordal cells express cytokeratin-8 and carbonic-anhydrase III and maintain expression in 3D cell cultures despite morphological changes <b>Omlor, G</b> , Nerlich, A, Lorenz, S, Huettner, F, Richter, W, Guehring, T: Heidelberg, Germany, Munich, Germany and Ludwigshafen, Germany
GP35.	Role of death receptor, mitochondrial and endoplasmic reticulum pathway in different stages of degenerated human lumbar disc <b>Zheng, ZM</b> , Wang, H, Liu, H, Zhang, KB, Wang, TP: GuangZhou, China
GP36.	The effect of Neurotrophin<startsup><registered><endsup> on proteoglycan and collagen synthesis by intervertebral disc cells Yoshikawa, T, Hemmad, A, Naiki, M, Uchida, A, <b>Masuda, K</b> : La Jolla, US, Hyogo, Japan and Mie, Japan

GP37.	The effects of punctured nucleus pulposus on lumbar radicular pain in rats: a behavioral and immunohistochemical study Zhang, KB, <b>Zheng, Z</b> , Liu, H, Liu, XG: GuangZhou, China
GP38.	Increased pro-inflammatory gene expression in annulus fibrosus cells exposed to omega-3 fatty acids Sowa, S, Moore, C, Liggon, M, Coelho, JP, <b>Vo, N</b> , Balk, J, Preuss, H, Kang, J: Pittsburgh, US and Washinton DC, US
GP39.	LRP1 functions as a neurotrophic receptor in dorsal root ganglion sensory neurons <b>Yamauchi, K</b> , Mantuano, E, Yamauchi, T, Takahashi, K, Gonias, S: La Jolla, US and Chiba, Japan
<b>2. BIOMECHANICS</b>	
GP40.	The loaded disc culture system; Ex vivo organ culture and loading of large species intervertebral discs <b>Paul, CP</b> , Zuiderbaan, B, Zandieh Doulabi, B, Van der Veen, A, Smit, TH, Helder, MN, Mullender, MG, Van Royen, BJ: Amsterdam, Netherlands
GP41.	Applicability of structural vibration testing for assessment of the mechanical properties of goat vertebral motion segments <b>Van Engelen, S</b> , Van der Veen, A, De Boer, A, Ellenbroek, M, Smit, T, Van RoyenB, Van Dieen, J: Amsterdam, Netherlands
GP42.	A biomechanical study of two different pedicle screw methods for fixation in osteoporotic and non-osteoporotic vertebrae <b>Higashino, K</b> , Kim, JH, Horton, W, Hutton, W: Tokushima, Japan and Atlanta, US
GP43.	Effects of change of ball radius on creation of wear debris in ball-and-socket total disc arthroplasty <b>Moghadas, P</b> , Hukins, D, Shepherd, D, Mahomed, A: Birmingham, UK
GP44.	How does vertebroplasty affect adjacent vertebrae? <b>Luo, J</b> , Annesley-Williams, D, Adams, M, Dolan, P: London, UK, Nottingham and Bristol, UK
GP45.	Establishment of a herniation model and experiments with an annulus reconstruction implant Wilke, H-J, Widmann, L, Graf, N, Heuer, F: Ulm, Germany
GP46.	Spinal sagittal alignment and balance in normal Nigerian subjects <b>Kawu, AA</b> , Olawepo, A, Salami, O, Kuranga, S: Gwagwalada, Nigeria, Ilorin, Nigeria and Lagos, Nigeria
GP47.	The biomechanical influence of superior facet joint violation by pedicle screws on the corresponding segment in lumbar fusion surgery <b>Kim H-J</b> , Moon, S-H, Kim H-S, Park J-O, Chun H-J; Kang K-T, Jang J-W, Park J-H: Seoul, Republic of Korea
GP48.	Effect of common lumbosacral motions on sacral screw bending moments in long posterior fusion constructs <b>Fleischer, G</b> , Freeman, A, Ferrera, L: Nashua, US, Minneapolis, US and Southport, US
GP49.	Analysis of abdominal muscular activity using wire electromyography during standing jump

	<b>Okubo, Y</b> , Kaneoka, K, Shiina, I, Tatsumura, M, Miyakawa, S: Fujikawaguchiko, Japan, Tokorozawa, Japan and Tsukuba, Japan
GP50.	A biomechanical evaluation of pedicle fixation and facet fixation using the boucher technique for primary and circumferential fusions <b>Agarwala, A</b> , Bucklen, B, Muzumdar, A, Moldavsky, M, Khalil, S: Golden, US and Audubon, US
GP51.	Axial rotation motion induces highest loads in multifidus <b>Robie, B</b> , Dendorfer, S, Rasmussen, J, Torholm, S: North Andover, US and Aalborg, Denmark
GP52.	Construct stiffness in lumbosacral fixation varies with number of fixation screws <b>McLain, R</b> , Inceoglu, S, Mekhail, A: Cleveland, US and Chicago, US
GP53.	Effects of compression and degeneration on cell viability in intervertebral disc: finite element analysis Gu, W, Jackson, A, Huang, C-Y, <b>Brown, M</b> : Coral Gables, FL,US and Miami, FL, US
GP54.	Quantifying low back injury risk associated with manual lifting jobs in distribution centers <b>Lavender, S</b> , Marras, W, Ferguson, S, Splittstoesser, R, Yang, G:, Columbus, OH, US
GP55.	Recommended loads for the simulation of axial rotation in the lumbar spine <b>Dreischarf, M</b> , Rohlmann, A, Bergmann, G, Zander, T: Berlin, Germany
GP56.	Patterns of intradiscal pressure generation are similar between rat and human degenerate discs Hwang, D, Yu, M, <b>Hsieh, A</b> : College Park, ML, US and Baltimore, ML, US
GP57.	Would bi-cortical screws plating system improve the stability of lateral lumbar inter body cage Kodigudla, M, Palepu, V, Goel, V, <b>Serhan, H</b> , Mhatre, D, Cheng, W, Allen, T, Garfin, S, Chen, J: Toledo,OH, US, Raynham, MA, US, Loma Linda, CA, US, San Diego, CA, US and Orange County, CA, US
GP58.	The biomechanical influence of the facet joint orientation and the facet tropism on the corresponding disc in the lumbar spine <b>Kim, H-J</b> , Chun H-J, Park J-O, Kim H-S, Park J-H, Moon S-H, Kang, K-T, Jang J-W: Seoul, Republic of Korea
GP59.	Vertebroplasty reduces gradual 'creep' deformity of fractured vertebrae <b>Luo, J</b> , Annesley-Williams, D, Adams, M, Dolan, P: London, UK, Nottingham, UK and Bristol, UK
GP60.	An injectable nucleus pulposus implant to restore spinal range of motion in compression Malhotra, N, Han, W, Beckstein, J, Cloyd, J, Chen, W, <b>Elliott, D</b> : Philadelphia, US and Stony Brook, US
GP61.	Relevance of disc tissue composition, morphology and annular lesions with respect to lumbar disc degeneration <b>Natarajan, R</b> , An, H, Andersson, G: Chicago, IL, US
GP62.	A new method for facet fusion provides similar stability to the treatment with an internal

