



ISSLS ANNUAL
MEETING 2022
MAY 9-13, 2022 BOSTON, USA



ISSLS ANNUAL MEETING 2022

Boston Marriott Copley Place, May 9 - 13, 2022

 www.issls.org

Welcome by the locals hosts



Dear Members and Guests,

On behalf of the Local Organizing Committee, it is our great honor to welcome you to this 48th Annual Meeting of the International Society for the Study of the Lumbar Spine (ISSLS) in Boston, USA.

To say the past two and a half years have been challenging, would be an understatement. When we last met in Kyoto in 2019, none of us could have imagined what was coming. The COVID pandemic has certainly created hardship for all of us, both personally and professionally. Although it is a great relief to be able to once again meet face to face after a two-year hiatus, it is still disheartening and sad that we will miss so many of our colleagues from around the world, particularly in Japan, China, Hong Kong and South Korea, who will not be able to attend due to COVID-19 travel restrictions that still persist. We send our most sincere good wishes to all who cannot be with us.



Our Virtual Meeting in 2021 was historic and a testament to our ability to bring our unique society together, despite the pandemic. This year in Boston, we have also had to use our creativity to meet the challenges of COVID-19. Although we held out hope of in-person attendance by our members and guests, we also made

contingency plans to enable some participation in the meeting for those who could not attend. To this end, we are pleased that we have been able to include Zoom sessions for Oral and Special Poster presentations and we hope you will enjoy these sessions. We will also be recording oral sessions from the live program and uploading them to the ISSLS website for viewing by all registered participants.

We hope you enjoy your time in Boston. It is arguably the most historic city in the United States and the scene of many key events in the American Revolution, including the Boston Tea Party, the Battle of Bunker Hill and the Siege of Boston.

Bostonians also enjoy a rich sporting culture – with the famous Boston Red Sox baseball team, Boston Bruins ice hockey and Boston Celtics basketball teams. The Boston Bruins and the Celtics will be in the midst of their playoff run in May so you will be able to enjoy the City's energy and become temporary fans.

Boston is also a City for the Arts with many theatres, museums and galleries, where opera, ballet, drama and art, can be enjoyed by all. The Museum of Fine Arts, the Institute of Contemporary Arts, the Boston Opera House, and the Theater District are just a few of the great venues that you may want to visit and enjoy during your visit. .

Finally, Boston, which is the home of Harvard, MIT, and more than 30 other Universities, is a world leader in higher education, and at the forefront in medicine, engineering, business, law, innovation and entrepreneurship. We therefore feel that Boston is an ideal city to host ISSLS, an organization that we all know is rooted in academics and research.

We greatly look forward to welcoming you at the 48th Annual Meeting of ISSLS in Boston!

Sincerely,

James Kang and Andrew Schoenfeld
(local co-hosts)

Welcome by the ISSLS President 2021/2022



Dear Friends & Colleagues

On behalf of the ISSLS Executive Committee, it gives me great pleasure to welcome you all to our 48th Annual Meeting in the historic city of Boston, USA. Our local hosts, Drs James Kang and Andrew Schoenfeld, together with the local organizing committee have worked hard to meet and surmount the many challenges faced in organizing our first face-to-face meeting since 2019. I would also like to express our thanks to the Program Committee under the leadership of Dr Yong Hai and the many volunteer abstract reviewers for a comprehensive program based on scientific presentations and symposia.

This year has been especially taxing, as we have made last minute changes and introduced a hybrid element to the Program in order to offer delegates and presenters, who are unable to attend in person, the opportunity to participate virtually. Despite the obstacles, we know we will learn from high-quality research and active discussions.

The Fellowship Awards Ceremony on May 12 will honor two of our respected senior members with the Wiltse Lifetime Achievement Award along with the winners of the Young Investigator Travel Grant. The prestigious ISSLS Prizes will be presented at a special session on the same day.

Invited Lectures have always been highlights of our Annual Meeting, and this year makes no exception. We are honored to have four excellent invited speakers who will share with us their expertise. We are especially excited to welcome Drs White and Panjabi, two of ISSLS' founding members, who will share with us their reflections on the history of ISSLS. The variety of topics promises exciting presentations that nobody should miss.

The traditional ISSLS outing will take us out to sea for a whale watching experience, where we will get up close and personal with Humpback, Fin and Minke whales. Our spouses will also enjoy a culinary experience, enjoying lobster, chowder and Boston cream pie on the Bites of Boston tour.

Looking forward to seeing you all in Boston.

Scott Blumenthal
ISSLS President 2021-2022

Invited speakers



Harry Farfan Presidential Lecture – Nicole Saphier: Covid-19: How Science Bent to Politics

Day and time: Wednesday May 11, 11:40

Raised in Scottsdale, AZ Nicole B. Saphier, MD, is an Assistant Professor at Memorial Sloan Kettering Cancer Center and Weill Cornell Medical College and the Director of Breast Imaging at Memorial Sloan Kettering Cancer Center New Jersey sites.

Since completing her fellowship at Mayo Clinic in 2013, Dr. Saphier has had a meteoric rise in national prominence serving as a senior medical contributor on Fox News and Fox Business programming, being a best-selling author of two books, leading advocacy efforts to achieve health care legislation in both Arizona and New Jersey, running for political office, serving on her township's health board and serving as a member of the Centers for Disease Control and Prevention (CDC)'s Advisory Committee on Breast Cancer in Young Women.

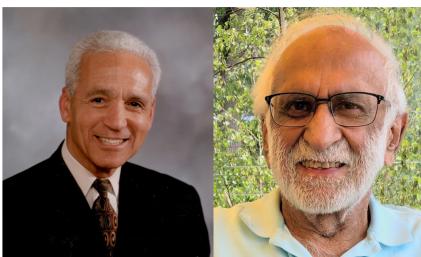


Invited Guest Speaker – James H. Stock: The Macroeconomics of Climate Change

Day and time: Tuesday May 10, 11:30

James H. Stock is Vice Provost for Climate and Sustainability, Harvard University; the Harold Hitchings Burbank Professor of Political Economy, Faculty of Arts and Sciences; and a member of the faculty at the Harvard Kennedy School.

His current research includes energy and environmental economics with a focus on fuels and on U.S. climate change policy. He is co-author, with Mark Watson, of a leading undergraduate econometrics textbook. In 2013-2014 he served as Member of President Obama's Council of Economic Advisers, where his portfolio included macroeconomics and energy and environmental policy. He was Chair of the Harvard Economics Department from 2007-2009. He holds a M.S. in statistics and a Ph.D. in economics from the University of California, Berkeley.



“Reflections from two ISSLS Founding Members“

Day and time: Thursday May 12 at 11:30

It is with great pleasure we announce that two of our ISSLS Founding Members will be attending the meeting in Boston to talk about the ISSLS History

Augustus A. White and Manohar M. Panjabi will talk about the beginning of ISSLS and the first meetings. They will also talk about the role of ISSLS in advancing the research in spine biomechanics and spinal disorders

Other highlights

Meetings open to everyone on Monday May 9

Monday May 9

09:00 – 10:00 Focus Group #1 (open to everyone)

ISSLS Degenerative Spinal Phenotypes Focus Group. Creating a common language to advance knowledge

Chairs: M Battié & D Samartzis

Location: Salon J

10:00 – 12:00 Focus Group #2 (open to everyone)

Artificial Intelligence in Spine – (AI-ISSLS)

Chairs: F Galbusera, A Mannion, D Samartzis, HJ Wilke

Location: Salon J

13:00 – 16:00 Focus Group #3

How High Is Up? A Virtual Debate On The Future of Outcomes Research in Spinal Disorders

Chair: RG Hazard

Location: Salon J

16:00 – 17:30 Women's ISSLS (women only)

Location: Yard House

Chairs: Christy Tomkins-Lane, Jeannie Bailey and Marit E Johnson

In the program

Wednesday May 11, 16:30-17:10 ISSLS – ORS Spine Section: Artificial Intelligence-Based Spine Care and Research: Current Technology and Future Developments

Chair: Morgan Giers and Dino Samartzis

Thursday May 12, 16:30-17:30 DEBATE: Is subclinical infection a cause for disc degeneration and low back pain? - Fact or Fiction

Chairs: Helena Brisby and Robert Gunzburg

Introduction of topic

- Subclinical infection is fiction - Peter Fritzell
- Subclinical infection is a fact - S Rajasekaran

Zoom sessions - oral and special poster presentations

Because so many of our friends from Asia were not able to attend the meeting this year due to the Covid situation we were able to give them the opportunity to take part in zoom sessions which will take place on Wednesday and Thursday morning just before the podium sessions starts.

So take the opportunity to listen to their presentations and to take an active part in the discussions. You can see all information including links to the zoom sessions in the scientific program

- Wednesday morning at 06:30 (Boston time) oral presentations
- Thursday morning at 06:30 (Boston time) special poster presentations

Social Events

The social events are included in registration fee for all fully registered delegates/accompanying persons. Additional tickets may be purchased at the registration desk, pending availability

Welcome Reception

Finally, time for an ISSLS Welcome Reception when everyone can meet and mingle again!. The reception will be held at the Marriott Copley Hotel (meeting hotel)

Time: Monday May 9, at 18:00 – 20:00

Dress code: formal



Afternoon outing - Whale Watching Tour

Time: Wednesday May 11, at 13:00

Boarding begins: 13:30 | Departure: 14:00 |
Return: 18:00

Dress code: Casual

Boxed lunch will be served

Enjoy a half day tour for Boston Whale Watching ! Experience the ride of a lifetime on a high speed catamaran during this Boston Whale Watching experience!

Banquet at the Boston Marriott Copley Place

All registered are welcomed to join in this formal dinner to meet professionals and newcomers at the banquet and strengthen professional networks and friendship.

Time: Thursday May 12, 19:00

Dresscode: Business attire

Location: Boston Marriott Copley Place



Spouses program – Bites of Boston

For accompanying persons only

Time: Tuesday, May 10 (3 hours)

Wear: comfortable clothing and shoes! We will be outside and on our feet most of the time.



Lobster, Chowder, Baked Beans and Boston Cream Pie! Curious about where to eat

them? Wondering why these foods became so popular in Boston in the first place? Join us on our Classic Bites of Boston Tour and you'll learn about all of the above – and taste these iconic dishes for yourself too!



