

Preliminary Program: 3rd International Workshop on Spine Loading and Deformation

Thursday, July 4th

12.45-13.00		Welcome		Organizers: Hendrik Schmidt, Saeed Shirazi-Adl, Idsart Kingma
Session 1	Intervertebral disc - Tissue Mechanics			Moderators:
13.00 - 14.00	Benjamin A. Walter	In-vitro Measurements of Osmotic Pressure within the Intervertebral Disc		
	Kaj Emanuel	Time dependent behavior of pressure and height of a loaded intervertebral disc are inconsistent		
	Grace D. O'Connell	Annulus Fibrosus Hydration Affects Rate-Dependent Failure Mechanics In Tension		
	Farshid Ghezelsheh	On the modeling of human disc annulus fibrosus: Elastic, yield and failure responses		
14.00-14.20		<i>Coffee Break</i>		
14.20 - 15.20	Nicolas Newell	Internal deformations in human intervertebral discs: a 9.4T MRI study		
	Rivera Tapia	In-vitro perspective into micro-structural degeneration of the intervertebral disc: a biomechanical approach		
	Magdalena Wojtków	Collagen fiber bundles disintegration during pull-out from the endplate		
	Philip Poillot	Voltage-Gated Ion Channels in Intervertebral Disc Mechanotransduction		
15.20-15.50	all	Open Discussion		
15.50-16.20		<i>Coffee Break</i>		
Session 2	Debate on mechanical load, injury, degeneration and pain			Moderators:
16.20 - 17.20	Saeed Shirazi-Adl	Low back pain paradox		
	Peter-Paul Vergroesen	Intervertebral disc degeneration from a biomechanical point of view: What do we need to fix?		
	Daniel Belavy	Spine postures, physical exposure, and back pain: a systematic review of systematic reviews		
	Jill Urban	Interactions between genetics and loading in development of disc degeneration and low back pain – a review		
17.20-18.00	all	Open Discussion		
18.00-20.00		<i>Happy Hour with Beer & Pretzel</i>		