	<p>fixator  Wilke, H-J, Midderhoff, S, Graf, N, Berlemann, U: Ulm, Germany and Thun, Switzerland</p>
GP63.	<p>The role of the inter- / supraspinous ligament complex in stand alone interspinous process devices. A biomechanical and anatomical study  <b>Sobottke, R</b>, Kaulhausen, T, Eysel, P, Knifka, J, Notermans, H, Koebke, J: Cologne, Germany</p>
GP64.	<p>Subsidence evaluation of 4-WEB, a novel cross strut based, interbody cage design  Kiapour, A, Goel, V, Ferrara, L, <b>Jessee, H</b>: Toledo, US and Plano, US</p>
GP65.	<p>The effect of applied spinal manipulation force vector on resultant vertebral accelerations: an in vivo animal model  <b>Colloca, C</b>, Kosmopoulos, V, Gunzburg, R, Moore, R: Chandler, Arizona, US, Fort Worth, TX, US, Antwerp, Belgium and Adelaide, Australia</p>
GP66.	<p>Effect of thread pitch on pull-out strength of lateral mass screws  <b>McLain, R</b>, St Clair, S, Inceoglu, S, Montgomery, W: Cleveland, United States</p>
<b>3. DEFORMITY</b>	
GP67.	<p>Multicenter minimally invasive AxialIF L5-S1 interbody fusion for anterior column support at the end of a long segment construct: Feasibility, safety, complications, early and late 3 year outcomes  <b>Anand, N</b>, Kahwaty, S, Daroudi, S, Baron, E, Boachie-Adjei, O: Los Angeles, US and New York, US</p>
GP68.	<p>Asymmetric degeneration of multifidus and longissimus muscles in the patient with degenerative lumbar scoliosis  <b>Suzuki, A</b>, Shafaq, N, Matsumura, A, Terai, H, Toyoda, H, Yasuda, H, Nakamura, H: Osaka, Japan</p>
GP69.	<p>Histomorphometric analysis for growth modulation in pinealectomized chickens  <b>Aota, Y</b>, Terayama, H, Ito, M, Kawai, T, Tanabe, H, Nakamura, Y, Yamaguchi, Y, Nakamura, N, Saito, T: Yokohama, Japan and Tokyo, Japan</p>
GP70.	<p>Proximal junctional failure following surgical treatment of global sagittal imbalance: predictive analysis using a 2D biomechanical model  Murray, H, Street, J, <b>Oxland, T</b>: Vancouver, Canada</p>
GP71.	<p>Effect of different supplemental supports on S1 pedicle screw loads in long fusion constructs  <b>Loughran, G</b>, Wessman, B, Freeman, A: Wilmington, NC, US and Minneapolis, MN, US</p>
GP72.	<p>Withdrawn</p>
GP73.	<p>Global spinal balance after long corrective fusion versus short-segment fusion for degenerative lumbar scoliosis  <b>Kanayama, M</b>, Togawa, D, Tomoyuki, H, Shigenobu, K, Oha, F, Yamada, K: Hakodate, Japan</p>
GP74.	<p>Severe hip contracture affects the contralateral side scoliosis in lumbar spine  <b>Okuda, T</b>, Kawahara, N, Fujita, T, Kaneuji, A, Hatano, E, Ichiseki, T, Yasuda, Y, Fukui, K, Matsumoto, T: Kanazawa Medical University, Department of Orthopaedic Surgery, Kahoku, Japan</p>

GP75.	Role of interbody fusion in rate of rod fractures after pedicle subtraction osteotomy Sassan, K, Deviren, V, <b>Ames, C</b> : San Francisco, US
GP76.	Withdrawn
GP77.	Correction loss after posterior spinal shortening for kyphosis due to osteoporotic vertebral collapse <b>Nakamura, N</b> , Aota, Y, Kawai, T, Tanabe, H, Nakamura, Y, Yamaguchi, Y, Saito, T: Yokohama City, Japan
GP78.	Spinal osteotomies in management of adult spinal deformities a retrospective comparative study of different types of osteotomies as regard surgical complications <b>Mossaad, M</b> , Mohamed, A: Zagazig-Sharkia, Egypt
GP79.	Clinical incidence of sacroiliac joint arthritis and pain after sacroiliac fixation for spinal deformity <b>Sainoh, T</b> , Ohtori, S, Inoue, G, Orita, S, Eguchi, Y, Ishikawa, T, Miyagi, M, Arai, G, Kamoda, H, Suzuki, M, Takahashi, K: Chiba, Japan
GP80.	Changes of spinopelvic balance following long spinal fusion with and without iliac fixation for degenerative lumbar scoliosis <b>Ha, K-Y</b> , Park, S-A, Change, D-G: Seoul, Republic of Korea
GP81.	Decancellation osteotomy for fixed sagittal deformity – The incidence of acute neurological complications & early outcomes Lebl, D, Chaudhari, R, Kotwal, S, Pumberger, M, Cammisa, F, <b>Girardi, F</b> : New York, US
GP82.	The prevalence of diffuse idiopathic skeletal hyperostosis (DISH) in the patients with spinal disorders <b>Toyoda, H</b> , Terai, H, Yamada, K, Suzuki, A, Dozono, S, Matsumoto, T, Yasuda, H, Takahashi, S, Tsukiyama, K, Nakamura, H: Osaka, Japan
GP83.	A novel portable navigation system for the placement of pedicle screws in Scoliosis surgery <b>Shirado, O</b> , Imada, M, Kitahara, K, Iwabuchi, M, Shida, T: Aizu-wakamatsu, Japan and Tokyo, Japan
<b>4. DISC DEGENERATION/ARTHRITIS</b>	
GP84.	Comparison between anterior interbody fusion(ALIF) and posterolateral fusion(PLF) in a punctured disc model in rats <b>Kamoda, H</b> , Ohtori, S, Miyagi, M, Ishikawa, T, Eguchi, Y,; Arai, G, Suzuki, M, Sakuma, Y, Kubota, G, Oikawa, Y, Inoue, G, Takahashi, Ka, Chiba, Japan
GP85.	No acceleration of intervertebral disc degeneration after clinical injection of bupivacaine <b>Ohtori, S</b> , Inoue, G, Eguchi, Y, Orita, S, Ishikawa, T, Miyagi, M, Arai, G, Kamoda, H, Suzuki, M, Oikawa, Y, Sakuma, Y, Kubota, G, Takahashi, K: Chiba, Japan
GP86.	Histological features of mammalian endplates of the spine: from mice to men <b>Lenart, BA</b> , Zhang, Y, RenJ, An, HS: Chicago, IL, US
GP87.	Radiologic findings of the lumbar spine in patients with Rheumatoid Arthritis <b>Yasuda, H</b> , Suzuki, A, Terai, H, Matsumura, A, Toyoda, H, Matsumoto, T, Yamada, K,