07:00 – 08:00	<p>Program Committee Meeting (Committee members only) <i>Chair: Yong Hai</i></p> <p>Location: Board Room Salon I</p>
08:00 – 09:00	<p>Membership Committee Meeting (Committee members only) <i>Chair: Fabio Zaina</i></p> <p>Location: Board Room Salon I</p>
09:00 – 12:00	<p>Focus Group #1-2 ISSLS Degenerative Spinal Phenotypes Focus Group. Creating a common language to advance knowledge <i>Chairs: M Battié & D Samartzis</i></p> <p>Artificial Intelligence in Spine – (AI-ISSLS) <i>Chairs: F Galbusera, A Mannion, D Samartzis, HJ Wilke</i></p> <p>Location: Salon J (open to everyone)</p>
09:30 – 11:30	<p>Strategy Group Meeting (Committee members only) <i>Chair: Helena Brisby</i></p> <p>Location: Board Room Salon I</p>
12:00 – 15:00	<p>Executive Committee Meeting (Committee members only) <i>Chair: S Blumenthal</i></p> <p>Location: Board Room Salon I</p>
13:00 – 16:00	<p>Focus Group #3 How High Is Up? A Virtual Debate On The Future of Outcomes Research in Spinal Disorders <i>Chair: RG Hazard</i></p> <p>Location: Salon J</p>
16:30 – 18:00	<p>Registration opens</p>

Monday, May 9, 2022 – Committee meetings – Focus Groups

16:00 – 17:30	Women’s ISSLS Location: Yard House <i>Chairs: Christy Tomkins-Lane, Jeannie Bailey and Marit E Johnson</i> Sponsored by: 
18:00 – 20:00	Opening Ceremony & Welcome Reception Location: Back Bay Conference & Exhibition Center Sponsored by: 

		
07:45 – 07:50	Welcome – Local Hosts Chair: James D Kang and Andrew Schoenfeld Sponsored by:  DePuy Synthes <small>THE ORTHOPAEDICS COMPANY OF Johnson & Johnson</small>	
07:50 – 08:00	Program Chair Report Chair: Yong Hai	
08:00 – 09:00	SESSION #1 - LOW BACK PAIN Chair: Scott Blumenthal and Jeffrey Lotz	
08:00 – 08:05	1	Polygenic risk score for persistent back pain Frances M. Williams, Maxim M.B. Freidin, Y.A. Tsepilov, Y.S. Aulchenko, P. Suri, (United Kingdom) id# 3209
08:07 – 08:12	2	Intradiscal injection of platelet-rich plasma releasate for discogenic low back pain patients: a double-blind, randomized active-controlled trial Koji Akeda, N. Takegami, T. Sudo, J. Yamada, T. Fujiwara, A. Sudo, (Japan) id# 3064
08:14 – 08:19	3	Characteristics of sagittal spinopelvic alignment changes after symptom relief following simple lumbar decompression Chang Hwa Ham, D. Kim, W. Kwon, J. Kim, Y. Park, H. Moon (Korea, Republic of) id# 3370
08:21 – 08:26	4	The influence of psychosocial factors on chronic back pain: a bidirectional Mendelian randomisation study Frances MK Williams, E.E. Elgaeva, M.B. Freidin, O.O. Zaytseva, Y.S. Aulchenko, T.A. Yakov, P. Suri (United Kingdom) id# 3142
08:28 – 08:40		Discussion
09:00 – 10:00	SESSION #2 - BASIC SCIENCE Chairs: Helena Brisby and Dino Samartzis	
09:00 – 09:05	5	Terminal complement complex formation in C6-deficient and CD59-knockout mice during disc aging and degeneration Cornelia Neidlinger-Wilke, G. Q. Teixeira Y. Höpfner, J. Ostertag, J. Riegger, A. Ignatius, R. Brenner, (Germany) id# 2905

Tuesday May 10, 2022 – Podium presentations

09:07 – 09:12	6	<p>Irisin stimulates anabolism and matrix synthesis in human nucleopulpcytes in vitro: new insights into a cross-talk between the muscle and the intervertebral disc.</p> <p><i>G. Vadalà, G. Di Giacomo, Luca Ambrosio, C. Cicione, V. Tilotta, F. Russo, R. Papalia, V. Denaro (Italy) id# 3213</i></p>
09:14 – 09:19	7	<p>Cell survival in the nucleus pulposus center is affected by loading</p> <p>Elias Salzer, V.H. Mouser, J.A. Bulsink, M.A. Tryfonidou, K. Ito (Netherlands) id# 3139</p>
09:21 – 09:26	8	<i>Cancelled</i>
09:28 – 09:33	9	<p>Does general exercise improve paraspinal myopathy, disc health and spinal alignment in sarcopenic TSC1mKO mice?</p> <p>Wenhai Zhuo, W.M.R. Lam, W. Zhuo, X. Chan, W. Chen, S. Cool, E. Crombie, S. Tsai, H. Hey (Singapore) id# 3184</p>
09:35 – 09:40	10	<p>Intensively loaded intervertebral disc enhances the spontaneous calcium oscillation in CGRP-negative dorsal root ganglion neurons</p> <p>Junxuan Ma, S. Grad, J. Gewiess, J. Eglauf, A. Soubrier, M. Peroglio, M. Alini, (Switzerland) id# 3193</p>
09:42 – 10:00		<i>Discussion</i>
10:00 – 10:30	<p>COFFEE</p> <p>Sponsored by:  SONIK by Neuro Spinal Innovation.</p>	
10:30 – 11:30	<p>SESSION #3 – SPONDYLOLISTHESIS</p> <p><i>Chairs: Richard Guyer and Edward Vresilovic</i></p>	
10:30 – 10:35	11	<p>Decompression with or without Fusion in Degenerative Lumbar Spondylolisthesis</p> <p>Christian Hellum, I. Austevoll, E. Hermansen, M. Fagerland, k. Storheim, J. Brox, T. Solberg, F. Rekeland, E. Franssen, C. Weber, H. Brisby, O. Grundnes, k. Algaard, T. Bøker, H. Banitalebi, K. Indrekvam (Norway) id# 3027</p>


10:37 – 10:42	12	<p>Tandem Spondylolisthesis and the Rising Psoas: The Danger of the Direct Lateral Trans-psoas Approach</p> <p>Anthony A Oyekan, D. Ridolfi, B.K. Couch, A. Zheng, A. Mirvish, J.F. Dalton, A. Chang, C.M. Gibbs, J.D. Shaw, W.F. Donaldson, J.Y. Lee (United States) id# 3131</p>
10:44 – 10:49	13	<p>Assessment of Lumbar Motion and Patient Reported Outcomes after Decompression and use of Paraspinous Tension Band for Degenerative Spondylolisthesis: Results from 24-month FDA Study</p> <p>Michael P Stauff, R.C. Sasso, S. Hu, A.T. Villavicencio, T. Yoon, W. Lavelle, K.D. Kim, S. Harvinder, H. Bae, H. Deutsch, K. Sethi, J.S. Fischgrund, M. Perez-Cruet, E. Yu, S.H. Berven, M. Mermer, R.J. Davis, R.S. Bains, C.C. Kuo, W. Ray, T.F. Alamin, L. Fielding, W.C. Welch (United States) id# 3252</p>
10:51 – 10:56	14	<p>A Canadian Spine Outcomes and Research Network Study of Functional Outcomes After Surgery for Lumbar Degenerative Spondylolisthesis</p> <p>Patrick Thornley, Y. Rampersaud, R. Glennie, C. Fisher, J. Urquhart, C. Bailey (Canada) id# 3360</p>
10:58 – 11:03	15	<p>A Prospective Study of Lumbar Facet Arthroplasty in the Treatment of Degenerative Spondylolisthesis and Stenosis: Results from the Total Posterior Spine System (TOPS) IDE Study</p> <p>Harold Salmons, Z. W. Pinter, B.A. Freedman, A.N. Nassr, A.S. Sebastian, D. Coric, W.C. Welch, M.P. Steinmetz, S.E. Robbins, Y. Smorgick, Y. Anekstein (United States) id# 3376</p>
11:05-11:30		Discussion
11:30 – 12:15		<p>INVITED LECTURE Moderator: James Kang</p> <p>Title: The Macroeconomics of Climate Change James H. Stock: Vice Provost for Climate and Sustainability, Harvard University</p>
12:15 – 13:30		LUNCH
13:30 – 15:00		<p>SESSION #4 - BEST PAPER AWARD SESSION Chairs: Dawn Elliott, Michele Battié and Frances Williams</p>
13:30 – 13:35	16	<p>Cell-Laden Injectable High-Modulus Biomaterial Composites Repair Intervertebral Discs Under Physiological Loading</p> <p>Christopher J Panebianco S. Rao, W.W. Hom, A.C. Hecht, J.R. Weiser, J. Iatridis (United States) id# 3163</p>
13:37 – 13:42	17	<p>Infectious and autoinflammatory etiologies of Modic type 1 change have different cytokine profiles</p> <p>Stefan Dudli, I. Heggli, R. Schüpbach, N. Farshad-Amacker, M. Betz, J. Spirig, F. Wanivenhaus, C. Laux, F. Brunner, M. Farshad, O. Distler (Switzerland) id# 2907</p>

Tuesday May 10, 2022 – Podium presentations

13:44 – 13:49	18	Progression of spinal degenerative changes in a group of chronic low back pain patients and patients 11-14 years after discography evaluation Hanna Hebelka, K. Lagerstrand, V. Gunterberg, H. Brisby (Sweden) id# 3137
13:51 – 13:56	19	A systematic review of Clinical Practice Guidelines for persons with non-specific low back pain with and without radiculopathy: Identification of best evidence for rehabilitation to develop the WHO's Package of Interventions for Rehabilitation Fabio Zaina P. Coté, C. Cancelliere, F. Di Felice, S. Donzelli, A. Rauch, L. Verville, S. Negrini, M. Nordin, (Italy) id# 3221
13:58 – 14:03	20	Lumbar Total Disc Replacement Removals/Revisions during a 20 Year Experience with 1,775 Patients Richard D Guyer S.L. Blumenthal, J.E. Zigler, J.L. Shellock, D.D. Ohnmeiss (USA) id# 2866
14:05 – 14:10	21	Comparative plasma proteomics analysis between clinically mild and severe participants from two independent pilot samples of Lumbar Spinal Stenosis and Chronic Low Back Pain Valerio Tonelli Enrico, M. Schneider, N. Vo, N. Yates, G. Sowa. (United States) id# 3208
14:12 – 14:17	22	Spatial distribution of fat infiltration within the paraspinal muscles: implications for chronic low back pain Karim Khattab L.K. Dziesinski, R. Crawford, A. Ballatori, P. Nyayapati, R. Krug, A. Fields, C.W. O'Neill, J.C. Lotz, J.F. Bailey (United States) id# 3207
14:19 – 14:24	23	Automated analysis of the lumbar paravertebral muscles in MRI: an accurate tool for large-scale clinical studies Fabio Galbusera F. Niemeyer, A. Zanker, R. Jonas, Y. Tao, H. Wilke (Germany) id# 2943
14:26 – 15:00		<i>Discussion</i>
15:00 – 15:30	COFFEE	
15:30 – 16:30	SESSION #5 – SURGERY <i>Chairs: Robert Gunzburg and Tim Yoon</i>	


