PROGRAMME

XVIIth Conference – Marseille, FRANCE
May 29th to June 2nd

ISPGR 2005

International Society for Postural and Gait Research

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	Sunday 29 th	Monday 30th			Tuesday 31th			Wednesday 1st			Thursday 2nd			
7:30		REGISTRATION & *Morning coffee*			REGISTRATION & *Morning coffee*			*Morning coffee*			*Morning coffee*			7:30
8:30		Development of Balance Control	Proprioceptive Integration	Fear of Falling	Visuo-vestibular Integration	Parkinson's Disease (3)	Stroke (2) : Motor Deficits	Orthopaedic Disorders	Rehabilitation (1) : Training	Ageing (2) : Locomotion	Fall Prevention	Physiology of Motor Control (1)	Rehabilitation (2) : Sensory Aspects	8:30
9h30														9h30
9h45								N. TEASDALE			P. ELLAWAY			9h45
10h15														
10:30		*Coffee Break*			*Coffee Break*									10:30
10:45		H. FORSSBERG			A. BERTHOZ			*Coffee Break*			*Coffee Break*			
11h30								Biomechanics	Developmental Disorders (2) : Cerebral Palsy	Ageing (3) : Sensory Aspects	Spinal Control of Motor Activity	Physiology of Motor Control (2) : Pathological Models	Rehabilitation (3) : Locomotion	11:00
11h45		Brain Imaging and Motor Control	Cognitive and Mental influences (1) : Posture	Stroke (1): Sensory Deficits	Visual Functions	Developmental Disorders (1) : DCD and Autism	Modelling Approach (1) : Posture							12:00
13:00								Yes / No Debate			CONCLUDING REMARKS			12h15 12:30
		LUNCH AND ISPGR MEMBERS MEETING			LUNCH			LUNCH			TAKE AWAY LUNCH			13:00
14:00		N. GILADI			POSTER SESSION			M. LATASH						14:00
14:45														14:45
15:00		Parkinson's Disease (1)	Ageing (1) : Adaptative Strategies	Visual Flow and Virtual Reality				Modelling Approach (2) : Movements and Gait	Multisegmental Coordination (2) : Posture	Developmental Disorders (3) : Idiopathic Scoliosis	*Social Event*			15:00
16:15					R. EDGERTON									16:00 16:15
		Coffee Break						*Coffee Break*						
16:45		Parkinson's Disease and Basal Ganglia Disorders(2)	Vestibular Functions	Multisegmental Coordination (1) : Gait	Neurophysiology: Animal Models	Cognitive and Mental influences (2) : Gait	Techniques and Methods (1) : Posture	Anticipatory Control and Representation of Action	Multisensory Integration	Techniques and Methods (2) : Gait				16:45
17:00	REGISTRATION													
18:00	WELCOME WORDS C. ASSAIANTE and F. HORAK													18:30
18:30	F.CLARAC													
19:00	B.AMBLARD	*Reception in the City Hall - Vieux-Port*			*Pastis Party and Marey's Exhibition - Pharo Palace & Poster Award*			*Gala Dinner: La Presqu'Île Restaurant - Cassis & Esther Thelen Prize*						19:00
19:30	*Welcome Party*													

Sunday 29th May

17:00-18:00

Registration

18:00-19:30 Welcome Words

C. Assaiante ***F. Horak***

18:30-19:30 Lecture

Neuronal mechanisms for locomotion: from historical perspectives to new concepts

F. Clarac (Marseille, France) ***Chaired by J.R. Cazalets***

The strategies of segmental stabilization: development, adaptation and clinical evaluation

B. Amblard (Marseille, France) ***Chaired by JP. Azulay***

from 19:30 Welcome Party *Hôtel Mercure*

Sunday 29th May

Monday 30th May

7:30-8:30 ***Morning Coffee and Registration***

8:30-10:15 Thematic Sessions

Development of Balance Control

Chaired by C. Assaiante and H. Forssberg

Learning to walk modifies the whole locomotor skeleton. Functional meaning of these changes for posture and gait
C. Tardieu, P. Loridon, J. Hecquet, C. Boulay, G. Duval-Beaupère

The coupling between optical flow and neonatal stepping
M. Barbu-Roth, M. Trujillo, A. Després, D.I. Anderson, J. Provasi, L. Vaivre-Douret, D. Cabrol

Development of postural adjustments during infancy: evidence for a major transition at 6 months?
M. Hadders-Algra

Early development of postural adjustments in standing with and without support
A. Hedberg, C. Schmitz, H. Forssberg, M. Hadders-Algra

Gait kinematics in newly walking toddlers
N. Dominici, G. Cappellini, Y.P. Ivanenko, F. Lacquaniti

What visual information guides navigation around obstacles in children?
S. Tomescu, A.E. Patla

Attention demands of postural control in typically developing children
M.H. Woollacott, D. Reilly, S. Saavedra, P. van Donkelaar

Proprioceptive Integration

Chaired by P. Ellaway and J. Paillard

Bodies, strength, proprioception and balance
A.A. Butler, R.C. Fitzpatrick

Transcutaneous electrical nerve stimulation (TENS) to the calf muscles decreases postural sway in healthy adults
R. Dickstein, Y. Laufer

Recalibration to novel limb mechanics during treadmill walking
J.W. Noble, S.D. Prentice

Sensory contribution to postural control: a deafferented patient study
M. Vaugoyeau, S. Viel, I. Pellissier, C. Schmitz, J.P. Azulay, C. Assaiante

Intercepting head on moving targets: testing the relevance of proprioceptive information
J. Bastin, G. Montagne

Postural responses to neck-proprioceptive-vestibular input interaction during locomotion: effect of aging
N. Deshpande, A.E. Patla

Effects of altering head posture on podokinetic adaptation
M.A. Hollands, G.J. Chapman, E.L. Palframan, P. Beeching

Fear of Falling

Chaired by P. McKinley and BE. Maki

Devastating influence of fear of falling in the elderly
K. Delbaere, T. Willems, D. Cambier

Backward disequilibrium in elderly who fall: exaggerated postural tone of the extensor muscles or tilted biological vertical?
Y. Penven, P. Manckoundia, F. Mourey, J. van Hoecke, J.P. Didier, P. Pfitzenmeyer, D.A. Pérennou

Obstacle avoidance skills deteriorate with advancing age
J.E.J. Duysens, V. Weerdesteyn, B. Nienhuis

Foot and ankle characteristics associated with impaired balance and functional ability in older people
H.B. Menz, M.E. Morris, S.R. Lord

Older fallers are less able to rapidly generate rapid push-off reactions
M. Pijnappels, M.F. Bobbert, J.H. van Dieën

The importance of fear of falling on gait performance in elderly patients admitted for post-acute rehabilitation
E. Martin, S. Rochat, K. Aminian, M. Thomi, V. Besson, B. Najafi, C. Piot-Ziegler, C.J. Bula

Idiopathic "cautious" gait disorder of the elderly: more than fear of falling
M. Hadar-Frumer, N. Giladi, J.M. Hausdorff

10:15-10:45: Coffee Break & Trade Exhibition

Monday 30th May

Monday 30th May

10:45-11:30 Lecture

Exploring neural control mechanisms of skilled hand movements by brain imaging techniques

H. Forssberg (Stockholm, Sweden) ***Chaired by C. Schmitz***

11:45-13:00 Thematic Sessions

Brain Imaging and Motor Control

Chaired by H. Forssberg and JP Roll

Cerebral blood flow in the process of adaptation of standing posture control to floor oscillation measured by near-infrared spectroscopy
K. Fujiwara, K. Maeda

Cortical representation of stepping rhythms
H. Stolze, J. Raethjen, R.B. Govindan, S. Pohle, F. Kopper, G. Deuschl

Anticipatory postural adjustments in a bimanual load-lifting task: central aspects
C. Schmitz, P. Jenmalm, G. Westling, H. Ehrsson, H. Forssberg

Brain activation during subjective visual vertical judgment: a functional magnetic resonance imaging study
C. Lopez, M. Lacour, M. Ballester, M. Dumitrescu, J. Anton, B. Nazarian, L. Borel

Cognitive and Mental Influence: Posture

Chaired by S. Lord and N. Teasdale

Dual task effects on postural control during a continuous balance challenge
SB. Akram, JS. Frank, A. Patla, J.H.J. Allum

Different effects of spatial and non-spatial memory tasks on stepping reaction times
S.R. Lord, D.L. Sturnieks, R. St George, R.C. Fitzpatrick

Attention effects on upper limb assisted stabilisation of standing
A.M. Wing, S. Wilson, K. Elger

Postural sensitivity to optic flow in anxiety disorders
M.S. Redfern, J.M. Furman, R.G. Jacob

Postural control in patients with unilateral vestibular lesions is more impaired in the frontal than in the sagittal plane: a static and dynamic posturography study
Mbongo F, Patko T, Vibert N, Tran Ba Huy P, de Waele C, Vidal PP

Stroke: Sensory Deficits

Chaired by M. Gresty and J. Fung

Assessing the visual, the haptic, and the postural vertical in stroke patients: which modality best explains the postural disability?
D. Pérennou, G. Mazibrada, V. Chauvineau, R. Greenwood, M Gresty, J. Rothwell, A. Bronstein

Subjective visual vertical in spatial neglect: opposite deviation in patients with and without pusher syndrome
A. Saj, M. Rousseaux, J. Honoré

Evolution and effect of subjective visual vertical perturbation on balance after stroke
I. Bonan, K. Hubeaux, M.C. Leman, F. Colle, A. Yelnik

Influence of optic flow on speed and heading control of locomotion following stroke
A. Lamontagne, J. Fung, C. Paquette, BJ. McFadyen, J. Faubert

Balance during obstacle crossing following stroke
C. Said, P. Goldie, A.E. Patla, M.E. Morris, W. Sparrow, E. Culham

13:00-14:00: *Lunch and ISPGR Members Meeting*

Monday 30th May

Monday 30th May

14:00-14:45 Lecture

Gait and Mental Function

N. Giladi (Tel-Aviv, Israel) ***Chaired by B. Bloem***

15:00-16:15 Thematic Sessions

Parkinson's Disease

Chaired by L. Defebvre and B. Bloem

Turning strategy in patients with Parkinson's disease
M.K.Y. Mak, C.W.Y. Chan, A.E. Patla

Predictable postural perturbations in Parkinson's disease disclose impairment of anticipatory postural adjustments associated with history of falls
A. Nardone, M. Grasso, M. Schieppati

Control of dynamic stability during gait termination on a moving surface in Parkinson's disease
A.R. Oates, J.S. Frank, A.E. Patla, F.B. Horak

Adaptation of step initiation to postural assistance in patients with Parkinson's disease
M.W. Rogers, K.M. Martinez, M.E. Johnson, T. Simuni, M.L. Mille

Ambulatory analysis of gait and postures in Parkinson's disease: a novel method based on kinematics sensors
A. Salarian, H. Russmann, F.J.G. Vingerhoets, P.R. Burkhard, K. Aminian

Ageing: Adaptative Strategies

Chaired by PP. Vidal and F. Horak

Improving balance through imagery in frail elderly: a pilot study
E.D. de Bruin, D. Uebelhart, K. Murer

The elderly combat to strive for better physical health
K. Delbaere, T. Willems, D. Cambier

The effect of postural sway on responses to an unexpected perturbation in young and elderly adults
C.D. Tokuno, M.G. Carpenter, A. Thorstensson, A.G. Cresswell

Kinematic synergy adaptation to unstable support surface and equilibrium maintenance in aging adults
V. Tricon, S. Mesure, A. Le Pellec-Muller, J.P. Azulay, S. Vernazza-Martin

Visual Flow and Virtual Reality

Chaired by A. Patla and J. Blouin

Determining the effects of visual and self-motion inputs on intersegmental postural responses
R.V. Kenyon, S. Gurses, E.A. Keshner

