ESMAC 2025

ESMAC
European Society
for Movement Analysis
in Adults and Children

ANNUAL MEETING OF THE EUROPEAN SOCIETY
FOR MOVEMENT ANALYSIS IN ADULTS AND CHILDREN
BASEL
•2025•

ESMAC 2025

8–13 September 2025
Basel, Switzerland

Programme
Book

Programme at a Glance

Time	Gait Course & Seminars - Fachhochschule Nordwestschweiz (FHNW)					
	08.IX	09.IX		10.IX		
	Monday	Tuesday		Wednesday		
	Gait Course Hörsaal 01.W.20	Gait Course Hörsaal 01.W.20	Seminar 01.S.21	Gait Course Hörsaal 01.W.20	Seminar 01.S.21	01.S.07
8:15						
8:30						
8:45			Seminar 1: From Electromyography to High-Density Surface Electromyography (HDsEMG): New Opportunities for Easy and Advanced Analyses	Gait Course	Seminar 3: ESMAC meets BMT on robotic rehabilitation	
9:00	Gait Course	Gait Course				
9:10						
9:15						
9:30				Coffee Break		
9:45						
10:00		Coffee Break				
10:15						
10:30			Coffee Break	Gait Course	Coffee Break	
10:45	Coffee Break					
11:00						
11:15	Gait Course	Gait Course	Seminar 1: From Electromyography to High-Density Surface Electromyography (HDsEMG): New Opportunities for Easy and Advanced Analyses	Gait Course	Seminar 3: ESMAC meets BMT on robotic rehabilitation	
11:30						
11:45						
12:00						
12:05				Lunch Break		
12:15						
12:30	Lunch Break	Lunch Break	Break		Break	
12:45						
13:00				Gait Course		
13:15	Gait Course	Gait Course	Seminar 2: Heterogeneous Protocols and Multimodal Data in Clinical Motion Analysis: Towards Harmonization for Collaborative Research		Seminar 4: From Diagnosis to Decision: 3D Gait Analysis in Flatfoot Management	Musculoskeletal Modelling Workshop
13:30						
13:45						
14:00						
14:15						
14:30		Coffee Break		Coffee Break		
14:40						
14:45	Coffee Break					
15:00			Coffee Break		Coffee Break	
15:15						
15:30	Gait Course	Gait Course	Seminar 2: Heterogeneous Protocols and Multimodal Data in Clinical Motion Analysis: Towards Harmonization for Collaborative Research	Gait Course	Seminar 4: From Diagnosis to Decision: 3D Gait Analysis in Flatfoot Management	
15:45						
16:00						
16:15	Break					
16:30		Break				
16:45						
17:00						
17:15	Gait Course	Gait Course	Towards a Swiss movement analysis society			
17:20						
17:30						
17:35						
17:45						
					Welcome Cocktail - University Hospital Basel	
					Early Career Network (ECN) - UKBB	

ESMAC Main Conference - ZLF

Time	11.IX Thursday — Grosser Hörsaal	11.IX Thursday — Kleiner Hörsaal	Time	12.IX Friday — Grosser Hörsaal	12.IX Friday — Kleiner Hörsaal	Time	13.IX Saturday — Grosser Hörsaal	13.IX Saturday — Kleiner Hörsaal
			7:00	Charity run				
8:15	Opening and awards		8:15			8:15		
8:30	Baumann Lecture:		8:30	Keynote Lecture 1:		8:30		
8:45	Dr. Julie Stebbins		8:45	Prof. Annegret Mündermann		8:45		
9:00			9:00			9:00	14) Motor control and stability	15) Innovative assessments
9:10	1) High and low techs to support paediatric neurology research		9:10			9:10		
9:15			9:15			9:15		
9:30			9:30	7) Sports / orthopaedics related conditions	8) Adult neurological conditions	9:30		
9:45			9:45			9:45		
10:00	Sponsors' Pitches		10:00			10:00	Coffee Break	
10:15	Coffee Break		10:15	Coffee Break		10:15		
10:30			10:30			10:30		
10:45			10:45			10:45	16) Machine learning to inform decisions	17) Musculoskeletal conditions
11:00	2) Best papers		11:00	9) Clinical cases		11:00		
11:15			11:15			11:15		
11:30			11:30			11:30		
11:45			11:45	Sponsors' Pitches		11:45	Keynote Lecture 3: Prof. Henri Lorach (NeuroRestore, Bloch & Courtine)	
12:00			12:00			12:00		
12:05	Industry Presentation		12:05	Industry Presentation		12:05		
12:15	Poster Panic Session I.		12:15	Poster Panic Session II.		12:15	Awards and closing	
12:30			12:30			12:30		
12:45			12:45			12:45		
13:00	Lunch and Poster I.		13:00	Lunch and Poster II.		13:00		
13:15			13:15			13:15		
13:30			13:30			13:30		
13:45			13:45			13:45		
14:00			14:00	Keynote Lecture 2:		14:00		
14:15			14:15	Prof. Georg Rauter		14:15		
14:30	3) Machine learning to capture or to extend data collection	4) Prosthetics and orthosis	14:30			14:30		
14:40			14:40			14:40		
14:45			14:45	10) Assisted rehabilitation	11) Foot & Ankle	14:45		
15:00			15:00			15:00		
15:15			15:15			15:15		
15:30	Coffee Break		15:30			15:30		
15:45			15:45	Coffee Break		15:45		
16:00			16:00			16:00		
16:15			16:15			16:15		
16:30			16:30			16:30		
16:45	5) Lower limb muscles and ultrasonography	6) Spine conditions	16:45	12) Measuring clinical effects	13) Modelling and Imaging	16:45		
17:00			17:00			17:00		
17:15			17:15			17:15		
17:20			17:20			17:20		
17:30			17:30			17:30		
17:35			17:35			17:35		
17:45			17:45			17:45		
18:00	ESMAC Annual General Assembly		18:00			18:00		
18:15			18:15					
18:30			18:30					
18:45			18:45					
19:00			19:00					
19:15				ESMAC Networking Event - Paulus Kulturkirche				
19:30								
19:45								
20:00								
			23:30					

Scientific programme

Thursday, 11 September 2025

Opening Ceremony & Awards
08:15–08:30, Grosser Hörsaal

Baumann Lecture: Dr. Julie Stebbins
08:30–09:00, Grosser Hörsaal

Ensuring Global Impact of Movement Analysis Research: Bridging the Gap Between Europe and Low-to-Middle-Income Countries

Julie Stebbins[1]

[1] University of Oxford, Oxford Gait Laboratory - Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, Oxford, United Kingdom

Plenary Session:
1) High and low techs to support paediatric neurology research
09:00–10:00, Grosser Hörsaal

Chairs: Jean Stout (USA), Annemieke Buizer (Netherlands)

O 001 **Clinical and instrumented assessments of trunk movement and posture in spastic and dyskinetic cerebral palsy: A scoping review**

Ellen Van Wonterghem[1], Anna-Klara Nohlin Sandsjö[2], Inti Vanmechelen[3], Helga Haberfehlner[1], Meta Nyström Eek[2], Kaat Desloovere[4], Kate Himmelmann[5], Elegast Monbaliu[1]

[1] KU Leuven, Rehabilitation Sciences, Bruges, Belgium
[2] University of Gothenburg, Health and Rehabilitation, Gothenburg, Sweden
[3] Karolinska Institutet, Women's and Children's health, Stockholm, Sweden
[4] KU Leuven and University Hospital Leuven, Rehabilitation Sciences, Pellenberg, Belgium
[5] University of Gothenburg, Pediatrics, Gothenburg, Sweden

O 002 Can game-based metrics serve as relevant measures to evaluate upper limb impairments in children with neuromotor disorders? A systematic review

Kevin Rose-Dulcina[1,2], Stéphane Armand[1,2], Marine Cacioppo[2,3,4]

[1] Geneva University Hospitals and Geneva University, Kinesiology Laboratory, Geneva, Switzerland
[2] Geneva University and Geneva University Hospitals, Research Center of skeletal Muscle and Movement, Geneva, Switzerland
[3] Geneva University Hospitals, Pediatric Neurology Unit- Children's Hospital, Geneva, Switzerland
[4] Inserm, LaTIM UMR 1101 Laboratory, Brest, France

O 003 Video observations are reliable for gait pattern assessment in Children with cerebral Palsy

Inti Vanmechelen[1], Edwin Råsberg[1], Tina Andersson[2], Evgenia Manousaki[1], Cecilia Lidbeck[1]

[1] Karolinska Institutet, Department of Women's and Children's Health, Stockholm, Sweden
[2] Team Olmed, Children and youth, Solna, Sweden

O 004 Walking speed reserve and associated clinical parameters in children with cerebral palsy

Esteban Abad Coronado[1], Alice Bonnefoy-Mazure[1], Annie Pouliot-Laforte[2], Geraldo DeCoulon[3], Marys Revaz[1], Anne Tabard-Fougere[1], _Stéphane Armand[1]_

[1] Geneva University Hospitals and University of Geneva, Kinesiology Laboratory, Geneva, Switzerland
[2] Université du Québec, Department of Physical Activity Sciences, Montreal, Canada
[3] Geneva University Hospitals and University of Geneva, Division of Pediatric Orthopaedics, Geneva, Switzerland

O 005 A digital twin approach for monitoring neuro-motor developmental trajectory in preterm infants

Sara Montagna[1], _Rita Stagni[2]_, Giada Pierucci[1], Arianna Aceti[3], Duccio Maria Cordelli[3], Maria Cristina Bisi[2]

[1] Università di Urbino Carlo Bo, Department of Pure and Applied Sciences, Urbino, Italy
[2] Università di Bologna, Department of Electrical- Electronic and Information Engineering "Guglielmo Marconi", Cesena FC, Italy
[3] Università di Bologna, Department of Medical and Surgical Sciences, Bologna, Italy

O 006 Evaluating ChatGPT-4O's performance in gait pattern classification using sagittal kinematic data and video-based inputs in children with cerebral palsy

Meltem Celik[1], Sema Ertan Birsel[2], Elif Demirci[1], Osman Dogan[1], Muharrem Inan[2]

[1] Istanbul Ortopediatri- Academy of Pediatric Orthopedics, Gait Analysis / Physiotherapy and Rehabilitation, Istanbul, Turkey
[2] Istanbul Ortopediatri- Academy of Pediatric Orthopedics, Orthopedics and Traumatology, Istanbul, Turkey

Sponsors' Pitches – Vicon, Moveshelf, Fior&Gentz, Moveck

10:00–10:15, Grosser Hörsaal

Coffee Break

_10:15–10:45_

Plenary Session:
2) Best Papers
10:45–12:05, Grosser Hörsaal

Chairs: Kaat Desloovere (Belgium), Hans Kainz (Austria)

O 007   ☆ **Patients suffering from femoroacetabular impingement syndrome show altered external hip joint moments**

Katrin Dätwyler[1,2], Samara Monn[1], Natascha Kaister[1], Antonia Salgo[1], Nicola A Maffiuletti[1], Michael Leunig[3], Stephen J Ferguson[2], Renate List[1]

[1]   *Human Performance Lab, Schulthess Clinic, Zurich, Switzerland*
[2]   *Institute for Biomechanics, ETH Zurich, Zurich, Switzerland*
[3]   *Hip Surgery Department, Schulthess Clinic, Zurich, Switzerland*

O 008   ☆ **Exploring the limitations of a biomechanical scoring system in a six-task return-to-sport evaluation for pediatric patients after ACL reconstruction**

Mathieu Lalumière[1,2], Justin Drager[1], Shawn Robbins[3], Louis-Nicolas Veilleux[1]

[1]   *Shriners Hospitals for Children - Canada, Motion Analysis Center, Montreal, Canada*
[2]   *McGill University, Department of Medecine, Montreal, Canada*
[3]   *McGill University, School of Physical and Occupational Therapy, Montreal, Canada*

O 009   ☆ **Gait patterns according to the CPAK classification in patients with end-stage knee osteoarthritis**

Alice Bonnefoy-Mazure[1], Gasparutto Xavier[1], Turcot Katia[2], Attias Michael[3], Armand Stéphane[1], Miozzari Hermes H.[4]

[1]   *Kinesiology Laboratory & Research Center of skeletal Muscle and Movement – Geneva University Hospitals and University of Geneva, Division of Orthopaedic Surgery and Musculoskeletal Trauma Care- Surgery Department, Geneva, Switzerland*
[2]   *Centre for Interdisciplinary Research in Rehabilitation and Social Integration CIRRIS-, Laval University, Quebec City, Canada*
[3]   *HES-SO University of Applied Sciences and Arts Western Switzerland, School of Health Sciences, Geneva, Switzerland*
[4]   *Division of Orthopaedic Surgery and Musculoskeletal Trauma Care & Research Center of skeletal Muscle and Movement, Surgery Department, Geneva, Switzerland*

O 010   ☆ **Changes in the distance between the talus and lateral malleolus during the stance phase of gait in chronic ankle instability**

Satoshi Onoue[1], Tsubasa Tashiro[1], Satoshi Arima[1], Ayano Ishida[1], Honoka Ishihara[1], Noriaki Maeda[1]

[1]   *Hiroshima University, Graduate School of Biomedical and Health Sciences, Hiroshima-shi, Japan*

O 011 ☆ Functional relevance of the spine-hip radiographic classification in patients with adult spinal deformity

Moustapha Rteil[1], Ibrahim Hamati[1], Rami Rachkidi[1], Abir Massaad[1], Mohamad Karam[1], Aren Joe Bizdikian[1], Gilles Prince[1], Ismat Ghanem[1], Ayman Assi[1,2]

[1] Faculty of Medicine/ University of Saint-Joseph, Laboratory of Biomechanics and Medical Imaging, Beirut, Lebanon
[2] Arts et Métiers, Institut de Biomécanique Humaine Georges Charpak, Paris, France

O 012 ☆ Dystonic posture detection of the hand from common video recordings through MediaPipe and Convolutional Neural Networks

Helga Haberfehlner[1,2,3], Shankara S. van de Ven[1], Sonja Georgievska[4], Laura A. van de Pol[5,6], Jean-Marie Aerts[7], Elegast Monbaliu[2], Marjolein M. van der Krogt[1,3], Annemieke I. Buizer[1,3,6]