Tuesday May 10, 2022 – Podium presentations

15:30 – 15:35	24	<p>The Impact of Frailty on Postoperative Complications in Geriatric Patients Undergoing Multi-Level Lumbar Fusion Surgery</p> <p>Nima Saboori A. Ton, S. Shahrestani, X. Chen, A. Ballatori, J.C. Wang, Z. Buser (United States) id# 3113</p>
15:37 – 15:42	25	<p>Appropriate Telemedicine Utilization in Spine Surgery: Results From a Delphi Study</p> <p>Sravisht Iyer, P. Bovonratwet, D. Samartzis, A.J. Schoenfeld, H.S. An, W. Awwad, S.L. Blumenthal, J.P. Cheung, P.B. Derman, M. El-Sharkawi, B.A. Freedman, R. Hartl, J.D. Kang, H. Kim, P.K. Louie, S.C. Ludwig, M.H. Neva, M.H. Pham, F.M. Phillips, S.A. Qureshi, K.E. Radcliff, K.D. Riew, H.S. Sandhu, D.M. Sciubba, R.K. Sethi, M. Valacco, H.A. Zaidi, C.C. Zygourakis, M.C. Makhni (United States) id# 2909</p>
15:44 – 15:49	26	<p>Social Vulnerability is an Important Contributor to Racial Disparities in the Safety of Spine Surgery</p> <p>Brook I Martin, I.D. Engler, K.D. Vasavada, M.E. Vanneman, A.J. Schoenfeld (United States) id# 2973</p>
15:51 – 15:56	27	<p>Healthcare Resource Utilization and Costs Two Years Pre and Post Lumbar Spine Surgery for Stenosis: A National Claims Cohort Study of 22,182 Cases</p> <p>Serena S Hu J.C. Koltsov, T.F. Alamin, K.B. Wood, I. Cheng (United States) id# 2981</p>
15:58 – 16:03	28	<p>The influence of patient perceptions on the decision to undergo surgery for lumbar spinal stenosis</p> <p>Michele C. Battié A. El Chamaa, J. Marsh, R. Hu, C. Bailey (Canada) id# 3110</p>
16:05 – 16:10	29	<p>Full-endoscopic Transforaminal Discectomy is Non-inferior and Cost-effective compared to Microdiscectomy for Sciatica: Two-year results of a randomized controlled trial</p> <p>Pravesh Gadhradj S. Rubinstein, M. van Tulder, B. Harhangi (The Netherlands) id# 2841</p>
16:10 – 16:30		<p>Discussion</p>

16:30 – 17:10	 <p>ISSLS - ORS Spine Section: Artificial Intelligence-Based Spine Care and Research: Current Technology and Future Developments</p> <p><i>Chair: Morgan Giers and Dino Samartzis</i></p> <p>Speakers:</p> <ul style="list-style-type: none">• Dino Samartzis – Intelligence-Based Spine Care Model• Daisuke Sakai - Spine surgeon's expectations in AI• Fabio Galbusera – Applications and future direction of artificial intelligence for automated image recognition• Morgan Giers – Predictive modeling for spine degeneration, herniation and pain• Augustus J. Rush – Robotics and augmented reality for spine care - current technology and future direction
17:10 – 18:10	<p>FIRST BUSINESS MEETING (MEMBERS ONLY)</p> <p><i>Chair: Scott Blumenthal</i></p>

		
06:30-08:15	ZOOM - ORAL PRESENTATIONS Link to zoom <i>Chairs: Yong Hai and Jeffrey Lotz</i>	
06:30 – 06:35	Z01	A 2-year longitudinal study of skeletal muscle mass in women over 40 years of age with degenerative lumbar scoliosis. Masaya Mizutani, (Japan) id#2934
06:35 – 06:40	Z02	The cortical trajectory fixation versus traditional pedicle screw fixation in the treatment of lumbar degenerative patients with osteoporosis: a prospective randomized controlled trail. Yuzeng Liu, (China) id#3365
06:40 - 06:45	Z03	Innovative Percutaneous Endoscopic Transforaminal Lumbar Interbody Fusion of Lumbar Spinal Stenosis with Degenerative Instability: A non-randomized clinical trial. Jincai Yang, (China) id#3295
06:45 – 06:55	<i>Discussion</i> <i>Moderator: Yong Hai</i>	
06:55 – 07:00	Z04	Prevalence of lumbar scoliosis and its association with clinical symptoms - A large scale general population survey-: The Wakayama Spine Study. Stashi Arita, (Japan) id#3051
07:00-07:05	Z05	Facet joint osteoarthritis and low back pain: an epidemiological study in the community. Keni Kobayashi, (Japan) id#3038
07:05 – 07:10	Z06	Natural history of the lumbar facet joint angle and onset of spondylolisthesis over 10 years. Takehiro Watanabe, (Japan) id#3240
07:10 – 07:20	<i>Discussion</i> <i>Moderator: Jeffrey Lotz</i>	

07:20 – 07:25	Z07	Central sensitization is a significant risk factor for the chronic low back pain. Hiroshi Hashizume, (Japan) id#3073
07:25 – 07:30	Z08	Sensory innervation by NETRIN1 from osteoclasts mediates spinal pain hypersensitivity in lumbar endplate Modic changes. Bao Huang, (China) id#3045
07:30 – 07:35	Z09	Microbiome and bone marrow metabolism dysbiosis in Low Back Pain. Wentian Li, (Australia) id#3181
07:35 – 07:45	<i>Discussion: Moderator Yong Hai</i>	
07:45 – 07:50	Z010	Integrating 2D radiographs and 1D clinical data in the AI prediction of adolescent idiopathic scoliosis progression. Jason Pui Yin Cheung, (Hong Kong, China) id#3338
07:50 – 07:55	Z011	Novel ultrasound applications for the characterization of adult lumbar intervertebral disc. Claudio Vergari, (France) id#2845
07:55 – 08:00	Z012	A novel technique for in vivo deformation and strain measurements in human lumbar intervertebral discs using 3T clinical MRIs. Saman Tavana, (United Kingdom) id#3019
08:00 – 08:05	Z013	Single-cell transcriptome profiling reveals multicellular ecosystem of nucleus pulposus during degeneration progression Ji Tu (Australia) id# 3170
08:05 – 08:15	<i>Discussion: Moderator Jeffrey Lotz</i>	
07:45 – 08:45	SPECIAL POSTER SESSION	
	1A. PAIN GENERATOR AND TREATMENT <i>Chairs: Max Aebi and Christy Tomkins-Lane</i> <i>Location: Fairfield</i>	
	1B. SURGERY AND CLINICAL OUTCOME <i>Chair: Masahiro Kanayama and Donn Ohnmeiss</i> <i>Location: Exeter</i>	
	1C. OSTEOPOROSIS, MUSCLE AND DEFORMITY <i>Chair: John Popovich and Asseem Sharma</i> <i>Location: Dartmouth</i>	

	<p>1D. INTERVERTEBRAL DISCS AND MODIC CHANGE <i>Chair: Stefan Dudli and Cornelia Neidlinger-Wilke</i> <i>Location: Clarendon</i></p>	
09:00 – 10:00	<p>SESSION #6 - SURGERY II: FUSION AND MINIMALLY INVASIVE SURGERY <i>Chairs: Ashish Diwan and James Kang</i></p>	
09:00 – 09:05	30	<p>Clinical Outcome of Lumbar Hybrid Surgery in a Consecutive Series of Patients with Long-term Follow-up Richard D Guyer S.L. Blumenthal, J.L. Shellock, J.E. Zigler, D.D. Ohnmeiss (USA) id# 2867</p>
09:07 – 09:12	31	<p>Comparison of Value Per Operative Time Between Anterior Lumbar Interbody Fusion and Lumbar Disc Arthroplasty: A Propensity Score-Matched Analysis Junho Song, A. Katz, T. Ng, E. Neufeld, N. Sodhi, J. Silber, D. Essig, S. Qureshi, S. Virk (United States) id# 3024</p>
09:14 – 09:19	32	<p>Clinical outcome in decompression-alone versus decompression and instrumented fusion in patients with isthmic spondylolisthesis: a prospective cohort study Kayoumars Azizpour P. Schutte, M. Arts, W. Pondaag, G.Bouma, M. Coppes, E. Steyerberg, W. Peul, C. Vleggeert-Lankamp. (The Netherlands) id# 3097</p>
09:21 – 09:26	33	<p>A Canadian Spine Outcomes and Research Network study of radiographic alignment outcomes with different surgery type for degenerative lumbar spondylolisthesis Patrick Thornley J. Urquhart, R. Glennie, Y. Rampersaud, C. Fisher, C. Bailey, (Canada) id# 3361</p>
09:28 – 09:33	34	<p>Comparing osteostimulative bone graft substitutes in interbody fusion – is there a difference? Paul Licina E. Johnston, C. Lehmann (Australia) id# 3362</p>
09:35 – 10:00		<p><i>Discussion</i></p>
10:00 – 10:30	<p>COFFEE Sponsored by:  bioventus <small>Innovations For Active Healing</small></p>	
10:30 – 11:00	<p>SESSION #7 – SCOLIOSIS <i>Chairs: Serena Hu and S Rajasekaran</i></p>	
10:30 – 10:35	35	<p>Asymmetry in lumbar trunk muscle activation in adolescent idiopathic scoliosis during forward flexion: A computational study based on musculoskeletal modelling approach Tito Bassani M. Panico, D. Ignasiak, F. Galbusera (Italy) id# 2962</p>

Wednesday May 11, 2022 – Podium presentations

10:37 – 10:42	36	<p>Comparison of Relative Value Units and 30-Day Outcomes Between Primary and Revision Pediatric Spinal Deformity Surgery</p> <p>Junho Song A. Katz, D. Essig, S. Virk (United States) id# 3227</p>
10:44 – 10:49	37	<p>Using a Convolutional Neural Network (CNN) model to quantify longitudinal changes in MRI readings of the lumbar spine</p> <p>Jeremy Fairbank A. Jamaludin, J. Urban, T. Kadir, A. Zisserman, F.M. Williams. United Kingdom)id# 3087</p>
10:51 – 11:00		<i>Discussion</i>
11:00 – 11:40		<p>PRESIDENTIAL ADDRESS</p> <p>Scott Blumenthal: ISSLS Presidential Address 2022 - It's Personal</p> <p><i>Introduction by Jeffrey Lotz</i></p>
11:40 – 12:20		<p>HARRY FARFAN PRESIDENTIAL LECTURE</p> <p>Nicole Saphier - Title: Covid-19: How Science Bent to Politics</p> <p><i>Introduction: Scott Blumenthal</i></p>
13:00 -		AFTERNOON OUTING