	Takahashi, S, Tsukiyama, K, Koike, T, Tada, M, Sugioka, Y, Okano, T, Nakamura, H: Osaka, Japan
GP88.	Ingrowth of nerves and blood vessels into painful Intervertebral discs <b>Stefanakis, M</b> , Sychev, I, Summers, B, Dolan, P, Harding, I, Adams, MA: Bristol, UK
GP89.	Vertebral endplate lesions and size are associated with lumbar disc degeneration <b>Wang, Y</b> , Battié, MC, Videman, T: Edmonton, Canada
GP90.	Interleukin 1-beta (IL-1) exposure significantly upregulates neurotrophin gene expression for brain-derived neurotrophic factor, neurotrophin 3 and neuropilin 2 during 3D culture of human annulus cells Gruber, H, Hoelscher, G, Bethea, S, <b>Hanley, E</b> : Charlotte, US
GP91.	Lypopolysaccharide injection provokes secretion of pro-inflammatory mediators of intervertebral disc degeneration <b>Chahine, N</b> , Bloom, O, Grande, D, Sherry, B, Levine, M: Manhasset, NY, US
GP92.	Role of PGE2 on the expression of nerve growth factor in human intervertebral disk cells <b>Alimasi, W</b> , Sawaji, Y, Kimura, D, Tanaka, H, Kosaka, T, Endo, K, Yamamoto, K: Tokyo, Japan
GP93.	A natural lumbar disc degeneration model in the vervet monkey Kim, SS, Kaplan, J, Jorgensen, M, <b>Yoon, ST</b> : Atlanta, US and Winston-Salem, US
GP94.	Expression of galectin-1 in nucleus pulposus cells of intervertebral disc and potential for magnetic activated cell sorting (MACS) Jing, L, So, S, Lim, S, Richardson, W, Fitch, R, <b>Setton, L</b> , Chen, J: Durham, US
GP95.	Lumbar disc degeneration is increased in subjects with a history of slipped capital femoral epiphysis (SCFE) Toy, J, Gordon, Z, Eubanks, J, Cooperman, D, Ahn, N: Cleveland, Ohio, US
GP96.	Severity of intervertebral disc degeneration limits therapeutic potential of mesenchymal stem cells <b>Chahine, N</b> , Stetson, N, Rajan, N, Grande, D, Levine, M: Manhasset, NY, US
GP97.	Human umbilical cord blood-derived mesenchymal stem cells in the cultured rabbit intervertebral disc-a cell therapy approach Anderson, G, Markova, F, An, HS, Markov, V, Saitta, B, <b>Chee, A</b> , Enomoto-Iwamoto, M, Gupta, C, Thonar, E, Zhang, Y: Philadelphia, US, Chicago, US, Newark, US and Evanston, US
GP98.	Investigations of different cell types and gel carriers for cell based intervertebral disc therapy - in vitro and in vivo studies <b>Barreto Henriksson, H</b> , Hagman, M, Horn, M, Lindahl, A, Brisby, H: Gothenburg, Sweden
GP99.	Cartilage intermediate layer protein (CILP) regulation in intervertebral discs: The effect of BMP-2, age and disc degeneration Wang, Z, Kim, JH, Higashino, K, Kim, SS, Wang, S, Seki, S, Hutton, W, <b>Yoon, ST</b> : Atlanta, US and Toyama, Japan
GP100.	Internal disc disruption: The role of stress gradients <b>Stefanakis, M</b> , Luo, J, Polintine, P, Dolan, P, Adams, MA: Bristol, UK and London, UK



GP101.	Reduced dose of rhBMP-2 with demineralized bone matrix-based product for spinal fusion Delamarter R, Kropf M, <b>Bae H</b> , Houman, J, Safai, Y, Zhang, X, Kanim, L, Zhao, L: Los Angeles, US
GP102.	Different macroscopic changes in a degenerated lumbar disc influence its biomechanics <b>Galbusera, F</b> , Schmidt, H, Neidlinger-Wilke, C, Wilke, H-J: Ulm, Germany
GP103.	Scanning- and transmission electron microscopic analyses of neurite outgrowth from dorsal root ganglia <i>in vitro</i> with and without the presence of intervertebral disc cells <b>Larsson, K</b> , Johansson, B, Runesson, E, Rydevik, B, Brisby, H: Gothenburg, Sweden
GP104.	Role of nucleoplasty in the treatment of discogenic axial low back pain <b>Abbah, SA</b> , Kumar, N, Juned, A, Chen, YS: Singapore
GP105.	Lumbar disc degeneration induces persistent groin pain <b>Oikawa, Y</b> , Ohtori, S, Koshi, T, Inoue, G, Orita, S, Eguchi, Y, Ishikawa, T, Miyagi, M, Arai, G, Kamoda, H, Suzuki, M, Takahashi, Ka: Chiba, Japan
GP106.	Heme oxygenase-1 modulates degeneration of the intervertebral disc in Bach 1 deficient mice <b>Ohta, R</b> , Tanaka, N, Nakanishi, K, Kamei, N, Nakamae, T, Izumi, B, Fujioka, Y, Ochi, M: Hiroshima City, Japan
GP107.	Cell death of intervertebral disc cells: the influence of species and environmental factors Sitte, I, Jones, P, Trivedi, J, <b>Roberts, S</b> : Innsbruck, Austria and Oswestry, UK
<b>5. HEALTH ECONOMICS/EPIDEMIOLOGY</b>	
GP108.	Metabolic syndrome in community-dwelling people with low back pain: Locomotive syndrome and health outcome in Aizu cohort study <b>Ono, R</b> , Yamazaki, S, Takegami, M, Otani, K, Sekiguchi, M, Onishi, Y, Hayashino, Y, Kikuchi, S, Konno, S, Fukuhara, S: Kobe, Japan, Kyoto, Japan and Fukushima, Japan
GP109.	Perioperative incidence and risk factors for deep vein thrombosis associated with spinal surgery <b>Imanishi, T</b> , Akeda, K, Matsunaga, H, Hasegawa, M, Sakakibara, T, Kasai, Y, Sudo, A: Tsu, Japan, Himeji, Japan
GP110.	Heterogeneity in systematic reviews on spinal surgery: a meta-epidemiological study <b>Jacobs, W</b> , Kruyt, M, Verbout, A, Oner, C: Leiden, Netherlands and Utrecht, Netherlands
GP111.	Withdrawn
GP112.	Cost-effectiveness analysis of a reduction in diagnostic imaging for the assessment of degenerative spinal disorders Kim, J, Dong, J, Brener, S, Coyte, P, <b>Rampersaud, R</b> : Toronto, Canada
GP113.	Normal value of the Japanese version of the Oswestry Disability Index (ODI) <b>Tonosu, J</b> , Hara, N, Matsudaira, K, Masuda, K, Takeshita, K, Nakamura, K: Tokyo, Japan and Kawasaki, Japan
GP114.	Translation of the Neck Disability Index to utility scores for the cost-effectiveness analysis of spine treatments

	Richardson, S, <b>Berven, S</b> : San Francisco, CA, US
GP115.	Risk factors associated with surgical site infection, identified using an integrated data repository Abdul-Jabbar, A, <b>Berven, S</b> , Weber, M, Takemoto, S: San Francisco, US
GP116.	Cost-utility analysis of low back pain interventions: a systematic review Indrakanti, S, Weber, M, <b>Berven, S</b> , Takemoto, S, Hu, S: St. Louis, US and San Francisco, US
GP117.	Pre-operative activity levels do not correlate to self-reported scores in patients undergoing lumbar spine surgery <b>Wustrack, R</b> , Ramirez, G, Burch, S: San Francisco, US
GP118.	Risk factors for nonorganic pain in worker's compensation patients with low back pain Sebastian, A, Ahn, N: Cleveland, US
<b>6. HNP</b>	
GP119.	Variability in inflammatory pathways in human herniated intervertebral discs <b>Roberts, S</b> , Menage, J, Kuiper, JH, McCall, I, Eisenstein, S, Urban, J: Oswestry, UK and Oxford, UK
GP120.	Stronger infiltration of sequestered intervertebral discs with plasmacytoid dendritic cells is associated with postoperative persistence of muscle weakness: Evidence from a prospective study on patients undergoing microdiscectomy <b>Geiss, A</b> , Delank, K-S, Sobottke, R, Springorum, H-P, Michael, J-W, Eysel, P: Cologne, Germany
GP121.	Puncture of an intervertebral disc in the rat induces up-regulation of inflammation-associated genes in the adjacent dorsal root ganglion Strandberg, L, Spetz, A, <b>Blixt, Å</b> , Nakamae, T, Schéle, E, Jansson, J-O, Olmarker, K: Gothenburg, Sweden and Hiroshima, Japan
GP122.	Patient-level prediction of functional change for surgical and non-operative care in SPORT patients treated for disc herniation <b>Spratt, K</b> , Morgan, T: Lebanon, NH, US
GP123.	The factors for the postoperative low back pain in lumbar disc herniation <b>Iwabuchi, M</b> , Shirado, O, Murakami, K, Taguchi, H, Shida, T, Sugeno, N: Fukushima City, Japan and Aizu Wakamatsu, Japan
GP124.	Gait kinematics and dynamics are altered to protect the affected limb in a rat model of lumbar radiculopathy Allen, K, Shamji, M, Mata, B, Hwang, P, Jing, L, Schmitt, D, <b>Setton, L</b> : Durham, NC, US
GP125.	Fas-ligand plays an important role in the production of pro-inflammatory cytokines in human nucleus pulposus cells <b>Yamamoto, J</b> , Maeno, K, Takada, T, Kakutani, K, Yurube, T, Zhang, Z, Hirata, H, Sakai, D, Mochida, J, Doita, M, Kurosaka, M, Nishida, K: Kobe, Japan and Kanagawa, Japan
GP126.	Comparison of CatWalk analysis and von Frey testing for pain assessment in a model of lumbar disc hernia <b>Kamoda, H</b> , Sakuma, T, Ohtori, S, Miyagi, M, Ishikawa, T, Eguchi, Y, Suzuki, M, Sakuma, Y,