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[2] KU Leuven campus Bruges, Department of Rehabilitation Sciences, Bruges, Belgium
[3] Amsterdam Movement Sciences, Rehabilitation & Development, Amsterdam, Netherlands
[4] Netherlands eScience Center, esciencecenter, Amsterdam, Netherlands
[5] Amsterdam UMC, Department of Child Neurology, Amsterdam, Netherlands
[6] Amsterdam UMC, Emma Children's Hospital, Amsterdam, Netherlands
[7] KU Leuven, Department of Biosystems- M3-BIORES, Amsterdam, Netherlands

O 013 ☆ Self-reported leisure time activities, sports participation and standing frame use in adults with cerebral palsy

Lien Cluyts[1], Karen Craenen[2], Britta Hanssen[2,3], Anja Van Campenhout[4,5], Koen Peers[2,5]

[1] KU Leuven, Faculty of Medicine, Leuven, Belgium
[2] UZ Leuven, Department of Physical Medicine and Rehabilitation, Leuven, Belgium
[3] KU Leuven, Department of Rehabilitation Sciences, Leuven, Belgium
[4] UZ Leuven, Department of Orthopaedics, Leuven, Belgium
[5] KU Leuven, Department of Development and Regeneration, Leuven, Belgium

O 014 ☆ Accurate steady-state VO2 estimation with less metabolic data using calibrated patient-specific Bayesian regression models

Andrew J. Ries[1,2], Mackenzie N. Pitts[3], Katherine M. Steele[3], J. Maxwell Donelan[4], Michael H. Schwartz[1,2]

[1] Gillette Children's Specialty Healthcare, Center for Gait and Motion Analysis, St Paul, USA
[2] University of Minnesota, Orthopedic Surgery, Minneapolis, USA
[3] University of Washington, Mechanical Engineering, Seattle, USA
[4] Simon Fraser University, Biomedical Physiology & Kinesiology, Burnaby, Canada

Vicon Industry Presentation
12:05–12:15, Grosser Hörsaal

Poster Panic Session I.
12:15–12:45, Grosser Hörsaal

Posters I.
12:45–14:00, Foyer ZLF Ground Floor

Parallel Session:
3) Machine learning to capture or to extend data collection

14:00–15:30, Grosser Hörsaal

Chairs: Marjolein van der Krogt (Netherlands), Ursula Trinler (Germany)

O 015 **A gait lab in your pocket? Accuracy and reliability of monocular smartphone-based markerless 3D gait analysis in pathological gait**

Brian Horsak[1,2], Mark Simonlehner[1,2], Viktoria Quehenberger[1], Bernhard Dumphart[1,2], Djordje Slijepčević[3], Andreas Kranzl[4]

[1] St. Pölten University of Applied Sciences, Center for Digital Health and Social Innovation, St. Pölten, Austria
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[3] St. Pölten University of Applied Sciences, Institute of Creative Media and Technology, St. Pölten, Austria
[4] Orthopedic Hospital Vienna-Speising, Laboratory for Gait and Movement Analysis, Vienna, Austria

O 016 **Improving pelvic orientation estimation for real-time frontal-view motion capture systems**

Silvia Zaccardi[1], Redona Brahimetaj[1], Reinhard Claeys[2], Daan De Vlieger[2], Eva Swinnen[2], David Beckwée[2], Bart Jansen[1]

[1] Vrije Universiteit Brussel, Department of Electronics and Informatics ETRO, Brussel, Belgium
[2] Vrije Universiteit Brussel, Rehabilitation Research Group RERE, Brussel, Belgium

O 017 **A markerless gait analysis in a child with achondroplasia: A case study**

Mareike Hergenröther[1], Katja Palm[2], Klaus Mohnike[2], Kerstin Witte[1]

[1] Otto-von-Guericke University Magdeburg, Human sciences - Sport & Technologies / Movement Sciences, Magdeburg, Germany
[2] Otto-von-Guericke University Magdeburg, Childrens Hospital, Magdeburg, Germany

O 018 **Adapting machine learning-based gait event detection models from walking to running: Evaluating transfer learning vs. training from scratch**

Bernhard Dumphart[1], Djordje Slijepcevic[2], Andreas Kranzl[3], Florian Dobler[4], Nathalie Alexander[4], Arnold Baca[5], Brian Horsak[6]

[1]   St. Pölten University of Applied Sciences, Institute for Health Sciences, St. Pölten, Austria
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     for Motion Analysis, St. Gallen, Switzerland
[5]   University of Vienna, Centre for Sport Science and University Sports, Vienna, Austria
[6]   St. Pölten University of Applied Sciences, Center for Digital Health & Social Innovation, St. Pölten, Austria

O 019 **A deep convolutional autoencoder to predict the position of the full-body centre of mass from lower limb kinematics**

Maxime Devanne[1], Morgan Sangeux[2]

[1]   IRIMAS- Université de Haute-Alsace, Haut-Rhin, Mulhouse, France
[2]   Computational Movement Analysis- University of Basel-, Basel, Basel, Switzerland

O 020 **Estimation of ground reaction forces in running via deep learning models: A comparative analysis**

Salvatore Tedesco[1], Sean Francis Ahern[1], Brendan O'Flynn[1]

[1]   University College Cork, Tyndall National Institute, Cork, Ireland

O 021 **Predicting joint contact forces using a combination of kinematics, anthropometrics, and demographics with explainable artificial intelligence**

Philipp Krondorfer[1], Djordje Slijepčević[2], Andreas Kranzl[3], Matthias Zeppelzauer[2], Brian Horsak[1,4]

[1]   St. Pölten University of Applied Sciences, Center for Digital Health and Social Innovation, St. Pölten, Austria
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[3]   Orthopaedic Hospital Vienna-Speising, Laboratory of Gait and Movement Analysis, Vienna, Austria
[4]   St. Pölten University of Applied Sciences, Institute of Health Sciences, St. Pölten, Austria

O 022 **Walking conditions change biomechanical gait signatures**

Djordje Slijepčević[1], Tomislav Baček[2], Fabian Horst[3]

[1]   St. Pölten University of Applied Sciences, Institute of Creative Media Technologies, St. Pölten, Austria
[2]   The University of Melbourne, Department of Mechanical Engineering, Melbourne, Australia
[3]   Johannes Gutenberg-University Mainz, Institute of Sport Science, Mainz, Germany

O 023 **Evaluation of dataset robustness for video-based automated General Movement Assessment: A protocol for video inclusion via visual clustering**

Arianna Tomadin[1], Maria Cristina Bisi[1], Arianna Aceti[2], Ettore Benvenuti[2], Luigi Tommaso Corvaglia[2], Rita Stagni[1]

[1]   University of Bologna, Department of Electric-Electronic and Information Engineering "Guglielmo Marconi" -
     DEI, Bologna, Italy
[2]   University of Bologna, Department of Medical and Surgical Sciences - DIMEC, Bologna, Italy

Parallel Session:
4) Prosthetics and orthosis
14:00–15:30, Kleiner Hörsaal

Chairs: Han Houdijk (Netherlands), Martin Švehlík (Austria)

O 024 The clinical role of 3d gait analysis on orthotic management for cerebral palsy: A systematic review

Moaaz Khalil[1], WeijieWang[2]

[1] Hamad Medical Corporation- Qatar Rehabilitation Institute, Gait Lab, Doha, Qatar
[2] University of Dundee, University Department of Orthopaedic and Trauma Surgery- Ninewells Hospital and Medical School, Dundee, United Kingdom

O 025 Do footwear properties matter when walking with AFOs? A predictive simulation study

Niels Waterval[1], Marjolein van der Krogt[1], Juha Hijmans[2], Kirsten Veerkamp[3]

[1] Amsterdam UMC, Rehabilitation Medicine, Amsterdam, Netherlands
[2] University Medical Center Groningen, Department of Rehabilitation Medicine, Groningen, Netherlands
[3] Vrije Universiteit Amsterdam- Faculty of Behavioural and Movement Sciences, Departments of Human Movement Sciences& Experimental and Applied Psychology, Amsterdam, Netherlands

O 026 The influence of the ankle-foot orthoses on the gross motor function of children with neurological disorders

Laure Everaert[1], Silke Van de Lisdonk[2], Jolien Vanloocke[1,3], Marjan Raeymaekers[2],
Patricia Van de Walle[4], Anja Van Campenhout[5,6], Luc Labey[7], Kaat Desloovere[1,3]

[1] KULeuven, Research Group for Neurorehabilitation eNRGy, Pellenberg, Belgium
[2] Pulderbos, Revalidatiecentrum voor kinderen en jongeren v.z.w., Pulderbos, Belgium
[3] University Hospital Leuven, Clinical Motion Anlysis Laboratory, Pellenberg, Belgium
[4] University of Antwerp, Rehabilitation Sciences and Physiotherapy, Antwerpen, Belgium
[5] University Hospital Leuven, Orthopedics, Leuven, Belgium
[6] KULeuven, Development and Regeneration - Organ Systems, Leuven, Belgium
[7] KULeuven, Mechanical Engineering, Geel, Belgium

O 027 Biomechanical gait changes in relation to change in walking energy cost following orthosis provision in usual and specialized orthotic care

Elza Van Duijnhoven[1,2], Fieke Sophia Koopman[1,2], Frans Nollet[1,2], Merel-Anne Brehm[1,2]

[1] Amsterdam UMC- location University of Amsterdam, Department of Rehabilitation Medicine, Amsterdam, Netherlands
[2] Amsterdam Movement Sciences, Rehabilitation & Development, Amsterdam, Netherlands

O 028 The impact of amputation level on gait patterns, mobility, and daily life: A comparison between transtibial and transfemoral amputees

Anna Zeitzschel[1], Maria Bisele[1], Merkur Alimusaj[2], Cornelia Putz[3], Sebastian Wolf[1]

[1] Universität Heidelberg, Orthopädie und Unfallchirurgie- Motion Laboratory, Heidelberg, Germany
[2] Universität Heidelberg, Orthopädie und Unfallchirurgie- Prosthetics Department, Heidelberg, Germany
[3] Universität Heidelberg, Orthopädie und Unfallchirurgie, Heidelberg, Germany

O 029 The biomechanical impact of joint axis misalignment in hinged ankle-foot orthoses

Harald Boehm[1,2], Gwen Spelly[3], Jörg Miehling[3], Markus Müller[2], Hildebrandt-Ahlborn Markus[2], Malte Bellmann[2]

[1] _Treatment Center Aschau gGmbH, Orthopaedic Hospital for Children, Aschau im Chiemgau, Germany_
[2] _HAWK University of Applied Sciences and Arts-, Faculty of Engineering and Health, 37075 Göttingen, Germany_
[3] _Friedrich-Alexander-Universität Erlangen-Nürnberg, Engineering Design, 91058 Erlangen, Germany_

O 030 The effect of restricting forefoot motion on walking over level and uneven ground

Pierre Storey[1], Julie Stebbins[2], Amy Zavatsky[3]

[1] _University of Oxford, Engineering Science, Oxford, United Kingdom_
[2] _University of Oxford, Nuffield Department of Orthopaedics- Rheumatology and Musculoskeletal Sciences, Oxford, United Kingdom_
[3] _University of Oxford, Department of Engineering Science, Oxford, United Kingdom_

O 031 Effects of using different optimization metrics in selecting the optimal ankle-foot orthosis stiffness in patients with calf muscle weakness

Yvette Keij[1], Merel-Anne Brehm[1], Niels Wateval[1], Frans Nollet[1], Jaap Harlaar[2]

[1] _Amsterdam UMC, Department of Rehabilitation Medicine, Amsterdam, Netherlands_
[2] _Delft University of Technology, Department of Biomechanical Engineering, Delft, Netherlands_

O 032 Optimizing gait with bidirectional tuning of ankle-foot orthosis stiffness in people with neuromuscular disorders: Preliminary results

Elza Van Duijnhoven[1,2], Niels Wateval[1,2], Fieke Sophia Koopman[1,2], Merel-Anne Brehm[1,2]

[1] _Amsterdam UMC- location University of Amsterdam, Department of Rehabilitation Medicine, Amsterdam, Netherlands_
[2] _Amsterdam Movement Sciences, Rehabilitation & Development, Amsterdam, Netherlands_

Coffee Break

_15:30–16:00_

Parallel Session:
5) Lower limb muscles and ultrasonography
16:00–17:35, Grosser Hörsaal

Chairs: Francesco Cenni (Finland), Linda Bühl (Switzerland)

O 033   Validation of automated fascicle tracking algorithms for functional gait tasks in children

Suvi Lotta Van Hunen[1,2], Babette Mooijekind[1,3,4], Winfred Mugge[2], Lynn Bar-On[3], Marjolein M. van der Krogt[1,4]

[1]   Amsterdam UMC location Vrije Universiteit, Rehabilitation Medicine, Amsterdam, Netherlands
[2]   Delft University of Technology, BioMechanical Engineering, Delft, Netherlands
[3]   Ghent University, Rehabilitation Sciences, Gent, Belgium
[4]   Amsterdam Movement Sciences, Rehabilitation and Development, Amsterdam, Netherlands

O 034   A delphi-consensus study about macroscopic muscle morphology in the clinical decision-making process of children with cerebral palsy

Britta Hanssen[1,2], Jari Baart[3], Ines Vandekerckhove[1], Anja Van Campenhout[4,5], Kaat Desloovere[1,6]

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[2]   UZ Leuven, Department of Physical Medicine and Rehabilitation, Leuven, Belgium
[3]   KU Leuven, Faculty of Medicine, Leuven, Belgium
[4]   UZ Leuven, Department of Orthopedics, Leuven, Belgium
[5]   KU Leuven, Department of Development and Regeneration, Leuven, Belgium
[6]   UZ Leuven, Clinical Motion Analysis Laboratory, Pellenberg, Belgium

O 035   Exploration of early muscle growth and its interaction with spontaneous movement patterns in typically developing 3-month-old infants

Nathalie De Beukelaer[1,2], Mathieu Bourgeois[1,2], Marina Castellano[1,2], Laura Hänni-Del Zio[1,2], Alice Bonnefoy-Mazure[1,2], Stéphane Sizonenko[3], Olivier Baud[4], Stéphane Armand[1,2]