		
06:30 - 07:30	ZOOM - SPECIAL POSTERS Link to zoom <i>Chairs: Ashish Diwan and Arnold Wong</i>	
06:30 – 06:33	ZSP1	Prevalence of facet joint degeneration preceding the intervertebral disc: an epidemiological study in community? Kenji Kobayashi, (Japan) id#3357
06:33 – 06:36	ZSP2	The association of abdominal trunk muscle weakness and the development of osteoporotic vertebral fracture in the middle-aged and older adult women: a three-year prospective longitudinal cohort study. Satoshi Kato, (Japan) id#3081
06:36 – 06:39	ZSP3	The quantity and quality of lumbar muscles and lumbopelvic parameters in patients with degenerative spondylolisthesis. Shuhei Ohyama, (Japan) id#2874
06:39 – 06:42	ZSP4	Is clinical result of posterior lumbar interbody fusion for the elderly in the 80s inferior to that in the 60s patients? Masahiro Ozaki, (Japan) id#3047
06:42– 06:45	ZSP5	Sagittal imbalance and need for future care in elderly adults: Locomotive Syndrome and Health Outcomes in the Aizu Cohort Study (LOHAS). Kazuyuki Watanabe, (Japan) id#3151
06:45– 06:48	ZSP6	An Artificial Intelligence Powered Platform for Auto-Analyses of Spine Alignment Irrespective of Image Quality with Prospective Validation. Teng Zhang, (Hong Kong, China) id#3014
06:48-07:00	Discussion: <i>moderator Ashish Diwan</i>	
07:00– 07:03	ZSP7	Utility of the Decubitus or the Supine Rather Than the Extension Lateral Radiograph in Evaluating Lumbar Segmental Instability. Xu Sun, (China) id#3359
07:03– 07:06	ZSP8	Needle tract seeding after computed tomography-guided percutaneous needle biopsy. Motoya Kobayashi, (Japan) id#3041

07:06 - 07:09	ZSP9	Prevalence and risk factors for development of venous thromboembolism after spinal tumor surgery. Motoya Kobayashi, (Japan) id#3040
07:09 – 07:12	ZSP10	Factors Associated with an Increased Risk of Developing Postoperative Symptomatic Lumbar Spondylolisthesis after Decompression Surgery: A Two-centre International Cohort Study. Inge Caelers, (Netherlands) id#2886
07:12 – 07:15	ZSP11	Small Preoperative Dural Sac Cross-Sectional Area and Anteriorly Placed Fusion Cages Are Risk Factors for Indirect Decompression Failure after Oblique Lateral Interbody Fusion (OLIF). Hao Wu (Hong Kong, China) id#3077
07:15 – 07:18	ZSP12	Mast cells and smoking interaction in intervertebral disc degeneration Ji Tu (Australia) id# 3173
07:18 – 07:30	<i>Discussion: moderator Arnold Wong</i>	
07:30 – 08:30	SESSION #8 - MODIC CHANGE AND SPINAL CORD SENSITIZATION <i>Chairs: Jeremy Fairbank and Fabio Zaina</i>	
07:30 – 07:35	38	CD90-positive bone marrow stromal cells in Modic changes associate with bone marrow fibrosis and edema Stefan Dudli L. Guidici, A. Karol, C. Germann, N. Farshad-Amacker, C. Laux, M. Betz, J. Spirig, F. Wanivenhaus, F. Brunner, M. Farshad, O. Distler, (Switzerland) id# 2904
07:37 – 07:42	39	The natural history of modic changes - a 5- and 15-year follow-up study Michele Battié, P. Saremi A. Leung, M. C.Battié (United Kingdom) id# 3179
07:44 – 07:49	40	Lumbar endplate microfracture induces Modic-like changes and pain-related behaviors in rats in-vivo Dalin Wang A. Lai, J. Gansau, A. Seifert, Y. Lee, J. Munitz, P. Nasser, D. Laudier, A. Hecht, J. Iatridis (United States) id# 3132
07:51 – 07:56	41	Spinal cord sensitization following lumbar endplate microfracture – An In Vivo Rat Model Alon Lai, K. Zaheer, D. Wang, D.M. Laudier, V. Zachariou, J.C. Iatridis (United States) id# 3176
07:58 – 08:03	42	Are Modic changes 'Primary infective endplatitis'?- A study by multimodal imaging Shanmuganathan Rajasekaran, Dilip Chand Raja, C. Murugan, A. Shetty, R. Kanna (India) id# 3367

08:05 – 08:10	43	Disability in patients with endplate bone marrow lesions (Modic changes) is associated with continuous measures of lesion composition assessed using water-fat MRI Noah B. Bonnheim A.A. Lazar, J. Zhou, R. Chachad, N. Sollmann, X. Guo, C. O'Neill, J.C. Lotz, T.M. Link, R. Krug, A.J. Fields (USA) id# 3233
08:10 – 08:30		<i>Discussion</i>
08:30 – 09:30	SESSION #9 - CLINICAL IMAGING AND OUTCOME <i>Chairs: Grace O'Connell and Hans-Joachim Wilke</i>	
08:30 – 08:35	44	Chronic Low Back Pain Subpopulations with Higher Probabilities for Continued Opioid Use have Higher Self-Reported Pain Scores at Initial Visit Ayesha Firdous P. Pancoska, G.A. Sowa (United States) id#2961
08:37 – 08:42	45	Prediction of Lumbar Disc Herniation Resorption and Self-Healing in Symptomatic Patients: <i>a Prospective, Multi-Imaging and Clinical Phenotype Study</i> Alexander J. Hornung J. Barajas, S.S. Rudisill, A. Butler, G.J. Park, G. Harada, S.F. Leonard, A.C. Roberts, H.S. An, A. Epinof, H.B. Albert, A. Tkachev, D. Samartzis (USA) id# 3037
08:44 – 08:49	46	Clinical and Radiographic Differences Between Single- and Multi-Level Lumbar Disc Herniations and Resorption: <i>a Prospective Multi-Imaging and Clinical Phenotype Study</i> Samuel S Rudisill A.L. Hornnung, J. Barajas, G. Harada, A. Fitch, S.F. Leonard, A.C. Roberts, H.S. An, A. Epifanov, H.B. Albert, A. Tkachev, D. Samartzis (USA) id# 3249
08:51 – 08:56	47	Risk factors for postoperative complaints in patients following lumbar decompression and fusion: analyses focusing on preoperative symptoms Sangyun Seok J.2. Cho (Korea, Republic of) id# 2968
08:58 – 09:03	48	10-year prediction of adjacent-level degeneration and disease after lumbar total disc replacement and fusion: A post hoc analysis of 7-year data from a prospective clinical trial Anton Jorgensen D. Coric, P. Derman, E. Braxton, K. Radcliff, G. Buttermann, A. Situ, N. Ferko, J. Zigler (United States) id# 3245
09:05 – 09:10	49	MRI Quantification of Intervertebral Disc Between Physiological and Experimental States Harrah R Newman N.A. Thurlow, K.D. Meadows, A. Barba, T.P. Schaer, E.J. Vresilovic, D.M. Elliott (United States) id# 3164
09:10 – 09:30		<i>Discussion</i>


09:30 – 10:00	FELLOWSHIP AWARD CEREMONY <i>Chair: Jeffrey Lotz</i>	
10:00 – 10:20	COFFEE Sponsored by:  by Neuro Spinal Innovation.	
10:20 – 11:30	THE ISSLS PRIZE FOR LUMBAR SPINE RESEARCH	
10:20 – 10:30		ISSLS PRIZE INTRODUCTION <i>Chair: Helena Brisby</i>
10:30 – 10:40	50	Accelerated disc degeneration after pubertal growth spurt differentiates adults with low back pain from their asymptomatic peers Teija Lund A. Aavikko, M. Lohman, L. Ristolainen, H. Kautiainen, K. Österman, D. Schlenzka (Finland) id# 2879
10:40 – 10:50		<i>Discussion</i>
10:50 – 11:00	51	Epidemiology, Risk Factors and Clinical Impact of Juvenile Modic Changes in Pediatric Patients with Low Back Pain G. Michael Mallow D. Zepeda, T.G. Kuzel, J. Barajas, K. Aboushaala, M.T. Nolte, A. Espinoza-Orias, C. Oh, M. Colman, M. Kogan, F.M. Phillips, H.S. An, D Samartzis (USA) id# 3042
11:10 – 11:10		<i>Discussion</i>
11:10 – 11:20	52	Repeated Cyclic Loading Induces Intervertebral Disc Regeneration Eric Ledet E.A. Capogna, E. Brown, E. Walrath, W. Furst, C. Zhou, Q. Dong, S. Gullbrand, G. Sowa, N. Vo (United States) id#3158
11:20 – 11:30		<i>Discussion</i>
11:30 – 12:20	INVITED LECTURE <i>Chair: Tom Oxland</i> Reflections from two ISSLS Founding Members Augustus A. White and Manohar M. Panjabi Sponsored by:  THE ORTHOPAEDICS COMPANY OF Johnson & Johnson	
12:20 – 13:30	LUNCH	
13:30 – 14:30	SESSION #10 – BIOMECHANICS <i>Chair: Christopher Colloca and Teija Lund</i>	
13:30 – 13:35	53	Torque- and Muscle-Driven Flexion Provoke Disparate Herniation Risk Grace D O'Connell M. Zhou, R.D. Huff (United States) id# 2912

13:37 – 14:42	54	How to treat lumbar disc herniations in order to prevent a reherniation? Laura Zengerle, H.J. Wilke, L. Zöllner, J. Jansen, Y. Tao (Germany) id# 2913
13:44 – 13:49	55	An In Vivo Biomechanical Analysis of Neuromuscular Recovery of Dynamic Lumbar Spinal Stiffness Following Joint Injury Christopher J Colloca, R. Gunzburg, M. Szpalski, M.A. Hegazy, B.J. Freeman (United States) id# 2957
13:51 – 13:56	56	Dysfunctional Paraspinal Muscles in Adult Spinal Deformity Patients Lead to Increased Spinal Loading Masoud Malakoutian, A.M. Noonan, I. Dehghan-Hamani, S. Yamamoto, S. Fels, D. Wilson, M. Doroudi, P. Schutz, S. Lewis, T. Ailon, J. Street, S.H. Brown, T.R. Oxland (Canada) id# 2984
13:58 – 14:03	57	Investigating the active contractile function of the rat paraspinal muscles reveals unique crossbridge kinetics in the multifidus Alex M. Noonan, T.R. Oxland, S.H. Brown (Canada) id# 3036
14:05 – 14:10	58	3D internal strain analysis of intervertebral disc at three stages of nucleus replacement surgery Tamanna Rahman, S. Tavana, N. Baxan, A. Moore, J. Bull, N. Smith, N. Newell (UK) id# 3151
14:10 – 14:30		<i>Discussion</i>
14:30 – 15:30	GENERAL POSTER SESSION - Coffee	
14:30 - 15:30	GENERAL POSTERS ON-LINE	
15:30 – 16:30	SESSION #11 – NON-SURGERY <i>Chairs: Anne Mannion and Olavi Airaksinen</i>	
15:30 – 15:35	59	Improved sagittal spinal alignment and standing body balance by a “locomotion training” rehabilitation program in patients with “locomotive syndrome” Yutaro Kanda, T. Yurube, T. Takeoka, N. Watanabe, H. Inaoka, R. Tsujimoto, K. Miyazaki, H. Ohnishi, T. Matsuo, M. Ryu, Y. Takeoka, Y. Kakiuchi, Z. Zhang, R. Kuroda, K. Kakutani” (Japan) id# 2956
15:37 – 15:42	60	Home-Based Functional Outcome Measurements: Validation and Feasibility Study of Low-Cost Wearable Sensor for Spine Patients Ram Haddas, Y. Barzilay (United States) id# 2875
15:44 – 15:49	61	Regenerative potential of moderately degenerated human nucleus pulposus cells subjected to changes in physicochemical stresses mimicking daily spinal motion Yutaro Kanda, Y. Takeoka, J. Kang, S. Mizuno (United States) id# 2870