Kubota, G, Oikawa, Y, Inoue, G, Arai, G, Takahashi, Ka: Chiba, Japan

## 7. IMAGING/DIAGNOSIS

- GP127. Are Modic changes associated with increased bone turnover on bone scans?  
Järvinen, J, Niinimäki, J, **Karppinen, J**, Takalo, R, Haapea, M, Tervonen, O: Oulu, Finland
- GP128. Two-year follow-up of lumbar Modic changes and low back symptoms  
Järvinen, J, **Karppinen, J**, Niinimäki, J, Haapea, M, Grönblad, M, Kääpä, E: Oulu, Finland and Helsinki, Finland
- GP129. Prevalence and radiological characteristics in patients with lower thoracic ossification of yellow ligament  
Lee, HM, **Park, SY**, Chae, IJ, Kim, HJ, Suh, SW: Republic of Korea
- GP130. Predicting the outcome of spinal fusion for discogenic low back pain from clinical response to preoperative discoblock  
**Koshi, T**, Ohtori, S, Nemoto, T, Akazawa, T, Kotani, T, Minami, S, Takahashi, K: Chiba, Japan
- GP131. Lumbar disc and vertebral body sagittal shape variation vis-à-vis gender during growth: A three-year follow-up MRI study in children from the general population  
**Masharawi, Y**, Kjaer, P, Manniche, C, Bendix, T: Tel Aviv, Israel and Odense, Denmark
- GP132. The double-crush syndrome of the 5th lumbar spinal nerve as a cause of failed back surgery  
**Yamada, H**, Yoshida, M, Hashizume, H, Minamide, A, Kawai, M, Iwasaki, H, Tsutsui, S, Nakagawa, Y: Wakayama, Japan
- GP133. Comparing spino-pelvic parameters during sitting and upright position in the elderly and young adults  
**Suzuki, H**, Endo, K, Mizuochi, I, Kimura, D, Kobayashi, H, Tanaka, H, Yamamoto, K: Tokyo, Japan
- GP134. Intervertebral disc height measurement: Comparison of two-dimensional and three-dimensional methods  
Yamaguchi, T, **Bae, W**, Inoue, N, Gregory, D, Cory, E, Sah, R, Masuda, K: La Jolla, US
- GP135. Diagnostic feature of radiculopathy due to osteoporotic vertebral fractures: Emphasis on neuroforaminal lesions  
**Yamada, K**, Kanayama, M, Togawa, D, Shigenobu, K; Oha, F, Hashimoto, T: Hokkaido, Japan
- GP136. Diffusion-weighted MR imaging of degenerative intervertebral discs  
Kubota, G, **Eguchi, Y**, Ohtori, S, Inoue, G, Orita, S, Kamoda, H, Arai, G, Ishikawa, T, Miyagi, M, Miyako, S, Sakuma, Y, Oikawa, Y, Masuda, Y Takahashi, K: Chiba, Japan
- GP137. Investigation of Trendelenburg sign among patients presenting lumbosacral radicular symptoms caused by lumbar spinal disease  
**Morita, M**, Miyauchi, A: Izumi City, Japan and Osaka city, Japan
- GP138. Validity of the Patrick test for osteoarthritis of the hip and sciatica  
**Morimoto, T**, Sonohata, M, Mawatari, M: Saga City, Japan
- GP139. The effect of Modic changes on health-related quality of life among patients referred to spine surgery

	<p><b>Maatta, J</b>, Kautiainen, H, Taimela, S, Niinimäki, J, Jarvenpää, S, Koskelainen, T, Makela, P, Pesala, J, Kyllonen, E, Cheung, K, Karppinen, J: Oulu, Finland, Jyväskylä, Finland, Helsinki, Finland, Aankoski, Finland and Hong Kong, China</p>
GP140.	<p>CT-based measurements of the lumbar spinous processes  <b>Sobottke, R</b>, Koy, T, Kreitz, T, Müller, D, Bangard, C, Eysel, P: Cologne, Germany</p>
<p><b>8. LOW BACK PAIN</b></p>	
GP141.	<p>Intradiscal injection of autologous serum isolated from platelet-rich-plasma for the treatment of discogenic low back pain: Preliminary prospective clinical trial  <b>Akeda, K</b>, Imanishi, T, Ohishi, K, Masuda, K, Uchida, A, Sakakibara, T, Kasai, Y, Sudo, A: Tsu, Japan and La Jolla, US</p>
GP142.	<p>Predicting the transition from acute to persistent low back pain  <b>Melloh, M</b>, Elfering, A, Egli Presland, C, Röder, C, Hendrick, P, Darlow, B, Theis, J-C: Dunedin, New Zealand, Berne, Switzerland and Wellington, New Zealand</p>
GP143.	<p>Anatomical study of entrapment of the superior cluneal nerves as a cause of low back pain  Kuniya, H, <b>Aota, Y</b>, Nakamura, N, Kawai, T, Tanabe, H, Saito, T, Terayama, H, Itoh, M, Kamiya, Y, Funakoshi, K: Yokohama, Japan and Tokyo, Japan;</p>
GP144.	<p>Expression and localization of BMP13 and its receptors in human intervertebral discs  <b>Wei, A</b>, Gulati, T, Shen, B, Chung, S, Kishen, T, Diwan, A: Sydney, Australia</p>
GP145.	<p>Pain receptor expression in the midbrain in a rodent model of radiculopathy  Hwang, P, Shamji, M, Jing, L, Gabr, M, Mata, B, Allen, K, Chen, J, Richardson, W, <b>Setton, L</b>: Durham, US</p>
GP146.	<p>The relationship between fracture site instability and degrees of back pain in patients with the osteoporotic vertebral fractures  <b>Kukita, H</b>, Shimizu, K, Tahara, H, Hamada, K, Takayama, J: Kitakyusyu City, Japan</p>
GP147.	<p>Relationship of Modic changes, Schmorl's nodes, spondylolytic defects, high intensity zone lesions, disc herniations, and radial tears with low back symptom severity among young Finnish adults  <b>Takatalo, J</b>, Karppinen, J, Niinimäki, J, Taimela, S, Mutanen, P, Blanco Sequeiros, R, Kyllönen, E, Tervonen, O: Oulu, Finland and Helsinki, Finland</p>
GP148.	<p>The prevalence of spondylolysis and its relationship with low back pain in selected Korean adults  <b>Ko, S-B</b>, Lee, S-W, Kim, S-K, Cho, M-R, Park, C-M: Korea, Republic of Korea</p>
GP149.	<p>Factor analysis of the north american spine society lumbar spine outcome assessment instrument  <b>Aghayev, E</b>, Mannion, A on behalf of the SWISSpineRegistry: Bern, Switzerland and Zurich, Switzerland</p>
GP150.	<p>Further support that pain behavior changes following disc puncture in the rat is induced by presence of nucleus pulposus in the spinal canal rather than the disc injury per se  <b>Nakamae, T</b>, Spetz, A, Olmarker, K: Hiroshima, Japan and Gothenburg, Sweden</p>