[1]   University of Geneva and Geneva University Hospitals, Kinesiology Laboratory - Department of Surgery, Geneva, Switzerland
[2]   University of Geneva and Geneva University Hospitals, Research Center of Skeletal Muscle and Movement, Geneva, Switzerland
[3]   University of Geneva, Division of Child Development and Growth- Department of Pediatrics, Geneva, Switzerland
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O 036 **Medial gastrocnemius muscle growth in children with cerebral palsy compared to typically developing children: Deficit trajectories and impact of severity**

Ines Vandekerckhove[1], Ineke Verreydt[1], Nathalie De Beukelaer[2,3], Britta Hanssen[1],

Geert Molenberghs[4,5], Daisy Rymen[2], Els Ortibus[2], Anja Van Campenhout[2,6], Kaat Desloovere[1,7]

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[7]   University Hospital Leuven, Clinical Motion Analysis Laboratory, Pellenberg, Belgium

O 037 **Relationship between lower limb muscle size and gait pathology in children with cerebral palsy**

Lisa Schaerlaeken[1], Britta Hanssen[2,3], Ines Vandekerckhove[3], Tijl Dewit[1,3], Anja Van Campenhout[4,5], Kaat Desloovere[1,3]

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[4]   University Hospital Leuven, Department of Orthopedics, Leuven, Belgium
[5]   KU Leuven, Department of Development and Regeneration, Leuven, Belgium

O 038 **Long-term effects of botulinum toxin on medial gastrocnemius muscle morphology parameters in children with cerebral palsy: A one-year follow-up study**

Charlotte Lambrechts[1], Nathalie De Beukelaer[2,3], Ineke Verreydt[1], Ines Vandekerckhove[1], Anke Andries[4], Francesco Cenni[5], Ghislaine Gayan-Ramirez[4], Anja Van Campenhout[2,6], Kaat Desloovere[1,7]

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[4]   KU Leuven, Department of Chronic Diseases and Metabolism- Laboratory of Respiratory Diseases and Thoracic Surgery, Leuven, Belgium
[5]   University of Brescia, Department of Clinical and Experimental Sciences, Brescia, Italy
[6]   UZ Leuven, Department of Orthopaedic Surgery, Leuven, Belgium
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O 039 **Combining immobilization and activity to influence calf muscle morphology in children with cerebral palsy: randomized controlled trial using 3D ultrasound**

Martin Švehlík [1], Annika Kruse[2], Bernhard Guggenberger[1], Markus Tilp[2], Nina Mosser[2], Tanja Kraus[1], Hans Kainz[3], Andreas Habersack[1]

[1]   Medical University of Graz, Paediatric orthopaedics- Department of Orthopaedics and Trauma, Graz, Austria
[2]   University of Graz, Department of Human Movement Science- Sport and Health, Graz, Austria
[3]   University of Vienna, Department of Biomechanics- Kinesiology and Computer Science in Sport, Vienna, Austria

O 040 **Sonomyography of the gastrocnemius medialis muscle during walking in persons post-stroke**

Lynn Bar-On[1], Daan De Vlieger[1,2], Hannah-Eva Decorte[3], Babbette Mooijekind[1,4,5], Francesco Cenni[6], Eva Swinnen[2], David Beckwée[2], Anke Van Bladel[1,3,7]

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[6]   University of Jyväskylä, Faculty of Sport and Health Sciences, Jyväskylä, Finland
[7]   University of Antwerpen, Department of Rehabilitation Sciences and Physiotherapy/Movant, Antwerpen, Belgium

Parallel Session:
6) Spine conditions
16:00–17:35, Kleiner Hörsaal

Chairs: Şenol Bekmez (Turkey)

O 041 **4D External Body Scanning: A new tool for functional analysis of scoliosis**

Salvador Pitarch-Corresa[1], Helios De Rosario[1], Fermín Basso Della Vedova[1], José Luis Peris Serra[1], Rosa Porcar Seder[1], Juan López-Pascual[1]

[1]   Instituto de Biomecánica de Valencia - Universitat Politècnica de València, Biomechanical Assessment, Valencia, Spain

O 042 **Can 3D kinematic parameters be predicted by radiographic and quality of life scores in patients with adolescent idiopathic scoliosis?**

Jean Pierre Saad[1], Elio Mekhael[1], Mohamad Karam[1], Luna Choukr[1], Mohamad Hajj Youssef[1], Josef Lattouf[1], Abir Massaad[1], Rami Rachkidi[1], Ismat Ghanem[1], Ayman Assi[1]

[1]   Faculty of Medicine/ University of Saint-Joseph, Laboratory of Biomechanics and Medical Imaging, Beirut, Lebanon

O 043 **The influence of spinal posterior instrumentation and fusion on rib cage deformity in adolescent idiopathic scoliosis**

Mohamad Karam[1], Ayman Assi[1,2], Claudio Vergari[2], _Frederic Maatouk[1]_, Josef Lattouf[1], Mohamad Hajj Youssef[1], Abir Massaad[1], Khalil Kharrat[1], Rami Rachkidi[1], Ismat Ghanem[1]

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[2]   Arts et Métiers, Institut de Biomécanique Humaine Georges Charpak, Paris, France

O 044 **Sitting radiographs may assist surgeons in selecting fusion levels for posterior spinal fusion in AIS**

Guy Awad[1], Ayman Assi[1], Mohamad Karam[1], Abir Massaad[1], Yamen Beyh[1], Aren Joe Bizdikian[1], Marc Boutros[1], Joe Azar[1], Ismat Ghanem[1], Rami Rachkidi[1]

[1]   Faculty of Medicine/ University of Saint-Joseph, Laboratory of Biomechanics and Medical Imaging, Beirut, Lebanon

O 045 **Kinematic adaptations during trunk movements in adolescent idiopathic scoliosis with different types of curvature**

Maria Asmar[1], Emmanuelle Wakim[1], Maria Karam[1], Frederic Maatouk[1], Rami Rachkidi[1], Abir Massaad[1], Mohamad Karam[1], Marc Mrad[1], Maria Rassam[1], Ismat Ghanem[1], Ayman Assi[1,2]

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[2]   Arts et Métiers, Institut de Biomécanique Humaine Georges Charpak, Paris, France

O 046 **Muscle fat infiltration in the lumbar spine is related to functional impairment in patients with adult spinal deformity**

Nabil Nassim[1], Ayman Assi[1,2], Elio Mekhael[1], Moustapha Rteil[1], Ibrahim Hamati[1], Marc Boutros[1], Georges El Haddad[1], Yamen Beyh[1], Abir Massaad[1], Ismat Ghanem[1], Rami Rachkidi[1]

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[2]   Arts et Métiers, Institut de Biomécanique Humaine Georges Charpak, Paris, France

O 047 **Relationship between thoracolumbar/lumbar scoliotic deformity and hip rotational mobility in adolescent idiopathic scoliosis: A kinematic evaluation**

Luna Choukr[1], Abir Massaad[1], Mohamad Karam[1], Jean Pierre Saad[1], Yamen Beyh[1], Mohamad Hajj Youssef[1], Frederic Maatouk[1], Ismat Ghanem[1], Rami Rachkidi[1], Ayman Assi[1]

[1]   Faculty of Medicine/ University of Saint-Joseph, Laboratory of Biomechanics and Medical Imaging, Beirut, Lebanon

O 048 **Three gait parameters are sufficient to evaluate functional impairment in patients with adult spinal deformity**

Elio Mekhael[1], Rami Rachkidi[1], Nabil Nassim[1], Maria Saadé[1], Georges El Haddad[1], Marc Boutros[1], Jean Pierre Saad[1], Mohamad Karam[1], Abir Massaad[1], Ismat Ghanem[1], Ayman Assi[1]

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ESMAC Annual General Assembly

17:45–18:45, Grosser Hörsaal

Friday, 12 September 2025

Charity Run
07:00–08:15

Keynote Lecture 1:
Prof. Annegret Mündermann
08:30–09:10, Grosser Hörsaal

Modern motion analysis in orthopaedics: Bridging technology and clinical practice

Annegret Mündermann[1]

[1]   *Schulthess Clinic, Teaching- Research and Development, Zurich, Switzerland*

Parallel Session:
7) Sports / orthopaedics related conditions
09:15–10:15, Grosser Hörsaal

Chairs: Annegret Mündermann (Switzerland), Katrin Bracht-Schweizer (Switzerland)

O 049   **Characterizing movement patterns in individuals with knee osteoarthritis using inertial measurement units**

Karol Gawelowicz[1], Morten Bilde Simonsen[2], Cecilia Aulin[3], Josefine Eriksson Naili[4]

[1]   *Karolinska Institutet, Department of Women's and Children's Health, Stockholm, Sweden*
[2]   *Aalborg University, Department of Materials and Production- Center for Mathematical Modeling of Knee Osteoarthritis, Aalborg, Denmark*
[3]   *Karolinska Institutet, Department of Medicine Solna- Division of Rheumatology- Centre for Molecular Medicine, Stockholm, Sweden*
[4]   *Karolinska Institutet and Karolinska University Hospital, Dept. of Women's and Children's Health, Stockholm, Sweden*

O 050   **Injury mechanisms, situational patterns, and biomechanics of anterior cruciate ligament injuries in professional volleyball players: A systematic video analysis**

Fatih Eren Oluç[1], İrem Tamer[2], Tuğçe Tekin[2], Umut Ziya Koçak[3]

[1]   *Ege University, Faculty of Health Sciences- Department of Physiotherapy and Rehabilitation, İzmir, Turkey*
[2]   *İzmir Katip Çelebi University,Institution of Health Sciences- Department of Physiotherapy and Rehabilitation, İzmir, Turkey*
[3]   *İzmir Katip Çelebi University, Faculty of Health Sciences- Department of Physiotherapy and Rehabilitation, İzmir, Turkey*

O 051   **Temporal sequence of muscle activation in the glute bridge exercise**

Sebastian Scheurer[1], Salvatore Tedesco[2], Brendan O'Flynn[2], Kenneth Brown[1]

[1]   *University College Cork, Insight Centre for Data Analytics- School of Computer Science and Information Technology-, Cork, Ireland*
[2]   *University College Cork, Tyndall National Institute, Cork, Ireland*

O 052 **Computational assessment of knee joint reaction forces in the supporting leg during taekwondo roundhouse kicking**

Sheida Shourabadi Takabi[1], Reza Karimi[1], Maryam Namazifard[2], Meroeh Mohammadi[3]

[1] Shahid Bahonar University of Kerman, Department of Sports Biomechanics, Kerman, Islamic Republic of Iran
[2] Tomsk State University, National Research, Tomsk, Russian Federation
[3] Islamic Azad University, Biomedical Engineering, Tehran, Islamic Republic of Iran

O 053 **Does correcting valgus malalignment always result in a normalised medio-lateral knee joint contact force distribution?**

Andreas Kranzl[1,2], Brian Horsak[3,4], Dominik Töller[1], Djordje Slijepčević[5], Philipp Krondorfer[33], Sebastian Farr[6], Fabian Unglaube[1]

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[2] Vienna Bone and Growth Center, Vienna, Vienna, Austria
[3] St. Pölten University of Applied Sciences, Center for Digital Health & Social Innovation, St. Pölten, Austria
[4] St. Pölten University of Applied Sciences, Institute of Health Sciences, St. Pölten, Austria
[5] St. Pölten University of Applied Sciences, Institute of Creative Media Technologies, St. Pölten, Austria
[6] Orthopaedic Hospital Speising, Department of Pediatric Orthopaedics and Foot Surgery, Vienna, Austria

O 054 **Evaluation of inter-limb jump symmetry performance in adolescents with idiopathic scoliosis**

Aleyna Ceren Bicioğlu[1], Adnan Apti[2]

[1] Istanbul Kultur University, Institute of Graduate Studies- Department of Physiotherapy and Rehabilitation, Istanbul, Turkey
[2] Istanbul Kultur University, Faculty of Health Sciences- Physiotherapy and Rehabilitation Department- Istanbul Kultur University- Motion Analysis Center, Istanbul, Turkey

Parallel Session:
8) Adult neurological conditions
09:15–10:15, Kleiner Hörsaal

Chairs: Linda Rennie (Norway), Alice Bonnefoy-Mazure (Switzerland)

O 055 **Variabilities in both Modified Ashworth Scale scores and biomechanical parameters among different physiotherapists when assessing lower limb spasticity**

Simon Hinnekens[1], Sacha Guitteny[1], Alexandre Naaïm[1], Hugo Ardaillon[2,3], Raphaël Dumas[1], Sébastien Mateo[2,3], Yoann Lafon[1]

[1] Université Claude Bernard Lyon1 - Université Gustave Eiffel, Laboratoire de Biomécanique et Mécanique des Chocs, Bron, France
[2] Hospices Civils de Lyon- Hôpital Henry Gabrielle, Plateforme Mouvement et Handicap, Saint Genis Laval, France
[3] Université Claude Bernard Lyon 1, CNRL Equipe Trajectoires, Bron, France

O 056 **Impact of self-reported fatigue on walking capacity in adults with cerebral palsy**

Nawale Hadouiri[1,2,3,4], Alice Bonnefoy-Mazure[3,4], Anne Tabard-Fougere[3,4], Geraldo DeCoulon[3,4], Stéphane Armand[3,4]

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[2]   University Hospital- Dijon- France, INSERM- CIC 1432- Clinical Investigation Center- Plurithematic Module- Technological Investigation Platform-, Dijon, France
[3]   Geneva University Hospitals and University of Geneva, Research Center of skeletal Muscle and Movement, Geneva, Switzerland
[4]   Hôpitaux universitaires de Geneve / Faculté de médecine, Kinesiology laboratory, Geneva, Switzerland

O 057 **Relationship between changes in Gait Deviation Index, walking speed and 6-minute-walk-test in adults with cerebral palsy: A 16-year follow-up**

Sandra Klund-Hansen[1], Arve Opheim[2], Terje Gjøvaag[1], Eivind Lundgaard[2], Grethe Månum[3], Linda Rennie[1]