Thursday May 12, 2022 – Podium presentations


15:51 – 15:56	62	Is pelvic incidence constant value?: Minimum 13 year longitudinal follow-up of pelvic incidence Han-Dong Lee C. Jeon, N. Chung, H. Chung, K. Park, H. Yoon (South Korea) id# 3119
15:58 – 16:03	63	Detection and Characterization of Vertebral Endplate Structural Defects on Clinical Imaging and Micro-CT: A Diagnostic Test Validity Study Michele C. Battié , A. Lawan A. Leung, S. Leung, M. C. Battié (Canada) id# 3126
16:05 – 16:10	64	Extending the straight leg raise test for improved clinical evaluation of sciatica Janne Pesonen M. Shacklock, J. Suomalainen, L. Karttunen, J. Mäki, O. Ariksinen, M. Rade (Finland) id# 3212
16:10 – 16:30		Discussion
16:30 – 17:30		DEBATE: Is subclinical infection a cause for disc degeneration and low back pain? - Fact or Fiction Chairs: Helena Brisby and Robert Gunzburg Introduction of topic - Subclinical infection is fiction - Peter Fritzell - Subclinical infection is a fact - S Rajasekaran - Rebuttal - 3 minutes each - Peter Fritzell and S Rajasekaran - Discussion
17:30 – 18:30		SECOND BUSINESS MEETING (MEMBERS ONLY)
19:00 –		BANQUET Sponsored by: 

		
07:45 – 08:45	SPECIAL POSTER SESSION 2	
	2F. ARTIFICIAL INTELLIGENCE AND NOVEL TECHNOLOGIES <i>Chair: Fabio Galbusera and Matthew Smuck</i> <i>Location: Fairfield</i>	
	2G. EPIDEMIOLOGY, RISKS AND INFECTION <i>Chair: Zorica Buser and Paul Licina</i> <i>Location: Exeter</i>	
	2H. DEGENERATIVE LUMBAR DISEASE <i>Chair: Lisbeth Haglund and Peter Robertson</i> <i>Location: Dartmouth</i>	
	2I. TEST AND GUIDE <i>Chair: Drew Bednar and Hanna Hebelka</i> <i>Location: Clarendon</i>	
09:00 – 09:10	REPORT FROM FOCUS GROUPS	
09:10 – 10:10	SESSION #12 - DISC DEGENERATION <i>Chair: James Iatridis and Andrew Schoenfeld</i>	
09:10 – 09:15	65	The severity of disc degeneration associates with poor cartilage endplate composition but not with deficits in vertebral bone marrow composition Noah B. Bonnheim L. Wang, A.A. Lazar, J. Zhou, R. Chachad, N. Sollmann, X. Guo, C. Iriondo, C. O'Neill, J.C. Lotz, T.M. Link, R. Krug, A.J. Fields (USA) id# 3225
09:17 – 09:22	66	How to mimic disc degeneration for in vitro experiments to test regenerative approaches? Usage of chondroitinase versus papain Jan Ulrich Jansen G. Teixeira, A. Vernengo, S. Grad, K. Benz, C. Neidlinger-Wilke, H. Wilke (Germany) id# 3204
09:24 – 09:20	67	Chimera Decoy Oligodeoxynucleotide Attenuated Intervertebral Disc Degeneration in the Rabbit Anular-puncture Model and Degenerated Disc-induced Pain Generation in the Rat Xenograft Radiculopathy Model Koichi Masuda , D. Fukui, S.Y. Adachi, R. Baba, N. Arimoto, P. Choo, M. Esparza, J.J. Garcia, M. Kawakami, H. Yamada (United States) id# 3069

09:31 – 09:36	68	TLR-2 Signaling Leads to the Dysregulation of miR-100-5p and miR-155-5p in Intervertebral Disc Degeneration Petra Cazzanelli M. Lamoca, O. Hausmann, A. Mesfin, K. Wuertz-Kozak (nited States) id# 3229
09:38 – 09:43	69	Development of a Robust Intervertebral Disc Degeneration Model in-vitro Using Surgical Disc Specimen Jennifer Gansau A.C. Hecht, S. Chaudhary, J.C. Iatridis (United States) id# 2977
09:45 – 09:50	70	Protective roles of Atg5-dependent autophagy against human and rat disc cellular apoptosis and senescence: an <i>in-vitro</i> and <i>in-vivo</i> loss-of-function study Yoshiki Takeoka , Y. Kanda, T. Yurube, M. Ito, R. Tsujimoto, , Y. Kakiuchi, K. Miyazaki, H. Ohnishi, T. Matsuo, M. Ryu, Z. Zhang, R. Kuroda, K. Kakutani (Japan) id# 2988
09:50 – 10:10		Discussion
10:10 – 10:30	COFFEE Sponsored by:  bioventus <small>Innovations For Active Healing</small>	
10:30 – 11:00	SESSION #13 - TECHNIQUE AND MRI Chair: Jeannie Bailey and Scott Boden	
10:30 – 10:35	71	Is there any association between preoperative MRI disc characteristics and back pain at 1-year follow up in surgically treated lumbar disc herniation patients? Helena Brisby K. Lagerstrand, E. Cedergardh, C. Waldenberg, H. Hebelka (Sweden) id# 3210
10:37 – 10:42	72	Assessment of different nucleotomy techniques using ultra-high resolution MRI Tamanna Rahman N. Baxan, R.T. Murray, S. Tavana, T.P. Schaer, N. Smith, J. Bull, N. Newell (United Kingdom) id# 3155
10:44 – 10:49	73	Long-Term Nucleus Pulposus Replacement Mitigates Disc Degeneration in a Caprine Model Rachel Hilliard H. Newman, A. Barba, L. Brewer, E. Brewer, Z. Brown, P. Wilson, A. Lowman, D.M. Elliott, T.P. Schaer (United States) id# 3182
10:50 – 11:00		Discussion
11:00 – 12:00	SESSION #14 - ARTIFICIAL INTELLIGENCE AND NOVEL TECHNIQUE Chair: Howard An and Svenja Illien-Junger	

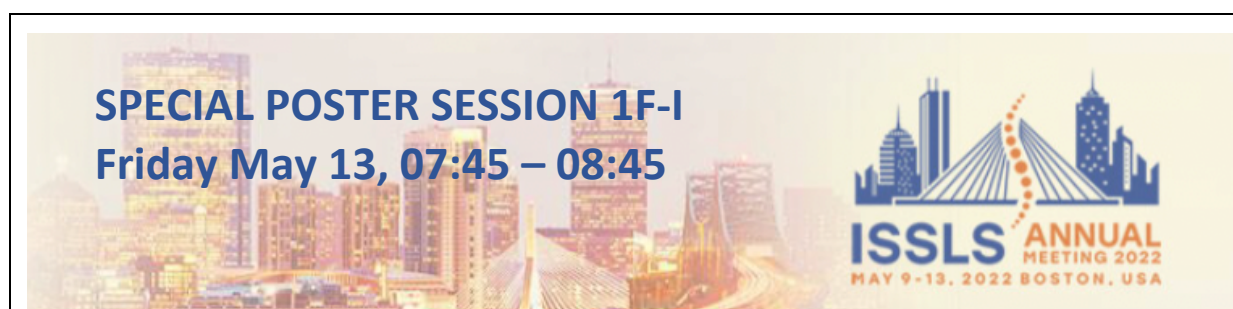
Friday, May 13, 2022 – Podium presentations

11:00 – 11:05	74	Machine learning analysis of spinal movements to differentiate chronic low back pain Spencer Baker K. Clark, A. Bowden, U. Mitchell, D. Fullwood (United States) id# 3006
11:07 – 11:12	75	Validation of an automated, artificial-intelligence-based system for grading radiological features of degeneration on MRIs of the lumbar spine Alexandra Grob M. Loibl, A. Jamaludin, J.C. Fairbank, S. Winklhofer, T.F. Fekete, D. Haschtmann, F.S. Kleinstück, D. Jeszenszky, F. Porchet, A. Mannion (Switzerland) id# 3206
11:14 – 11:19	76	A fresh look at the three-dimensional spinal alignment: an AI-based <i>big data</i> retrospective analysis Fabio Galbusera T. Bassani, A. Cina (Switzerland) id# 2942
11:21 – 11:26	77	Augmented Reality-Assisted Spine Surgery: An Early Experience Demonstrating Safety and Accuracy with 218 screws Fenil Bhatt L. Orosz, A. Tewari, R. Roy, C. Good, T. Schuler, C. Haines, E. Jazini (United States) id# 2852
11:28 – 11:33	78	Detection intervertebral disc fissures in conventional MRI for clinical decision support using a combination of AI methods Hanna Hebelka , C. Waldenberg S. Eriksson, H. Brisby, K. Lagerstrand (Sweden) id# 2995
11:33 – 12:00		<i>Discussion</i>
12:00 – 12:10	CLOSING REMARKS – Tim Yoon	

<p>SPECIAL POSTER SESSION 1A-D Wednesday May 11, 07:45 – 08:45</p>  <p>ISSLS ANNUAL MEETING 2022 MAY 9-13, 2022 BOSTON, USA</p>	
<p>1A. PAIN <i>Chairs: Max Aebi and Christy Tomkins-Lane</i> <i>Room: Farfield</i></p>	
SP101	<p>Preliminary Comparison of Objective Functional Balance Tests to Better Assess Recovery Following Discectomy for Lumbar Disc Herniations</p> <p>Kyle Robinson D. Mar, A. Reichow, A. Satin, B. Staub, P. Derman (United States) id# 3218</p>
SP102	<p>Using full-body kinematic trajectory patterns to distinguish chronic low back pain patients based on underlying pathology and persisting symptoms</p> <p>Jeannie F. Bailey, R.T. Halvorson K. Khattab, J. Booker, J. Lotz, P. Wu, R.P. Matthew (United States) id# 3280</p>
SP103	<p>The relationships between sleep quality or quantity and clinical outcomes in patients with chronic low back pain-A systematic review</p> <p>Dino Samartzis, R. Chang, X. Wang, G. Lin, S. Pinto, A. Wong, USA id#2916</p>
SP104	<p>A collaborative regional multi-site and multi-departmental initiative for improving consensus on clinical outcomes data in spine surgery</p> <p>Bahar Shahidi R.K. Eastlack, G.M. Mundis, C. Kim, R.T. Allen, S.R. Garfin, J. Osorio, W. Taylor, P.O. Newton, S.R. Ward, B.A. Akbarnia (United States) id# 3215</p>
SP105	<p>Risk factors of postoperative low back pain after posterior lumbar interbody fusion in the elderly over 75 years of age</p> <p>Hisataka Suzuki T. Tsujimoto, M. Kanayama, F. Oha, Y. Shimamura, M. Tanaka, D. Ukeba, K. Ura, Y. Hasegawa, T. Hashimoto (Japan) id# 3070</p>
<p>1B. SURGERY AND CLINICAL OUTCOME <i>Chairs: Masahiro Kanayama and Donna Ohnmeiss</i> <i>Room: Exeter</i></p>	
SP106	<p>Spine and walking biomechanics of patients with symptomatic lumbar spinal stenosis after decompression 303008surgery</p> <p>Seyed Javad Mousavi A.C. Lynch, A.P. White, D.E. Anderson (United States) id# 3066</p>
SP107	<p>Opioid Use After Spine Surgery: How Much Are We Over-prescribing?</p> <p>Fenil Bhatt A. Thomson, L. Orosz, B. Allen, A. Sabet, T. Schuler, C. Good, C. Haines, E. Jazini (United States) id# 2849</p>