Influence of optic flow on speed and heading control of locomotion due to ageing
A. Lamontagne, J. Fung, C. Paquette, J. Faubert, B.J. McFadyen

Visual flow in directions that differ from self-motion affects the automatic postural reactions
E.A. Keshner, J.W. Streepey, V. Gade

Posture-movement co-ordination when reaching in immersive visual virtual environment
O. Martin, L. Boissieux, B. Julian, J.D. Gascuel, C. Prablanc

16:15-16:45: *Coffee Break & Trade Exhibition*

Monday 30th May

Monday 30th May

16:45-18:30 Thematic Sessions

Parkinson's Disease and Basal Ganglia Disorders

Chaired by N. Giladi and A. Nieuwboer

Isolating vision and proprioception during locomotor navigation toward a target in PD
Q.J. Almeida, J.S. Frank, E.A. Roy, A.E. Patla, S. Spaulding, M.S. Jog

Proprioceptive neglect in PD
JP Azulay, H. Hakam, S. Mesure, M. Vaugoyeau

Postural responses to multidirectional stance perturbations in cerebellar ataxia
M. Bakker, J.H.J. Allum, C. Grüneberg, J.E. Visser, B.P.C. van de Warrenburg, B.Bloem

Akinesia in Huntington's disease: a biomechanical study of gait initiation
A. Delval, P. Krystkowiak, J-L. Blatt, E. Labyt, K. Dujardin, A. Destée, P. Derambure, L. Defebvre

Influences of cerebellar dysfunction on gait– quantification of the spatio-temporal characteristics for balance-related and limb kinetics-related impairments
W. Ilg, H. Golla, P. Thier, M.A. Giese

Characteristics of bilateral coordination of gait in patients with PD prone to freezing
M. Plotnik, G. Yogev, J.M. Hausdorff, Y. Balash, N. Giladi

Oral festination in PD
C. Moreau, C. Oszancak, J-L. Blatt, P. Derambure, A. Destée, L. Defebvre

Vestibular Functions

Chaired by M. Lacour and EA. Keshner

The hand does not need a map to find its way during body motion
J. Blouin, J.P. Bresciani, J.L. Vercher, G. Gauthier

Stroboscopic assessment of vestibular gain
R. St George, S. Hicks, R.C. Fitzpatrick

Time estimation during vestibular stimulation in darkness
A. Capelli, A. Priot, I. Israël

Effects of vestibular galvanic stimulation onto various monosynaptic reflexes and presynaptic inhibition in humans
Z. Ghanim, J.C. Lamy, I. Wargon, M. Baret, A. Pénicaud, S. Meunier, R. Katz

Motor strategy adaptation to microgravity during whole body pointing task execution
M. Tagliabue, S. Introini, M. Lencioni, A. Pedrocchi, G. Ferrigno, T. Pozzo

Changes of the dynamic visual vertical perception: a long-term sign of vestibular loss
L. Borel, C. Lopez, A. El Ahmadi, J. Magnan, M. Lacour

The "accelerated" tandem walking test – a new diagnostic screening tool
A.I. Mallinson, N.S. Longridge

Multisegmental Coordination: Gait

Chaired by A. Aruin and J. Duysens

Motor implementation of spatially-oriented locomotion in humans
G. Courtine, M. Schieppati

Coordination between head and body movements during steering tasks in human locomotion
H. Hicheur, S. Vieilledent, A. Berthoz

Adaptations of walking pattern on a compliant surface
M.J. MacLellan, A.E. Patla

Active control of knee flexion during the step off an unexpected compliant surface to maintain similar toe clearance
D.S. Marigold, A.E. Patla

Influence of voluntary arm movement during locomotion on stability margin
M.G.A. Ishac, A.E. Patla

Neck muscle fatigue and spatial orientation during stepping-in-place in humans
M. Schmid, M. Schieppati

Interaction of locomotor patterns with voluntary movement
G. Cappellini, Y.P. Ivanenko, N. Dominici, R.E. Poppele, F. Lacquaniti

from 19:00: Reception in City Hall: Vieux Port

Monday 30th May

Tuesday 31th May

7:30-8:30: *Morning Coffee*

8:30-10:15 Thematic Sessions

Visuo-Vestibular Integration

Chaired by K. Ishikawa and PP. Vidal

Visuo-vestibular influences involved in the 'broken escalator' gait aftereffect
K.L. Bunday, A.M. Bronstein

Saturation of postural responses to visual stimulation: results and model simulations
T. Mergner, G. Schweigart, C. Maurer, A. Blümle

Assessing vestibular contributions during changes in gait trajectory
P.M. Kennedy, E.K. Cressman, A.N. Carlsen, I.M. Franks, R. Chua

Gaze behavior associated with the response to an unexpected balance perturbation while walking in an unfamiliar environment
C. Cejka, T.A. Lee, W.E. McIlroy, B.E. Maki

Stance position determines direction of sway during performance of a visuo-postural coordination task
P. Koutakis, D. Boudouris, V. Hatzitaki

The effect of altered sensory feedback on balance and the timing of impulsive control
M. Lakie, I.D. Loram

Posture and gait are easily changed to ataxic in normal subjects
M. Takahashi, M. Sekine

Posture and Gait in Parkinson's Disease: Therapeutic Aspects

Chaired by J.M Hausdorff and JP Azulay

Improving the efficiency of physiotherapeutic care in Parkinson's disease: the PARKNET trial
S. Keus, B. Bloem, M. Nijkrake, I. Lim, R. Roos, G. Kwakkel, H. Berendse, M. Munneke

Methylphenidate treatment improves cognitive function and gait performance in patients with PD
E. Urihel, T. Herman, E.S. Simon, J.M Hausdorff, N. Giladi

The effects of guideline-based cueing therapy on gait related mobility in patients with Parkinson's disease: the RESCUE-project
A. Nieuwboer, F. Chavret, A.M. Willems, E.E.H. van Wegen, G. Kwakkel, L. Rochester, D. Jones

Learning a high-precision locomotor task in patients with Parkinson's disease
H.J.A. van Hedel, D. Waldvogel, V. Dietz

Effect of bilateral subthalamic nucleus stimulation (STN) on balance and finger control in Parkinson's disease (PD)
B.R. Bloem, A.M.P.M. Vrancken, J.E. Visser, R.A.J. Esselink, M.G. Carpenter, H.R. Siebner, J.H.J. Allum

Effects of subthalamic nucleus stimulation on kinematic and dynamic aspects of the initiation of gait in Parkinson's disease
P. Crenna, I. Carpinella, M. Rabuffetti, M. Rizzone, L. Lopiano, M. Ferrarin

Stroke: Motor Deficits

Chaired by D. Pérennou and A. Bronstein

Selected posturographic force-platform parameters can predict gait dependency in the postacute phase of stroke
A.C.H. Geurts, M. de Haart, J.E.J. Duysens

Voluntary control of EMG with or without visual FB in healthy subjects andv patients with poststroke hemiparesis
M. Shestakova, L. Lanskaya, L. Chernikova, M. Ioffe

Mobility and balance: different strokes for different folks? A comparison of test values in four different groups: young and healthy adults, geriatric- and acute stroke patients
B. Langhammer, B. Lindmark, J.K. Stanghelle

Improved spatio-temporal gait characteristics after rehabilitation including BWS training in chronic stroke
S.H. Peurala, E.B. Titianova, K. Pitkänen, J. Sivenius, I.M. Tarkka

Postural sway complexity changes with recovery after stroke: findings from dynamical analyses
M. Roerdink, M. de Haart, S. Donker, A.C.H. Geurts, P. Beek

Level of effort at the plantarflexors and hip extensors and flexor muscles in healthy subjects walking at different cadences
S. Nadeau, L.F. Requiao, M.H. Milot, D. Gravel, D. Bourbonnais, D. Gagnon

Quantification of the level of effort at the plantarflexors and hip extensors and flexor muscles in persons with hemiparesis walking at self-selected and maximal paces
M.H. Milot, S. Nadeau, D. Gravel

Tuesday 31th May

Tuesday 31th May

10:15-10:45: *Coffee Break & Trade Exhibition*

10:45-11:30 Lecture

Common principles underlying neural control of arm and locomotor trajectory formation

A. Berthoz (Paris, France) ***Chaired by J. Paillard***

11:45-13:00 Thematic Sessions

Visual Functions

Chaired by N.Vibert and A.Patla

Fixate, therefore I will not hit the oscillating doors
M.E. Cinelli, A.E. Patla

Rapid visuomotor processes drive the leg regardless of balance constraints
R.F. Reynolds, B.L. Day

Are there any collerations between oculomotor abnormality and gait in patients with spinocerebellar degeneration?
K. Ishikawa, Y. Wang, Y. Shibata, W.H. Wong, Y. Itasaka

Effect of visual and postural perturbation in VR-posturography
I. Pyykkö, E. Toppila, P. Forsman, T. Tossavainen, J. Starck

Binocular coordination of saccades at far and near viewing distance in children with vertigo
M.P. Bucci, Z. Kapoula, Q. Yang, D. Brémond-Gignac, S. Wiener-Vacher

Developmental Disorders: DCD & Autism

Chaired by M. Hadders-Algra and P.Crenna

The influence of dual-task demands on postural control in sitting in children with and without developmental coordination disorder (DCD)
L.M. Johnston, Y.R. Burns, S.G. Brauer

Anticipatory postural adjustments in a bimanual load-lifting task in children with developmental coordination disorder
M. Jover, L. Centelles, C. Schmitz, F. Brun, B. Chabrol, C. Assaiante

Managing sensory input: changes in postural control (PC) in typical children and those with DCD aged 6–8 years
P. Watter, Y.R. Burns

Motor deficits in autism: the role of action representation
C. Schmitz, H. Forssberg, C. Assaiante

Effects of a cognitive task on gait kinematics of habitual toe walkers
P. Crenna, A. Marzegan, L. Salvadori, L. Sandrin

Modelling Approach of Posture

Chaired by M. Latash and J. Jeka

"Natural" synergies provide the basis for equilibrium maintenance strategy during trunk movements in the sagittal plane in standing human
A.V. Alexandrov, P. Carlson-Kuhta, A.A. Frolov, F.B. Horak, J. Massion, S. Park

A throw-and-catch pattern in postural sway does not exclude continuous feedback control
C. Maurer, R.J. Peterka

Balance stability boundary for a feet-in-place strategy: the effect of time to peak ankle torque confirmed by a biomechanical model and an experimental validation
M. Simoneau, P. Corbeil

Effect of fatigue on postural sway dynamics: the viscoelastic modeling approach
M. Kuczynski, G. Czeczkowski

Postural sway of older female twins while doing math task
S. Pajala, P. Era, M. Koskenvuo, J. Kaprio, T. Rantanen

13:00-14:00: LUNCH & POSTER VIEWING

Tuesday 31th May

Tuesday 31th May

14:00-16:00 POSTER SESSION

16:00-16:45 Lecture

Automaticity and Plasticity: Key Factors which Facilitate Recovery of Posture and Locomotion following Spinal Cord Injury

R. Edgerton (Los Angeles, USA) Chaired by L.Vinay

16:45-18:30 Thematic Sessions

Neurophysiology: Animal Models

Chaired by L. Vinay and VR. Edgerton

The relation between motor deficit and proprioceptive loss after large-fibre sensory neuropathy
M. Hulliger, R.W. Banks

Feedback regulation of temporal muscle activation patterns for postural control before and after peripheral neuropathy
L.H. Ting, D. Lockhart, P. Stapley, J.M. Macpherson

Participation of the neostriatal cholinergic system in automation of motor skill in dogs
K.B. Shapovalova, J.V. Kamkina.

