



INTERNATIONAL
SOCIETY FOR
POSTURE & GAIT
RESEARCH

ISPGR 2015 Detailed Program

Please note that the program is Subject to change

Sunday, June 28

Morning Pre-Congress Workshops

11:00 – 14:00

- WS 1.** Physical behaviours and persons with mobility limiting conditions - how do we get person centred outcomes from body-worn accelerometer data
- WS 2.** Introduction to simple and complex movement disorders - A video journey
- WS 3.** The Ronnie Gardiner Method - challenges for cognition and coordination using rhythm and music as facilitating prompts
- WS 4.** A new age for health and fitness professionals: Assessment of postural and core stability
- WS 5.** Binocular eye movement control and posture

Afternoon Pre-Congress Workshops

15:00 – 18:00

- WS 6.** Controversies in mechanisms underlying Parkinsonian gait: What environmental obstacles can tell us about PD?
- WS 7.** Advanced rehabilitation technology to study and treat movement disorders
- WS 8.** Visual dependence and visual vertigo: Interpretation, diagnosis and treatment
- WS 9.** Consensus meeting on clinical stabilometry
- WS 10.** Aging, Central Nervous System and Mobility: Intervention Strategies to Prevent and Improve Late Life Gait Decline

Opening of World Congress

19:00 – 19:30

ISPGR World Congress Opening Ceremony

19:30 – 20:30

Opening Keynote – Daniel Wolpert, University of Cambridge, UK
Probabilistic models of sensorimotor control and decision making
Chair: **Brian Day**, University College London, UK

20:30 – 24:00

Opening Reception

Monday, June 29

- 10:30 – 11:30 **Keynote presentation – Karen Adolph**, Infant Action Lab, USA
How Infants Learn To Walk (And How They Don't)
Chair: **Christine Assaiante**, CNRS, France
- 11:30 – 13:30 **Poster Session 1 & Exhibitors (refreshments provided)**
- 13:30 – 14:30 **Lunch & Exhibitors**
- 14:30 – 16:30 **Oral Sessions 1-3**

O.1 Brain Imaging

Co-Chairs:

Klaus Jahn, University of Munich, Germany

Caterina Rosano, University of Pittsburgh, USA

- O.1.1** *The role of the frontal lobe in complex walking tasks in healthy older adults and patients with Parkinson's disease: An fNIRS study*
Inbal Maidan, Sourasky Medical Center, Israel
- O.1.2** *Anisotropy of human vertical and horizontal navigation in real space: behavioral and PET correlates*
Andreas Zwergal, University of Munich, Germany
- O.1.3** *A cerebral dissociation between motor imagery of gait and dynamic balance in Parkinson's disease*
Murielle Ferraye, Radboud University, Netherlands
- O.1.4** *Cortical control of human gait function: Similarities and differences in corticomuscular coherence during treadmill walking and overground walking*
Luisa Roeder, Queensland University of Technology, Australia
- O.1.5** *Increased functional connectivity of the central executive network in patients with Parkinson's disease with a history of falls*
Keren Rosenberg-Katz, Tel Aviv Sourasky Medical Center, Israel
- O.1.6** *The integrative role of the pedunculopontine nucleus in human gait*
Marie Laure Welter, Groupe Hospitalier Pitié-Salpêtrière, ICM, France
- O.1.7** *Increase in frontal brain activation during dual task walking after training using a Smartphone-based biofeedback system in patients with Parkinson's disease: a fNIRS study*
Jeffrey Hausdorff, Tel Aviv Sourasky Medical Center, Israel
- O.1.8** *Brain activity related to stabilizing gait in young and older adults.*

Sjoerd Bruijn, VU University Amsterdam, Netherlands

O.2 Sensorimotor control

Co-Chairs:

Jaak Duysens, KU Leuven, Belgium

Mike Cinelli, Wilfrid Laurier University, Canada

O.2.1 Both standing and postural threat decrease Achilles tendon reflex inhibition from tendon electrical stimulation.