SP108	<p>Prospective study for risk factors of postoperative complication of surgery for spinal metastasis</p> <p>Tomoya Matsuo Y. Kanda, Y. Sakai, Z. Zhang, T. Yurube, Y. Kakiuchi, Y. Takeoka, R. Tsujimoto, K. Miyazaki, H. Ohnishi, M. Ryu, R. Kuroda, K. Kakutani (Japan) id# 3146</p>
SP109	<p>Body Image and Cosmesis after Percutaneous Transforaminal Endoscopic Discectomy versus Conventional Open Microdiscectomy for Sciatica caused by Lumbar Disc Herniation: results of a randomized controlled trial.</p> <p>Pravesh Gadjraj S. Rubinstein, P. Depauw, P. Schutte, A. Vreeling, M. van Tulder, B. Harhangi (Netherlands) id# 2842</p>
SP110	<p>Predicting recovery after lumbar spinal stenosis surgery: a historical cohort study using data from the Canadian Spine Outcomes Research Network (CSORN)</p> <p>Luciana Macedo F. Jazinizadeh, L. Carlesso, J. Astephen Wilson, D. Gross, C. Fisher, H. Hall, N. Manson, K. Thomas, G. McIntosh, B. Drew, Y. Rampersaud (Canada) id# 3387</p>
<p>1C. DEFORMITY, MUSCLE AND INSTABILITY <i>Chairs: John Popovich and Asseem Sharma</i> <i>Room: Dartmouth</i></p>	
SP111	<p>Impact of Navigation on 30-Day Outcomes for Pediatric Deformity Surgery</p> <p>Junho Song, A. Katz V. Sarwahi (United States) id# 3058</p>
SP112	<p>Natural History of Adult Spinal Deformity: How do patients with Less than Optimal Surgical Outcomes Fare Relative to Non-Operative Counterparts?</p> <p>Peter Passias R. Joujon-Roche, O. Krol, T. Williamson, B. Imbo, P. Tretiakov, J. Lebovic, M. Janjua, P. Park, V. Lafage, R. Lafage, B. Diebo, S. Vira, J.S. Smith, A. Schoenfeld (United States) id# 3236</p>
SP113	<p>The Cost of Alignment – How do alignment criteria impact cost effectiveness of surgical intervention for adult spinal deformity?</p> <p>Peter Passias R. Joujon-Roche, P. Tretiakov, B. Imbo, O. Krol, T. Williamson, J. Lebovic, S. Owusu-sarpong, S. Vira, B. Diebo, V. Lafage, R. Lafage, P. Park, M. Janjua, A. Schoenfeld (United States) id# 3242</p>
SP114	<p>Does trunk muscle mass measured by DXA reflect trunk muscular strength?</p> <p>Masaru Tanaka M. Kanayama, F. Oha, Y. Shimamura, T. Tsujimoto, Y. Hasegawa, T. Hashimoto, H. Nojiri, M. Ishijima (Japan) id# 2939</p>
SP115	<p>Evaluation of the Clinical and Radiographic Degenerative Spondylolisthesis (CARDS) and Degenerative Spondylolisthesis Instability Classification (DSIC) Systems</p> <p>Steven P Baltic K.W. Lyons, F. Mariaux, S. Winklhofer, T. Fekete, F. Porchet, C. Kepler, K.J. McGuire, J.D. Lurie, A.F. Mannion, A.M. Pearson (United States) id# 3032</p>
SP116	<p>Cancelled</p>

1D. INTERVERTEBRAL DISCS AND MODIC CHANGE <i>Chairs: Stefan Dudli and Cornelia Neidlinger-Wilke</i> <i>Room: Clarendon</i>	
SP117	<p>Intradiscal injection of autologous bone marrow aspirate concentrate improves low back pain at one year</p> <p>Fenil Bhatt <i>L. Orosz, A. Thomson, S. Namian, N. Bharara, E. Jazini, C. Good, T. Schuler, C. Haines (United States) id# 2843</i></p>
SP118	<p>The protective role of the posterior elements of the spine against endplate fractures in a porcine model</p> <p>Diane E Gregory <i>N. Chow, J.G. McMorran (Canada) id# 3124</i></p>
SP119	<p>Disc-targeted disruption of autophagy promotes moderate age-associated disc degeneration in mice</p> <p>Nam Vo <i>R. Kritschil, V. Li, D. Wang, F. Li, q. dong, J. Lee, G. Sowa (United States) id# 3002</i></p>
SP120	<p>Progression of adjacent-level degeneration and disease 7 years after lumbar total disc replacement, a post hoc analysis of 7-year data from a prospective clinical trial</p> <p>Anton Jorgensen <i>D. Coric, P. Derman, E. Braxton, K. Radcliff, G. Buttermann, A. Situ, N. Ferko, J. Zigler (United States) id# 3196</i></p>



2F. ARTIFICIAL INTELLIGENCE AND NOVEL TECHNOLOGIES

Chairs: Fabio Galbusera and Matthew Smuck

Room: Fairfield

SP121	<p>SpineTrak: The First Randomized Control Trial Using the Apple Watch to Objectively Track Spine Surgical Patients</p> <p>Christy Tomkins-Lane C. Leung, P. Fatemi, K. Yerneni, A. Desai, C. Zygourakis (United States) id# 3009</p>
SP122	<p>Machine learning for predicting nonunion after osteoporotic vertebral fracture</p> <p>Shinji Takahashi M. Hoshino, H. Terai, M. Kato, H. Toyoda, A. Suzuki, K. Tamai, A. Yabu, H. Nakamura (Japan) id# 3083</p>
SP123	<p>Machine-learning based model predicts significantly inferior postoperative outcome in patients who drop out at follow-up</p> <p>Anne F Mannion D. Müller, D. O'Riordan, T.F. Fekete, F. Porchet, F.S. Kleinstück, R. Reitmeir, M. Loibl, D. Jeszenszky, D. Haschtmann (Switzerland) id# 3186</p>
SP124	<p>Comparison of Free-hand and O-arm Navigation Guided Pedicle Screw Placement in the Lumbar Spine: A Prospective, Randomized Controlled Trial</p> <p>Nishank Mehta B. Garg (India) id# 3189</p>
SP125	<p>Development of a Hierarchical Approach to SRS-Schwab Modifier Realignment in ASD Surgery</p> <p>Peter G Passias T.K. Williamson, R. Joujon-Roche, B. Imbo, P. Tretiakov, O. Krol, K. Moattari, S. Owusu-Sarpong, J. Lebovic, S. Vira, B. Diebo, P. Park, D. Chou, P. Mummaneni, S. Shabani, V. Lafage, R. Lafage, B. Janjua (United States) id# 3262</p>

2G. EPIDEMIOLOGY, RISKS AND INFECTION

Chairs: Zorica Buser and Paul Licina

Room: Exeter

SP126	<p>Cumulative burden of underweight (BMI < 18.5) on the risk of vertebral fracture</p> <p>Han-Dong Lee C. Jeon, N. Chung, H. Chung, K. Park, H. Yoon (South Korea) id# 3121</p>
SP127	<p>Fracture level is a risk factor for implant failure in thoracolumbar and lumbar fractures treated with posterior long segment instrumentation</p>

	Han-Dong Lee C. Jeon, N. Chung, H. Chung, K. Park, H. Yoon (South Korea) id# 3117
SP128	Lower Hounsfield Units and Severe Multifidus Sarcopenia are Independent Predictors of Increased Risk for Proximal Junctional Kyphosis and Failure following Thoracolumbar Fusion Harold Salmons Z. W. Pinter, A.L. Mikula, G. Michalopoulos, J. Fogelson, A.S. Sebastian, M. Bydon, B.A. Freedman, A.N. Nassr, B. Elder (United States) id# 3381
SP129	The trend of prophylactic perioperative antibiotic usage in instrumented lumbar surgeries: A narrative review of nationwide population-based cohort of 9 years. Chang Hwa Ham H. Moon, J. Kim, Y. Park, W. Kwon (Korea, Republic of) id# 3388
SP130	Invasive dental procedures as risk factors for postoperative spinal infection and the effect of antibiotic prophylaxis Soo-Bin Lee , S. Sung, J. Kwon, S. Moon, B. Lee (Korea, Republic of) id# 3148
2H. DEGENERATIVE LUMBAR DISEASE Chair: Lisbet Haglund Room: Dartmouth	
SP131	Adjunct Pelvic Fixation in Short-to-Medium Segment Degenerative Fusion Constructs Independently Predicts Readmission and Morbidity Junho Song , A. Katz S. Virk, J. Silber, D. Essig (United States) id# 3059
SP132	Posterolateral versus posterior interbody fusion for the management of lumbar degenerative spondylolisthesis : Analysis from the Canadian Spine Outcomes and Research Network (CSORN) prospective lumbar degenerative spondylolisthesis propensity score matched study Patrick Thornley , A. Toobaie J. Urquhart, P. Thornley, P. Rasoulinejad, C. Bailey, A. Glennie , R. Rampersaud , N. Manson , E. Abraham , C. Fisher , R. Charest-Morin , S. Paquette , N. Gélinas-Phaneuf , K. Thomas, N. Dea , M. Dvorak , B. Kwon, J. Street, T. Ailon, S. Christie (Canada) id# 3287
SP133	Evaluation of sleep disturbance in patients with degenerative lumbar diseases and its related factors Koji Akeda , T. Fujiwara, N. Takegami, J. Yamada, A. Sudo (Japan) id# 3313
SP134	Preoperative disc angle is an important predictor of segmental lordosis after degenerative spondylolisthesis fusion Patrick Thornley R. Glennie, A. Alahmari, F. Al-Jahdali, Y. Rampersaud, C. Fisher, J. Urquhart, C. Bailey (Canada) id# 3358
SP135	Cancelled
2I. TEST AND GUIDE Chair: Drew Bednar and Hanna Hebelka Room: Clarendon	