GP151.	Interleukin-8 present in intervertebral disc tissues from patients with discogenic back pain can stimulate Substance P release by cultured sensory neurons Shi, P, An, HS, Markova, D, Anderson, DG, <b>Chee, A</b> , Hartley, D, Chen, E-Y, Zhang, Y: Chicago, US and Philadelphia, US
GP152.	Pain distributions and patterns in acute and chronic osteoporotic vertebral fractures Takemasa, R, <b>Kiyasu, K</b> , Kawasaki, M, Tadokoro, N, Tani, T., Kochi, Japan
GP153.	Effects of trigger point injection for low back pain patients with suspected entrapment of the superior cluneal nerve Kuniya, H, <b>Aota, Y</b> , Nakamura, N, Kawai, T, Tanabe, H, Nakamura, Y, Yamaguchi, Y, Saito, T, Terayama, H, Itoh, M: Yokohama, Japan and Tokyo, Japan
GP154.	Sensory and autonomic innervation of the intervertebral disk in rats: Patho-mechanism of chronic diskogenic pain Fujimoto, K, <b>Miyagi, M</b> , Ishikawa, T, Kamoda, H, Eguchi, Y, Arai, G, Suzuki, M, Kubota, G, Sakuma, Y, Oikawa, Y, Inoue, G, Ohtori, S, Takahashi, K: Chiba, Japan
GP155.	The course of pain, disability and physical activity the first week after the onset of severe acute low back pain <b>Hansson, T</b> , Olaya-Contreras, P, Kaigle Holm, A, Olsson, M, Styf, J: Gothenburg, Sweden
GP156.	Quality of life with low back pain patients in a general health examination -Differences between the treatment group and non-treatment group- <b>Watanabe, K</b> , Otani K, Onda, A, Nikaido, T, Yabuki, S, Kikuchi, S, Konno, S: Fukushima city, Japan
GP157.	Annulus fibrosus cells interact with neuron-like cells to modulate production of growth factors and cytokines in symptomatic disc degeneration <b>Kim, JH</b> , Moon, HJ, Park, YK, Suh, JK Kang, J., Seoul, Republic of Korea and Pittsburgh, US
GP158.	Interaction between psychosocial and biological features of low back pain Karayannis, N, Smeets, R, van den Hoorn, W, <b>Hodges, P</b> : Brisbane, Australia and Maastricht, Netherlands
GP159.	Investigation of dichotomizing sensory nerve fibers projecting to the lumbar multifidus muscles and intervertebral disk or facet joint or sacroiliac joint in rats Umimura, T, <b>Miyagi, M</b> , Ishikawa, T, Kamoda, H, Sakai, R, Sakuma, T, Eguchi, Y, Arai, G, Suzuki, M, Kubota, G, Sakuma, Y, Oikawa, Y, Inoue, G, Ohtori, S, Takahashi, K: Chiba, Japan
GP160.	Kinematic analyses for spinal mobility changes in subjects with and without low back pain <b>Sung, P</b> , Song, AY, Jo, HJ, Joo, HA: Seoul, Korea, Republic of Korea
GP161.	MRI T2 mapping: non-invasive diagnostic imaging for discogenic low back pain <b>Ozawa, T</b> , Watanabe, A, Shioi, R, Okubo, T, Toyone, T: Chiba, Japan
GP162.	Leg symptoms (pain and numbness) caused by sacroiliac joint dysfunction <b>Murakami, E</b> , Kurosawa, D, Aizawa, T: Miyagi, Japan
GP163.	A kinematic analysis of the core spine and pelvis during lateral bending in subjects with and without chronic low back pain <b>Sung, PS</b> , Jo, HJ, Song, AY, Joo, HA: Seoul, Republic of Korea

GP164.	Withdrawn
GP165.	Efficacy of spinal manipulation for low back pain; correlativity of improvement and disc degeneration on MR images <b>Nakamura, N</b> , Aota, Y, Kawai, T, Tanabe, H, Nakamura, Y, Yamaguchi, Y, Saito, T: Yokohama City, Japan
GP166.	Benchmarking of low back pain alleviation after TDA by surgeon and its comparison to pain alleviation after ALIF <b>Aghayev, E</b> , Munting, E, Röder, C on behalf of the registries, SWISSspine/Sp.Tango: Ottignies, Belgium and Bern, Switzerland
GP167.	Sacroiliac joint arthrodesis in patients with chronic pelvic pain and non-specific sciatica Nystrom, B, <b>Gregebo, B</b> , Almgren, S-O, Schillberg, B: Strangnas, Sweden
GP168.	Understanding primary care physicians' challenges, barriers and priorities in caring for patients with low back pain Alleyne, J, Harvey, B, Meuser, J, <b>Rampersaud, R</b> : Toronto, Canada
GP169.	The effect of L2 spinal nerve root infiltration for chronic low back pain <b>Murata, Y</b> , Kanaya, K, Wada, H, Wada, K, Shiba, M, Hatta, S, Kato, Y: Shinjuku, Japan
GP170.	Transaxial fixation of the lumbosacral segment for discogenic back pain: Results with 1 and 2 years follow-up <b>Zeilstra, D</b> : Ede & Naarden, Netherlands
GP171.	Referred pain area depends on the sections of the sacroiliac joint <b>Kurosawa, D</b> , Murakami, E, Aizawa, T: Sendai, Japan
GP172.	Assessment of pain behavior in a rat model of myofascial inflammation using the CatWalk gait analysis system <b>Miyagi, M</b> , Ishikawa, T, Kamoda, H, Orita, S, Eguchi, Y, Arai, G, Suzuki, M, Inoue, G, Ohtori, S, Takahashi, K: Chiba, Japan
GP173.	Metabolic signatures of painful disc degeneration Buser, Z, Berven, S, Hu, S, <b>Lotz, J</b> : San Francisco, US
GP174.	Independent predictors of functional recovery in patients with chronic low back pain treated by spinal manipulation, individual physiotherapy or back school Cecchi, F, Negrini, S, Pasquini, G, Paperini, A, Conti, A, Chiti, M, <b>Zaina, F</b> , Macchi, C, Molino-Lova, R: Milan, Italy and Firenze, Italy
GP175.	Trunk muscle activity during lifting of unexpected weight objects <b>Watanabe, M</b> , Kaneoka, K, Okubo, Y, Shiina, I, Tatsumura, M, Miyakawa, S: Ibaraki, Japan, Saitama, Japan and Yamanashi, Japan
GP176.	Peek-cages in lumbar fusion: mid-term clinical and radiological outcome Horsting, P, Poeschmann, M, <b>Schimmel, J</b> , Schönfeld, D, Van Limbeek, J, Pavlov, P: Nijmegen, Netherlands, and Ede, Netherlands
<b>9. NON-OPERATIVE TREATMENT</b>	