Brian Horslen, The University of British Columbia, Canada

O.2.2 The role of hip abductor proprioception in mediolateral balance control of gait in older adults

Mina Arvin, VU University Amsterdam, Netherlands

O.2.3 Full Body Kinematic Analysis of Altered Vestibular Reflexes Caused by Postural Threat **Jonathan de Melker Worms**, Manchester Metropolitan University, United Kingdom

O.2.4 Cervical stretch reflexes in normal subjects and bilateral vestibular patients

Adolfo Bronstein, Imperial College London, United Kingdom

O.2.5 Noisy galvanic vestibular stimulation improves dynamic walking stability in healthy subjects

Klaus Jahn, University of Munich, Germany

O.2.6 Precise coding of ankle rotation by lower-limb muscle spindle afferents

Ryan Peters, University of British Columbia, Canada

O.2.7 Contribution of plantar-surface mechanoreception in recovery from a slip

Stephen Perry, Wilfrid Laurier University, Canada

O.2.8 Detecting the height of the ground underfoot

Marie-Laure Mille, Toulon University, France

O.3 Learning, relearning, and adapting

Co-Chairs:

Marjorie Woolacott, University of Southern California, USA

Kristen Hollands, Liverpool John Moores University, UK

O.3.1 The Development of Trunk Control and its Relation to Reaching: A Longitudinal Study **Jaya Rachwani**, University of Oregon, United States

O.3.2 The effects of practice and disuse on quadrupedal gait in infants, children, and adults **Beatrix Vereijken**, Norwegian University of Science and Technology, Norway

O.3.3 Adults with Autism Spectrum Disorders do not use vision for postural control.

Susan Morris, Curtin University, Australia

O.3.4 *Gymnastics skill level affects sensory reweighting processes during quiet stand in children.*

Albert Busquets, Institut Nacional d'Educació Física de Catalunya - Barcelona, Spain

O.3.5 *Gender affects the development of motor learning ability*

Kristin Musselman, Toronto Rehabilitation Institute/University of Toronto, Canada

O.3.6 *Estimating metabolic cost during non-steady state walking*

Jessica Selinger, Simon Fraser University, Canada

O.3.7 *Body lateropulsion and visual vertical tilts in unilateral midbrain infarctions: a lesion-behavior mapping and FDG-PET study*

Marianne Dieterich, Ludwig-Maximilians University of Munich, Germany

O.3.8 *Effects of Levodopa on adaptation of reactive stepping in people with Parkinson's disease*

Daniel Peterson, Oregon Health & Science University, USA

16:30 – 17:00 **Refreshment Break**

17:00 – 19:00 **Parallel Symposia 1-3**

S.1. *Directing motor control research in the 21st century: Should investigations be guided by strong hypothesis-driven questions (YES) or open to discovery of unexpected findings (NO)? - A Yes/No debate*

Chair & Discussant: **Stephen Prentice**, University of Waterloo, Canada

Participants:

Michael Cinelli, Wilfrid Laurier University, Canada

Jacques Duysens, KU Leuven, Belgium

Stephen Robinovitch, Simon Fraser University, Canada

Yuri Ivanenko, Fondazione Santa Lucia, Italy

S.2. *Balance implants or external prostheses or perturbation training: Which is the wave of the future?*

Chair & Discussant: **John Allum**, University Hospital Basel, Switzerland

Participants:

Nils Guinand, University Hospital Geneva, Switzerland

Kathleen Sienko, University of Michigan, USA

Clive Pai, University of Illinois, USA

John Allum, University Hospital Basel, Switzerland

S.3. *Free-living activity monitoring in older persons - which outcomes are meaningful?*

Co-Chair: **Kristin Taraldsen**, Norwegian University of Science and Technology, Norway
Co-Chair: **Jorunn Helbostad**, Norwegian University of Science and Technology, Norway
Discussant: **Malcolm Granat**, School of Health Sciences, University of Salford, UK