<p>SP136</p>	<p>A guide for standardized interpretation of lumbar multifidus ultrasonography; an observational study <i>Remko Soer</i> A. Hofste, F. Oosterveld, H. Hermens, R.v. Ravensberg, A. Wolff, G. Groen. (The Netherlands) id# 2896</p>
<p>SP137</p>	<p>Lumbar multifidus characteristics in university level athletes: Possible predictors of low back pain and lower limb injury <i>Meagan Anstruther</i> G. Dover, S. Valentin, M. Fortin (Canada) id# 3195</p>
<p>SP138</p>	<p>A "crosswalk" for converting scores between two commonly used condition-specific, patient-reported spine outcome measures, the Oswestry Disability Index (ODI) and the Core Outcome Measures Index <i>Anne F Mannion</i> A. Elfering, F.S. Kleinstück, M. Loibl, T.F. Fekete, F. Pellise, A. Vila-Casademunt, F. Mariaux, S. Richner-Wunderlin, F. Sanchez Perez-Grueso, I. Obeid, J. Pizones, A. Alanay, A. Pearson, J. Lurie, D. Haschtmann (COMI) (Switzerland) id# 3183</p>
<p>SP139</p>	<p>Pelvic thickness, sex, ethnicity, and age affect pelvic incidence in healthy volunteers of multi-ethnicity alignment normative study (means) database <i>Kazuhiro Hasegawa</i> S. Hatsushikano, J. Le Huec, S. Bourret, Z. Sardar, H. Wong, H. Dennis Hey, G. Liu, H. Riahi, L. Lenke (Japan) id# 3308</p>
<p>SP140</p>	<p>PHLPP Inhibition Maintains a Healthy NP Cell Phenotype via FOXO1 Activation <i>Svenja S. Illien-Junger</i>, C. Zhang K. Joseph, (United States) id# 3234</p>

 <p>GENERAL POSTER SESSION Thursday May 12, 14:30 – 15:30</p> <p>ISSLS ANNUAL MEETING 2022 MAY 9-13, 2022 BOSTON, USA</p>	
1001	<p>Force distribution within spinal tissues during posterior to anterior spinal manipulative therapy: a secondary analysis</p> <p>Martha Funabashi A. Breen, D. De Carvalho, I. Pagé, F. Nougrou, M. Descarreaux, G. Kawchuk (Canada) id# 2920</p>
1002	<p>In vivo evaluation of lumbar intervertebral disc structure and deformation utilizing MRI deformation-field magnetic resonance imaging</p> <p>Hanna Hebelka, F. Johansson Z. Sirat, , H. Brisby, F. Nordström, K. Lagerstrand (Sweden) id# 2923</p>
1003	<p>Using Lumbar Spine Intervertebral Motion Sharing as a Kinematics Biomarker for Classifying Individuals With Chronic Low Back Pain</p> <p>William Anderst T. Gale, C. LeVasseur, M. Johnson, S. Megherhi, G. McKernan, N. Vo, G. Sowa (United States) id# 3035</p>
1004	<p>Development of a High Throughput Bioreactor for testing Rodent Functional Spinal Units under Compressive Loading</p> <p>Nam V Vo H.A. Cook, X. Pashaj, A. Firdous, J.Y. Lee, G. Sowa, K.M. Bell (United States) id# 3166</p>
1005	<p>Next generation antibacterial nanostructured osseointegrated coatings for 3D printed customized prosthesis for vertebral replacement</p> <p>Maria Sartori, M. Braic, D. Monopoli Forleo, G. Graziani, N Baldini, C Griffoni, A. Gasbarrini, M. Fini (Italy) id# 3194</p>
1006	<p>The effect neuromuscular electrical stimulation using the StimaWELL 120MTRS system on pain, disability, and function in patients with chronic low back pain: A pilot study</p> <p>Daniel Wolfe G. Dover, M. Boily, M. Fortin (Canada) id# 3202</p>
1007	<p>The use of Motion Metrics parameters to predict Post-Operative Patient Reported Outcomes in Patients with Lumbar Stenosis and Spondylolisthesis</p> <p>Zorica Buser B. McKnight Z. Fresquez, T. Grieco, J. Hipp, J.C. Wang, (United States) id# 3214</p>

General Posters

1008	<p>Wearable IMU Sensor Clinical Repeatability of Participants with and without Chronic Low Back Pain</p> <p>Marit Johnson H. Cook, Z. Sedor-Schiffhauer, V. TonelliEnrico, E. Quinby, K. Chowdhary, K. Bell (United States) id# 3238</p>
1009	<p>CyroMilled Nucleus Pulposus Allograft – Sustaining Mechanical Property to Native Nucleus Pulposus</p> <p>Blake Martin R. Sicard, H. Temple, D. Beall, T. Ganey (USA) id# 3239</p>
1010	<p>Can We Quantify Patient’s Cone of Economy from Home? The Future of Functional Outcome Measurements for Spine Patients</p> <p>Ram Haddas Y. Barzilay (United States) id# 3251</p>
1011	<p>Calcification in Human Lumbar Cartilaginous Endplate and Disc Degeneration</p> <p>Dino Samartzis, V.P. Shah R. Ross, R.A. Martin, H.S. An, D. Samartzis, N. Inoue, A. Espinoza (United States) id# 3320</p>
1012	<p>Wearable Sensor Assessment of Neuropathic Physiological Impairments and Sensory Reweighting Caused by Lumbar Spinal Stenosis and Diabetic Peripheral Neuropathy: An Observational Pilot Study</p> <p>Jack Z Jin, J.D. Ralston, S.R. Passmore, C. Zygourakis, J.R. Fletcher, C. Tomkins-Lane (Canada) id# 3373</p>
1013	<p>Effects of Adiponectin receptor agonist AdipoRon on human intervertebral disc cell in a three-dimensional cell culture system and rat tail puncture model</p> <p>Kunihiko Miyazaki, H. Ohnishi Z. Zhang, M. Ryu, T. Matsuo, R. Tsujimoto, Y. Takeoka, Y. Kakiuchi, T. Yurube, R. Kuroda, K. Kakutani (Japan) id# 2928</p>
1014	<p>C-reactive protein as biomarkers for Modic type 1 changes</p> <p>Stefan Dudli R. Büchel, I. Heggli, N. Farshad-Amacker, F. Brunner, M. Farshad, O. Distler (Switzerland) id# 2906</p>
1015	<p>Advanced Disc Degeneration, Bi-Planar Instability and Pathways of Peri-discal Gas Suffusion Contribute to Pathogenesis of Intradiscal Vacuum Phenomenon</p> <p>S. Rajasekaran, R. Kanna S. Hajare, (India) id# 2937</p>
1016	<p>Impact of glucose depletion on the nucleus pulposus homeostasis</p> <p>Mathilde Padrona H. El-Hafci, M. Maroquenne, H. Petite, E. Potier (France) id# 2971</p>
1017	<p>A novel rat model of intervertebral disc degeneration induced by spinal destabilization leading to increased mechanical stress</p> <p>Wenhai Zhuo, W.M.R Lam, H. Hey, X. Chan, H. Wong (Singapore) id# 2997</p>
1018	<p>Lumbar spine Modic changes are associated with abdominal aorta calcification</p> <p>Carmen L.A. Vleggeert-Lankamp, W. Li, N. Djuric, C. Cobbaert, (Netherlands) id# 3022</p>

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1019	<p>Preventive effects on intervertebral disc degeneration of growth differentiation factor-6 in a Rat Tail Puncture Model</p> <p>Kunihiko KM Miyazaki S.S. Miyazaki, T.T. Yurube, Z.Z. Zhang, Y.Y. Kakiuchi, Y.Y. Takeoka, Y.Y. Kanda, R.R. Tsujimoto, H.H. Ohnishi, T.T. Matsuo, M.M. Ryu, R.R. Kuroda, K.K. Kakutani (Japan) id# 3026</p>
1020	<p>Reconsideration of Pfirmann classification for Disc degeneration : possible subtypes in collapse disc</p> <p>Yuji Yamada K. Sairyō, T. Maeda, M. Morimoto (Japan) id# 3086</p>
1021	<p>Metabolic characteristics in inner and outer annulus fibrosus cells in response to hydrostatic pressure and high osmotic pressure</p> <p>Ryo Taiji J. Kang, S. Mizuno (United States) id# 3114</p>
1022	<p>Histology of the lumbar intervertebral disc in degenerative disc disease and its correlation with clinical and radiological findings</p> <p>Nishank Mehta R. Ranjan, B. Garg, A. Subramanian, S. Gamanagatti (India) id# 3125</p>
1023	<p>Transient Receptor Potential Vanilloid 4 (TRPV4) knockdown suppresses autophagy in rat intervertebral disc cells</p> <p>Tomoya Matsuo Y. Takeoka, Z. Zhang, T. Yurube, Y. Kakiuchi, Y. Kanda, R. Tsujimoto, K. Miyazaki, H. Ohnishi, M. Ryu, R. Kuroda, K. Kakutani (Japan) id# 3144</p>
1024	<p>A systemic review of the association of atherosclerosis, degenerative disc disease, and clinical symptoms of the lumbar spine</p> <p>Carmen L.A. Vleggeert-Lankamp, W. Li, N. Djuric, (Netherlands) id# 3150</p>
1025	<p>Evidence for infection in intervertebral disc degeneration: a systematic review</p> <p>Frances MK Williams I. Granville Smith, N.P. Danckert, M.B. Freidin, P. Wells, J.R. Marchesi (United Kingdom) id# 3152</p>
1026	<p>Standardized Histopathology Score of Rabbit Intervertebral Disc Degeneration Model Induced by Monosodium Iodoacetate: Correlation Analysis with MRI T2-value</p> <p>Koji Akeda, K. Kawaguchi T. Sudo, T. Hasegawa, J. Yamada, N. Takegami, T. Fujiwara, K. Masuda, A. Sudo (Japan) id# 3167</p>
1027	<p>Characterization of Nucleus Pulposus Allograft for Replacement of Tissue Loss Due to the Degeneration of the Intervertebral Disc</p> <p>Jonathan Messer P. Sripadhan, R. Montalvan, H. Kaliada, S. Littlejohn, R. Sicard, S. Namin (United States) id# 3185</p>
1028	<p>Novel Collagen Biomarkers of Intervertebral Disc Degeneration And Candidate Molecules For Regeneration -Inferences from Comparative Proteomic Analysis Of Fetal, Healthy Adult And Diseased Discs</p> <p>S. Dilip Chand Raja S. Rajasekaran , S. K S, S. Nayagam, S. R, C. Tangavel, A. Shetty, R. Kanna (India) id# 3275</p>