[1]   Oslo Metropolitan University, Department of Rehabilitation Science and Health Technology, Oslo, Norway
[2]   Sunnaas Rehabilitation Hospital, Centre for Research and Eduction, Nesodden, Norway
[3]   Beitostølen Healthsports Center, Healthsports Center, Beitostølen, Norway

O 058 **Identifying knee extensor thrust in stroke patients using shank kinematics**

Sébastien Cordillet[1], Sophie Hameau[1], Charles Guignans[1], Karim Jamal[2], Isabelle Bonan[1]

[1]   Rennes University Hospital, physical medecine and rehabilitation department, Rennes, France
[2]   Rennes University, rehabilitation science department, Rennes, France

O 059 **Kinematic analysis of gait and levodopa response in young-onset and middle-aged Parkinson's disease**

Paula Faria Mazzilli Da Silva[1,2], Luciano L. Menegaldo[1], Adriane M Muniz[1]

[1]   Coppe- Peb- UFRJ, Biomedical Engineering Program, Rio de Janeiro, Brazil
[2]   Sarah network, Laboratório de movimento, Rio de Janeiro, Brazil

O 060 **The effects of frequency of subthalamic nucleus deep brain stimulation on postural control in Parkinson's disease**

Mehmet Yanardag[1], Nazlı Durmaz Çelik[2], Aslı Kula[3], Elif Göksu Yiğit Tekkanat[2], Müge Kuzu Kumcu[4], Serhat Özkan[2]

[1]   Anadolu University, Research Institute for Individuals with Disability, Eskisehir, Turkey
[2]   Eskisehir Osmangazi University, Department of Neurology, Eskisehir, Turkey
[3]   Bezmialem Foundation University, Department of Neurology, İstanbul, Turkey
[4]   Lokman Hekim University, Department of Neurology, Ankara, Turkey

Coffee Break
_10:15–10:45_

Plenary Session:
9) Clinical cases
10:45–11:45, Grosser Hörsaal

Chairs: Andrew Roberts (United Kingdom), Elke Viehweger (Switzerland)

O 061 Indirect improvement of multisegmental foot kinematics via lower limb strengthening in an adolescent with flatfoot: A case report

Halenur Evrendilek[1,2,3], Derya Çelik[4]

[1] Istanbul Kultur University- Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, İstanbul, Turkey
[2] Istanbul Kultur University, Motion Analysis Center, İstanbul, Turkey
[3] Istanbul University - Cerrahpasa- Institute of Graduate Studies, Department of Physiotherapy and Rehabilitation, İstanbul, Turkey
[4] Istanbul University - Cerrahpasa- Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, İstanbuul, Turkey

O 062 Comparative case studies of lower limb and trunk kinematics in AIS patients following spinal fusion at different vertebral levels

Michel Ammouri[1], Frederic Maatouk[1], Josef Lattouf[1], Abir Massaad[1], Mohamad Karam[1],
Jean Pierre Saad[1], Luna Choukr[1], Yamen Beyh[1], Ayman Assi[1], Rami Rachkidi[1]

[1] Faculty of Medicine/ University of Saint-Joseph, Laboratory of Biomechanics and Medical Imaging, Beirut, Lebanon

O 063 Gait compensatory strategies used by a 4-year old cerebral palsy child with genu recurvatum: A biomechanical case study

Tiago Neto[1], Jennifer Fayad[1,2], Camille Wojtylka[1], Andreas Tamang[1], Jan Cabri[1],
Katharina Ueberham[3]

[1] Luxembourg Institute of Research in Orthopedics- Sports Medicine and Science LIROMS, Human Motion Lab, Luxembourg, Luxembourg
[2] Luxembourg Institute of Health, Department of Precision Health, Luxembourg, Luxembourg
[3] Centre Hospitalier de Luxembourg, Service Evaluation et Rééducation Fonctionnelles, Luxembourg, Luxembourg

O 064 Dystonia: Usefulness of 3D gait analysis and dynamic surface electromyography in discriminating dystonic actions from compensatory mechanism

Viviana Libera[1], Emanuele Zibetti[1], Patrizia Belotti[2], Bruno Conti[3]

[1] Multimedica Hospital, Neuromotor Rehabilitation Department, Castellanza, Italy
[2] Bellini Hospital, Rehabilitation Department, Somma Lombardo, Italy
[3] IRCCS Multimedica, Neuromotor Rehabilitation Department, Sesto San Giovanni, Italy

O 065   Instrumental gait analysis (IGA) may suggest further neurologic assessments: A case study

Andrea Merlo[1], Francesco Cavallieri[2], Sara Scaltriti[1], Benedetta Damiano[1], Lorenzo Cavazzuti[1], Valentina Fioravanti[2], Giacomo Portaro[2], Franco Valzania[2], Mirco Lusuardi[3], Isabella Campanini[1]

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[3]   _Azienda USL-IRCCS of Reggio Emilia, Neuromotor & Rehabilitation Department, Reggio Emilia, Italy_

Sponsors' Pitches — AMTI, BTS Bioengineering, Cometa, Delsys Europe, NOKOV, Qualisys, XSENSOR

11:45–11:50, Grosser Hörsaal

Moveshelf Industry Presentation

11:50–12:00, Grosser Hörsaal

Fior & Gentz Industry Presentation

12:00–12:04, Grosser Hörsaal

Moveck Industry Presentation

12:04–12:09, Grosser Hörsaal

Poster Panic Session II.

12:15–12:45, Grosser Hörsaal

Posters II.

12:45–14:00, Foyer ZLF Ground Floor

Keynote Lecture 2: Prof. Georg Rauter

14:00–14:40, Grosser Hörsaal

New paradigms for developing usable rehabilitation robots

Georg Rauter[1]

[1]   _University of Basel, Department of Biomedical Engineering, Basel, Switzerland_

Parallel Session:
10) Assisted rehabilitation
14:45–15:45, Grosser Hörsaal

Chairs: Georg Rauter (Switzerland)

O 066 **Gait rehabilitation using intensive robotic exoskeleton training in individuals with incomplete spinal cord injury (ASIA D): A pilot study**

Eng Wah Tan[1], Wan Nazrin Wan Mazehi[1], Hui Sin Hii[1], Nur Aiman Mohd Yusof Ngoh[1], Hafez Hussain[1]

[1] *PERKESO Rehabilitation Centre, Rehabilitation, Melaka, Malaysia*

O 067 **Kinematics and kinetics during sit-to-stand and stair-walking in healthy individuals using robot-assisted body weight unloading**

Jon Skovgaard Jensen[1], Jakob Lindberg Nielsen[2], Anders Stengaard Sørensen[3], Per Aagaard[2], Anders Holsgaard Larsen[1], Jens Bojsen-Møller[2]

[1] *Orthopaedic Research Unit - Department of Clinical Research, University of Southern Denmark, Odense, Denmark*
[2] *Research Unit of Muscle Physiology and Biomechanics - Department of Sport Science and Clinical Biomechanics, University of Southern Denmark, Odense, Denmark*
[3] *SDU UAS Centre- The Maersk Mc-Kinney Moller Institute, University of Southern Denmark, Odense, Denmark*

O 068 **Effects of ankle exoskeleton on biomechanics and oxygen consumption of walking in typically developed children and children with cerebral palsy**

Mika Peltoniemi[1,2], Maxwell Thurston[1,2], Taija Finni[2], Juha-Pekka Kulmala[1]

[1] *Helsinki University Hospital, Motion Laboratory- New Children's Hospital, Helsinki, Finland*
[2] *University of Jyväskylä, Faculty of Sport and Health Sciences, Jyväskylä, Finland*

O 069 **Soft ankle exoskeleton for biplanar assistance of dropfoot with a human-in-the-loop optimization approach**

Xiaochen Zhang[1], Susanne Palmcrantz[2], Lanie Gutierrez Farewik[1]

[1] *KTH MoveAbility, KTH Royal Institute of Technology- Dept. Engineering Mechanics, Stockholm, Sweden*
[2] *Karolinska Institutet, Department of Clinical Sciences- Danderyd Hospital, Stockholm, Sweden*

O 070 **Learning to walk with passive ankle foot orthoses: Does it happen spontaneously?**

Niels Waterval[1], Katinka van der Kooij[2], iris Deelen[2], Elza van Duijnhoven[1]

[1] *Amsterdam UMC, Rehabilitation Medicine, Amsterdam, Netherlands*
[2] *Vrije Universiteit, Department of Human Movement Sciences, Amsterdam, Netherlands*

O 071 **RehaBot: Enhancing cerebral palsy rehabilitation with a chatbot and assessment of video-based activity recognition**

Hichem Saoudi[1], _Míriam Antón-Rodríguez_[1], _Beatriz De la Calle_[2], _Cristina Simón-Martínez_[3], _David González-Ortega_[1], _Mario Martínez Zarzuela_[1]

[1] University of Valladolid, Signal Theory and Communications and Telematics Engineering, Valladolid, Spain
[2] Hospital Universitario Río Hortega, Servicio de Rehabilitación, Valladolid, Spain
[3] University of Applied Sciences Western Switzerland HES-SO Valais-Wallis, Institute of Information Systems, Sierre, Switzerland

Parallel Session:
11) Foot & Ankle
14:45–15:45, Kleiner Hörsaal

Chairs: Julie Stebbins (United Kingdom), Zimi Sawacha (Italy)

O 072 **Does the anterior tibiofibular gap influence subjective ankle instability?**

Madoka Koyanagi[1], _Tsubasa Tashiro_[1], _Satoshi Arima_[1], _Takeru Abekura_[1], _Sakura Oda_[1], _Yuki Tamura_[1], _Noriaki Maeda_[1]

[1] Hiroshima University, Graduate School of Biomedical and Health Sciences, Hiroshima city, Japan

O 073 **Analysis of toe clearance mechanisms in idiopathic and voluntary toe walking**

Ching Hang Chiu[1], _Julie Stebbins_[2], _Amy Zavatsky_[3], _Alpesh Kothari_[2]

[1] University of Oxford, NDORMS, Oxford, United Kingdom
[2] University of Oxford, Nuffield Department of Orthopaedics- Rheumatology and Musculoskeletal Sciences, Oxford, United Kingdom
[3] University of Oxford, Department of Engineering Science, Oxford, United Kingdom

O 074 **Exploring morphological variations of the subtalar joint in children with cerebral palsy: A statistical approach**

Harry Poole[1,2], _Caroline Stewart_[1,3], _Derfel Williams_[1], _Robert Freeman_[1], _Adam Shortland_[2,4], _Erik Meilak_[1,3]

[1] The Robert Jones Agnes Hunt Orthoepaedic Hospital, ORLAU, Oswestry, United Kingdom
[2] King's College London, School of Biomedical Engineering & Imaging Sciences, London, United Kingdom
[3] Keele University, School of Medicine, Keele, United Kingdom
[4] Guy's & St Thomas' NHS Foundation Trust, One Small Step Gait Laboratory, London, United Kingdom

O 075 **Impact of medial longitudinal arch configuration on foot and ankle motion in end-stage varus ankle osteoarthritis**

Min Gyu Kyung[1], _Kyoung Min Lee_[2], _Dong Yeon Lee_[3]

[1] Kyung Hee University Hospital at Gangdong, Department of Orthopaedic Surgery, Seoul, Republic of Korea
[2] Seoul National University Bundang Hospital, Department of Orthopaedic Surgery, Seongnam, Republic of Korea
[3] Seoul National University Hospital, Department of Orthopaedic Surgery, Seoul, Republic of Korea

O 076 **Stronger toe strength is related to enhanced subtalar joint function during counter movement jump in adolescents**

Halenur Evrendilek[1,2,3], Merve Balaman[1], Derya Çelik[4], Nazif Ekin Akalan[1,2]

[1] Istanbul Kultur University- Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, İstanbul, Turkey
[2] Istanbul Kultur University, Motion Analysis Center, İstanbul, Turkey
[3] Istanbul University - Cerrahpasa- Institute of Graduate Studies, Department of Physiotherapy and Rehabilitation, İstanbul, Turkey
[4] Istanbul University - Cerrahpasa- Faculty of Health Science, Department of Physiotherapy and Rehabilitation, İstanbul, Turkey

O 077 **A musculoskeletal modeling approach in studying the biomechanics of clubfoot recurrence**

Christian Greve[1], Bryce Killen[2], Joyce Bos[3], Han Houdijk[4], Sophie Moermans[3], Alessio Murgia[4]

[1] University of Groningen- University Medical Center Groningen, Department of Rehabilitation Medicine, Groningen, Netherlands
[2] KU Leuven, Department of Movement Sciences, Leuven, Belgium
[3] University Medical Center Groningen, Department of Orthopaedic Surgery, Groningen, Netherlands
[4] University of Groningen, Department of Human Movement Sciences, Groningen, Netherlands

Parallel Session:
12) Measuring clinical effects
16:15–17:35, Grosser Hörsaal

Chairs: Thomas Dreher (Switzerland), Stéphane Armand (Switzerland)

O 078 **Surgical decision-making in children with walking impairments: Comparing a surgeon's algorithm and two machine learning models**

Michael Schwartz[1], Andrew Georgiadis[1]

[1] Gillette Children's Specialty Healthcare, Center for Gait and Motion Analysis, St. Paul, USA

O 079 **Alterations in gastrocnemius medialis muscle length after lengthening surgery in children with cerebral palsy**

Babette Mooijekind[1,2,3], Marjolein van der Krogt[1,2,4], Melinda Witbreuk[1,5], Wouter Schallig[2,6], Richard Jaspers[2,7], Guido Weide[2,7], Lynn Bar-On[3], Annemieke Buizer[1,2,5]

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[5] Emma Children's Hospital, Amsterdam UMC, Amsterdam, Netherlands
[6] Erasmus MC, Department of Radiology & Nuclear Medicine, Amsterdam, Netherlands
[7] Laboratory for Myology- Vrije Universiteit Amsterdam, Faculty of Behavioural and Movement Sciences, Amsterdam, Netherlands

O 080 Limb lengthening surgery solves anatomical and functional leg length discrepancy during gait

Laura Tetzel[1], Jacqueline Romkes[2], Morgan Sangeux[2], Andreas Krieg[1], Elke Viehweger[3]