Participants:

Stephen Lord, University of New South Wales, Australia
Mirjam Pijnappels, VU University Amsterdam, Netherlands
Silvia Del Din, Newcastle University, UK
Jeffrey Hausdorff, Tel Aviv Sourasky Medical Center, Israel

Tuesday, June 30

- 10:00 – 10:30 **ISPGR Committees Information Meeting**
- 10:30 – 11:30 **Keynote presentation – Amy Bastian**, Kennedy Krieger Institute, USA
Learning and relearning locomotor patterns
Chair: **Jeff Hausdorff**, Tel Aviv Sourasky Medical Center, Israel
- 11:30 – 13:30 **Poster Session 2 & Exhibitors (refreshments provided)**
- 13:30 – 14:30 **Lunch & Exhibitors**
- 13:45 – 14:15 **AGM**
- 14:30 – 16:30 **Oral Sessions 4-6**

O.4 Neurological diseases

Co-Chairs:

Lynn Rochester, Newcastle University, UK
Alice Nieuwboer, KU Leuven, Belgium

- O.4.1** *Does a startling acoustic stimulus accelerate postural responses to balance perturbations in stroke survivors?*
Milou Coppens, Radboud University Medical Center, Netherlands
- O.4.2** *Are delayed postural responses to perturbations associated with poorer balance capacity in people after stroke?*
Digna de Kam, Radboud University Medical Center, Netherlands
- O.4.3** *Altered functional connectivity correlates with motor and cognitive control measures within clinical subtypes of Parkinson's disease*
Griet Vervoort, KU Leuven, Belgium
- O.4.4** *Perturbation-based balance training improves step quality in people with chronic stroke*
Jolanda Roelofs, Radboud University Medical Centre, Netherlands

O.4.5 *Effects of training with a new Smartphone-based biofeedback system (CuPiD) on mobility in people with Parkinson's disease: Clinical outcomes*

Pieter Ginis, KU Leuven, Belgium

O.4.6 *Postural control alterations in healthy LRRK2 G2019S mutation carriers*

Yoav Beck, Tel Aviv Sourasky Medical Center, Israel

O.4.7 *Gait is a sensitive marker of motor progression in early Parkinson's disease: A longitudinal correlational analysis*

Brook Galna, Newcastle University, United Kingdom

O.4.8 *Measuring and minimizing walking-induced fatigue in people with Multiple Sclerosis.*

James McLoughlin, Flinders University, Australia

O.5 Cognitive, attentional and emotional influences

Co-Chairs:

Karen Li, Concordia University, Canada

Will Young, Brunel University, UK

O.5.1 *Prioritization during dual tasking on a circular path is different from prioritization on a straight walking path in older people with poor cognitive flexibility*

Markus Hobert, University of Tuebingen, Germany

O.5.2 *A virtual reality avatar interaction (VRai) platform for context specific return to function assessment: an example of complex locomotor navigation for the military*

Bradford McFadyen, Laval University, Canada

O.5.3 *Anxiety affects stance and locomotion in acrophobia and phobic postural vertigo*

Thomas Brandt, German Center for Vertigo and Balance Disorders, Germany

O.5.4 *Balance impairment and its relation to cognition in a diverse population of elderly fallers and non-fallers*

Kim Dockx, KU Leuven, Belgium

O.5.5 *Are attentional demands of walking affected by variations in lateral balance? A comparison of young and older adults*

Masood Mazaheri, MOVE Research Institute Amsterdam / VU University Amsterdam, Netherlands

O.5.6 *Gait rather than cognition dominates the association with physical activity in incident Parkinson's disease*

Sue Lord, Newcastle University, United Kingdom

O.5.7 *Stay focused! The effects of attentional focus on motor and motor-cognitive dual-task performance after acquired brain injury*