Neural organization and plasticity of locomotor control in the rhesus monkey
G. Courtine, D.L. Jindrich, R.R. Roy, H.L. McKay, L. Havton, J.A. Hodgson, T.J. Bernot, H. Yang, M. Tuszynski, V.R. Edgerton

Head, neck, and trunk stabilization in horses
D.C. Dunbar, R.W. Simmons, A. Zarcades

Serotonergic shaping of the locomotor pattern in the in vitro neonatal rat spinal cord
F. Ben Mabrouk, E. Pearlstein, JF. Pfieger, L. Vinay Dorofeev ?

Cognitive and Mental Influences on Gait

Chaired by N. Giladi and F. Horak

Gait disturbances in depressed patients: effects of pharmacologic therapy
D. Paleacu, A. Shutzman, N. Giladi, E.S. Simon, T. Herman, J.M. Hausdorff

Dual-task related stride time variability among demented older adults with dysexecutive functions
G. Allali, R.W. Kressig, F. Assal, F.R. Herrmann, O. Beauchet

Dual-task related changes in stride time variability among healthy young adults: result of walking speed or effect of attention-demanding task?
V. Dubost, R.W. Kressig, R. Gonthier, F.R. Herrmann, O. Beauchet

Does spatial orientation determine the accuracy of blindfolded subjects in a path completion task?
S. Vieilledent

Does the rhythm of walking influence time perception?
A. Sainthuile, F. Mégrot, I. Israël

Added Tasks Adversely Affect Gait and Balance in Depressed Elders
S. Brauer, S. Clewett, A. Brown

Techniques and Methods: Posture

Chaired by J. Franck anc J. Allum

EMG normalization in postural control research: is it necessary?
R. Brydges, J.S. Frank, D.A. Winter, W.H. Gage

New tools for evaluating more accurately postural stability
M. Dumitrescu, M. Lacour

A new index for assessing human postural control
B. Najafi, T. Kato, Ph. Vuadens, S.I. Yamamoto, K. Aminian

Changing the axes of rotation in a six degrees of freedom moving platform used for postural research
J. Vanrenterghem, G. Barton, M. Lake, A. Lees

from 19:00: Pastis Party and Marey Exhibition Pharo Palace ISPGR Poster Award

Tuesday 31th May

Wednesday 1st June

7:30-8:30: *Morning Coffee*

8:30-9:30 Thematic Session

Orthopaedic Disorders

Chaired by F. Launay and F. Prince

Joint angle monitoring in osteoarthritis patients using body-fixed sensors
H. Dejnabadi, B.M. Jolles, E. Casanova, P. Fua, K. Aminian

Functional evaluation of prosthetic foot kinematics during lower-limb amputee gait
H. Goujon, X. Bonnet, P. Sautreuil, M. Maurisset, D. Darmon, P. Fodé, F. Lavaste

Linking clinical causes of toe-walking and gait analysis
S. Armand, E. Watelain, M. Mercier, E. Roux, F.X. Lepoutre

Whole body responses after ankle inversions during walking
PHJ.A. Nieuwenhuijzen, J.E.J. Duysens

Rehabilitation: Training

Chaired by P. McKinley and M. Hulliger

An animal model of locomotor rehabilitation
M. Hulliger

The synchronisation of lower limb responses with a variable metronome: the effect of biomechanical constraints on timing
H.Y. Chen, A.M. Wing

Path integration: is there a difference in terms of gender and training?
J. Bredin, Y. Kerlirzin, I. Israël

Tai chi practitioners have better standing balance control after vestibular stimulation than healthy elderly
W. Tsang, C.W.Y. Hui-Chan

A randomised crossover trial: the effects of aerobic treadmill training on gait characteristics, walking speed and endurance and fatigue in individuals with multiple sclerosis
M.E.L. van den Berg, M.A. Newman, H. Dawes, D. Wade

Ageing: Locomotion

Chaired by A. Bronstein and M. Woollacott

Performance based and self-reported postural control and functional correlates of stair climbing capacity
A. Bergland

A prospective study of older adults with a high level gait disorder: evidence for a neurodegenerative process
V. Huber, N. Giladi, T. Herman, C. Peretz, L. Gruendlinger, J.M. Hausdorff

Challenges to whole-body stability during turning in older adults
J.R. Fuller, A.L. Adkin, L.A. Vallis

Walking is more like catching than tapping: gait in the elderly as a complex cognitive task
J.M. Hausdorff, G. Yogev, S. Springer, E.S. Simon, N. Giladi

09:45-10:30 Lecture

The cognitive processing loop and balance control: Some modeling and experiment data

N. Teasdale (Quebec, Canada) ***Chaired by L. Mouchnino***

10:30-11:00: *Coffee Break & Trade Exhibition*

Wednesday 1st June

Wednesday 1st June

11:00-12:00 Thematic Sessions

Biomechanics

Chaired by N. Teasdale and E. Viehweger

Analysis of the moment-angle loops at the ankle joint during normal walking: effect of gender and age
C. Frigo, P. Crenna

Is step-to-step transition of walking the source of increased energy demand using AFO's?
H. Houdijk, R.M. Hijlaard .

Do foot and ankle characteristics predict peak plantar forces and pressures during level walking in older adults?
H.B. Menz, M.E. Morris

The efficacy of a footwear insole designed to improve balance
S. Perry, A. Radtke, G.R. Fernie, B.E. Maki

Developmental Disorders: Cerebral Palsy

Chaired by C. Assaiante and P. Crenna

Treatment of postural dysfunction in children with cerebral palsy
E. Brogren-Carlberg, M. Hadders-Algra

Postural adjustments during reaching in children with cerebral palsy: dysfunction or adaptation?
M. Hadders-Algra, J. van der Heide

Does dual task performance cause decreased balance and cognitive function in children with cerebral palsy?
M. Woollacott, D. Reilly, S. Saavedra, P. Van Donkelaar

Attentional networks contributing to postural stability during dual tasks in typically developing children and children with cerebral palsy
S. Saavedra, M.H. Woollacott, P. van Donkelaar

Ageing: Sensory Aspects

Chaired by L. Borel and M. Gresty

Gaze position, distance and postural stability in young and old subjects
Z. Kapoula, F. Jurion, L. Thanh-Thun, Q. Yang

Visual context affects postural strategies in healthy and labyrinthine deficient elderly
E.A. Keshner, R.V. Kenyon

Effect of tactile ground surface indicators to the gait of elderly with normal vision
Y. Kobayashi, Y. Mine, T. Takashima, H. Fujimoto .

Effect of age on movement amplitude and frequency during heel−toe rocking
B. Elston, D. Mackey, S.N. Robinovitch

12:00: *YES/NO DEBATE*

Organized by B. Bloem

13:00: *LUNCH & POSTER VIEWING*

14:00-14:45 Lecture

Muscle synergies in postural preparation for action

M.L. Latash (University Park, USA) ***Chaired by C. Assaiante***

Wednesday 1st June

Wednesday 1st June

15:00 -16:15 Thematic Sessions

Modeling Approach of Posture: Movements and Gait

Chaired by A. Patla and A. Feldman

Threshold control as a solution to the posture-movement problem and modelling of complex movements
A.Feldman

Alternate foot-placement in the presence of a planar obstacle: model development
F. Bahrami, A.E. Patla

Velocity-dependent stability of gait for patients with balance impairments can be explained by biomechanical stabilization
W. Ilg, H. Golla, M.A. Giese

Interplay between intersegmental dynamics and the structure of the neuromuscular-skeletal system in a two-joint rhythmic arm movement
A. de Rugy, S. Riek, R.G. Carson

A motor planning model for complex movements: a simulation study
M. Tagliabue, A. Pedrocchi, T. Pozzo, G. Ferrigno

Multisegmental Coordination: Posture

Chaired by L. Mouchnino and M. Latash

Influence of automatic and voluntary knee movements on balance control
L.B. Oude Nijhuis, B.R. Bloem, M. Munneke, F. Honegger, J.H.J. Allum

The influence of artificially induced knee "locking" on balance corrects
M. van Meel, J. Hegeman, J.H.J. Allum, M. Majewsky, B.R. Bloem

Squatting: a universal resting posture that minimises instability?
B. Bril, L. Ferrufino

Influence of multijoint bilateral arm coordination tasks on the control of postural stance
A. Forner-Cordero, O. Levin, Y. Li, S.P. Swinnen

Trunk muscle response to support surface translation in sitting: normal control and effects of respiration
P.W. Hodges, M. Smith, A. Grigorenko, A.G. Cresswell, A. Thorstensson.

Developmental Disorders: Idiopathic Scoliosis

Chaired by F. Launay and M. Woollacott

Postural control in non-treated scoliotic subjects
M. Beaulieu, G. Dalleau, M. Simoneau, M. Eslami, C.-H. Rivard, P. Allard

Balance strategies during walking in young patients with idiopathic scoliosis
S. Mallau, M. Jover, G. Bollini, J.-L. Jouve, E. Viehweger, C. Assaiante

Postural control in adolescent idiopathic scoliosis and control subjects
K.F. Zabjek, C. Coillard, CH. Rivard, F. Prince

Adolescent idiopathic scoliosis (AIS): new findings
D. Rousié, P. Salvetti, Fr. Hamon, J.C. Baudrillard, O. Joly, A. Berthoz

16:15-16:45: ***Coffee Break & Trade Exhibition***

Wednesday 1st June

Wednesday 1st June

16:45-18:30 Thematic Sessions

Anticipatory Postural Control and Representation of Action

Chaired by J. Massion and M. Latash

Postural reactions in deep and superficial abdominal muscles to support-surface translations: the effect of expectation
M.G. Carpenter, C.D. Tokuno, A. Thorstensson, A.G. Cresswell

The influence of learning and vision on the "broken escalator phenomenon"
K.L. Bunday, R.F. Reynolds, M. Rao, S. Salman, D. Kaski, A.M. Bronstein

Influence of proprioceptive input during anticipatory postural adjustments in obstacle avoidance
L. Mouchnino, H. Ruget, G. Robert, J. Blouin, N. Teasdale

The effect of fatigue on anticipatory postural adjustments in normal subjects
S.L. Morris, G.T. Allison

Modulation of anticipatory postural adjustments in case of constant postural perturbation: effect of components of a motor action
T. Shiratori, A. Aruin

Equilibrium constraints but not joint constraints determine hand trajectory planning
C. Paizis, C. Papaxanthis, P.J. Stapley, T. Pozzo

Multisensory Integration

Chaired by T. Mergner and B. Amblard

Lateropulsion, pushing and verticality perception: a causal relationship?
DA. Pérennou, G. Mazibrada, V. Chauvineau, R. Greenwood, M.A. Gresty, J. Rothwell, A.M. Bronstein

Alteration in somatosensory reference during stance on a tilting platform
F. Hlavacka, J. Kluzik, F.B. Horak

Body tilt influence on the perceived gravity-referenced eye level in labyrinthine defective subjects
L. Bringoux, L.E. Mezey, M. Faldon, M.A. Gresty, A.M. Bronstein

Quiet stance sway reflects differences in preferred reference frames for postural orientation
L. Chiari, J. Kluzik, M. Paci, M. Rossi, F.B. Horak

Vestibular input is calibrated to a visual reference frame during walking
D.L. Sturnieks, L.R. Bent, R.C. Fitzpatrick

The dynamics of sensory reweighting: a temporal symmetry
K. Oie, S. Carver, T. Kiemel, J. Barela, J. Jeka

Techniques and Methods: Gait

Chaired by C. Frigo and S. Mesure

Gait regularity: measurement and significance
B. Auvinet, A.S. Alix, D. Chaleil, M. Brun, E. Barrey

Functional data based approach for gait improvement analysis
J.L. Bourriez, C. Preda, P. Krystkowiak, A. Duhamel, P. Derambure, L. Defebvre

Procrustes analysis, a new approach for quantitative analysis of ankle cyclogram in sprint specialities
L. Decker, S. Renous, C. Berge, X. Penin

New gait analysis method based on three accelerometers fixed to the sacrum
R.C. van Lummel, S.C. Heikens, R.M.A. van der Slikke, P. Thoumie