[1]   University Children's Hospital Basel UKBB, Department Orthopaedics, Basel, Switzerland
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[3]   University Children's Hospital Basel UKBB and University of Basel, Department Orthopaedics / Neuroorthopaedics and Centre of Clinical Motion Analysis / Department of Biomedical Engineering DBE, Basel, Switzerland

O 081 The effect of selective dorsal rhizotomy on the incidence of orthopedic surgery: A matched cohort study

Michael Schwartz[1], Andrew Georgiadis[1]

[1]   Gillette Children's Specialty Healthcare, Center for Gait and Motion Analysis, St. Paul, USA

O 082 Favourable effect of selective dorsal rhizotomy on energy cost of walking in children with spastic cerebral palsy

Liza Van Dijk[1,2], Eefje Muselaers[1,2], Petra van Schie[1], Mariam Slot[3,4], Marjolein van der Krogt[1,2], Merel-Anne Brehm[1,2], Annemieke Buizer[1,2,3]

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[3]   Emma Children's Hospital, Amsterdam UMC, Amsterdam, Netherlands
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O 083 Calf muscle morphological adaptations to functional power training in children with cerebral palsy

Babette Mooijekind[1,2,3], Lynn Bar-On[3], Liesbeth van Vulpen[4], Christine van den Broeck[3], Richard Jaspers[2,5], Guido Weide[2,5], Marjolein van der Krogt[1,2,6], Annemieke Buizer[1,2,7]

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O 084 Recovery of muscle fatigability after a progressive exercise task in children in children with cerebral palsy

Jean Stout[1], Tom Novacheck[2], Laurent Bouyer[3]

[1]   Gillette Children's Specialty Healthcare, James R. Gage Center for Gait and Motion Analysis, St. Paul, USA
[2]   Gillette Children's Specialty Healthcare, Department of Orthopedics, St. Paul, USA
[3]   Université Laval, Centre Interdisciplinaire de Recherche Réadaptation et Intégration Sociale, Quebec, Canada

O 085   Effects of ballet training on kinematics and subjective parameters in children with idiopathic coxa antetorta: A pre-post intervention study

Estelle Hamer[1], Clare Maguire[1,2], Marco Odorizzi[3], Elke Viehweger[4], Michèle Widmer[5]

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[4]   Universitäts-Kinderspital beider Basel UKBB, Department of Paediatric Orthopaedics- Department of Paediatric Neuroorthopaedics- Laboratory for Movement Analysis, Basel, Switzerland
[5]   Universitäts-Kinderspital beider Basel UKBB, Department of Paediatric Orthopaedics, Basel, Switzerland

Coffee Break
15:45–16:15

Parallel Session:
13) Modelling and Imaging
16:15–17:35, Kleiner Hörsaal

Chairs: Lanie Gutierrez Farewik (Sweden), Matilde Bertoli (Switzerland)

O 086   Relationship between pelvic tilt and 3D acetabular orientation in patients with adult spinal deformity: The role of pelvic morphology

Renaud Lafage[1], Gilles Prince[2], Ayman Assi[2,3], Emil Haikal[1], Marc Boutros[2], Bassel Diebo[4], Virginie Lafage[1]

[1]   Lenox Hill Hospital, Department of Orthopaedic Surgery, New York, USA
[2]   Faculty of Medicine/ University of Saint-Joseph, Laboratory of Biomechanics and Medical Imaging, Beirut, Lebanon
[3]   Arts et Métiers, Institut de Biomécanique Humaine Georges Charpak, Paris, France
[4]   Brown University, Warren Alpert Medical School, Providence RI, USA

O 087   Frontal plane X-ray-based regression equation for more accurate hip joint center localization in gait analysis of children with Achondroplasia

Matthias Hösl[1,2], Antonia Thamm[1], Sean Nader[3]

[1]   Schön Klinik Vogtareuth, Gait and Motion Analysis Laboratory, Vogtareuth, Germany
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[3]   Schön Clinic Vogtareuth-, Specialist Centre for Paediatric Orthopaedics- Neuroorthopaedics and Deformity Reconstruction-, Vogtareuth, Germany

O 088 **Impact of femoral derotation osteotomies on gait, growth plate loading, and femoral growth trajectories in children with idiopathic torsional deformities**

Willi Koller[1], Andreas Kranzl[2], Gabriel Mindler[3], Martin Svehlik[4], Arnold Baca[1], Hans Kainz[1]

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[3] Orthopaedic Hospital Speising, Department of Pediatric Orthopaedics, Vienna, Austria
[4] Medical University of Graz, Department of Orthopedics and Traumatology, Graz, Austria

O 089 **Evaluating gait patterns from a predictive simulation framework against gait variations observed in knee osteoarthritis patients**

Miel Willems[1], Bryce Adrian Killen[1], Lars D'Hondt[1], Sanne Vancleef[2], Ilse Jonkers[1]

[1] KU Leuven, Movement Sciences, Leuven, Belgium
[2] Materialise NV, Materialise NV, Leuven, Belgium

O 090 **Toward a synergy-based ecological framework for application of musculoskeletal modelling in clinics**

Maria Dalle Vacche[1], Marco Romanato[1], Fabiola Spolaor[1], Zimi Sawacha[1]

[1] Università degli Studi di Padova, Department of Information Engineering, Padova, Italy

O 091 **The effects of Soleus and Gastrocnemius spasticity on gait: A comparison between predictive simulations and expert consensus**

Stefanie L. De Jager[1,2], Niels F.L. Waterval[1], Marjolein M. van der Krogt[1], Ajay Seth[2], Kirsten Waterval[3,4]

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[2] Delft University of Technology, Biomechanical Engineering, Delft, Netherlands
[3] Vrije Universiteit Amsterdam, Amsterdam Movement Sciences & Institute for Brain and Behavior Amsterdam- Human Movement Sciences, Amsterdam, Netherlands
[4] Vrij Universiteit Amsterdam, Institute for Brain and Behavior Amsterdam- Experimental and Applied Psychology, Amsterdam, Netherlands

O 093 **Prediction of crutch-assisted gait using data from instrumentalized crutches: Towards the generation of synchronization signals for personalized exoskeleton control**

Diana Quintana[1], Joan Aranda[2], Míriam Febrer-Nafría[1]

[1] Universitat Politècnica de Catalunya, Department of Mechanical Engineering, Barcelona, Spain
[2] Universitat Politècnica de Catalunya, Department of Automatic Control, Barcelona, Spain

ESMAC Networking Event — Paulus Kulturkirche

_19:00–23:30_

Location: Paulus Kulturkirche

Saturday, 13 September 2025

Parallel Session:
14) Motor control and stability
08:30–10:00, Grosser Hörsaal

Chairs: Morgan Sangeux (Switzerland), Linard Filli (Switzerland)

O 094 Continuous Margin of Stability: A stride-to-stride interpretation of dynamic stability

Sydney Garrah[1], Amy Coyle[1], W. Scott Selbie[1], Richard Moulton[1]

[1] HAS-Motion, Inc., Kingston, Canada

O 095 Limits of stability in men with obstructive sleep apnea and effects of concurrent chronic neck pain: A three-group comparison study

Mahbube Dogru[1], Ibrahim Oztura[2], Baris Baklan[3], Yesim Salik Sengül[4]

[1] Izmir Katip Celebi University Vocational School of Health Services, Physiotherapy Program, Izmir, Turkey
[2] Dokuz Eylul University- Faculty of Medicine, Department of Clinical Neurophysiology and Neurology, Izmir, Turkey
[3] Tinaztepe University- Faculty of Medicine, Department of Internal Medicine- Division of Neurology, Izmir, Turkey
[4] Dokuz Eylul University- Faculty of Physical Therapy and Rehabilitation, Department of Physiotherapy and Rehabilitation, Izmir, Turkey

O 096 Association of limits of stability with pain characteristics and functional mobility in adults with chronic neck pain: A case-control study

Müge Kırmızı[1], Gülşah Çallıoğlu[2], Sevtap Günay Uçururm[1]

[1] Izmir Katip Celebi University- Faculty of Health Sciences, Physiotherapy and Rehabilitation, İzmir, Turkey
[2] Izmir Katip Celebi University- Institute of Health Sciences, Physiotherapy and Rehabilitation, İzmir, Turkey

O 097 Patterns of gait stability in patients with Adult Spinal Deformity

Ibrahim Hamati[1], Abir Massaad[1], Moustapha Rteil[1], Gilles Prince[1], Michel Ammouri[1], Yamen Beyh[1], Frederic Maatouk[1], Mohamad Karam[1], Rami Rachkidi[1], Ayman Assi[1]

[1] Faculty of Medicine/ University of Saint-Joseph, Laboratory of Biomechanics and Medical Imaging, Beirut, Lebanon

O 098 sEMG to investigate anticipatory, predictive, and reactive strategies of healthy subjects walking on a yielding platform with different a-priori information

Maurizio Petrarca[1], Maria Chiara Bò[2], Martina Favetta[1], Azzurra Speroni[1], Gessica Della Bella[1], Andrea Merlo[1]

[1] Bambino Gesù Children's Hospital- IRCCS, Movement Analysis and Robotics Laboratory MARlab, Rome, Italy
[2] Sol et Salus Hospital, Research Unit, Torre Pedrera di Rimini, Italy

O 099 **Within- and between-assessor reliability of lower-limb inter-joint coordination during gait in individuals with and without cerebral palsy**

Cloé Dussault-Picard[1], Yosra Cherni[2], Fabien Leboeuf[1], Stéphane Armand[3]

[1] CHU of Nantes, Physical Medicine and Rehabilitation, Nantes, France
[2] University of Montreal, School of kinesiology and physical activity sciences, Montreal, Canada
[3] Geneva University Hospitals and University of Geneva, Kinesiology Laboratory, Geneva, Switzerland

O 100 **Perturbation training improves muscle coordination during reactive standing balance in trained and untrained conditions in children with cerebral palsy**

Jente Willaert[1], Anja Van Campenhout[2], Kaat Desloovere[3], Friedl De Groote[1]

[1] KU Leuven, Department of Movement Sciences, Leuven, Belgium
[2] KU Leuven / UZ Leuven, Department of Development and Regeneration, Leuven, Belgium
[3] KU Leuven / UZ Leuven, Department of Rehabilitation Sciences, Leuven, Belgium

O 101 **Exploring muscle coordination in response to irregular terrains: Implications for gait adaptation in healthy older adults**

Marina Algaba-Vidoy[1,2], İrem Akgün[3], Adriana Torres-Pardo[1,2], Carlota Trigo[1], María Carratalá-Tejada[4], Diego Fernández-Vázquez[4], Víctor Navarro-López[4], Francisco Molina-Rueda[4], Juan C. Moreno[1], Diego Torricelli[1]

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[2] E.T.S. Ingenieros de Telecomunicación, Universidad Politécnica de Madrid, Madrid, Spain
[3] Department of Physiotherapy and Rehabilitation, Gaziantep University, Gaziantep, Turkey
[4] Departamento de Fisioterapia- Terapia Ocupacional- Rehabilitación y Medicina Física. Laboratorio de Análisis del Movimiento- Biomecánica- Ergonomía y Control Motor LAMBECOM, Universidad Rey Juan Carlos, Madrid, Spain

O 102 **Assessing dynamic instability in bilateral vestibulopathy patients during daily living tasks using inertial measurement units**

Gautier Grouvel[1,2,3], Thomas Zimmermann[1,4], Raymond van de Berg[5], Nils Guinand[1], Angélica Pérez Fornos[1], Stéphane Armand[2,3], Julie Corre[1]

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[4] University of Applied Sciences and Arts Western Switzerland, HES-so, Lausanne, Switzerland
[5] Division of Balance Disorders, Department of Otorhinolaryngology and Head and Neck Surgery- Maastricht University Medical Center+, Maastricht, Netherlands

Parallel Session:
15) Innovative assessments
08:30–10:00, Kleiner Hörsaal

Chairs: Sebastian Wolf (Germany), Inti Vanmechelen (Sweden)

O 103 Could idiopathic toe walking stem from atypical supraspinal modulation of spinal reflexes?

Essi Marttinen Rossi[1,2], Leena Lauronen[2,3], Helena Mäenpää[4], Jussi Toppila[3], Jessica Guzmán-López[2], Harri Piitulainen[1,5], Päivi Nevalainen[2,3]

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[3] New Children's Hospital- Helsinki University Hospital and University of Helsinki, HUS Diagnostic Center- Clinical Neurophysiology, Helsinki, Finland
[4] New Children's Hospital- Helsinki University Hospital, HUS Child Neurology, Helsinki, Finland
[5] University of Jyväskylä, Faculty of Sport and Health Sciences, Jyväskylä, Finland

O 104 Effect of dual task on gait patterns of patients with cervical spinal stenosis

Corina Nüesch[1,2], Filippo Mandelli[1], Annegret Mündermann[2,3], Stefan Schären[1], Cordula Netzer[1,2]

[1] University Hospital Basel, Department of Spine Surgery, Basel, Switzerland
[2] University of Basel, Department of Biomedical Engineering, Allschwil, Switzerland
[3] Schulthess Klinik, Department of Teaching- Research and Development, Zürich, Switzerland

O 105 Exploring gait adaptations during dual-tasking in typically developing children: A systematic review and meta-analysis

Michelle Verhoeven[1], Frederik Deconinck[2], Ruth Van der Looven[3], Lynn Bar-On[1]

[1] Ghent University, Department of Rehabilitation Sciences, Ghent, Belgium
[2] Ghent University, Department of Movement and Sports Sciences, Ghent, Belgium
[3] Ghent University Hospital, Department of Physical and Rehabilitation Medicine, Ghent, Belgium

O 106 Investigating fast walking speed and walking speed reserve in patients before total knee arthroplasty

Alice Bonnefoy-Mazure[1], Xavier Gasparutt[1], Dupont Julien[1], Attias Michael[2], Miozzari Hermes H[3], Armand Stéphane[1]

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[2] HES-SO University of Applied Sciences and Arts Western Switzerland, School of Health Sciences, Geneva, Switzerland
[3] Division of Orthopaedic Surgery and Musculoskeletal Trauma Care & Research Center of skeletal Muscle and Movement, Surgery Department, Geneva, Switzerland

O 107 **Non-ambulatory individuals with severe spastic cerebral palsy show a profound decline in cardiorespiratory fitness and muscle strength**