Elmar Kal, Heliomare Rehabilitation, Netherlands

O.5.8 *Association between Smartphone-based long-term Monitoring Outcomes and Traditional Clinical Assessment Tools in Community-Dwelling Older People*

Sabato Mellone, University of Bologna, Italy

O.6 Coordination of posture and gait

Co-Chairs:

Rebecca Reed-Jones, University of Prince Edward Island, Canada

Vivian Weerdesteyn, Radboud University Medical Centre, Netherlands

O.6.1 *Adjustment of the step prior to foot-off in a visuomotor task*

Matthew Bancroft, University College London (UCL), United Kingdom

O.6.2 *Foot placement adjustment is not always required for recovery in perturbed walking*

Mark Vlutters, University of Twente, Netherlands

O.6.3 *Motor cortex excitability, attention networks and muscle synergies during single & dual task walking in elderly*

Eling de Bruin, IBWS ETH, Switzerland

O.6.4 *Multi-limb coordination for lateral stabilization of one-legged balance*

Amy Wu, University of Michigan, United States

O.6.5 *The effect of restricting arm movements on gait stability in children with Cerebral Palsy and Typically Developing children*

Pieter Meyns, UGent, Belgium

O.6.6 *Rhythm perception and production abilities relate to motor impairment and temporal gait variability after stroke.*

Kara Patterson, University of Toronto, Canada

O.6.7 *Do muscle strength and force development differ according to functional abilities in healthy elderly men?*

Charlotte Pion, Université du Québec à Montréal, Canada

O.6.8 *Vertical ground reaction force during walking: Are they related to bone mineral density left right asymmetries?*

Marina Brozgot, Sourasky Medical Center, Israel

16:30 – 17:00 **Refreshment Break**

17:00 – 19:00 **Parallel Symposia 4-6**

S.4 *Near-Infrared Spectroscopy: Applications of Functional Neuroimaging during Gait and Posture*

Chair: **Andrea Rosso**, University of Pittsburgh, USA

Participants:

Patrick Sparto, University of Pittsburgh, USA

Hugh Nolan, Trinity College Dublin, Ireland

Andrea Rosso, University of Pittsburgh, USA

Anat Mirelman, Center for the Study of Movement, Cognition and Mobility,
Israel

S.5 *From Mathematical Theory to Practical Application: Using the Dynamical Systems Approach to Develop Clinical Assessments and Rehabilitative Techniques*

Chair: **Joshua Liddy**, Purdue University, USA

Participants:

Denise Cruise, Purdue University, USA

Brian Cone, University of North Carolina at Greensboro, USA

Michael Busa, University of Massachusetts Amherst, USA

Vivien Marmelat, Universite Montpellier, France

S.6 *Gazing from bench to beyond: visual control of gait in the real-world and methodological challenges*

Chair: **Lynn Rochester**, Newcastle University, UK

Participants:

Mark Hollands, Liverpool John Moores University, UK

Rodrigo Vitorio, Sao Paulo State University, Brazil

Rebecca Reed-Jones, University of Prince Edward Island, Canada

Sam Stuart, Newcastle University, UK

Wednesday, July 1

- | | |
|---------------|---|
| 10:00 – 14:30 | Excursions |
| 14:30 – 15:30 | Keynote presentation – James Lackner , Brandeis University, USA
<i>Experiments in unusual force environments unmask our postural adaptations to earth gravity</i>
Chair: Geoff Wright , Temple University, USA |
| 15:30 – 16:30 | Promising Young Scientist Award Talk – Melvyn Roerdink ,
MOVE Research Institute Amsterdam, The Netherlands
<i>So you think you can ... walk?</i> |
| 16:30 – 17:00 | Refreshment Break |
| 17:00 – 19:00 | Parallel Symposia 7-9 |

S.7 *Structure of Variability as a Window into what Matters during Mobility*
Chair: **Young-Hui Chang**, Georgia Institute of Technology, USA