Assessment of biomechanical parameters with the gait training robot lokomat
M. Wirz, G. Colombo, V. Dietz, L. Lünenburger

Changes in lower limb joint contributions to energy generation and absorption during gait related to cadence and laterality
L. Teixeira-Salmela, S. Nadeau, M.H. Milot, D. Gravel, L.F. Requião

from 19:00 Gala Dinner : La Presqu'Ile Restaurant – Cassis Esther Thelen Prize

Wednesday 1st June

Thursday 2nd June

7:30-8:30: ***Morning Coffee***

8:30-9-30 Thematic Sessions

Fall Prevention

Chaired by S. Lord and JM.Hausdorff

Argentine tango dancing improves balance and complex task performance in at-risk elderly: a feasibility study
P. McKinley, V. Bednarczyk, A. Jacobson, A. Leroux, C. Rainville, M.L. Rossignol, J. Fung

An exercise program can improve obstacle avoidance skills in elderly
V. Weerdesteyn, H.A.F.M. Rijken, W. van Lankveld, J.E.J. Duysens

Influence of a secondary task on protective responses during sideways falls
S. Shankar, F. Feldman, A.E. Patla, S.N. Robinovitch

The influence of artificially increased trunk stiffness on the balance recovery after tripping
J.C.E. van der Burg, M. Pijnappels, J.H. van Dieën

Physiology of Motor Control

Chaired by JR. Cazalets and P. Ellaway

Muscle activity modulation in climbing stairs with non uniform risers
C. Frigo, M. Rabuffetti, A.E. Patla

Modulation of heteronymous recurrent inhibition between quadriceps and ankle muscles during walking in humans
J.C. Lamy, C. Iglesias, R. Katz, V. Marchand-Pauvert

Paradoxical muscle movements in human standing
I.D. Loram, C.N. Maganaris, M. Lakie

Modulation of multisegmental monosynaptic reflexes recorded from leg muscles during walking and running in human subjects
P. Dyhre-Poulsen, C. Dy, G. Courtine, S. Harkema, Y.P. Gerasimenko

Rehabilitation: Sensory Aspects

Chaired by L. Borel and EA. Keshner

Use of real-time bandwidth kinematic feedback in learning a cyclical lower limb movement skill
M. Hanlon, R. Anderson

Auditory feedback prosthesis for improving balance control during stance and gait tasks
J.H.J. Allum, J. Hegeman, L.B. Oude Nijhuis, F. Honegger

Audio biofeedback: sensory substitution for vestibular loss
F.B. Horak, M. Dozza, L. Chiari

Change in standing posture of lower limb amputees after muscle vibration: a potential tool for rehabilitation
C. Duclos, R. Roll, A. Kavounoudias, J.P. Roll, R. Forget

09:45-10:30 Lecture

The role of muscle spindle afferents and fusimotor neurones in gait control

P.H. Ellaway (London, United Kingdom) ***Chaired by J.P. Roll***

10:30-11-00: ***Coffee Break & Trade Exhibition***

Thursday 2st June

Thursday 2nd June

11:00-12:00 Thematic Sessions

Spinal Control of Motor Activity

Chaired by F. Clarac and J.R. Cazalets

Neuronal function in chronic spinal cord injury: divergent course of locomotor and reflex activity in humans
R. Müller, V. Dietz

Locomotor training with a driven gait orthosis in incomplete spinal cord injury
M. Wirz, T.G. Hornby, R. Rupp, V. Dietz

The postural control in incomplete spinal cord injured subjects during quiet standing with and without holding
KH. Lin, TW. Lu, PP. Hsu, SM. Yu

Task-dependent gain regulation of spinal proprioceptive circuits projecting to human wrist extensor motoneurons
C. Rossi-Durand, G. Nafati, A. Schmied

Physiology of Motor Control: Pathological Models

Chaired by S. Mori and J. Duysens

Experimentally induced low back pain leads to reduced spinal motion but does not interfere with the compensation for postural sway with reathing
M. Smith, M.W. Coppieters, P.W. Hodges

Balance control changes during "warming-up" in generalized myotonia patients
G. Drost, J. Nachtegaal, B.R. Bloem, B.G.M. van Engelen, J.H.J. Allum

Distal joint limitation induces conservation of temporal kinematics invariant
D. Laroche, J.F. Maillefert, P. Ornetti, Y. Ballay, T. Pozzo

Rehabilitation: Locomotion

Chaired by D. Pérennou and L. Bouyer

Posterior walkers for postural support during walking in spastic diplegia
L.C. Eve, M. Gough, A.E. McNee, A.P. Shortland

Do gait impairment correlates with strength reduction in ambulatory patients with multiple sclerosis?
P. Thoumie, D. Lamotte, S. Cantalloube, M. Faucher

A new appraisal of the biomechanics of gait for improved rehabilitation outcomes
D.S. McKenzie

12:15-12:30 Concluding Remarks

13:00-14:00: ***TAKE AWAY LUNCH***

15:00: ***Social Event***

Thursday 2st June

Poster Sessions

Session 1: Development of Balance Control

Chaired by M.Hadders-Algra and P. Crenna

P 1. Multiple obstacle avoidance strategies in adults and mid-childhood aged children
J.R. Berard, L.A. Vallis

P 2. Effect of multiple exposures to optical visual flows in infants
L. Lejeune, D.I. Anderson, M. Barbu-Roth

P 3. Sensory integration and postural control during ontogenesis
S. Mallau, S. Viel, C. Schmitz, C. Assaiante

P 4. Changes in the equilibrium of the standing on one leg at various life stages
S. Morioka, A. Matsuo, H. Takebayashi, K. Miyamoto, F. Yagi

P 5. Maturation of dynamic balance
R.M. Rine, J. Moore

P 6. Posture stability perfection and spectrum EEG mapping changes during gymnastics training in girls 4−7 years
A.B. Trembach, S.S. Sliva, E.I. Kurochkina

Session 2: Ageing and Balance Control

Chaired by C. Assaiante, L. Defebvre and S. Lord

P 7. Maintaining walking direction when combining gait with vision distraction in young and elderly
C.M. Bastiaanse, D. Frenken, L. Stolwijk, J.E.J. Duysens

P 8. Vision influences on postural stability in different ages
S.Y. Chen, P.W. Chiu, C.H. Lee, H.C. Lin

P 9. Kinematic and electromyographic analysis of rising from a chair during a "sit-to-walk" task in elderly subjects
P. Dehail, E. Bestaven, A. Mallet, B. Robert, F. Muller, I. Bourdel-Marchasson, J. Petit

P 10. Functional capacities evaluation during simulate working task
M. Gilles, G. Kreutz, M. Mouzé-Amady, E. Turpin-Legendre, J.C. Guélin, F. Horwat

P 11. Age related changes in coping strategies to postural threat
Y. Laufer, I. Chemel, Y. Barak

P 12. Dynamic electromyographic activities of lower extremity muscles in patients with osteoarthritis of the knees
K.B. Lim, H.J. Lee, S-J. Joo, J.-W. Chai

P 13. Dynamic control strategies used by older adults during obstacle avoidance
C.R. Lowrey, L.A. Vallis

P 14. Center of mass (CoM) kinematics at slip onset and slip severity
S. Margerum, R. Cham

P 15. The effect of age on dynamic postural equilibrium when stepping up
V. Michel, H. Amoud, D. Hewson, J.Y. Hogrel, J. Duchêne

P 16. The role of vision in static posture control is age- and task-dependent
I. Poulain, G. Giraudet

P 17. Effects of protective equipment on the balance control among younger and older firefighters
A. Punakallio, S. Lusa, R. Luukkonen

P 18. Postural balance in female and male subjects aged 8 to 93 years: a cross-sectional comparison
S. Sihvonen, S. Sipilä, P. Era

P 19. Effects of exercise and nutrition on Romberg quotient of postural balance in elderly with decreased bone mineral density
J. Swanenburg, E.D. de Bruin, M. Stauffacher, P. Baschung, D. Uebelhart

P 20. The passive forward-push test can determine postural strategies
P. Villeneuve, V. Leblanc, S. Villeneuve-Parpay, B. Weber, P. Thoumie

P 21. Controlling stability in challenging environments: effects of ageing on modulation of rapid stepping reactions
J.L. Zettel, W.E. McIlroy, B.E. Maki

P 22. Gaze behavior and the modulation of triggered stepping reactions to meet environmental demands in older adults
J.L. Zettel, W.E. McIlroy, B.E. Maki

Session 3: Vestibular Functions and Microgravity

Chaired by L. Borel and P-P. Vidal

P 23. Vestibular threshold changes evoked by monopolar vestibular stimulation when traversing a curved or irregular travel path
C. Cejka, A.E. Patla

Poster Sessions

P 24. Reaching for body-fixed and earth-fixed targets during whole-body rotation
E. Guillaud, J. Blouin, M. Simoneau, G. Gauthier

P 25. The "sloped" Romberg test – does it make office assessment more sensitive and specific?
N.S. Longridge, A.I. Mallinson

P 26. The normal postural response to galvanic vestibular stimulation in the arm in standing
J. Mcloughlin, M. Mockova, B.L. Day

P 27. Vestibulospinal responses in incomplete spinal cord injury
R. Müller, M. Liechti, A. Cur

P 28. Use of mobile phones and its acute effects on postural stability and hearing
E. Toppila, P. Forsman, I. Pyykkö, J. Starck

P 29. Microgravity: return to an egocentric spatial orientation control in adult
S. Viel, M. Vaugoyeau, C. Assaiante

Session 4: Visual Functions and Virtual Reality

Chaired by E. Keshner and J. Blouin

P 30. Modulating the interplay of visual attention and balance control: can color cueing attract attention to a handrail and facilitate subsequent reach-to-grasp reactions?
P. Corbeil, A. Peters, W.E. McIlroy, B.E. Maki

P 31. Age-related differences in voluntary visual sampling characteristics during ambulation over challenging terrain
K.A. Hamel, J. Rhodes, A. Mitch

P 32. Presence of a real hole does not affect the selection of alternate foot placement
R. Moraes, A.E. Patla

P 33. Online visual control of precision stepping
R.F. Reynolds, B.L. Day

P 34. A virtual reality-based walking simulator for gait re-training after stroke: a feasibility study
C.L. Richards, F. Malouin, B.J. McFadyen, F. Comeau, F. Dumas, J. Fung, A. Lamontagne, L.K. Hughey

P 35. Visual behavior governing rapid stepping reactions evoked in the presence of dynamic and unpredictable obstacles
J.L. Zettel, W.E. McIlroy, B.E. Maki

Session 5: Multi-Sensory Integration

Chaired by P. Ellaway, A. Patla and N. Vibert

P 36. Light finger touch can suppress postural effects induced by neck muscle vibration
M. Bove, C. Trompetto, L. Bonzano, G. Abbruzzese, M. Schieppati

P 37. Variation of cinematic and dynamic parameters in posturographic and gait analysis under normal conditions and after manipulation of visual and foot proprioceptive informations
R. Centemeri, R. Pozzo

P 38. Changing in visual conditions while balancing on an oscillating platform. Time to recalibrate
A.M. de Nunzio, A. Nardone, M. Schieppati

P 39. The effect of muscle vibration on a balancing task on a continuously oscillating platform
A.M. de Nunzio, A. Nardone, M. Schieppati

P 40. Sensory adaptation for postural control: standing vs. walking
N. Deshpande, A.E. Patla

P 41. Stop and go locomotion over an obstacle under no vision is less successful due to higher initial foot placement variability
M.A. Greig, A.E. Patla

P 42. Analysis of the visual field dependence behaviors on subjective vertical perception by two classification methods
E. Guillou, E. Golomer, M. Testa, T. Ohlmann, S. Hanneton

P 43. The peripheral nervous system and the perception of verticality
G. Mazibrada, S. Hussain, D.A. Pérennou, M.A. Gresty, R. Greenwood, A.M. Bronstein