GP177.	Effect of zoledronic acid in treatment of postmenopausal women with osteoporosis <b>Povoroznyuk, V</b> , Grygorieva, N, Vaóda, V, Dzerovych, N, Balatska, N: Kyiv, Ukraine
GP178.	The effect of antidepressant on pain-related behavior induced by nucleus pulposus applied on the nerve root in rats <b>Saito, H</b> , Sekiguchi, M, Kikuchi, S, Konno, S: Fukushima, Japan
GP179.	Physical exercise affects cell proliferation in lumbar intervertebral disc regions in rats <b>Sasaki, N</b> , Barreto Henriksson, H, Runesson, E, Larsson, K, Sekiguchi, M, Kikuchi, S, Konno, S, Rydevik, B, Brisby, H: Fukushima, Japan and Gothenburg, Sweden
GP180.	Domains of care and adherence to low back evidence based guidelines Weiner, S, Weiser, S, <b>Nordin, M</b> : New York, US
GP181.	A comparison of Intra-Capsular facet (IF) and Peri-facet (PF) injections in patients with low back pain (LBP) <b>Wardlaw, D</b> , Nandakumar, A, Beastall, J, Kumar, A, Smith, F: Aberdeen, UK
GP182.	Outcomes based on straight leg raise findings <b>McIntosh, G</b> , Hall, H, Rege, S, Carter, T: Toronto, Canada
<b>10. REHABILITATION/PSYCHOSOCIAL/OUTCOMES</b>	
GP183.	Which pain rehabilitation programme should patients with chronic back pain attend? – implementing research findings by varying duration and intensity <b>Barker, K</b> , Toye, F, Heelas, L, Buchanan, E: Oxford, UK
GP184.	Relation between trunk muscle force and postoperative curve progression in degenerative lumbar scoliosis <b>Omata, J</b> , Kanayama, M, Togawa, D, Hashimoto, T: Hakodate, Japan
GP185.	Patients' subjective fear of spine surgery under general anesthesia Kim, K-W, <b>Lee, J-S</b> , Kim, Y-S: Seoul, Republic of Korea
GP186.	The dependence of back muscle endurance time on psychological factors <b>Mannion, A</b> , O'Riordan, D, Dvorak, J, Masharawi, Y: Zurich, Switzerland and Tel Aviv, Israel
GP187.	The immediate effects of different core exercises on static balance <b>Imai, A</b> , Kaneoka, K, Shiraki, H: Tsukuba City, Japan and Tokorozawa City, Japan
GP188.	Withdrawn
GP189.	The influence of distress on disability, physical activity and pain intensity after 7 days of severe acute low back pain <b>Olaya-Contreras, P</b> , Styf, J, Olsson, M, Kaigle Holm, A, Hansson, T: Gothenburg, Sweden
GP190.	Validation of retrospective outcome scale for lumbar spinal surgery <b>Kuittinen, P</b> , Aalto, TJ, Leinonen, V, Savolainen, S, Sipola, P, Kröger, H, Turunen, V, Heikkilä, T, Airaksinen, O: Kuopio, Finland and Mikkeli, Finland
<b>11. SPONDYLOLYSIS/SPONDYLOLISTHESIS</b>	

GP191.	5-year follow-up of RCT for lumbar degenerative spondylolisthesis operation <b>Kato, T</b> , Okawa, A, Shoji, T, Toshitaka, Y, Kyohei, S, Mitsuhiro, E, Shigenori, K: Yushima, Japan
GP192.	The morphological study of listhesis form in patients with degenerative spondylolisthesis <b>Suzuki, H</b> , Endo, K, Alimasi, W, Kimura, D, Kobayashi, H, Tanaka, H, Yamamoto, K: Tokyo, Japan
GP193.	Withdrawn
GP194.	To fuse or not to fuse in lumbar degenerative spondylolisthesis: do baseline symptoms help provide the answer? <b>Kleinstueck, F</b> , Fekete, Tamás F, Mannion, A, Grob, D, Porchet, F, Mutter, U, Jeszenszky, D: Zurich, Switzerland
GP195.	Comparative study of clinical outcomes on sagittal balance after decompression surgery with or without fusion for degenerative lumbar spondylolisthesis <b>Minamide, A</b> , Yoshida, M, Yamada, H, Hashizume, H, Nakagawa, Y, Kawai, M, Iwasaki, H, Tsutsui, S, Okada, M: Wakayama, Japan
GP196.	Clinical results of microsurgical lumbar flavectomy that preserves facet joints in cases of lumbar degenerative spondylolisthesis: Comparison of bilateral laminotomy and bilateral decompression via unilateral approach <b>Nakanishi, K</b> , Tanaka, N, Fujimoto, Y, Kamei, N, Nakamae, T, Izumi, B, Fujioka, Y, Ota, R, Ochi, M: Hiroshima, Japan
GP197.	The surgical management of degenerative lumbar spondylolisthesis: a comparative study of outcomes following decompression with fusion and microendoscopic decompression - Minimum 2-year outcome - <b>Aihara, T</b> , Toyone, T, Aoki, Y, Ozawa, T, Inoue, G, Hatakeyama, K, Oouchi, J: Funabashi-city, Japan, Ichihara-city, Japan, Sakura-city, Japan and Chiba-city, Japan
GP198.	Disc height affects segmental motion in patients with L4-L5 degenerative spondylolisthesis, a new classification system Siemionow, K, <b>An, HS</b> : Chicago, US
GP199.	Analysis of static balances before and after the lumbar fusion operation in patients with lumbar degenerative diseases <b>Yo, K</b> , Murase, M, Hayashi, Y, Ogawa, T, Oishi, Y: Hiroshima, Japan
GP200.	Clinical outcomes more than 5 years after microendoscopic decompression surgery without fusion for degenerative lumbar spondylolisthesis <b>Minamide, A</b> , Yoshida, M, Yamada, H, Hashizume, H, Nakagawa, Y, Kawai, M, Iwasaki, H, Tsutsui, S, Okada, M, Ishimoto, Y, Nagata, K: Wakayama, Japan
GP201.	An evaluation of surgical treatment for lumbar isthmic spondylolisthesis <b>Shinohara, Y</b> , Kato, M, Konishi, S, Date, Y, Kazuki, K, Nakamura, H: Osaka, Japan
GP202.	Load transfer characteristics between posterior fusion devices and the lumbar spine <b>Melnyk, A</b> , Wen, T, Kingwell, S, Chak, J, Crompton, P, Dvorak, M, Oxland, T: Vancouver, Canada
<b>12. STENOSIS</b>	