General Posters

1029	<p>Is endplate the gateway for establishment of disc microbiome ?-Novel Insights from comparative Metagenomic analysis of Human Nucleus pulposus and Cartilaginous end plates</p> <p>Shanmuganathan Rajasekaran S. K S, S. Dilip Chand Raja, S. Nayagam, S. R, C. Tangavel, A. Shetty, R. Kanna (India) id# 3278</p>
1030	<p>Nanoroughened Microstructured Orthopaedic Implant Surfaces Support Production of Factors that Induce Ectopic Osteogenesis in a Preclinical Osteoinduction Model</p> <p>Paul J Slosar M.B. Berger, D.J. Cohen, M.L. Levit, K.B. Bosh, M. Kapitanov, M.B. Gallagher, Z. Schwartz, B.D. Boyan (USA) id# 3332</p>
1031	<p>Vertebral mesenchymal stromal cell transplantation for intervertebral disc repair; a preliminary rat tail disc degeneration study</p> <p>Daisuke Sakai, J. Schol ,T. Warita, K. Sako, S. Grad, M. Alini, M. Watanabe (Japan) id# 3341</p>
1032	<p>Dynamic cervical MRI in Juvenile Muscular Atrophy of the Distal Upper Extremity (Hirayama Syndrome) - Do we need to change the Spine Guidelines?</p> <p>Henrik Baecker P. Turner, J. Bock, M. Johnson, J. Cunningham, P Chan, R Gerraty (Australia) id# 2863</p>
1033	<p>Incidence, anatomy, and clinical importance of facet synovial cysts in degenerative spondylolisthesis</p> <p>Kirkham B Wood M. Tseng, J. Koltsov, T.F. Alamin, S.S. Hu, M. Hussain (United States) id# 2865</p>
1034	<p>Endplate deficits and posterior wall injury are predictive of prolonged back pain after osteoporotic vertebral body fracture</p> <p>Masatoshi Teraguchi M. Kawakami, Y. Enyo, M. Minetama, M. Nakagawa, Y. Yamamoto, T. Nakatani, Y. Nakagawa (Japan) id# 2892</p>
1035	<p>Lactic acid as a potential chemonucleolytic agent</p> <p>Andreas Gerward, A. Lehmann, A. Gerward, B. Isberg, S. Berg (Sweden) id# 2902</p>
1036	<p>Typical MRI patterns of lumbar disc degeneration in young and middle-aged men</p> <p>Niko Murto R. Raininko, R. Luukkonen, P. Leino-Arjas, K. Luoma (Finland) id# 2908</p>
1037	<p>The change of global spinal alignment after osteoporotic vertebral fracture and the change of lumbar pain</p> <p>Akira Ai Iwata M.M. Kanayama, F.F. Oha, Y.Y. Shimamura, T.T. Hashimoto, M.M. Takahata, N.N. Iwasaki. (Japan) id# 2929</p>
1038	<p>Characteristics of the patients with diffuse idiopathic skeletal hyperostosis of thoracic spine with decreased bone mineral density</p> <p>Takeru Tsujimoto C. Ishii, . Oha, Y. Shimamura, M. Tanaka, K. Ura, Y. Hasegawa, M. Miyano, T. Hashimoto, M. Kanayama (Japan) id# 2940</p>

General Posters

1039	<p>The Impact of Acute Lumbar Disc Herniation on Male Sexual Function</p> <p>S. Rajasekaran, R. Kanna, (India) id# 2953</p>
1040	<p>Differences in gait features in patients with lumbar spinal stenosis and knee osteoarthritis, do they change during a 6-minute walk?</p> <p>Junichi Kushioka R. Sun, W. Zhang, A. Muaremi, H. Leutheuser, C.A. Odonkor, M. Smuck (USA) id# 2964</p>
1041	<p>Had Prevalence of Vertebral Fractures Changed over Two Decades? –a Population-based Cohort Study of a Japanese Mountain Village-</p> <p>Koji Akeda, J.Y. Yamada, N. Takegami, T.Fujiwara, K.Kawaguchi, T.Hasegawa, A.Nishimura, A. Sudo (Japan) id# 2979</p>
1042	<p>Modic changes and high intensity zones commonly co-exist in spinal segments in chronic low back pain patients but are not evidently related to patient reported pain</p> <p>Helena Brisby, K. Lagerstrand H. Hebelka, (Sweden) id# 2992</p>
1043	<p>Intramuscular circulation of lumbar multifidus in different trunk positions in standing - Comparison between subjects with and without LBP-</p> <p>Masaru Kanda T. Kitamura, I. Konishi, Y. Suzuki, K. Watanabe, N. Sato (Japan) id# 3008</p>
1044	<p>Reliability and agreement of lumbar multifidus volume and fat fraction quantification using magnetic resonance imaging</p> <p>Sofie Rummens S. Bosch, S. Dierckx, A. Vanmechelen, R. Peeters, S. Brumagne, K. Desloovere, K. Peers (Belgium) id# 3023</p>
1045	<p>The use of 3D freehand ultrasound to determine muscle volume of the lumbar multifidus: preliminary results of a reliability study in people with low back pain</p> <p>Sofie Rummens S. Dierckx, Z. Louvaris, K. Peers, S. Brumagne, K. Desloovere (Belgium) id# 3030</p>
1046	<p>Lumbar muscle oxygenation in people with and without non-specific low back pain. An exploratory study.</p> <p>Sofie Dierckx Z. Louvaris, S. Rummens, K. Desloovere, S. Brumagne (Belgium) id# 3031</p>
1047	<p>Comparison of quantitative measurement of signal intensity of nucleus pulposus with visual interpretation as method for classification of disc degeneration</p> <p>Niko Murto L. Kerttula, T. Lund, K. Luoma (Finland) id# 3034</p>
1048	<p>Determinants of Postoperative Compliance of Patient-Reported Outcomes for Lumbar Spine Disorders</p> <p>Dino Samartzis I.H. Ifearulundu, G. Mallow, J. Woodward, E. Ferreira, C. Mestyaneck, C. Mbagwu, A. Sayari, H.S. An (USA) id# 3043</p>

General Posters

1049	<p>Normal Anatomy of the Lumbar Sublaminar Ridge in the Lateral Recess with Potential implications to Surgical technique in Degenerative Spinal Stenosis</p> <p>Drew Bednar EHW Son, B. Wainman (Canada) id# 3079</p>
1050	<p>The safety and efficacy of oral Zoledronic acid bisphosphonate for the treatment of chronic low back pain with associated Modic changes: a pilot randomized controlled trial</p> <p>Dino Samartzis G. Ka Hon Shea, C. Zhang, W. Suen, P. Hang Cheung, J. Yin Chueng, J. Maatta, J. Karppinen (Hong Kong) id# 3109</p>
1051	<p>Reliability and validity of measurement of cross-sectional area ratio of psoas muscle for evaluating sarcopenia: A comparison of CT and MRI</p> <p>Han-Dong Lee C. Jeon, N. Chung, H. Chung, K. Park, H. Yoon (South Korea) id# 3120</p>
1052	<p>Impact of Insurance Type on Patient-Reported Outcome Measures in Patients with Lumbar Disc Herniation</p> <p>Grace X Xiong B.C. Goh, N. Agaronnik, A.M. Crawford, J.T. Smith, S.H. Hershman, A.J. Schoenfeld, A.K. Simpson (United States) id# 3128</p>
1053	<p>The association between low back pain and patterns of physical activity accumulation throughout the day</p> <p>Matthew Smuck R. Sun, D.S. You, A. Roy, B.D. Darnall, S.C. Mackey (United States) id# 3133</p>
1054	<p>Quantitative MRI evaluation of the spine: a 2-year follow-up study of young individuals reporting different training doses</p> <p>Helena Brisby, L. Rosenqvist H. Hebelka, A. Baranto, K. Lagerstrand (Sweden) id# 3157</p>
1055	<p>Is There an Association Between Psychiatric Disorders and Adolescent Idiopathic Scoliosis? A Large-database Study</p> <p>Soo-Bin Lee J. Kwon, S. Sung, S. Moon, B. Lee (Korea, Republic of) id# 3161</p>
1056	<p>A Study of Psoas Morphology with Respect to Safe Surgical Corridors for Lateral Lumbar Interbody Fusion in Indian Population</p> <p>Nishank Mehta B. Garg (India) id# 3191</p>
1057	<p>Evaluation of Synergistic Effect of Senolytic Combination Treatment for Intervertebral Disc Degeneration</p> <p>Lisbet Haglund M. Mannarino, O. Wu Martinez, H. Cherif, S. Lee, M. Millecamps, J. Ouellet, L. Stone, Canada id# 3198</p>
1058	<p>Viable Allograft Supplemented Disc Regeneration in the Treatment of Patients With Low Back Pain (VAST Trial): Interim Results of an Open-label Extension Study</p> <p>Richard Guyer, D. Beall S. Gershon, G. Wilson, United States) id# 3203</p>

General Posters

1059	<p>Effects of Mindfulness Videos and Physical Therapy on Disability Outcomes in Individuals with Spine Pain</p> <p>Bahar Shahidi, S. Northway, N. Carter, L. Taitano, C. Richards, K. Raiszadeh, (United States) id# 3216</p>
1060	<p>Night-time bracing improves back pain in patients with painful scoliosis: six months results of a retrospective controlled study</p> <p>Fabio Zaina F. Di Felice, S. Donzelli, M. Poggio, S. Negrini (Italy) id# 3224</p>
1061	<p>Phenotypic Durability in Viable Bone Allograft</p> <p>Renaud Sicard S. Namin, B. Martin, T. Ganey (United States) id# 3230</p>
1062	<p>Donor age does not affect the therapeutic potential of clotted bone marrow in bone tissue engineering and regeneration</p> <p>Francesca Salamanna, G. Barbanti Brodano, D. Contartese, V. Borsari, S. Pagani, C. Griffoni, A. Gasbarrini, M. Fini (Italy) id# 3231</p>
1063	<p>Dysregulated serum lipid transport in Modic changes</p> <p>Stefan Dudli J. Määttä, I. Heggli, F. Schulze, F. Brunner, A. Fields, O. Distler, J. Karppinen, J. Lotz (Switzerland) id# 3232</p>
1064	<p>Reliability of Semi-Automated Spinal Measurement Software</p> <p>Kirkham Wood, M. A. Follett N. Liu, B. Karamian, T. Alamin, (United States) id# 3237</p>
1065	<p>Social/work/contextual factors are central to the perspectives of osteopathic neuromusculoskeletal medicine and physical medicine & rehabilitation physicians' understanding of low back pain</p> <p>John M. Popovich A.S. Lee, B. Pham, A. Tzau, K. Yu, H. Mashrah, L.A. DeStefano, J. Cholewicki, P.W. Hodges (United States) id# 3243</p>
1066	<p>Standing MRI of the lumbar intervertebral discs reveals osture-specific biomarkers of low back pain</p> <p>Simon Y Tang (United States) id# 3256</p>
1067	<p>Vacuum Discs in Lumbar Spinal Deformity: Relationships with Pain and Patient Factors</p> <p>Serena S Hu T.D. Sambare, J.P. Kleimeyer, A.C. Cabell, M.A. Follett, J. Koltsov, H. Shen, T. Alamin, K.B. Wood, I. Cheng (United States) id# 3260</p>
1068	<p>The "Disc Degeneration Profile" in Lumbar Disc Herniations that Resorb: a Prospective, One-Year, Multi-Imaging and Clinical Phenotype Study</p> <p>J. Nicolas Barajas A.L. Hornung, K. Aboushaala, G. Harada, H.S. An, A. Epinof, H.B. Albert, D. Samartzis, A. Tkachev (USA) id# 3268</p>

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