Nina Mosser[1], Ana Kunstic[1], Philipp Birnbaumer[1], Martin Švehlík[2], Markus Tilp[1], Mireille van Poppel[1], Julian Wenninger[1], Linnéa Corell[3], Ferdinand von Walden[3], Annika Kruse[1]

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[2]   Medical University of Graz, Department of Orthopaedics and Trauma, Graz, Austria
[3]   Karolinska Institutet, Department of Women's and Children's Health, Stockholm, Sweden

O 108 **Mind in motion: Lived experiences, systematic review and meta-analysis on how anxiety and/or depression changes the way we move**

Aleksandra Birn-Jeffery[1], Ruth G Lowry[2], Edward Hope[3], Matthew Smith[4], Dawn Amey[4], John Wills[4], Phoenix Amey[4], Raza Griffiths[4], Emily Sigston[5], Matthew JD Taylor[1]

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[2]   Ulster University, School of Psychology, Coleraine, United Kingdom
[3]   Liverpool John Moores University, School of Sport and Exercise Sciences, Liverpool, United Kingdom
[4]   University of Essex, Service User Advisory Group, Colchester, United Kingdom
[5]   University of Essex, Health and Social Care, Colchester, United Kingdom

O 109 **The co-design and validation of a lab-based, multi-task protocol to evaluate fatigue across daily living activities: Pilot results**

Reinhard Claeys[1], Juha Carlon[2], Elissa Embrechts[1,3,4], Benjamin Filtjens[5,6], Tom Verstraten[7], Eva Swinnen[1], David Beckwée[1,3]

[1]   Vrije Universiteit Brussel, Rehabilitation Research- Department of Physiotherapy- Human Physiology and Anatomy, Brussel, Belgium
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[4]   Universiteit Utrecht, Helmholtz Institute- Department of Experimental Psychology, Utrecht, Netherlands
[5]   University Health Network, KITE Research Institute, Toronto, Canada
[6]   KU Leuven, e-Media Research Lab- Department of Electrical Engineering, Leuven, Belgium
[7]   Vrije Universiteit Brussel,Robotics and MultiBody Mechanics Research Group- Department of Mechanical Engineering, Brussel, Belgium

O 110 **Human movements during unsuccessful threat encounters**

Ulises Daniel Serratos Hernandez[1], Yonatan Hutabarat[2], Lukas Kornemann[2], Dominik R. Bach[1,2]

[1]   University College London, Department of Imaging Neuroscience- UCL Queen Square Institute of Neurology, London, United Kingdom
[2]   University of Bonn, Transdisciplinary Research Area Life and Health- Centre for Artificial Intelligence and Neuroscience, Bonn, Germany

Coffee Break

_10:00–10:30_

Parallel Session:
16) Machine learning to inform decisions
10:30–11:45, Grosser Hörsaal

Chairs: Eric Desailly (France), Omar Galarraga (France)

O 111 Using smartphone accelerometer data to predict lower limb bradykinesia, tremor, and rigidity in Parkinson's disease

Göksel Çilga[1], Aybuke Cansu Kalkan[2], Turhan Kahraman[2], Arzu Genç[3], Melike Batum[4], Beril Donmez Colakoglu[5]

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[3] *Dokuz Eylul University Faculty of Physical Therapy and Rehabilitation, Physical Therapy and Rehabilitation, İzmir, Turkey*
[4] *Manisa Celal Bayar University Faculty of Medicine, Department of Neurology, Manisa, Turkey*
[5] *Dokuz Eylul University Faculty of Medicine, Department of Neurology, İzmir, Turkey*

O 112 Detection of antalgic gait simulations using an AI model in forensic medicine: A lie detector for walking

Semra Topuz[1], Ali İmran Yalçın[1], Muhammed Zeyit Alemdar[2], Emre Nuri İğde[3], Elif Kırdı[4], Şulenur Yıldız[4], Fatih İnci[5], Engin Demir[6], Ali Rıza Tümer[7]

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[5] *Ankara Bilkent City Hospital, Orthopedics and Traumatology, Ankara, Turkey*
[6] *Hacettepe University, Faculty of Engineering- Department of Computer Engineering, Ankara, Turkey*
[7] *Hacettepe University, Faculty of Medicine- Forensic Medicine, Ankara, Turkey*

O 113 Machine learning-based classification of FAIS patients from healthy subjects and feature analysis using explainable AI

Farshad Samadi Kohnehshahri[1,2,3], Katrin Dätwyler[2,4], Andrea Merlo[3], Nicola Maffiuletti[2], Rita Stagni[1], Renate List[2]

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[3] *OPA Sol et Salus, Gait and Motion Analysis Laboratory, Torre Pedrera- Rimini, Italy*
[4] *ETH Zurich, Institute for Biomechanics, Zurich, Switzerland*

O 114   **AI applications and data annotation practices in clinical gait analysis: Initial insights from a survey of ESMAC and GAMMA members**

Djordje Slijepčević[1], Sara Ladner[1], Peter Judmaier[1], Matthias Zeppelzauer[1], Andreas Kranzl[2], Brian Horsak[3,4]

[1]   St. Pölten University of Applied Sciences, Institute of Creative Media Technologies, St. Pölten, Austria
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[3]   St. Pölten University of Applied Sciences, Center for Digital Health & Social Innovation, St. Pölten, Austria
[4]   St. Pölten University of Applied Sciences, Institute for Health Sciences, St. Pölten, Austria

O 115   **Inter-rater agreement of systematic gait data interpretation in children with cerebral palsy using the GAIT.SCRIPT tool**

Koen Wishaupt[1,2], Sidney Foendoe[1], Sarah Dekker[1,3], Anouk van Westrhenen[1], Han Houdijk[4], Annemieke Buizer[1,5,6], Marjolein van der Krogt[1,6]

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[4]   University Medical Center Groningen, Department of Human Movement Sciences, Groningen, Netherlands
[5]   Amsterdam University Medical Center, Emma Children's Hospital, Amsterdam, Netherlands
[6]   Amsterdam Movement Sciences, Rehabilitation & Development, Amsterdam, Netherlands

O 116   **Gait phase importance in affected side prediction for cerebral palsy via gradient-based analysis**

Joao Antonio Candido Ramos[1,2], _Hugues Vinzant[1,2]_, Lionel Blondé[2], Stéphane Armand[3], Alexandros Kalousis[2]

[1]   University of Geneva, Computer Science, Geneva, Switzerland
[2]   University of Applied Sciences and Arts Western Switzerland, Management Information Technology, Geneva, Switzerland
[3]   Geneva University Hospitals and University of Geneva, Kinesiology Laboratory, Geneva, Switzerland

O 117   **Duration of muscle contraction as a key variable in FXS children classification from typically developing peers: an Unsupervised approach**

Federica Beghetti[1], Fabiola Spolaor[2], Valentina Liani[2], Roberta Polli[2], Damiano Varagnolo[1], Zimi Sawacha[1]

[1]   Università di Padova, Dipartimento di Ingegneria dell'Informazione, Padova, Italy
[2]   Università di Padova, Dipartimento della Salute della Donna e del Bambino, Padova, Italy

Parallel Session:
17) Musculoskeletal conditions
10:30–11:45, Kleiner Hörsaal

Chairs: Arve Opheim (Norway), Corina Nüesch (Switzerland)

O 118   **Lower limb joint moments in children with haemophilia**

Michael Warwick[1], Ann McCarthy[2], Trupti Bhandari[3], Jonathan Noble[4], Adam Shortland[4]

[1]   Guys and St Thomas NHS Foundation Trust, Clinical Engineering, London, United Kingdom
[2]   Royal Free London NHS Foundation Trust, Physiotherapy, London, United Kingdom
[3]   Evelina London Children's Hospital, Paediatric Physiotherapy, London, United Kingdom
[4]   Guys and St Thomas NHS Foundation Trust, Gait Laboratory, London, United Kingdom

O 119   **Impact of mild leg length discrepancy on pelvic alignment and gait compensation in children**

Harald Boehm[1,2], Chakravarthy Dussa[3]

[1]   Treatment Center Aschau gGmbH, Orthopaedic Hospital for Children, Aschau im Chiemgau, Germany
[2]   Faculty of Engineering and Health, HAWK University of Applied Sciences and Arts, Göttingen 37075, Germany
[3]   Department of Orthopaedics and Trauma Surgery- Musculoskeletal University Center Munich MUM-, LMU University Hospital- LMU Munich-, Munich 81377, Germany

O 120   **The influence of childhood sitting habits on gait patterns in individuals with joint hypermobility: A pilot study**

Yeşim Karakurt[1], Nazif Ekin Akalan[2,3], Kübra Önerge[2,3,4], Shavkat Sevket Kuchimov Nadir[2,3,5]

[1]   Istanbul Kultur University-, Faculty of Health Sciences- Division of Physiotherapy and Rehabilitation-, Istanbul-, Turkey
[2]   Istanbul Kultur University, Faculty of Health Sciences- Division of Physiotherapy and Rehabilitation, Istanbul, Turkey
[3]   Istanbul Kultur University, Motion Analysis Center, Istanbul, Turkey
[4]   Hacettepe University, Graduate School of Health Sciences- Physical Therapy and Rehabilitation Division, Ankara, Turkey
[5]   Bogazici University, Institute of Biomedical Engineering, Istanbul, Turkey

O 121   **Thorax and hip kinematics can differentiate limping severity in patients undergoing total hip arthroplasty**

Kevin Rose-Dulcina[1,2], Xavier Gasparutto[1,2], Noor Al Alem[1,2], Morgan Gauthier[3],

Didier Hannouche[3], Stéphane Armand[1,2]

[1]   Geneva University Hospitals and Geneva University, Kinesiology Laboratory, Geneva, Switzerland
[2]   Geneva University Hospitals and Geneva University, Research Center of skeletal Muscle and Movement, Geneva, Switzerland
[3]   Geneva University Hospitals, Division of Orthopaedics and Trauma Surgery, Geneva, Switzerland

O 122 **Combined effects of increased femoral anteversion and hypermobility on pelvis and hip biomechanics**

Adnan Apti[1,2], _Sevket Shavkat Nadir Kuchimov_[2,3], _Nazif Ekin Akalan_[1,2], _Burcu Semin Akel_[1,2], _Irem Opan_[4], _Abdullah Osman_[5]

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[3] Bogazici University, Institute of Biomedical Engineering, Istanbul, Turkey
[4] Istanbul Kultur University, Institute of Graduate Studies- Department of Physiotherapy and Rehabilitation, Istanbul, Turkey
[5] Istanbul University - Cerrahpasa, Institute of Graduate Studies, Istanbul, Turkey

O 123 **Observational study of kinematic and ground reaction force distribution strategies in individuals with knee osteoarthritis**

Denise-Teodora Nistor[1], _Samuel Bird_[2], _Kate Button_[1], _Mohammad Al-Amri_[1]

[1] Cardiff University, School of Healthcare Sciences, Cardiff, United Kingdom
[2] Cardiff and Vale University Health Board, Centre for Healthcare Evaluation- Device Assessment- and Research, Cardiff, United Kingdom

O 124 **Validation of Mobilize-D algorithm for estimating of cadence, stride length and walking speed in patients undergoing total hip arthroplasty**

Xavier Gasparutto[1], _Noor Alalem_[1], _Kevin Rose-Dulcina_[1], _Didier Hannouche_[2], _Stéphane Armand_[1]

[1] Geneva University Hospitals and Geneva University, Kinesiology Laboratory, Geneva, Switzerland
[2] Geneva University Hospitals and Geneva University, Division of Orthopaedic Surgery and Musculoskeletal Trauma Care, Geneva, Switzerland

Keynote Lecture 3:
Prof. Henri Lorach (NeuroRestore, Bloch & Courtine)
11:45–12:30, Grosser Hörsaal

Brain-controlled spinal cord stimulation to restore voluntary movements after spinal cord injury

Henri Lorach[1]

[1] University of Lausanne, Defitech Center for Interventional Neurotherapies (NeuroRestore), Lausanne, Switzerland

Awards & Closing Ceremony
12:30–12:45, Grosser Hörsaal

List of Posters

Day 1 – Posters I.
Topic groups: CS01, 02, 03, 04, 06, 07, 09, 10, 12, 13, 17

Group CS01 Clinical Case Study

P 001 **A 3D gait analysis in a girl with right hemipelvectomy after Ewing's sarcoma: A case study**

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P 002 **Case Study: Treatment of a child with fibular hemimelia and clubfoot**

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P 003 **Understanding the gait kinematics and functionality in an 8-year-old children with Freeman-Sheldon syndrome**

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P 004 **Idiopathic toe walking diagnosed by dynamic foot gait analysis in an adult patient with bilateral heel pain**

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P 005 **Do patients with midfoot Charcot deformity have better walking efficiency than patients with Ankle/Hindfoot Charcot deformity?**

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P 006 **The role of high-demand tasks in 3D gait analysis to enhance the functional assessment of Total Knee Arthroplasty designs**

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Group 02 Adult neurological disorders

P 007 **Anticipatory postural adjustments after stroke: Characteristics and influencing factors — A systematic review**

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P 008 **Effects of multi-targeted electrical stimulation on gait and spasticity in an East Asian individual with multiple sclerosis**

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P 009 ☆ **Predicting gait outcomes in stroke rehabilitation: The contribution of balance control**

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P 010 ☆ Effects of single- and dual-task training on dual-task gait costs in Parkinson's disease: A randomized controlled pilot trial

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P 011 Associations between executive functions and gait speed during single and dual tasks in Parkinson's disease

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P 012 ☆ Turning task in unilateral cerebral palsy: Does direction matter?