Participants:

Young-Hui Chang, Georgia Institute of Technology, USA

Jeffrey Hausdorff, Sackler School of Medicine, Tel Aviv University, Israel

Nicholas Stergiou, University of Nebraska, USA

S.8 *Control of Balance during Walking in Humans and Robots*

Chair: **John Jeka**, Temple University, USA

Participants:

Andy Ruina, Cornell University, USA

Hendrik Reimann, Temple University, USA

Jessie Huisinga, University of Kansas Medical Center, USA

Manoj Srinivasan, Ohio State University, USA

S.9 *Impact of hearing impairment on postural control in old age*

Chair: **Karen Li**, Concordia University, Canada

Participants:

Jennifer Deal, John Hopkins University, USA

Karen Li, Concordia University, Canada

Jennifer Campos, University of Toronto, Canada

Nicoleta Bugnariu, University of North Texas, USA

19:00 – 21:00 **Drinks & Honorary Member Presentations**

Thursday, July 2

10:00 – 10:30 **Round Table with the ISPGR President**

10:30 – 11:30 **Keynote presentation – Lena Ting**, Emory University, USA
Neuromechanics of gait and balance rehabilitation
Chair: **Shirley Rietdyk**, Purdue University, USA

11:30 – 13:30 **Poster Session 3 & Exhibitors (refreshments provided)**

13:30 – 14:30 **Lunch & Exhibitors**

14:30 – 16:30 **Oral Sessions 7-9**

O.7 Methods and Models

Co-Chairs:

Sjoerd Bruijn, VU University Amsterdam, Netherlands

John Jeka, Temple University, USA

O.7.1 *Kinematic validation of the Interactive Walkway against a gold-standard reference system*

Daphne Geerse, MOVE Research Institute Amsterdam, Netherlands

O.7.2 *Where are the parameters? A sensitivity analysis of an inverted pendulum balance control model*

Tjitske Boonstra, Delft University of Technology, Netherlands

O.7.3 *Mechanisms of interpersonal sway synchrony and stability*

Raymond Reynolds, University of Birmingham, United Kingdom

O.7.4 *The human subthalamic nucleus recruits single neurons for kinematic control using different strategies for movements of upper vs. lower extremities*

Ariel Tankus, Tel Aviv Sourasky Medical Center and Tel Aviv University, Israel

O.7.5 *Ankle trajectories for the quality and variability of semi-free-living gait in older adults, using a single ankle-worn inertial sensor*

Kejia Wang, UNSW Australia, Australia

O.7.6 *Muscle activity during walking measured using FDG-PET and 3D MRI segmentations*

Vivian Weerdesteyn, Radboud University Medical Centre, Netherlands

O.7.7 *Effect of Lab Environment and Segment Angular Velocity on the Accuracy of Orientation Data Issued from Inertial Measurement of Motion in a Clinical Biomechanical Evaluation Context*

Karina Lebel, Université de Sherbrooke, Canada

O.7.8 *Muscle force prediction of the lower limb compared to surface EMG at different walking speeds in individual healthy subjects*

Ursula Trinler, University of Salford, United Kingdom

O.8 Sensorimotor dysfunction

Co-Chairs:

Antonio Nardone, Fondazione Salvatore Maugeri (IRCCS) and University of Eastern Piedmont, Italy

Joyce Fung, McGill University, Canada

O.8.1 *Relationship between postural sway and motion sickness in young and older adults during a simulated driving task*

Alison Novak, Toronto Rehabilitation Institute, Canada

O.8.2 *The effect of recurrent low back on trunk neuromuscular performance during complex motion tracking tasks*

Seyed Javad Mousavi, University of Sydney, Australia

O.8.3 *Further Study on Otolith Function and Head Stability During Gait*

Kazuo Ishikawa, Akita Graduate School of Medicine, Japan

O.8.4 *Neuromodulation of the sense of upright to improve dynamic balance after stroke*