P 43A Effect of head and gaze orientation on vestibular-evoked postural responses in the absence of neck and body proprioception
Y.P. Ivanenko, J. Blouin, L. Mouchnino

P 44. Loading at the ankle modifies walked distance during forward blind navigation
N. Paquet, C. Rainville, F. Tremblay, Y. Lajoie

P 45. Side stepping induces trajectory deviation during blind navigation
C. Rainville, N. Paquet, Y. Lajoie, F. Tremblay

P 46. The role of strategic changes in plastic adaptation of locomotor function
J.T. Richards, A.P. Mulavara, T.M. Ruttley, J.J. Bloomberg

P 47. Posture and gait are skilfully controlled through a uniform casting in spatial framework
M. Takahashi, M. Sekine

P 48. Are the perceived kinesthetic vertical and horizontal orthogonal?
R. Thouvarecq, L. Lejeune, D.I. Anderson

P 49. Psychophysiological correlates of inter-individual variability of head movement control in seated humans
N. Vibert, T. Hoang, D.P.D. Gilchrist, H.G. MacDougall, A.M. Burgess, R.D. Roberts, P.P. Vidal, I.S. Curthoys

P 50. Evaluation of human gait on straight line and circular path
W.H. Wong, Y. Shibata, Y. Wang, K. Ishikawa

Session 6: Multi-Segmental Coordination

Chaired by B. Amblard, M. Latash and T. Mergner

P 51. Multi-segmental coordination during voluntary turning in humans
D. Anastasopoulos, N. Ziavra, M.A. Hollands, A.M. Bronstein

P 52. The circle performed on a pommel horse in gymnastics: the critical role of double support phase
L. Baudry, D. Leroy, D. Chollet

P 53. Segmental stabilization during upright standing under fixation and tracking of visual target
E.V. Bobrova, Y.S. Levick, V.Y. Shlykov

P 54. Motor aftereffects during a combined hand-trunk grasping task
K.L. Bunday, D.A. Green, A.M. Bronstein

P 56. Rapid reach to grasp arm movements induced by a tilting chair
W.H. Gage, K.F. Zabjek, S.W. Hill, B.E. Maki, W.E. McIlroy

P 57. Coordination between arm and leg movements during grasping of distant object with stepping
G.N. Gantchev, N. Gantchev, R. Aurenty, J. Massion

P 58. Effects of support surface slip characteristics on motor control during a task performed by seated subjects
C. Gaudez, J. Richardson, S. Le Bozec

P 59. The hierarchical organisation of the handstand
G. Gautier, R. Thouvarecq

P 60. Postural strategies of tennis players
E. Gillet, D. Leroy, S. Kosak, D. Chollet

P 61. Postural sway during lateral perturbation of tandem romberg test
O. Gorgy, J.L. Vercher, F. Buloup, T. Coyle

P 62. Postural organization of cascade juggling
D. Leroy, R. Thouvarecq, J. Vittecocq, N. Germaine

P 63. Stability requirements determine the preferred alternate foot placement choice during human locomotion
R. Moraes, A.E. Patla

P 64. Analysis of postural coordination during voluntary sway using cop feedback
B. Najafi, T. Kato, Ph. Vuadens, S.I. Yamamoto, K. Aminian

P 65. A paradigm to assess electromyographic responses during anteroposterior translations in sitting following whiplash injuries
I. Patenaude, N. St-Onge, J. Côté, J. Fung

P 66. A paradigm to assess kinematic responses during anteroposterior translations in sitting following whiplash injuries
N. St-Onge, I. Patenaude, J. Côté, J. Fung

P 67. Postural adjustments during perturbation of rhythmical arm movement
K.I. Ustinova, J. Fung, M.F. Levin

P 68. Function of early arm responses to balance perturbations
M. van Meel, P. Corbeil, A. Peters, B.R. Bloem, W.E. McIlroy, B.E. Maki

Session 7: Anticipatory Postural Control and Representation of Action

Chaired by L.Mouchnino and A. Aruin

P 69. Influence of a delayed perturbation on balance recovery strategy
F. Berrigan, M. Simoneau

P 70. Role of anticipatory postural adjustment during initiation of gait in older adults with diabetic peripheral neuropathy
H. Corriveau, H. Sveistrup

P 71. Effects of initial conditions and performance on anticipatory postural adjustments
C. Gaudez, S. Le Bozec, J. Richardson

P 72. Effects of predictable and unpredictable gait perturbations on grip force coordination of a hand-held object
P. Gysin, T.R. Kaminski, C.J. Hass, A.M. Gordon

Poster Sessions

P 73. Anticipatory postural adjustments during bilateral arm movement: effects of the load to be lifted and of the movement initiation mode
L. Lallouche-Boiron, M. Audiffren

P 74. The influence of prior experience and knowledge upon the aftereffect of walking onto a moving platform
R.F. Reynolds, A.M. Bronstein

P 75. Effect of lateral perturabation during anticipatory postural adjustments in obstacle avoidance
G. Robert, M. Simoneau, H. Ruget, J. Blouin, L. Mouchnino

P 76. Modulations of anticipatory postural adjustment (apa) associated with different heel-up movements and with different standing postures
K. Shimura, T. Kasai

P 77. Anticipatory postural adjustments during stepping in place
S. Siwasakunrat, M.L. Latash

P 78. Stepping on an unexpectedly lowered ground support surface: foot landing and ground reaction forces
M.H. van der Linden, M. Vermeulen, J.E.J. Duysens

Session 8: Brain Imaging and Motor Control

Chaired by C. Schmitz and A. Bronstein

P 79. Cortical responses associated with predictable or unpredictable compensatory balance reactions
A.L. Adkin, S. Quant, B.E. Maki, W.E. McIlro

P 80. Cortical contributions to compensatory reach-to-grasp reactions
K.F. Zabjek, W.H. Gage, S.W. Hill, S. Quant, B.E. Maki, W.E. McIlroy

Session 9: Cognitive and Mental Influences on Posture and Locomotion

Chaired by C. Schmitz, A. Bronstein, M. Gresty and J. Hausdorff

P 81. Increasing cognitive load with increasing balance challenge: recipe for catastrophe
J. Barrra, A. Bray, M.A. Gresty

P 82. Effect of postural complexity on the minimal foreperiod duration necessary to execute a rapid arm raising
R. Cuisinier, I. Olivier, V. Nougier

P 83. Effects of the initial distance, leadership and expertise during a locomotor task of maintaining distance in humans
T. Ducourant, S. Vieilledent, H. Hicheur, A. Berthoz

P 84. Aporia of stabilometric standards
N. Floirat, F. Bares, G. Ferrey, G. Kemoun, P. Carette, I. Larvaron-Appert, P.M. Garey

P 85. The effect of whole-body perturbations on voluntary reaction times
P.M. Glazer, S. Quant, B.E. Maki, W.E. McIlroy

P 86. Locomotion through a door-like aperture when wider space for locomotion is required
T. Higuchi, M.E. Cinelli, M.A. Greig, A.E. Patla

P 87. Pointing to a target and postural stability: what are the effects of orienting the attention on the precision or on the postural task?
O.A. Hue, V. Cantin, M. Simoneau, N. Teasdale

P 88. Temporal congruence of motor imagery in stroke patient
A. Matsuo, S. Morioka, M. Hiyamizu, K. Shomoto, K. Takatori, K. Nagino, K. Tokuhisa

P 89. Interference between postural control and cognitive processing in patients suffering from a unilateral peripheral vestibular loss
F. Mbongo, C. Magnani, F. Zamith, P. Tran Ba Huy, P.P. Vidal, C. de Waele

P 90. The interaction between cognitive and postural processes: a 'posture-first' principle?
M.L.T.M. Müller, M.S. Redfern, J.R. Jennings, J.M. Furman

P 91. Sitting dynamics as the basis for body rocking stereotypies
K.M. Newell, K. Jordan, J.W. Bodfish

P 92. Choice stepping reaction time in depressed and non-depressed older people
K.H. Plumb, A.C. Tiedemann, M. Mun San Kwan, K. Anstey, S.R. Lord

P 93. Attention demends of postural control in aging during obstacle clearance: a preliminary study
K.C. Siu, M.H. Woollacott, P. van Donkelaar, L.S. Chou

P 94. "Learning" to balance: changes in postural control as a function of experience
K. van Ooteghem, J.S. Frank, F.B. Horak

P 95. Perception of verticality during dynamic postural tasks
W.G. Wright, F.B. Horak

P 96. Mental loading increases gait asymmetry and stride-to-stride variability in patients with Parkinson's disease
G. Yogev, N. Giladi, S. Springer, J.M. Hausdorff, C. Peretz, M. Plotnik

Poster Sessions

Session 10: Neurophysiology of Motor Control: Animal Models

Chaired by J. Simmers and L. Vinay

P 97. Long term motor and cognitives consequences of combined mptp + 3-nitropropionic (3-np) administration in mice: relevance for striatonigral degeneration (SDN)
L. Centelles, E. Diguet, P.O. Fernagut, B. Bioulac, F. Tison

P 98. Developmental emergence of limb-based locomotor circuitry from an axial-based precursor during amphibian metamorphosis
D. Combes, S. Ramanathan, K. Sillar, J. Simmers

P 99. Reflex pathways to ankle extensors following step-training in spinal cats
M.P. Côté, I. Poulin, J.P. Gossard

P 100. Study of intersegmental coordinations in newborn rat isolated spinal cord
M. Falgairolle, J.R. Cazalets

P 101. Features of bipedal stepping induced by epidural spinal cord stimulation and quipazine administration in spinal rats
Y.P. Gerasimenko, R. Ichiyama, H. Zhong, R.R. Roy, V.R. Edgerton

P 102. Role of ascending propriospinal circuitry in interlimb coordination during mammalian quadrupedal locomotion
L. Juvin, J. Simmers, D. Morin

P 103. Postural control in rabbits: impairment and recovery after spinal cord lesions
V. Lyalka, P. Zelenin, G. Orlovsky, T. Deliagina

P 104. Locomotor-like activity in acute spinalized rats induced by epidural spinal cord stimulation
T.R. Moshonkina, V.D. Avelev, I.N. Bogacheva, A.A. Savohin, Y.P. Gerasimenko

P 105. Stepping movements induced by epidural spinal cord stimulation in decerebrated and spinalized cats in different conditions of afferent control
P. Musienko, I.N. Bogacheva, Y.P. Gerasimenko

P 106. Influences of bipedal walking on neuronal systems (using rat bipedal-walking model: RBM)
N. Wada, F. Mori, S. Hirano, W. Iwamoto, N. Kato, G. Suzuki, S. Mori

P 107. Kinematic and electromyographic studies of the rat bipedal-walking model (RBM)
N. Wada, F. Mori, N. Kato, S. Hirano, W. Iwamoto, G. Suzuki, S. Mori

P 108. Locomotor discoordination in cerebellar Golgi cell-deficient mice
T. Watanabe, D. Yanagihara, W. Yue, R. Shigemoto, T. Yamamoto

P 109. Possible behavioral significance of the conditional postural readjustment
KB. Shapovalova, VN. Chihman, JV. Kamkina

P 110. Brain enables spinal cord inhibition to be inhibitory
C. Jean-Xavier, JF Pflieger, L. Vinay

Session 11: Physiology of Motor Control: Healthy and Pathological Human Models

Chaired by R. Edgerton and J. Massion

P 111. Changes in locomotor pattern after a 10-minute exposure to an elastic force field
L. Bouyer, E. Tremblay, S. Fournier

P 112. Is leg muscle recruitment during running less skilled in triathletes than runners?
A. Chapman, B. Vicenzino, P. Blanch, P.W. Hodges

P 113. The quest of the lumbar muscles function in human locomotion
M.P. de Sèze, S. Viel, M. Jover, M. Falgairolle, C. Blondeau, C. Assaiante, J.R. Cazalets