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P 013 Muscle synergies alterations during irregular ground walking in Parkinson's Disease with and without freezing of gait

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P 014 Smartphone accelerometry as a tool for assessing bradykinesia in Parkinson's disease

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P 015 From healthy to myotonia: Tibialis anterior muscle mechanics revealed by shear wave elastography

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P 016 A real-time, joint-specific index to detect compensatory gait in stroke rehabilitation

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P 017 An IMU-based ambulatory assessment for spinal decompressive surgery

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P 018 **Sensory integration is partially associated with gait speed in healthy community-dwelling older adults: A systematic review and Meta-analysis**

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Group 04 Coordination and motor control

P 019 **☆ Active lidar-assisted spatial sensing: Performance analysis of a bio-inspired system for navigation and obstacle detection**

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P 020 **Disparities in gait between adolescent idiopathic scoliosis patients and healthy matched controls**

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P 021 **Moving towards personalization of split belt treadmill-based treatment of gait asymmetry**

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P 022 **Does the brain utilize the force sensation to determine joint position?**

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P 023 **A virtual reality balance assessment for central sensory-motor integration**

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P 024 **☆ VAF-CI: Quantifying low-dimensional global movement complexity during a novel lower limb motor learning task**

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P 025 **☆ Modeling tibialis anterior muscle activity of children with cerebral palsy during passive stretches using plantar flexor sensory feedback**

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P 026 **Influence of surface type on postural sway and tibialis anterior muscle tone in quiet bipodal stance**

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Group 06 Imaging and anatomy

P 027 **Experimental investigation of muscle-tendon unit geometry in lower-limb muscles during gait analysis: A Scoping Review**

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Group 07 Modelling and simulation

P 028 **Effect of selecting different biomechanical gait model on outcomes of the AI model**

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P 029 **Biomechanical analysis of lower limb muscle forces during lifting of incremental loads using OpenSim**

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P 030 **Investigation of lumbar paraspinal muscle loading in relation to arm swing variability during human gait**

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P 031 **☆ Determining the minimal level of detectable change (MLDC) in normalised muscle tendon lengths (nMTL) and velocities (nMTV) from reliability studies**

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P 032 **A 6DOF knee musculoskeletal model for estimating neuromuscular control patterns in drop landing: An EMG-informed approch**

Maria Dalle Vacche[1], Giulio Rigoni[1], Davide Pavan[1], Fabiola Spolaor[1], Zimi Sawacha[1]

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P 033 **Influence of anthropometric variation in femur and tibia length on muscle-tendon length during walking**

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P 034 **Classification of daily human activities based on IMU data and machine learning models**

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Group 09 Musculoskeletal disorders

P 035 ☆ **Effects of symmetric and asymmetric sitting postures on lower extremity rotational walking kinematics in healthy adolescents**

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P 036 **Impact of obesity on gait mechanics in chronic low back pain: Insights from spatiotemporal parameters and vertical ground reaction force**

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P 037 **Effects of increased femoral anteversion with asymmetric and neutral sitters on pelvis and hip rotational gait kinematics: A pilot study**

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P 038 **Foot posture and gait parameters in individuals with bruxism: A preliminary study**

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P 039 ☆ **Effect of cervicothoracic inhibition test on cervical painful ranges in individuals with mechanical cervical pain**

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P 040 **Machine learning-driven preoperative evaluation of lower limbs in spinal sagittal imbalance using IMU sensors**

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P 041 **Machine learning for surgical outcome evaluation: Gait analysis in spinal sagittal imbalance patients**

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P 042 **Investigation of the effects of hamstring stretching exercises on pelvic posture and biomechanics**

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P 043 Machine learning model for discriminating hallux valgus based on plantar pressure measurements

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P 044 The effect of asymmetric femoral anteversion on gait kinematics: A pilot study

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P 045 Can pelvic protraction contribute ipsilateral knee flexion in stance during walking in children with increased femoral anteversion?

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P 046 Investigation of knee flexion effect of ipsilateral pelvic drop at stance for individuals with lumbar scoliosis during walking

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P 048   Short-term treatment outcomes for idiopathic toe walking

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P 049   Gait is minimally affected in adults with soft tissue sarcoma after limb-salvage surgery

Catherine Huenaerts[1], Hazem Wafa[2], Tijl Dewit[1,3], Ines Vandekerckhove[1,3], Ineke Verreydt[3], Lotte Antonissen[1], Lennart Scheys[4], Lieven Moke[2], Kaat Desloovere[1,3]

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P 050   Effects of myofunctional rehabilitation on pain, function and spinal characteristics in temporomandibular joint dysfunction: Preliminary study

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P 051   ☆ Spine-hip adaptation during the sit-to-stand transitioning in patients with adult spinal deformity

Moustapha Rteil[1], Yamen Beyh[1], Mohamad Hajj Youssef[1], Ibrahim Hamati[1], Michel Ammouri[1], Josef Lattouf[1], Abir Massaad[1], Mohamad Karam[1], Rami Rachkidi[1], Ayman Assi[1,2]

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Group 10 Sports and sports injury

P 052   Sex and side differences in muscle stiffness of lower limb muscles in healthy adults

Tsubasa Tashiro[1], Tomohito Okugaki[1], Takeru Abekura[1], Seiya Kumamoto[1], Satoshi Arima[1], Noriaki Maeda[1]

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P 053   ☆ **Dynamic postural stability and compensation strategy for balance deficit during lateral jump landing in individuals with chronic ankle instability**

Yuka Eto[1], Yuta Suzuki[2], Shiori Kojima[3], Ayane Kanemaru[4], Tsubasa Tashiro[1], Satoshi Arima[1], Noriaki Maeda[1]

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P 055   **Which joint drives ball velocity during throw-in in football? A kinematic analysis**

Ayşegül Yılmaz[1], Nazif Ekin Akalan[2,3], Sertac Yakal[4], Turker Sahinkaya[4], Shavkat Kuchimov[2,3], Fethi Murat Altunay[5], Mehmet Guven Gunver[6]

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P 056   **Impact of reduced hip internal rotation on frontal plane lower extremity biomechanics during landing in volleyball players with pes planus**

Eyyub Gece[1], Nazif Ekin Akalan[2,3], Sevket Shavkat Nadir Kuchimov[3,4]

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P 057   **Postural stability during specific postural tasks in more and less experienced female figure skaters**

Jana Krizanova[1]

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P 058   **Biomechanical influence of anthropometry on stroke technique and power output in malaysian elite rowers: A motion and force analysis approach**

Fakhrizal Azmy Nasruddin[1,2,3], Muhamad Noor Harun Muhamad Noor Harun[1,4], Ardiyansyah Syahrom[4], Mohd Azizi Abdul Rahman[3,5], Hadafi Fitri Mohd Latip[1], Mohamad Azlan Shapie[2,3], Mohd Hafiz Awang Hassim[2,3], Ab Aziz Mohd Yusof[6]

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P 060   **The effect of kinesio taping on running kinematics in recreational runners with shin splint: A pilot study**

Irem Tamer[1], _Fatih Eren Oluç_[2], Ilknur Naz Gursan[3], Umut Ziya Koçak[3]

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P 061   **Acute effects of insoles on trunk-pelvis and hip kinematics during jumping in athletes with flexible pes planus: A plot study**

Nazif Ekin Akalan[1,2], Shavkat Nadir Kuchimov[2,3], Kevser Burma[4], Umut Şener[1], Melih Bayın[1], Dilara Durmaz[1], Tuana Keçoğlu[1], Eyyub Gece[5]

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P 062   **Altered drop vertical jump mechanics in increased femoral anteversion**

Sevket Shavkat Nadir Kuchimov[1,2], Adnan Apti[2,3], N. Ekin Akalan[2,3], Semin Akel[2,3], Irem Opan[4]

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P 063 **Biomechanical analysis of single-leg drop landing in individuals with joint hypermobility**

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P 064 ☆ **Three-dimensional glenohumeral joint reaction forces during a middle direct punch in elite taekwondo athletes: A musculoskeletal modeling analysis**

Bita Mohammadkhani Omran[1], Reza Karimi[2], Najmeh Asadimoghaddam[3], Meroeh Mohammadi[4]

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Group 12 Orthopedic problems – osteoarthritis and joint disorders

P 047 **Pain-driven gait alterations: The role of the movement deviation profile in evaluating joint kinematics and pain intensity in patellofemoral pain**

Felipe Reis De Souza[1], Gabriel Jacob Navarro[1], Otávio Cardoso Leite[1], Cid André Fidelis de Paula Gomes[1], Silvio Antonio Garbelotti Jr.[2], József Barton Gabor[3], Paulo Lucareli[1]

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P 065 **The immediate effect of myofascial release of the iliotibial band on knee kinematics in dynamic knee valgus**

Esra Demirpençe[1], İmge Nas[1,2], Halenur Evrendilek[1,3]

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P 066 Longitudinal evaluation of functional mobility in different knee prostheses using an inertial sensor

Andrei Machado Viegas Trindade[1], Rodolfo Borges Parreira[2], Leonardo Pinheiro Rezende[3], Roberta Carneiro Toledo[2], Christopher Atsushi Iwamoto Moribayashi[4], Fabio Felippe Silva[4], Fernanda Silva Azevedo Nora[5], Helder Rocha da Silva Araujo[6], Veronica Cimolin[7], Cláudia Santos Oliveira[8]

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P 067 Pain, fear, and movement: Cognitive-behavioural connections in patellofemoral pain

Otávio Cardoso Leite[1], Gabriel Jacob Navarro[1], Nara Lourdes Moreno Rodrigues[1], Cid André Fidelis de-Paula-Gomes[1], Caio Sain Vallio[2], Gábor József Barton[3], Paulo Lucareli PT- PhD[1]

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P 068 Neural network analysis reveals no kinematic effects of knee braces in patellofemoral pain during step-down tasks

Gabriel Jacob Navarro[1], Otávio Henrique Cardoso Leite[1], Nara Lourdes Moreno Rodrigues[1], Cid André Fidelis de-Paula-Gomes[1], Gábor József Barton[2], Paulo Lucareli PT- PhD[1]

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P 069 Assessment of muscle activity in individuals with temporomandibular disorder using the Movement Deviation Profile

Maria Priscila de Souza Monteiro Pugliese[1], Daniela Aparecida Biasotto-Gonzalez[1], Silvio Antonio Garbelotti Junior[2], Gábor József Barton[3], Paulo Lucareli PT- PhD[1], Fabiano Politti[1]

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P 070 **In patients with cervical pain, which segments does the inhibition technique applied to increase cervical range?**

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P 071 **Neuromuscular adaptations of quadriceps to cane use during gait in obese women with knee osteoarthritis**

Bita Mohammadkhani Omran[1], Reza Karimi[2], Najmeh Asadimoghaddam[3], Maryam Namazifard[4], Meroeh Mohammadi[5]

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Group 13 Foot and ankle

P 072 **Differences in intersegmental foot and ankle motion between patients with varus and valgus ankle osteoarthritis**

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P 073 **Feasibility of foot posture assessment within ankle-foot orthoses using weight-bearing CT scans and plantar pressure insoles**

Gaia van den Heuvel[1,2], Ruud H. H. Wellenberg[2,3], Jaap J. van Netten[2,4], Marian H. van Beers-Tas[4], Wouter Schallig[1,5], Mario Maas[2,3], Marjolein M. van der Krogt[1,2], Annemieke I. Buizer[1,2,6]

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P 074 **Relationship between Foot Mobility Magnitude and navicular bone displacement during the stance phase of gait**

Tomohito Okugaki[1], Tsubasa Tashiro[1], Satoshi Arima[1], Ryoya Takaue[1], Tatsuyoshi Hara[1], Maeda Noriaki[1]

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P 075   **Video-based screening for clubfoot recurrence: A first step towards remote assessment**

Åsa Thelaus[1,2], Salik Kashif[3], Eva Broström[1], Alaric Aroojis[4], Steven Frick[5], Stephanie Böhm[1,2], Josefine Naili[1,6]

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P 076   **Assessing forward propulsion and propulsion efficiency and their association with ankle dorsiflexion range of motion in idiopathic toe walking**

Ching Hang Chiu[1], Julie Stebbins[2], Amy Zavatsky[3], Alpesh Kothari[2]

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P 078   **Development of foot outward rotations in children with clubfoot treated with the Ponseti method and the foot abduction brace**

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Group 17 Normative studies

P 079   **☆ How small can your sample size get for reliable EMG reference data considering age and gender variations?**

Mehrdad Davoudi[1], Firooz Salami[1], Cornelia Putz[1], Sebastian Wolf[1]

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P 080   **Three-dimensional gait analysis of typically developing children in the MENA region**

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P 081 **Understanding normative gait spatio-temporal variability: A multi-factor analysis of age, gender, and BMI**

Rifdatun Ni'mah[1], Dimas Adiputra[1], Helisyah Nur Fadhilah[2], Mohamad Azlan Mohamed Shapie[3], Mohd Hafiz Awang Hassim[3]

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P 082 ☆ **Clustering gait and functional measures in adults**

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P 083 **Establishment of normative lower limb kinematic and spatio-temporal gait parameters in healthy Malaysian adults using three-dimensional motion capture**

Mohamad Azlan Bin Mohamed Shapie[1,2], Hafez Hussain[1,3], Mohd Hafiz Awang Hassim[1,2], Muhammad Iqzaham Ismail[2], Norhayati Abdul Hadi[3], Nazrin Mazehi[1,3], Zainizam Rasid[1,3], Hafiza Abas[4], Fakhrizal Azmy Nasruddin[1,2], Mohammed Rafiq Abdul Kadir[5]

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P 084 **Isokinetic dynamometers and inverse dynamics provide different moments for the ankle and knee joints**

Juha-Pekka Kulmala[1]

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P 085 ☆ **Insights into early gait development: Variability and harmony during supported and independent walking of typically developing 12-month-olds**

Gouwy Kaat[1,2], Mathieu Bourgeois[1,2], Kevin Rose-Dulcina[1,2], Alice Bonnefoy-Mazure[1,2], Stéphane Armand[1,2], Nathalie De Beukelaer[1,2]

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P 087 **Clusters of frontal knee angle range-of-motion in healthy people during level walking**

Klaus Widhalm[1,2], Harald Penasso[1], Sebastian Durstberger[1], Lukas Maul[1], Peter Putz[1], Hans Kainz[3], Peter Augat[2,4]

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Day 2 – Posters II.
Topic groups: 01, 05, 08, 10, 11, 14, 15

Group 01 Paediatric neurological disorders

P 088 **Is gait symmetrical in hereditary spastic paraplegia?**

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P 089 **Selective motor control correlates with gait function in patients with hereditary spastic paraplegia**