GP203.	<p>Cross-cultural adaptation of the Japanese Version of the Zurich Claudication Questionnaire (ZCQ)  <b>Hara, N</b>, Masuda, K, Morii, J, Tohnosu, J, Takeshita, K, Nakamura, K, Matsudaira, K: Tokyo, Japan and Kawasaki, Japan</p>
GP204.	<p>Comparator health outcomes for X-STOP&lt;registered&gt; cost-effectiveness analyses  <b>Lurie, J</b>, McDonough, C, Zhao, W, Tosteson, T, Tosteson, A: Lebanon, US</p>
GP205.	<p>A physiotherapy exercise programme improves walking distance but not quality of life for neurogenic claudication  <b>Comer, C</b>, Redmond, A, Bird, H, Hensor, E, Conaghan, P:, Leeds, UK</p>
GP206.	<p>Do walking tests accurately assess responsiveness to treatments for neurogenic claudication?  <b>Rainville, J</b>, Childs, L, Suri, P, Pena, E, Jouve, C, Limke, J, Hunter, D: Boston, US, Austin, US and Sydney, Australia</p>
GP207.	<p>Comparison of ipsilateral and contralateral canal decompression using an unilateral laminotomy approach for single- or multilevel lumbar stenosis  An, HS, <b>Hong, JT</b>: Chicago, US and Suwon, Republic of Korea</p>
GP208.	<p>Outcome of decompressive spinal stenosis surgery related to preoperative MRI findings - A prospective study in 109 patients  <b>Sigmundsson, FG</b>, Kang, X, Jonsson, B, Stromqvist, B: Karlshamn, Sweden and Lund, Sweden</p>
GP209.	<p>Is there a difference between simultaneous or staged decompressions for combined cervical and lumbar stenosis?  Eskander, M, Aubin, M, Drew, J, Eskander, J, Balsis, S, <b>Eck, J</b>, Lapinsky, L, Connolly, P: Worcester, US</p>
GP210.	<p>Microscopic posterior decompression surgery for lumbar canal stenosis accompanied with degenerative scoliosis in patients with longer than a 5-year follow-up  <b>Sumiyoshi, N</b>, Fujiwara, Y, Sumida, T, Manabe, H, Miyauchi, A, Fujimoto, Y: Hiroshima City, Japan</p>
GP211.	<p>Readmission rates after decompression in patients with lumbar spinal stenosis  Takemoto, S, Braid-Forbes, MJ, Capobianco, R, <b>Berven, S</b>: San Francisco, US and San Jose, US</p>
GP212.	<p>Radiological difference between sitting and standing posture of patients with lumbar canal stenosis  <b>Nishida, K</b>, Maeno, K, Kakutani, K, Yurube, T, Zhang, Z, Yamamoto, J, Hirata, H, Doita, M, Iguchi, T, Kurosaka, M: Kobe, Japan</p>
GP213.	<p>Factors associated with balance impairment in lumbar spinal stenosis  <b>Tomkins, C</b>, Battie, M, Kaumeyer, N: Edmonton, Canada</p>
GP214.	<p>Clinical validity of the Nerve Root Sedimentation Sign for the diagnosis of lumbar spinal stenosis  Barz, T, Staub, L, Lord, S, <b>Melloh, M</b>, Merk, H: Schwedt/Oder, Germany, Sydney, Australia, Dunedin, New Zealand and Greifswald, Germany</p>
GP215.	<p>Conservative treatment for spinal canal stenosis  <b>Hanai, K</b>, Miyashita, T, Takeiti, F, Ogikubo, O: Nagoya, Japan</p>

GP216.	Revision surgery following operations for lumbar stenosis <b>Deyo, R</b> , Martin, B, Kreuter, W, Jarvik, J, Angier, H, Mirza, S: Portland, Oregon, United Hanover, New Hampshire, US and Seattle, WA, US
GP217.	Correlation between cross-sectional area of the lumbar spinal canal and the type of clinical symptoms in patients with lumbar spinal stenosis <b>Mukaiyama, K</b> , Takahashi, J, Hashidate, H, Ogihara, N, Kato, H: Shinshu University, Orthopaedics, Matsumoto, Japan
GP218.	Lumbar spinal stenosis with peripheral arterial disease. Part 2 <b>Uesugi, K</b> , Sekiguchi, M, Kikuchi, S, Kanayama, M, Takahashi, K, Chiba, K, Doita, M, Toribatake Y, Matsuo H, Yasumura, S, Yonenobu, K, Konno, S, Matsuyama, Y; Kobe City, Japan, Osaka City, Japan and Hamamatsu City, Japan
GP219.	Solid fusion results in better long term functional outcome in elderly patients  4-8 year follow-up on a randomized controlled multi-center trial on the effect of DC-stimulation on spinal fusion in patients above 60 years <b>Andersen, T</b> , Christensen, FB, Ernst, C, Fruensgaard, S, Østergaard, J, Andersen, JL, Rasmussen, S, Niedermann, B, Høy, K, Helmig, P, Holm, R, Lindblad, BE, Hansen, ES, Egund, N, Bünger, C: Aarhus, Denmark, Esbjerg, Denmark, Holstebro, Denmark, Viborg, Denmark and Vejle, Denmark
GP220.	Lumbar spinal stenosis in the community: the relationship between QoL and the cross-sectional area of the cauda equina in MR imaging <b>Otani, K</b> , Kikuchi, S, Yabuki, S, Onda, A, Nikaido, T, Watanabe, K, Konno, S: Fukushima City, Japan
GP221.	Diagnostic value of the lumbar extension-loading test compared with the gait-loading test in patients with lumbar Spinal stenosis - A prospective cohort study <b>Takahashi, N</b> , Kikuchi, S, Yabuki, S, Otani, K, Konno, S: Fukushima city, Japan
GP222.	Midsagittal diameter is not related to functional status or disability in lumbar spinal stenosis Lange, J, Archer, B, Eskander, M, Franklin, P, Connolly, P, <b>Eck, J</b> : Worcester, US and New Orleans, US
<b>13. SURGERY</b>	
GP223.	Function after spinal treatment, exercise and rehabilitation (FASTER): Cost-effectiveness analysis based on a randomised controlled trial Morris, S, Morris, T, <b>McGregor, A</b> , Doré, C; London, UK
GP224.	Postoperative satisfaction in elderly patients with lumbar spinal stenosis: a prospective cohort study <b>Kawakami, M</b> , Nakao, S, Fukui, D, Kadosaka, T, Morishita, S, Matsuoka, Y: Ito Gun, Japan
GP225.	Analysis of complications with XSTOP <b>Strömqvist B</b> , McCarthy, T, Iezza, A, Vaughn, C, Hsu, K, Khondrashov, D, Nosova, E, Zucherman, J: Lund, Sweden, San Francisco, US and Santa Rosa, US
GP226.	Treatment options for two-level symptomatic disc degeneration: Comparison of Total Disc Replacement, fusion, and hybrid

	Duffy, M, Saqqa, S, Zigler, J, Guyer, R, Ohnmeiss, D, <b>Blumenthal, S</b> : Plano, United
GP227.	Functional disabilities after long-level lumbar fusion <b>Lee C-S</b> , Chung, S-S, Kang, K-C, Park, S-J: Seoul, Republic of Korea
GP228.	Motion distribution between components of a mobile-core lumbar disc prosthesis implanted in patients: An explanation of unequal Wear distribution in explanted polyethylene cores <b>Patwardhan, A</b> , Havey, R, Wharton, N, Tsitsopoulos, P, Newman, P, Zindrick, M, Carandang, G, Voronov, L: Maywood, US, Houston, US, Hinsdale, US and Hines, US
GP229.	Investigating the potential effect of "euphoric bias" for the new technology on results of randomized lumbar total disc replacement trials <b>Ohnmeiss, D</b> , Blumenthal, S, Guyer, R: Plano, US
GP230.	The outcome of lumbar spinal surgery in diabetic patients Suzuki, A, Terai, H, Toyoda, H, Dozono, S, Matsumoto, T, Yasuda, H, Yamada, K, Tsukiyama, K, Nakamura, H,; <b>Takahashi, S</b> : Osaka, Japan
GP231.	Assessment of health-related quality of life after surgical treatment of osteoarthritis of the hip or knee compared to degenerative spinal stenosis. A prospective study of 662 patients Orovio, J, Villar, J, Fernandez, M, <b>Alvarez, L</b> , Study Group, XIA, Study Group, Symax, Study Group, Scorpio: , Barcelona, Spain, Leon, Spain and Madrid, Spain
GP232.	Progression of scoliotic angle after fusion surgery in degenerative lumbar scoliosis patients <b>Murata, Y</b> , Kanaya, K, Wada, H, Wada, K, Shiba, M, Hatta, S, Kato, Y: Shinjuku, Japan
GP233.	Instrumented Lumbar arthrodesis in elderly patients: Prospective study using cannulated cemented pedicle screw instrumentation <b>Alvarez, L</b> , Piñera, AR, Duran, C, Lopez, B, Saez, I, Correia, E, Mahillo, I: Madrid, Spain
GP234.	Does minimally invasive transforaminal lumbar interbody fusion really decrease the rate of complications compared with conventional lumbar fusion? <b>Kim, MC</b> , Chung, HT, Kim, DJ, Chun, SH, Kim, SH: Busan, Republic of Korea
GP235.	Evaluation of the risk factors for L5 spinal nerve disorder after lumbar floating fusion with transforaminal lumbar interbody fusion surgery <b>Orita, S</b> , Yamagata, M, Ikeda, Y, Nakajima, F, Shimizu, K, Yoshihara, M, Iwasaki, J, Mukoyama, S, Hagiwara, S, Toshihide, S, Yasuchika, A, Inoue, G, Ohtori, S Takahashi, K: Ichihara, Japan, Sakura, Japan and Chiba, Japan
GP236.	Lumbar total disc replacement vs. fusion: Analysis of cost comparison studies Guyer, R, Darwish, A, Blumenthal, S, <b>Ohnmeiss, D</b> , Zigler, J: Plano, Texas, US
GP237.	Efficacy of novel minimally invasive surgery using spinal microendoscope for treating extraforaminal stenosis at the lumbosacral junction <b>Yamada, H</b> , Yoshida, M, Hashizume, H, Minamide, A, Nakagawa, Y, Kawai, M, Iwasaki, H, Tsutsui, S: Wakayama, Japan
GP238.	Extended-release epidural morphine provides a safe and effective method of pain control for lumbar surgery <b>Berend, C</b> , Offley, S, Coyne, E, Horodszki, MB, Rubery, P, Zeidman, S, Rehtine, G: Rochester, NY, US and Gainesville, Florida, US