P 114. Impairments in postural control resulting from taxane-induced peripheral neuropathy in women with breast cancer
M. Edwards

P 115. Changes in quadriceps voluntary activation and stretch reflex profile in ACL deficiency
S.F. Hsiao, P.H. Chou, J.S. Li

P 116. Modulation of the activity of a propriospinal reflex pathway during walking in man
C. Iglesias, J.B. Nielsen, V. Marchand-Pauvert

P 117. The fractal dynamics of running
K. Jordan, J.H. Challis, K.M. Newell

P 118. Effect of obstacle placement on the strategy used to cross over an obstacle during walking
M. Ladouceur, N. Gueguen, E.A. Gustafson, B. Floyd

P 119. Phase resetting of uni- and bi-manual rhythmic arm movements due to perturbation
M.F. Levin, K.I. Ustinova, A.G. Feldman

P 120. Somatosensory graviception inhibits soleus H-reflex gain during walking in humans revealed by reduced gravity condition
T. Miyoshi, K. Hotta, S.I. Yamamoto, K. Nakazawa, M. Akai

P 121. Aminopyridines improve postural sway in patients with downbeat nystagmus
E. Schneider, R. Kalla, S. Glasauer, M. Strupp, T. Brandt

Session 12: Descending Tracts and Spinal Disorders

Chaired by F. Clarac and S. Mori

P 122. Cutaneous reflexes evoked during walking are reduced when controlled by the subject rather than by the computer
B.C.M. Baken, P.H.J.A. Nieuwenhuijzen, C.M. Bastiaanse, V. Dietz, J.E.J. Duysens

P 123. Reactive responses to balance perturbations in seated persons with spinal cord injury
A. Bjerkefors, M.G. Carpenter, A.G. Cresswell, A. Thorstensson

P 124. Cognitive tuning of corticospinal excitability during human gait: adaptation to the phase
M. Camus, J. Pailhous, M. Bonnard

P 125. Functional and reflex-related outcomes associated with different forms of body weight supported (BWS) locomotor training in individuals with SCI
E.C. Field-Fote, M.T. Khan, S.D. Lindley

P 126. Modulation of the gait cycle using focal transcranial magnetic stimulation
N. Gueguen, B. Hanna, M.M. Rank, A. Marquis, M. Ladouceur

P 127. Modulation of TMS evoked motor potential of thigh muscles during walking
M. Ladouceur, N. Gueguen, M.M. Rank, A. Marquis

P 128. CT-guided injection of botulinum toxin a in iliopsoas muscles improves gait in hereditary spastic spinal paralysis
H. Stolze, S. Klebe, S. Pohle, G. Deuschl

P 129. Magnetic stimulation predicts clinical recovery after spinal cord injury
M. Zedka, J. Kriz

Session 13: Biomechanics and Orthopaedic Disorders

Chaired by E. Viehweger, F. Launay, F. Prince and N. Teasdale

P 130. Foot type classification based on geometrical parameters: application of fuzzy logic
M. Anbarian, M. Eslami, P. Allard, N. Farahpour, S. Hinse, G. Dalleau

P 131. Application of the inverse dynamics: study of the traumas of the lower limbs joints of overweight and obese indivuduals performing a vertical jump
F. Chedevergne, L. Hajri, P. Lacouture, M.L. Frelut

P 132. Biomechanical asymmetry in the lower limb during obstacles-crossing following anterior cruciate ligament reconstruction
H.L. Chen, T.W. Lu, H.C. Lin, H.C. Hsu

P 133. Changes in postural control of patients with anterior cruciateligament dificiency
P.W. Chiu, S.Y. Chen, H.C. Lin, H.C. Hsu

P 134. Analysis of postural sway to determine the balance strategy utilised in normal and chronic anterior cruciate ligament reconstructed subjects
A.M. Clifford, Rr. Woledge, H.M. Holder-Powell

P 135. Joint compensation actions under different wedge conditions during single-limb stance
M. Eslami, P. Allard, C. Tanaka, S. Hinse, N. Frahpour

P 136. Effect of obesity on standing work posture
W.L. Gilleard, T. Smith

P 137. Comparison of relative velocity of lower limbs at obese teenagers before and after loss of weight and their effects on fear performance during a vertical jump (cmj)
L. Hajri, P. Lacouture, M.L. Frelut

P 138. Influence of knee braces on lower limb mechanics during stair locomotion after anterior cruciate ligament reconstruction
H.C. Hsu, T.W. Lu, H.C. Lin

P 139. The relationship between rearfoot eversion and tibia internal rotation in patellofemoral pain syndrome individuals during walking
P. Levinger, W.L. Gilleard

P 140. Changes in center of pressure with stimulations via anterior orthotic devices
M. Janin, L. Toussaint

P 141. Factors associated with balance and walking ability in patients with degenerative lumbar spinal stenosis
S.I. Lin, R.M. Lin

P 142. Biomechanics of the lower limb in anterior cruciate ligament deficient subjects during stair locomotion
H.C. Lin, T.W. Lu, H.C. Hsu

P 143. Lower limb kinetics changes during obstacles-crossing following anterior cruciate ligament injury
T.W. Lu, H.L. Chen, H.C. Lin, H.C. Hsu

P 144. Study of the design method of an ankle–foot orthosis
Y. Mine, Y. Kobayashi, T. Takashima, H. Fujimoto

P 145. Ramped descent and directional changes: a new paradigm for investigating the anterior cruciate ligament during locomotor control
R.J. Reed, L.A. Vallis

P 146. Undisturbed upright stance control in amputees
P. Rougier, N. Genthon

P 147. 13.28 Influence of posterior cruciate ligament reconstruction on the lower limb kinematics during obstacles-crossing
H.C. Yen, J.H. Wang, T.W. Lu

Session 14: Developmental Sensory, Motor and Mental Disorders

Chaired by E. Brogen-Carlberg and B. Chabrol

P 148. The use of botulinum toxin (BT) on rectus femoris (RF) and semitendinosus (ST) in cerebral palsy (CP) child. A preliminary report
A. Bonnefoy, B. Dohin, L. Chèze, E. Chaleat-Valayer, R. Kohler

P 149. The changes of ankle kinematics in children with cerebral palsy between before and after btx-A injection
S.S. Eun, S. Miyano, C.I. Park, E.S. Park, J. Chu

P 150. Measuring hip and knee intra-limb coordination in gait of normal children: implications for children with cerebral palsy
S. Farmer, C. Stewart

P 151. Fear of falling in children with mental disorders
V. Fayt, M. Radziminski, S. Lazzari

P 152. Anticipatory postural adjustments in a bimanual load-lifting task in children with Duchene muscular dystrophy
M. Jover, E. Bosdure, C. Schmitz, B. Chabrol, C. Assaiante

P 153. Postural stability in adults with developmental dyslexia
K.S.H. Rochelle, J.B. Talcot

P 154. Postural typology of patients with atypical deglutition
F. Scoppa

P 155. Does idiopathic scoliosis alter the sensory integration mechanisms participating to balance control?
M. Simoneau, P. Mercier, P. Allard, J. Blouin, N. Teasdale

P 156. Manual dexterity learning in children diagnosed as benign congenital hypotonia (BCH)
E. Tzioni, R. Lidor, Y. Sandhaus, A. Karni

P 157. Physiotherapy intervention improves postural control (PC) in children with DCD aged 6–8 years
P. Watter, Y.R. Burns

Session 15: Posture and Gait in Parkinson's Disease

Session 16: Basal Ganglia and Cerebellar Disorders

Chaired by JP Azulay, B. Bloem , N.Giladi and A. Nieuwboer

P 158. Influence of subthalamic nucleus stimulation on anticipatory postural adjustments during shoulder flexion in Parkinson's disease
S. Bleuse, L. Defebvre, F. Cassim, J-L. Blatt, E. Labyt, S. Blond, P. Derambure, A. Destée

P 159. Anticipatory postural adjustments during shoulder flexion in Parkinson's disease and influence of levodopa
S. Bleuse, L. Defebvre, F. Cassim, J-L. Blatt, E. Labyt, P. Derambure, A. Destée, J.D. Guieu

P 160. Effects of unilateral subthalamic nucleus stimulation on gait in Parkinsonian patients
M. Capecci, C. Catalano, R.A. Ricciuti, G. Ghetti, P. Pace, L. Provinciali, M.G. Ceravolo

P 161. Application of gait analysis in Parkinson's disease
V. Cimolin, M. Galli, G. Albani, A. Mauro, M. Crivellini

P 162. Validation of the freezing of gait questionnaire (FOG-Q) in Parkinson's disease
N. Giladi, Y. Tal, R. Meiron, O. Rascol, D.J. Brooks, E. Melamed, W.H. Oertel, W. Poewe, F. Stocchi, E. Tolosa

P 163. Does turning differ from walking? Turning duration, gait indices and fall risk in Parkinson's disease and idiopathic fallers
L. Gruendlinger, G. Yogev, S. Springer, J.M. Hausdorff, N. Giladi

P 164. Six weeks intensive treadmill training improves gait and quality of life in patients with Parkinson's disease
T. Herman, N. Giladi, S. Erlich, L. Gruendlinger, J.M. Hausdorff

P 165. Compensatory step deficits in Parkinson's disease: an inability to select motor programs

J.V. Jacobs, F.B. Horak, J.G. Nutt

P 166. Responsiveness of Berg's functional balance scale to disease severity in patients with Parkinson's disease
S.J. Lee, M.W. Tsai, LC. Wang, Y.T. Hsu, DE. Shan

P 167. Postural control during auto destabilization by seesaw in Parkinson's disease
S. Mesure

P 168. Coordination of grasp and posture in Parkinson's disease
L.M. Muratori, G. Dapul, A.M. Gordon

P 169. Kinematic assessment of walking through narrow spaces in subjects with Parkinson's disease
L. Rocchi, C. Minardi, M. Mancini, M. Dozza, F. Rasi, L. Chiari

P 170. The relations between the unified Parkinson's disease rating scale score and self-selected and fast walking speeds in patients with early-stage Parkinson's disease
J.-E. Song, A. Wu, B. Fisher, J. Gordon, G. Salem

P 171. Repetitive transcranial magnetic stimulation (rTMS) improves freezing of gait (FOG) in patients with Parkinsonism
M. Tamaki, Y. Sawada, Y. Ichikawa, K. Arasaki, K. Sudo

P 172. Postural control during sitting in Parkinson's disease
J.C.E. van der Burg, E.E.H. van Wegen, J.H. van Dieën

P 173. Posturographic analysis in patients with essential tremor
L. Avanzino, R. Marchese, M. Bove, L. Marinelli, G. Abbruzzese

P 174. Postural responses to continuous asymmetric neck muscle vibrations in patients with cervical dystonia
M. Bove, G. Brichetto, G. Abbruzzese, R. Marchese, M. Schieppati

P 175. Role of hypokinesia and bradykinesia in gait disturbances in Huntington's disease: a biomechanical study
A. Delval, P. Krystkowiak, J-L. Blatt, E. Labyt, K. Dujardin, A. Destée, P. Derambure, L. Defebvre

P 176. Effect of deep brain stimulation of the GPi on upper limbs kinematics of dystonic patients
A. Legros, M. Camus, L. Cif, P. Coubes

P 177. Factors underlying gait impairments in Huntington's disease
A.K. Rao, L.M. Muratori, K. Marder

P 178. Postural control in case of a tilted head: model of cervical dystonia
F. Vacherot, M. Vaugoyeau, S. Viel, S. Mallau, S. Soulayrol, J.P. Azulay

Session 17: Sensorimotor Deficits Following Stroke

Chaired by M. Ioffe and D. Pérennou

P 179. Early TENS improves stroke-induced motor dysfunction of the upper extremity
S.S.Y. Au-Yeung, C.W.Y. Hui-Chan

P 180. Biomechanical symptoms from gait and posture in patients after stroke
T.T. Batisheva, L.R. Rusina, D.V. Skvortsov