Friday, July 5th

Session 3	Motion Segments: Load Sharing			Moderators:
08.00 - 09.30	Marwan El-Rich	Review of load-sharing in intact, transected, degenerate and surgically altered passive human lumbar spines		
	Maxim Bashkuev	Relationship between intervertebral disc and facet joint degeneration: a probabilistic finite element model study		
	Nicolas Damm	Lumbar spinal ligament characteristics extracted from stepwise reduction experiments allow for precise modeling		
	Luigi La Barbera	Detailed full-filled analysis of the ventral lumbar spine: insights on the biomechanical role of the anterior longitudinal ligament		
	Mohammad Nikkhoo	Effects of Lumbar Lordosis on Mechanical Response of Post-operative Lumbar Spine- Personalized Parametric Finite Element Simulations		
09.30-10.00	all	Open Discussion		
10.00-10.30		<i>Coffee Break</i>		
Session 4	Lumbar Spine I: Shape & Kinematics			Moderators:
10.30 - 12.00	Sandra Reitmaier	Review article on spine kinematics of quadrupeds and bipeds		
	Alexander Breen	Dynamic interactions between lumbar intervertebral motion segments during forward bending		
	Fumin Pan	Sex-dependent difference in lumbo-pelvic coordination for different lifting tasks		
	Stephen H. M. Brown	A novel model and experimental validation demonstrate the large contribution of passive muscle to spine flexion relaxation		
	Fabio Galbusera	Calculating the three-dimensional vertebral orientation from a planar radiograph: is it feasible?		
	Thomas Zander	Which landmark is best suited to assess the thoracic orientation?		
12.00-12.30	all	Open Discussion		
12.30-14.00		<i>Lunch Break</i>		
Session 5	Lumbar Spine II: Loads & Kinematics - Injury/Degeneration/Pain			Moderators:
14.00 - 15.30	Philipp Damm	In vivo hip and lumbar spine implant loads during activities in forward bent postures		
	Gert S. Faber	Bottom-up versus top-down L5/S1 moment estimation during manual lifting using an ambulatory measurement system		
	Babak Bazrgari	A prospective study of lumbo-pelvic coordination in patients with non-chronic low back pain		
	William Anderst	Patient-Specific Changes in Adjacent Segment Kinematics After Lumbar Decompression and Fusion		
	Shirin Yazdani	The impact of curve severity on the pelvic kinematic and erector spinae and gluteusmedius muscles activity during gait in patients with adolescent idiopathic scoliosis		
15.30-16.00	Sebastiano Caprara	Automatic Generation of Patient-Specific FE Models of the Lumbar Spine		
16.00-16.30	all	Open Discussion		
16.00-16.30		<i>Coffee Break</i>		
Session 6	Spinal Loads – In Vivo Measurements + Modeling			Moderators:
16.30 - 18.00	Iraj Dehghan-Hamani	Biomechanics of Intra-Abdominal Pressure in Spine Stiffening and Loading - A Systematic Review of in vivo and Modeling Studies		
	Ali Firouzabadi	Sex-dependant estimation of spinal loads during static manual material handling activities- combined in vivo and in silico analyses		
	Andre Plamondon	Subject-specific regression equations to estimate spinal loads in asymmetric static lifting		
	Ameet K. Aiyangar	Sensitivity of Musculoskeletal Model-based Lumbar Spinal Loading Estimates to Type of Kinematic Input and Passive Stiffness Properties		
	William Marras	Assessment of Spine Loading via a 2 Muscle Model vs. 10 Muscle Model during One vs. Two Handed Lifting Tasks		
18.00-18.30	Christian Affolter	Estimating Lumbar Passive Stiffness Behaviour from Subject-Specific Finite Element Models and In Vivo 6DOF Kinematics		
18.00-18.30	all	Open Discussion		
19.00-23.00		<i>Social Event: Dinner</i>		

Saturday, July 6th

Session 7	Spinal Loads – Computational Models			Moderators:
08.00 - 09.15	Dominika Ignasiak	A novel method for prediction of postoperative global sagittal alignment based on full-body musculoskeletal modeling and posture optimization		
	Stefan Schmid	Predicting intervertebral disc loading and trunk muscle activity in healthy adolescents using musculoskeletal full-body models		
	Navid Arjmand	Coupled Artificial Neural Networks to Predict Whole Body Posture, Lumbosacral Moments, Trunk Muscle Forces, and Lumbar Disc Loads during Three-dimensional Material Handling Activities		
	Xuguang Wang	Influence of seat parameters on computationally predicted spine loading		
	Marco Senteler	Statistical Shape Model Predicted Alignments and Musculoskeletal Simulation in Surgical Planning		
09.15-09.35	all	Open Discussion		
09.35-10.30		<i>Coffee to Go - Poster Session</i>		
Session 8	Trunk Stabilization / Control			Moderators:
10.30 - 12.15	Jaap van Dieën	Trunk stabilization in patients with low-back pain and healthy controls		
	Seyyed M. Sohokouhyan	Indication of diagnostic criteria for proprioception disorders between non-specific low back pain patients and healthy people based on analysis of linear and nonlinear parameters of center of pressure and trunk stability		
	Juliane Mueller	Sudden gait perturbations elicit sex-specific neuromuscular trunk responses in persons with low back pain		
	Christian Larivière	Can trunk postural control during unstable sitting be considered a proxy measure of dynamic lumbar stability?		
	Axel S. Koopman	Effect of a passive exoskeleton on mechanical loading during dynamic lifting.		
	Michiel Punt	Real-time feedback to reduce lower back moment while lifting a box: proof-of-concept-study		
12.15-12.45	Ali Tabasi	Reducing the number of input variables required to control an active exoskeleton		
12.15-12.45	all	Open Discussion		
12.45-13.00		Final Words		
13.00-14.00		<i>Lunch</i>		