GP239.	A radiological analysis of morphological changes after TLIF and PLF in the degenerative lumbar spine <b>Serrano, L</b> , Neumann, P, Hedlund, R: Gothenburg, Sweden
GP240.	Dural tears incidence, types and outcome following lumbar spine surgery- An analysis of dural tears in our hospital <b>Aithala, J</b> : Udupi, India
GP241.	Radiographic evaluation of monocortical versus tricortical purchase approaches in lumbosacral fixation with sacral pedicle screws <b>Orita, S</b> , Ohtori, S, Eguchi, Y, Kamoda, H, Arai, G, Ishikawa, T, Miyagi, M, Inoue, G, Suzuki, M, Takahashi, K: Ichihara, Japan and Chiba, Japan
GP242.	Stand alone PLIF with box type intervertebral cages <b>Ohwada, T</b> , Yamashita, T, Sakaura, H, Miwa, T, Ikuta, T: Amagasaki, Japan
GP243.	One-year follow-up after LP-ESP<registered> lumbar disc replacement: clinical and radiological outcomes including mean center of rotation and sagittal balance Lazennec, J-Y, Even, J, Rakover, J-P, <b>Rousseau, M-A</b> : Paris, France
GP244.	Influence of lumbar disc degeneration and microstructural morphological changes on the outcome of total lumbar disc replacement: A prospective clinical, histological, X-Ray and MRI investigation <b>Siepe, C</b> , Nerlich, Am Haas, E, Heider, F, Beisse, R, Korge, A, Szeimies, U, Staebler, A, Mayer, M: Munich, Germany and Salzburg, Austria
GP245.	Posterior reamed transsacral transvertebral interbody fusion at the lumbosacral junction: Early results of a novel technique Lebl, D, Cammisa, F, Caridi, J, Pumberger, M, Sama, A, <b>Girardi, F</b> : New York, US
GP246.	Clinical and radiological assessment of posterior lumbar interbody fusion with porous hydroxyapatite chip bone Kim, H,; Lee, C-K, Lee, K-H, <b>Chang, B-S</b> : Seoul, Republic of Korea
GP247.	Incidence and characterization of bone graft donor site pain in patients undergoing lumbar fusion <b>Simmons, E</b> , O'Hear, K: Buffalo, NY, US
GP248.	Osteoporotic vertebral fracture in DISH requires vertebroplasty combined with posterior long fusion <b>Terai, H</b> , Toyoda, H, Suzuki, A, Dozono, S, Nakamura, H: Osaka, Japan
GP249.	Mini-open approach to lateral transpsoatic interbody fusion of the lumbar spine: a technical perspective Fantini, GA, Girardi, FP, Sama, AA, Hughes, AP, <b>Pumberger, M</b> , Abjornson, C, Cammisa Jr, FP: New York, NY, US
GP250.	An evaluation of long-term outcomes of PLIF with local bones and cage or spacer for degenerative lumbar disease of elderly patients <b>Suetsuna, F</b> , Itabashi, T: Hachinohe, Japan
GP251.	Treatment outcome of transforaminal lumbar interbody fusion using unilateral pedicle screw

fixation for lumbar foraminal stenosis

**Ozawa, T**, Toyone, T, Shibo, R, Kamikawa, K, Watanabe, A, Matsuki, K: Chiba, Japan

#### 14. TRAUMA/INSTABILITY

GP252. Spinal fractures and spino-pelvic dissociations in airborne sports

**Benneker, L**, Hasler, R, Keel, M, Huettner, E, Exadaktylos, A: Bern, Switzerland

GP253. Motion is reduced in the unstable spine with the use of mechanical devices for bed transfers

Hu, C, DiPaola, C, Conrad, B, Horodyski, MB, Del Rossi, G, **Rechtine II, G**: Rochester, US, Worcester, US, Gainesville, US and Tampa, US

GP254. The clinical significance of bone contusion in patients with thoracolumbar vertebral fractures

**Park, SJ**, Chung, SS, Lee, CS, Kang, KC, Shin, SK, Kang, JH: Seoul, Republic of Korea

GP255. Withdrawn

GP256. Pedicle screw fixation by indirect reduction without vertebroplasty for thoracolumbar burst fractures

**Tobimatsu, H**, Aono, H, Kuroda, M, Yamasaki, R, Furuya, M, Ariga, K, Ueda, T: Osaka, Japan

GP257. Rationale for limited surgical intervention in vertebral body fractures of the osteoporotic patient

**Blatter, T**, Josten, C: Schwarzach, Germany and Leipzig, Germany

#### 15. TUMOR INFECTION

GP258. Efficacy of percutaneous nucleotomy and stabilization surgery: treatment strategy for lumbar spondylodiscitis

**Murata, Y**, Kanaya, K, Wada, H, Wada, K, Shiba, M, Hatta, S, Kato, Y: Shinjuku, Japan

GP259. Single stage dorsal vertebra resection and instrumentation for solitary and multilevel metastasis of the thoracolumbar spine

Behrendt, C, **Kroeber, M**: St. Gallen, Switzerland and Lucern, Switzerland

GP260. MRI findings and strategy for deep wound infection after posterior lumbar instrumentation surgery

**Kanayama, M**, Togawa, D, Hashimoto, T, Shigenobu, K, Oha, F, Yamada, K: Hakodate, Japan

GP261. Wound dehiscence: parameters and treatment

**Mirkovic, S**, Chicago, United States

GP262. Survival rate of spine metastasis according to operation types: 200 operations

Lee, HM, **Lee, BH**, Moon, SH, Kim, SH. Kim, SH Lee, SJ, Seoul, Republic of Korea

GP263. Lumbar epidural gas-containing pseudocysts as a cause of severe radicular pain

**Kuh, S**, Heo, D, Kim, K, Kim, D, Park, J, Seoul, Republic of Korea