P 181. Visual dependence after recent stroke
I. Bonan, F. Derighetti, M.C. Leman, F. Colle, A. Yelnik

P 182. Procedural versus declarative learning in gait rehabiltation after stroke: a pilot study
M. Capecci, F. Saltarelli, V.G. Bombace, C. Cecchetelli, G. Lazzaro, E. Matteucci, L. Provinciali, M.G. Ceravolo

P 183. Kinetic analysis of lateral-wedge insole on symmetry of stance and ambulation in stroke individuals
C.H. Chen, K.H. Lin, T.W. Lu, H.-M. Chai, P.-F. Tang, M.-H. Hu

P 184. Effect of learning postural tasks on postural stability in patients with poststroke hemiparesis, Parkinson's disease and cerebellar ataxia
L.A. Chernikova, K.I. Ustinova, N. Katsuba, M. Ioffe

P 185. Upright stance control in hemiparetics: are the two legs independent?
N. Genthon, P. Rougier, J. Froger, P. Decavel, D.A. Pérennou

P 186. Contribution of both supports in upright stance control following stroke
N. Genthon, P. Rougier, J. Froger, J. Pélissier, D.A. Pérennou

P 187. Temporal disorganization and balance disturbance of the step test after stroke
A. Leroux, J.N. Rozen, S. Artuso

P 188. Interference of gait performance by rhythmic auditory cues in chronic stroke patients
S.I. Lin

P 190. Longitudinal study of locomotor recovery up to two years after stroke
C.L. Richards, F. Malouin, F. Dumas, S. Wood-Dauphinee

P 191. Short-term effects of semi-recumbent pedaling exercise on control of gait in sub-acute stroke
K.M. Sibley, A. Tang, D. Brooks, W.E. McIlroy

P 192. Detailed footprint analysis reflects the potential for gait recovery in stroke
I.M. Tarkka, E.B. Titianova, J. Sivenius, K. Pitkänen

P 193. Asymmetry and functional performance in chronic stroke survivors before and after a training program in fitness center

L. Teixeira-Salmela, F. Goulart, C. Coelho de Morais Faria, C. Queiroz Guimarães

P 194. Short-term effects of whole body vibration on postural control in unilateral chronic stroke patients: preliminary evidence
I. van Nes, A.C.H. Geurts, H. Hendricks, J.E.J. Duysens

P 195. Analysis of spasticity on medial gastrocnemius in stroke individuals wearing articulated ankle–foot orthoses during ambulation
L.H. Yuan, L.W. Chang, K.H. Lin, M.C. Lin

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Chaired by J. Fung, F. Horak, J. Duysens and J. Frank

P 196. Analysis of postural stability in diabetes/peripheral neuropathy during threshold level acceleration perturbation
V. Balasubramanian, K.A. Arasu, C.J. Robinson

P 197. Weakness but not neuromuscular dysfunction is related to fear in inpatient fallers
S.G. Brauer, T. Quai, H. Huang, R. Eernisse

P 198. Evidence for a link between changes to gaze behaviour and risk of falling in older adults during adaptive locomotion
G.J. Chapman, M.A. Hollands

P 199. Correlation between elbow flexion angle and joint loading of the upper extremity during a forward fall
P.H. Chou, Y.L. Chou, C.K. Chen, Y.C. Shi

P 200. Test–retest reliability of the Grille d' ´Evaluation de la Séurité à la Marche (GEM scale)
F. Dubé, J. Rousseau, R. Boudreault, C. Kaegi, S. Nadeau

P 201. Fear of falling and strategies used by older adults to change travel direction
J.R. Fuller, L.A. Vallis, A.L. Adkin

P 202. Hip impact velocity and trunk orientation play a role in the reduction of hip impact force by martial arts fall techniques
B. Groen, V. Weerdesteyn, W. van Lankveld, J.E.J. Duysens

P 203. Changes in gait characteristics following cataract surgery
J.L. Helbostad, O. Sletvold, M. Ødegård, S.S. Western, R. Moe-Nilssen

P 204. Gait analysis while stepping over tilted obstacles
Y. Kobayashi, Y. Mine, T. Takashima, H. Fujimoto

P 205. Screening for balance and gait characteristics in relation to falls in a healthy elderly population
U. Læssøe, M. Voigt, O. Simonsen, H.C. Hoeck, T. Sinkjær

P 206. Prevention of accidents on the level in occupational situations: need for better adaptation of the working situation to man
S. Leclercq, C. Tissot, C. Gaudez, S. Thouy, E. Rossignol

P 207. An embedded microsystem for early detection of the fall – methods and results
N. Noury, P. Barralon, D. Flammarion, N. Vuillerme, P. Rumeau

P 208. Sensitivity & specificity evaluation of mobility measures
V. Panzer, D. Wakefield, C. Hall, L. Wolfson

P 209. Proposition for a backward disequilibrium scale
Y. Penven, P. Manckoundia, F. Mourey, J. van Hoecke, J.P. Didier, P. Pfitzenmeyer, D.A. Pérennou

P 210. Falls in neuromuscular disease
A.J. Pieterse, T. Luttikhold, B.R. Bloem, B.G.M. van Engelen, M. Munneke

P 211. Effect of a short term training program on falls in community dwelling elderly
H.A.F.M. Rijken, V. Weerdesteyn, J.E.J. Duysens

P 212. The impact of illumination on gait characteristics in older persons with cataract
S.S. Western, J.L. Helbostad, M. Ødegård, R. Moe-Nilssen, O. Sletvold

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Chaired by M. Woollacott, P. Crenna and B. Maki

P 213. Effects of a fatiguing treadmill exercise on body balance
M. Bove, A. Brunori, C. Cogo, E. Faelli, P. Ruggeri

P 214. Anticipation of postural instability alters body orientation in persons with recurrent low back pain
S. Brumagne, I. Paulus, S. van Deun, F. Staes

P 215. A distinct clinical syndrome defining the postural patient
P.M. Gagey, B. Weber, A. Scheibel, L. Bonnier

P 216. Decreased margin of stability in response to postural perturbations in persons with low back pain
J.R. Hitt, S.M. Henry, S.L. Jones, J.Y. Bunn

P 217. Persons with chronic low back pain (LBP) demonstrate less dynamic frontal plane torque responses to unexpected perturbations
S.L. Jones, S.M. Henry, C.C. Raasch, J.R. Hitt, J.Y. Bunn

P 218. Persons with chronic low back pain (LBP) demonstrate reduced sagittal plane joint torques in response to surface translations
S.L. Jones, S.M. Henry, C.C. Raasch, J.R. Hitt, J.Y. Bunn

P 219. Gait analaysis related to the level of lumbosacral radiculopathy in patients with chronic low back pain
S.H. Lee, C.H. Ryu, H.-S. Yang, Y.O. Park

P 220. The decline of postural control in elderly women with unilateral painful knee osteoarthritis
K.B. Lim, Y.-M. Na, H.J. Lee, S-J. Joo

P 221. How chronic pain relief affects the temporal organisation of physical activity?
A. Paraschiv-Ionescu, E. Buchser, K. Aminian

P 222. Kinematic assessment of gait in subjects with chronic fatigue syndrome
L. Paul, D. Rafferty, L. Wood, W. Maclaren

P 223. Altered internal representation of shoulder position in patients with recurrent neck pain
I. Paulus, S. Brumagne, G. Belmans, S. van Deun, F. Staes

P 224. Fatigue influence on postural coordination: comparison of observed and predicted pattern
A. Ponce, F. Fouque, A. Martin, L. Martin, V. Cahouët

P 225. Effect of lower body muscle fatigue on a whole body pointing task
M. Schmid, T. Pozzo, M. Schieppati

P 226. Musculoskeletal fatigue: studied by 3D movement analysis and electromyography
E. Turpin-Legendre, F. Horwat, J.P. Meyer

P 227. Measurement of postural response following leg muscle fatigue
P. Vlach, J. Otahal, S. Otahal

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Chaired by L. Bouyer, M. Hulliger, K. Ishikawa and J. Paillard

P 228. Impact of aquatic exercises on the postural stability
L. Berger, N. Genthon, P. Rougier

P 229. Gait stability adaptation: strategies for prevention of backward loss of balance
T. Bhatt, J. Wening, Y.-C. Pai

P 230. Differences in the coordination of sit-to-stand in teachers of the Alexander technique
T.W. Cacciatore, F.B. Horak, V.S. Gurfinkel

P 231. Development and clinical assessment of a cop-feedback control fes balance training system for the hemiplegics
S.C. Chen, C.H. Lai, W.S. Chen, Y.L. Chen

P 232. Postural disturbances in multiple sclerosis
L.A. Chernikova, A.V. Peressedova, I.A. Zavalishin

P 233. Correlation between the speed of exercise and joint loading during a close-chain exercise of the upper extremity
P.H. Chou, Y.L. Chou, C.K. Chen, C.M. Kuo

P 234. Analysis of locomotor parameter programming in a neuromuscular disease
A. Couillandre, Y. Brenière, J.Y. Hogrel, B. Eymard, P. Portero

P 235. Tongue position and postural control. Double blind random study in 360 post-puberal subjects
A. Ferrante, F. Scoppa

P 236. Modulation of pre-landing lower limb muscle responses in basketball players with bilateral multiple ankle sprains
S.N. Fu, C.W.Y. Hui-Chan

P 237. A sensory substitution equipment for rehabilitation of patients with endoprosthesis implants for lower limbs
D. Giansanti, G. Maccioni, G. Graziani

P 238. The effects of four weeks aerotrim® training period on postural balance
H. Hannola, H. Pekkarinen

P 239. A randomised controlled trial to evaluate task-related-exercise classes for older people with movement difficulties
M.M.-S. Kwan, C. Sherrington, P. Pamphlett, J. Jacka, L. Olivetti, J. Nugent, J. Hall, S.R. Lord

P 240. Taï chi practice reduces leg muscles co-activation during gait initiation in elders
T. Lelard, I. Mora, P.L. Doutrellot, S. Ahmaidi

P 241. The use of a pneumatic substituction system for gait rehabilitation with a body weight
G. Maccioni, D. Giansanti, V. Macellari, F. Gazzani

P 242. Vertical heterophoria and postural deficiency syndrome
E. Matheron, P. Quercia, B. Weber, P.M. Gagey

P 243. Balance rehabilitation with movable platform versus exercises: a crossover study
A. Nardone, M. Galante, M. Godi, M. Grasso, M. Schieppati

P 244. Custom made dynamic foot orthoses: an investigation into their effect on balance and gait in people with multiple sclerosis
G.M. Ramdharry, J.F. Marsden, B.L. Day, A.J. Thompson

P 245. Stabilometric evaluation of the effects of auriculotherapy on postural control. Double blind randomized study
F. Scoppa, G.A. Amabile

P 246. Training of balance under single and dual task conditions in older adults with balance impairment: three case reports
P. Silsupadol, K.C. Siu, A. Shumway-Cook, M.H. Woollacott

P 247. The second side of fes – it is not only a prostesis of function but also direct function recovery tool
D.V. Skvortsov

P 248. Role of a sensorimotor training and a cervical stabilisation exercise program in the correction of forward head posture in male visual display unit operators
Z. Veqar, D. Kumar

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P. Thoumie, R.C. van Lummel, S.C. Heikens, R.M.A. van der Slikke

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T. Yoshida, M. Yamamoto, T. Nomura, R. Shimura

Lectures

Neuronal mechanisms for locomotion: from historical perspectives to new concepts

F. Clarac (Marseille, France)

During the XX century, different hypothesis on motor control has been proposed depending upon the progressive development of various technical approaches. Considering the locomotion, we will summarize different neuronal mechanisms to see how early concepts highlighted by recent discoveries, can explain actual motor control hypothesis.