Dominic Pérennou, Academic Hospital Grenoble, France

O.8.5 *Wearable sensor-based balance training in older cancer patients with chemotherapy-induced peripheral neuropathy: a randomized controlled trial*

Michael Schwenk, Robert-Bosch Hospital, Germany

O.8.6 *Effects of implantable peroneal nerve stimulation on energy expenditure, gait quality, participation and user satisfaction in patients with post-stroke drop foot using an ankle-foot orthosis*

Frank Berenpas, Radboudumc Nijmegen, Netherlands

O.8.7 *Standing slows the production of gaze shifts to double-step perturbations in the elderly*

Paul Stapley, University of Wollongong, Australia

O.8.8 *Recovery rates of balance control during stance and gait tests after an acute unilateral peripheral vestibular deficit.*

John Allum, University Hospital Basel, Switzerland

O.9 Falls and fall prevention

Co-Chairs:

Stephen Lord, Neuroscience Research Australia, Australia

Mirjam Pijnappels, VU University Amsterdam, Netherlands

O.9.1 *What you see is what you step: The horizontal-vertical illusion increases toe clearance in older adults during stair ascent*

Richard Foster, Nottingham Trent University, United Kingdom

O.9.2 *Gazing into thin air: dual-task costs of movement planning and execution during adaptive gait*

Toby Ellmers, Brunel University, United Kingdom

O.9.3 *Reduced functional limits of stability during lateral balance perturbations in older adult non-fallers and fallers*

Masahiro Fujimoto, Ritsumeikan University, Japan

O.9.4 *Reduction in older people's fall risk through home-based exergames targeting balance*

Kim Delbaere, University of New South Wales, Australia

O.9.5 *Very fast muscle activations during adjustment of tripping responses*

Zrinka Potocanac, KU Leuven, Belgium

O.9.6 *Fall risk reduction in chronic stroke survivors: Acquisition and retention of reactive adaptation to large-scale slip perturbations*

Tanvi Bhatt, University of Illinois at Chicago, United States

O.9.7 *A comparison of accuracy of fall detection algorithms (threshold-based vs. machine-learning) using waist mounted tri-axial accelerometer data*

Omar Aziz, Simon Fraser University, Canada

O.9.8 *Daily-life walking patterns from 1085 days of monitoring in older people with and without a history of falling*

Matthew Brodie, Neuroscience Research Australia, Australia

16:30 – 17:00 **Refreshment Break**

17:00 – 19:00 **Parallel Symposia 10-12**

S.10 *From neurophysiology to cognitive psychology: How does anxiety influence the regulation of posture and gait?*

Chair: **William Young**, Brunel University, UK

Participants:

Mark Carpenter, University of British Columbia, Canada

Mark Hollands, Liverpool John Moores University, UK

Thomson Wong, Hong Kong University

William Young, Brunel University, UK

S.11 *The Quest to Apply VR Technology to Rehabilitation: Tribulations and Treasures*

Chair: **Emily Keshner**, Temple University, USA

Co-Chair: **Joyce Fung**, McGill University, Canada

Participants:

Racheli Kizony, University of Haifa, Israel

Anouk Lamontagne, McGill University, Canada

Christopher Rhea, University of North Carolina at Greensboro

Geoffrey Wright, Temple University, USA

S.12 *Advanced measures of gait; why, and how, should we (not?) calculate them?*

Chair: **Sjoerd Bruijn**, VU University Amsterdam, The Netherlands

Participants:

Christine Wu, University of Manitoba, Canada

Nicholas Stergiou, University of Nebraska, USA

Philippe Terrier, Clinique Romande de Réadaptation, Switzerland

Espen Ihlen, Norwegian University of Science and Technology, Norway

20:30 – 1:30 **Closing Gala Dinner**

- End of 2015 World Congress -