Lane Wimberly[1], Lizabeth Bunkell[2], Kelly Jeans[2]

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P 090 **Gait deviations in hemiplegic cerebral palsy: Comparing outcomes of achilles lengthening with and without medial hamstring lengthening**

Lane Wimberly[1], Lizabeth Bunkell[2], Kelly Jeans[2], Cinthya Meza[2]

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P 091 **Comparing Theia3D markerless to marker-based lower limb kinetics during walking in typically developing and children with cerebral palsy**

Jutharat Poomulna[1], Brian Knarr[1], Vivek Dutt[2], David Kingston[1]

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P 092 **Free-living daily physical activity levels in children with cerebral palsy: An EMG and accelerometry study**

Maija Piiparinen[1], Pedro Valadão[1], Tiina Savikangas[1], Ying Gao[2], Francesco Cenni[3], Taija Juutinen[1]

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P 093 **Crouch gait in children with cerebral palsy: A cross-sectional study**

Harriet Hughes[1], Gabriela Gonzalez Chan[1], Cherry Kilbride[2], Rachel Rapson[1], Jonathan Marsden[1]

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P 094 **A scoping review exploring variables associated with crouch gait in ambulatory children with cerebral palsy**

Harriet Hughes[1], Rachel Rapson[1], Cherry Killbride[2], Jonathan Marsden[1]

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P 095 **Joint kinematic and kinetic variability in children with periventricular and intraventricular brain lesions**

Nathalie Alexander[1], Melissa Köckemann[2], Christoph Künzle[2], Eugen Boltshauser[2], Stephan Waelti[3], Philip Julian Broser[2]

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P 096 **☆ Retrospective analysis of hamstring lengthening in children with cerebral palsy: Muscle-tendon-length as base for identifying surgical indications and assessing outcomes**

Katharina Bednar[1], Alexander Krebs[2], Robert Csepan[2], Margit Gföhler[1], Bernhard Attwenger[3], Andreas Kranzl[3,4]

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P 097 ☆ **Longitudinal relation between muscle impairments and gait pathology in growing boys with Duchenne muscular dystrophy**

Ines Vandekerckhove[1], Geert Molenberghs[2,3], Marleen Van den Hauwe[1,4], Nathalie Goemans[4,5], Liesbeth De Waele[4,5], Anja Van Campenhout[5,6], Friedl De Groote[7], Kaat Desloovere[1,8]

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P 098 **Artificially induced temporary muscle weakening methodology to determine the related gait alterations for cerebral palsy children: A long-term concept**

Kubra Onerge[1,2,3], _Nazif Ekin Akalan_[1,3], Rukiye Sert[4], Buse Ayan[5], Şevket Shavkat Nadir Kuchimov[3,6], Fuat Bilgili[7,8]

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P 099 ☆ **The effect of orthoses in children with cerebral palsy with limited rehabilitation services in Suriname: A preliminary evaluation**

Fenna Walhain[1], Ruby Chin A Fat[2], Delaja Plein[3], Chelsi Bardan[3], Seemran Nandlal[4], Roché van Ritter[5], Koen Desloovere[5], _Kaat Desloovere_[6], Anja Van Campenhout[7]

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P 100 **The complex interplay between knee kinematics, motor functioning and passive knee range of motion in children with spastic cerebral palsy**

Inti Vanmechelen[1], Edwin Råsberg[1], Eva Broström[1], Cecilia Lidbeck[1]

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P 101 **Can a treadmill tell us more than the eye? Quantitative gait assessment using C-Mill in clinical practice**

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P 102 **☆ From motion to muscle: Exploring the influence of movement mechanics on muscle activation patterns in common exercises**

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P 103 **Implementing motor control theory in robotic orthosis design for children's gait recovery**

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P 104 **Investigating the biomechanical importance of gracilis muscle weakness on gait kinematics for healthy individuals**

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P 105 Influence of hip adductor weakness on lower limb biomechanics during walking in adolescents with cerebral palsy: A pilot study

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P 106 Cerebellar transcranial direct current stimulation and gait training in children with Down Syndrome: Preliminary results

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P 107 ☆ Transcranial direct current stimulation and treadmill training in children with spastic cerebral palsy: Predictors of positive effects

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P 108 Lower limb muscle fatigue after uphill walking in children with unilateral spastic cerebral palsy

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P 109 Impact of spasticity markers during gait on daily mobility in children with cerebral palsy: Insights from EMG and musculoskeletal modeling

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P 110 Paediatric rehabilitation: Integrated instrumental evaluation of the upper limb in children with neuromotor disabilities

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P 111 **Postural sway during and within seconds after basic mobility tasks in relation to sway during static standing in young adults**

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P 112 **Investigation of the effects of myopia and occlusion disorders on balance**

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P 113 **Postural balance while standing at virtual heights in children with and without cerebral palsy**

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P 114 **Analyzing gait stability in Parkinson's disease: Event-specific differences in margin of stability**

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P 115 **☆ Immediate and retained effects of single-session multidirectional perturbation-based training on balance recovery in older adults**

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P 116 ☆ **Comparing clinician-measured, marker-based, and markerless leg length and margin of stability measures in children with and without cerebral palsy**

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P 117 ☆ **From real-world mobility to predictive simulation: Fall risk assessment**

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Group 08 Movement analysis methodology

P 118 **Fine-tuning from a clinical gait analysis dataset to predict the effect of botulinium toxin injection during gait**

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P 119 **Separation of patients with reverse total shoulder arthroplasty from controls based on their Movement Deviation Profiles derived from shoulder kinematics**

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P 120 **The relationship between walking speed and lower limb kinematics in typically developing children across age groups in the MENA region**

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P 121 A comparison of different methods of centre of mass extraction across various walking tasks

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P 122 Individuals with hip Osteoarthritis walk with less symmetry and stability during natural walking measured by a single trunk IMU

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P 123 Speaking the same gait language? Inter-professional agreement between physiotherapists and pediatric orthopedic surgeons on Edinburgh Visual Gait Score assessments

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P 124 Virtual reality and motion capture in orthopedic rehabilitation: A preliminary study using the eMotion system

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P 125 Surgical impact on walking patterns in patients with sagittal spinal misalignment

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P 126 **AI-driven markerless gait analysis for orthotic fine-tuning: Reliability and validity of OpenPose for knee angle measurement in clinical practice**

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P 127 **Usability and feasibility of the web-based GAIT.SCRIPT interpretation tool for systematic gait analysis in children with cerebral palsy**

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P 128 **Clustering using fuzzy C-means: Challenges in identifying clinically meaningful clusters in the gait of stroke patients**

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P 129 **Quantifying gait smoothness: Are all metrics equivalent?**

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P 130 **☆ Comparative evaluation of monocular deep learning pose estimation and IMU-based systems for remote kinematic assessment**

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P 131 **The influence of clothing on the accuracy of markerless 3D gait analysis using DeepLabCut**

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P 132 **How do different event detection algorithms affect the global scores – gait profile score and gait deviation index?**

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P 133 **Evolving trends in motion analysis: The last 5 years of the ESMAC congress**

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P 134 **☆ Usability of iGait@Healthcore: Gait analysis from a smartphone for use in clinical routine**

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P 135 **Lower leg angular velocity for offline EMG-inertial recordings synchronization and gait segmentation in healthy and cerebral palsy subjects**

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P 136 **Usability of capturing upper limb movement kinematics in clinical routine: Do wearable sensors beat markerless motion capture?**

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P 137 **IMU-based balance assessment: Alternative or complementary to gold standard GRF-based posturography?**

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P 139 **☆ Identifying the type and number of sensors required to capture behavioral complexity in daily activities in chronic stroke patients**

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P 140 **Can real-time feedback correct your exercise biomechanic? Investigating an AI-supported telerehabilitation platform**

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P 141 **Can IMU-based systems match clinician Edinburgh Visual Gait Score ratings? A gait assessment study in cerebral palsy patients**

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P 142 **More than just weight: The biomechanical impact of carrying sensitive objects during gait**

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P 143   Non-invasive gait analysis approaches for Parkinson's disease: Assessing the reliability of various markerless methods

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P 144   Dynamic ankle joint stiffness assessment in typical and pathological gait

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P 145   Balancing accuracy and wearability: IMU configuration effects on human activity recognition in patients undergoing total hip arthroplasty

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P 146   Biomechanical evaluations of bodyweight exercises: A scoping review of current practices

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P 147   Comparison of running kinematics between recreational runners with and without shin splints: A pilot study

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P 148 **Test-retest reliability of inertial measurement unit-derived trunk and arm swing metrics across different walking conditions**

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P 149 **Exploring lifting coordination in chronic low back pain using modified vector coding: A methodological case-based approach**

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P 150 **Test-retest reliability of gait event detection methods using optical motion capture and a single sacral inertial measurement unit**

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P 151 **Reliability assessment of markerless-driven inverse kinematics and inverse dynamics in Parkinson's disease**

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P 152 **Kinematic signatures of knee joint reaction load patterns during self-paced level walking in healthy adults**

Harald Penasso[1], Sebastian Durstberger[1], Lukas Maul[1], Peter Putz[1], Klaus Widhalm[1]

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P 180 **EMG-driven machine learning approach for gravel terrain classification**

Muhamad Amirul Sunni Bin Rohim[1], Nurhazimah Nazmi[1,2], Shin-Ichirou Yamamoto[2], Muhammad Kashfi Shabdin[3,4], Zool Hilmi Ismail[1], Mohd Azizi Abdul Rahman[1], Mohamad Azlan Mohamed Shapie[5], Fakhrizal Azmy Nasruddin[5]

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Group 11 Physical activity methodology

P 153 **Acute effects of gait training watching virtual reality video of faster speed on comfortable walking**

Itsuki Hamaguchi[1], Yuta Suzuki[2], Katsuki Shudo[3], Yusei Sugino[4], Ryunosuke Sugiyama[5], Tsubasa Tashiro[1], Satoshi Arima[1], Noriaki Maeda[1]

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P 154 **Barriers and facilitators of the sedantary parents' exercise behaviours**

Mehmet Yanardag[1], Tezcan Cavusoglu[2], Caner Ozboke[3], Günay Yıldızer[3], Cihan Aygün[3], Ramazan Akdoğan[1]

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P 155 **Stepping forward in recognising activities of daily living: Sharing labelled datasets between individuals for identifying unsupervised clustering**

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P 156 **Functional motor assessments in children with Autism Spectrum Disorder: A test-retest study of neuromuscular power, strength, and balance**

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P 157 **Effectiveness of model-based digital intervention for physical activity behavior of parents with and without children with special needs**

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Group 14 Upper extremity and trunk

P 158 **Relationship of regional sagittal and frontal spinal curvatures and mobility with respiratory function and balance in adolescents with idiopathic scoliosis**

Sevtap Günay Uçurum[1], Hilal Uzunlar[1], Müge Kırmızı[1], Karya Polat[2], Ebru Özdemir[3], Aynur Şahin[2], Kevser Şevik Kaçmaz[1], Derya Özer Kaya[1]

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P 159 **☆ The effects of different shoulder angles on high plank exercise on upper extremity biomechanics**

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P 160 **Exercise-specific shoulder muscle activation across kettlebell variations: A pilot EMG study**

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P 161 Applicability of a 3D hand model to investigate the spastic hand

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P 162 Investigation of the effect of mental fatigue on hand reaction time in patients with Parkinson's disease: A pilot study

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P 163 Radiographic assessment of shoulder imbalance and its correlation with gait patterns

Maria Rassam[1], Ayman Assi[1,2], Mohamad Karam[1], Maria Asmar[1], Emmanuelle Wakim[1], Maria Karam[1], Marc Mrad[1], Abir Massaad[1], Ismat Ghanem[1], Rami Rachkidi[1]

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P 164 Alterations of the flexion relaxation phenomenon in asymptomatic participants induced by hamstring mobility restrictions

Anne Tabard-Fougère[1,2,3], _Kevin Rose-Dulcina[1,2,3]_, Andreas Tsoupras[1,3], Stéphane Genevay[4], Nicolas Lauper[1,3], Dennis Dominguez[1,3], Stéphane Armand[1,2,3]

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P 165 Stand up and walk! Are we missing information about trunk movement?

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P 166 **Wireless surface EMG assessment of trunk muscle activity during lifting with a passive back-support exoskeleton in elite firefighters**

Fakhrizal Azmy Nasruddin[1,2], Mohamad Azlan Shapie[1,2], Mohd Hafiz Awang Hassim[1,2],
Helmi Rashid[3], Hazreen Haizi Harith[4], Hadafi Fitri Mohd Latip[5], Mohd Najeb Jamaludin[6]

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P 167 **Spinal fusion limits 3D trunk movement, but improves gait in patients with adult spinal deformity**

Stephanie Huysmans[1], Rachel Senden[2], Jacobs Eva[1], Annemarijn Weber[1], Paul Willems[3],
Rik Marcellis[2], Mark Van den Boogaart[1], Kenneth Meijer[3], Paul Willems[1]

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P 168 **☆ From metrics to meaning: Exploring clinical perspectives on upper limb kinematics in neurological rehabilitation**

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P 169 **Acceptability of wearing IMU sensors in a home environment in stroke patients**

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P 170 **The contribution of the dominant arm to gait dynamics: A reliability study of arm swing using wearable sensors**

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P 171 **Association of reaction time with trunk muscle strength, endurance and balance in healthy young adults**

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P 172 ☆ **Assessing trunk control in dyskinetic cerebral palsy using pressure mapping: A pilot study**

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Group 15 Prosthetics and orthotics

P 173 **Forefoot relief by reducing plantar pressure when walking with precompressed spring hinged AFOs: Wound prevention in patients with vascular diseases**

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P 174 **Effects of functional electrical stimulation and time on gait in short- and long-term users with neurological impairments**

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P 175 **Clinical recommendations for orthotic provision and follow-up: A Norwegian evidence-based guideline**

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P 176   Influence of walking conditions on spatiotemporal and kinematic gait symmetry following unilateral transtibial amputation

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P 177   The effects of a prosthetic walking practice using virtual reality on gait kinematics: A pilot study

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Group 10 Sports and sports injury

P 059   ☆ Sport-specific biomechanical and neuromuscular profiles during sidecutting: A comparative study of young female handball and football players

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