Three aspects of this evolution will be considered:

1) From stepping reflexes to central pattern generators (CPG): Data presented by different pioneers like J.M. Charcot, E.J. Marey and M. Philippson, C. Sherrington and T. Graham Brown, explained the locomotor rhythm by peripheral reflexes or by central spinal networks. If during the first part of the XX century, the former hypothesis was dominant, the second became important around 1970 when was developed a new paradigm "the fictive locomotion" (nervous preparations where the rhythm can be induced without phasic proprioceptive inputs). CPGs are networks composed of an ensemble of interneurones; the rhythm they induce is due to the interneuronal intrinsic properties and to the connectivity of the network.

2) Rhythmical and postural locomotor processes during ontogenesis: In developmental studies in the neonate rat, it appeared that the CPGs develop during an early foetal stage, before the sensory afferents [1]. At birth, walking is delayed; the posture, which needs to regulate the gravity to adapt to the environment, is still very immature. These data can be compared with the infant development where it can be suggested that at birth a spinal CPG is also present but due to an immaturity in posture, walking is delayed. Equilibrium strategy needs a stable reference frame on which the balance control is based [2].

3) Skilled Locomotor mechanisms: Shik et al. [3] demonstrated that a "decerebrate" cat is able to walk like a machine above a treadmill if the locomotor mesencephalic region (MLR) is stimulated. They described the peripheral and central cerebellar loops that induced this automatism. It is only later that the role of higher structures has been considered. In parallel to an approach of the cognitive components of human walking, a neurophysiological approach in the cat [4], proposes to consider simultaneously, higher and lower structures activation; a separation between automatic and voluntary locomotion, between innate and learned locomotor movements seems not tenable, as suggested Grillner and Wallen [5]. To day, locomotion has to be considered as a complex behaviour involved at least in human, with voluntary processes.

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The strategies of segmental stabilization: development, adaptation and clinical evaluation

B. Amblard (Marseille, France)

Posture and postural-kinetic activities are complex behaviors, due both to the high number of degrees of freedom that have to be controlled simultaneously and to the variety of the sources of perturbation and of the concomitant errors signals from sensory canals. The central nervous system has thus to built up and to memorize various strategies of global as well of segmental stabilization that are devoted to simplify the postural task on the one hand, and on the other hand to increase efficiency and speed of the postural responses. During the two past decades, strategies of segmental stabilization have been described, largely after those involving the whole body. During more or less dynamic activities, a given body segment may be required to be linearly and/or angularly stabilized, in order to constitute a fixed frame of reference for the movements to be executed. These strategies of segmental stabilization are based on the existence of a modular control of the considered body segments [1]. The most remarkable example is the stabilization of the head in space classically described during various locomotor tasks.

By means of an appropriate tool, the anchoring index (AI) [2], we were able to determining the mode of segmental angular stabilization adopted (when AIÑ0) during natural behaviors in various populations, tasks and ages. The sign of AI, when it is significantly different from zero, indicates the frame of reference that has been chosen (namely the external space when AI is positive or the supporting segment (or the physical moving support] when it is negative). The module of AI indicates the efficiency (the strength) of the corresponding strategy. AI = 0 indicates the absence (or the loss) of any frame of reference or preferred segmental strategy.

Examples of strategies of segmental stabilization as revealed by the use of AI will be given in the fields of human development, adaptation to various constraints in healthy adults or children as well as in the clinical approach. I will thus evoke the construction of the strategies of segmental stabilization during ontogenesis, there dependence with respect to task constraints or phases and there adaptation to various neurological (Parkinson's disease, hemiplegics patients) or rheumatologic (spondylarthropathy) diseases. I will also briefly evoke the cerebral structures potentially involved in the control of these strategies (occipital-temporal-parietal junction of the left hemisphere).

Lectures

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Exploring neural control mechanisms of skilled hand movements by brain imaging techniques

H Forssberg (Stockolm, Sweden)

The dexterity of the human hand is based on the ability to control movement and force of the fingertips precisely in relation to a given task. When we lift a familiar object the fingertip forces are targeted to the weight of the object, in order to perform a smooth and well coordinated lift movement. At the same time, or rather prior to the lifting of the object, the postural control system is activated. Anticipatory postural adjustments are scaled depending on the predicted weight. The programming of the fingertip forces, as well as of the anticipatory postural adjustments, is based on internal neural representations of the object, which are updated after each lift of the object. The development of these sophisticated control mechanisms are inflicted in some neurodevelopmental disorders, e.g., CP, ADHD, and autism spectrum.

In a series of fMRI experiments (functional magnetic resonance imaging) we have explored the bilateral fronto-parietal cortical areas that are involved in the control of the fingertip forces during object manipulation. Recent studies indicate that Brodman area 44 and the anterior part of the inferior parietal gyrus are involved in the process of updating the internal representation of the object, and that cerebellum is involved in correcting an erroneously high programmed movement, while the contra lateral sensorimotor cortex induce increased force pulses after an erroneously low programmed force out put.

In another series of MR experiments we have used DTI (diffusion tensor imaging) to study the infrastructure of the neural pathways passing through the white matter. Examples of activity related plasticity will be given from adult persons after stroke and from professional musicians who performed extensive motor training during childhood.

Automaticity and Plasticity: Key Factors which Facilitate Recovery of Posture and Locomotion following Spinal Cord Injury.

VR Edgerton (Los Angeles, USA)

It is becoming increasingly obvious that we can take advantage of the hierachial control of the neural control of posture and locomotion. It is also apparent that the level of plasticity, much of which is activity dependent, can be utilized to achieve remarkable levels of recovery of postural locomotion in mice, rats, monkeys and humans. It, also, has been clear from studies over the last few decades that many of the fundamental neural control mechanisms for locomotion in invertebrates as well as vertebrates has been highly conserved. This has given scientists the opportunity to examine fundamental neural control strategies in simpler, but more integrative models. These models in turn have provided critical insight into how posture and locomotion is controlled in humans. I will describe the results of a series of experiments on each of these species (mice to humans) to illustrate the level of neural control of locomotion that can be captured as a result of both the hierarchial design as well as the plasticity of this neural control system for posture and locomotion.

The cognitive processing loop and balance control: Some modeling and experiment data

N Teasdale (Quebec, Canada)

When a person is standing upright, balance control depends on the availability and reliability of the visual, vestibular and somatosensory (cutaneous and proprioceptive) afferent inputs and on the capability motor output system (eg torque magnitude and rate of torque development of the ankle response). There are now several studies that have showed that this input-output system is not entirely sensori-motor but is also cognitively penetrable. Hence, the ability to regulate body oscillations also depends on the individual's ability to detect the direction of an oscillation to select, plan and execute the proper change of joint torques. A main characteristic of this cognitive processing loop is its response latency that varies with internal and external constraints. We have integrated this aspect into a model predicting stability and loss of stability following a forward oscillation. The model allows several predictions on balance recovery and falls, notably on why slowness of response compromises postural stability. Examples will be presented for different populations and contexts. In particular, experimental data for an obese population will be presented and the case will be made that a greater mass increases balance control problems when standing upright and modifies the relationship between trunk and the control of an upper arm goal-directed movement.

Muscle Synergies In Postural Preparation For Action

M.L. Latash (University Park, USA)

Introduction: We used the framework of the uncontrolled manifold (UCM) hypothesis to analyze multi-muscle synergies stabilizing shifts of the center of pressure (COP) in preparation to a fast voluntary arm movement or to making a step. This approach allows to test whether independent commands to muscle groups co-vary to preserve a trajectory of a potentially important performance variable.

Methods: Each experiment involved two parts. First, standing subjects were required to release different loads held in front of the body or at its side. Principal component analysis across trials was applied to integral indices of changes in the activity of leg and trunk muscles over time intervals typical of anticipatory postural adjustments. This allowed to define a set of independent variables (M-modes). Regression analysis related M-mode changes to COP shifts. The two main tasks involved fast arm movement and step initiation. Fast arm movements were always performed in a self-paced manner. The subjects initiated comfortable and quick steps in a self-paced manner and "as fast as possible" to a visual stimulus. During the main tasks, variability in the M-mode space was analyzed within time windows preceding the action. This variability was partitioned into components that did and did not affect the average COP shift.
Results: Three to four M-modes were identified for each subject and each direction of COP shift. They accounted for 60%-70% of the variance in the muscle activation space. COP shifts were stabilized by covariation of M-mode magnitudes across trials for both main tasks. Prior to step initiation, such M-mode synergies in both legs stabilized early COP shifts; these synergies disappeared in the stepping leg closer to the take-off. Time profiles of indices of M-mode synergies differed for COP shifts in the anterior-posterior and medio-lateral directions. During step initiation in the reaction time conditions, M-mode synergies were preserved but shifted in time closer to the moment of foot lift-off.
Discussion: The UCM hypothesis provides a fruitful framework for analysis of multi-muscle postural synergies. It shows task and effector specific covariation in M-modes related to COP shift stabilization. These observations provide support for the following hypotheses: (1) The central nervous system organizes muscles into stable groups (M-modes); (2) COP coordinates are important variables for keeping balance and, as such, are stabilized over time by co-varied changes in M-modes; (3) Control of COP shifts in anterior-posterior and medio-lateral directions is decoupled during preparation to stepping; (4) Time pressure leads to a shift in the relative timing of M-mode synergies participating in postural adjustments and action initiation; this result implies relative independence of postural synergies and movement synergies.

The role of muscle spindle afferents and fusimotor neurones in gait control

P. Ellaway (London, UK)

Introduction: Attempts to study fusimotor activity during locomotion in the cat have largely been indirect, through observation of muscle afferent discharges. Here we report results from employing a novel method, comparing active and passive discharges of spindle afferents, and from direct recordings of γ-efferent discharges.
Methods: *1.* Length changes and EMG were recorded for medial gastrocnemius (MG) and tibialis anterior (TA) muscles of the left hind limb in pre-collicular decerebrated cats. Spindle afferents were recorded from dorsal roots exposed by a minimal laminectomy. Following active locomotion on a treadmill, fusimotor activity was suppressed with sodium pentobarbitone. The length changes recorded in MG and TA muscles were then reproduced via a servo-controlled puller and the passive responses of the same afferents recorded. Afferent identification was by succinylcholine (200 $\mu g.kg^{-1}$ IV) and conduction velocity. The fusimotor pattern was deduced by constructing the difference between active and passive afferent records.
2. In an identical preparation, additionally the discharges of individual γ-efferents (conduction velocity < 45 $m.s^{-1}$) were recorded in filaments of a small fascicle of either the MG or TA muscle nerve.
Results: *1.* Static γ-motor activity was revealed as an increase in secondary and b_2c primary afferent discharge during contraction of MG and TA muscles, phase-advanced for MG. In b_1b_2c (primary) afferents, a burst of activity during early muscle lengthening indicated dynamic γ-motor activity (Taylor et al., 2000a)
2. MG γ-efferents were identified as static (γ_S) or dynamic (γ_D) during electrical stimulation of the midbrain. During locomotion, γ_S discharges were either heavily modulated rising in discharge rate with extensor muscle shortening, falling with lengthening and mirroring the change in muscle length or showed a less modulated pattern with increasing discharge accompanying flexion of the ankle. γ_D discharge was in the form of a burst starting at the onset of muscle shortening and continuing just into the lengthening phase of each locomotor cycle (Taylor et al., 2000b).
Discussion: Study *1* allowed a reasonably confident prediction of the nature of γ_S activity during locomotion but could not reveal the profile of the γ_D discharge. Study *2* confirmed the nature of γ_S activity suggesting that it provides a temporal template of the intended movement. Some γ_S-efferents additionally provide a simpler biasing signal. The timing of γ_D discharge is appropriate for sensitising primary endings of muscle spindles to the onset of muscle stretch.
Conclusion: Inferences from these studies are limited by the extensive denervation and immobilisation of one hind limb. To obtain representative γ-motor activity during locomotion with more normal afferent feedback, experiments are being extended to a preparation without significant denervation and with all four limbs walking on the treadmill.

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