SOFMER

1st International Congress

UNIVERSITE CHAMBERY ANNECY SAVOIE

Scientific Testing of Orthotic Devices

Aix les Bains

March 23-26, 2011

THERMES NATIONAUX

Keynote speakers :

J.Cholewicki (USA) - S.Yamamoto (Japan)
J.Hertel (USA) - D.Chow (China)
P. Thoumie (France) - T. Birmingham (Canada)
M. Janin (France)

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SAVOIE CONSEIL GENERAL

Aix les bains

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Les Thermes Nationaux d'Aix-les-Bains

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SCIENTIFIC TESTING OF ORTHOTIC DEVICES

First International Congress

Aix les Bains – Thermes Nationaux – March 2011, 23rd-26th

1 Oral Communications

Wednesday, March 23rd

18.30 Welcome with Drinks and Hors d'oeuvre

19.45 Forewords
Pr Patrice Rougier (Organizing Committee), Pr Gilbert Angénieux (Président of the University of Savoie) and Dr Marc Genty (Treasurer of the French Society of Physical Medicine and Rehabilitation)

20.00 Introductive Conference

The three-dimensional aspect of orthosis evaluation

Pr Philippe Thoumie
Pierre and Marie Curie University, Paris, France

21.00 Round Table
Prevailing regulations for orthoses reimbursement
Pr Pascal Giraux
Jean Monnet University, Saint Etienne, France

Thursday, March 24th

Chairpersons: Pr P Thoumie, Dr M Janin

8.30 Lecture

Current knowledge about ….Orthotic insoles

Dr Marc Janin,
Physiology Laboratory, Medical College, Toulouse, France

9.30 Personalised orthotics for rheumatoid arthritis (po4ra): phase I testing of novel devices
Gibson KS, Telfer S, Dalgarno KW, Pallari J, Woodburn J, on behalf of the A-FOOTPRINT Consortium
Glasgow Caledonian University, UK

9.50 Plantar orthotics for patients with chronic low back pain (CLBP) decreases pain and improves spine function and mobility
P Villeneuve, C Ehring, S Kurzawa, B Weber
Institut de posturologie, Paris, France

10.10 Break

10.50 How evaluating the impact of plantar orthotics? A preliminary study
L Berger1, J Calleja2
1 Laboratoire de Physiologie de l'Exercice (EA 4338), Université de Savoie, Domaine scientifique de Savoie-technolac, Le Bourget du Lac, France; 2 Centre d'orthopédie du sport, ZA champfeuillet, Voiron, France

11.10 Finite Element Modelling of the human foot: a tool for the design and assessment of podiatry interventions
M Bucki, N Vuillerme, F Cannard, B Diot, Y Payan
TIMC-IMAG, UMR UJF CNRS 5525, La Tronche, France, TXS, Montceau-les-Mines, France
AGIM Laboratory, CNRS FRE UJF, La Tronche, France, IDS, Montceau-les-Mines, France

11.30 Testing foot orthoses can be made through four situations
M Janin
Physiology Laboratory, Medical College, Toulouse, France

11.50 Apéritif and reception by the Mayor of Aix les Bains

12.15 Lunch

Chairpersons: Pr P Giraux, Pr Yamamoto

13.30 Lecture

Current knowledge about ….Ankle Foot Orthoses

Pr Sumiko Yamamoto
International University of Health and Welfare, Tokyo, Japan

14.30 Appropriate ankle-foot orthoses model for patients with Charcot-Marie-Tooth disease
B Guillebastre1, P Calmels2, PR Rougier1
1 Laboratoire de Physiologie de l'Exercice (EA 4338), Université de Savoie, Domaine scientifique de Savoie-technolac, Le Bourget du Lac, France; 2 MPR, CHU Saint-Etienne, France

14.50 Rehabilitation of early stroke patients using a custom made solid ankle-foot orthosis: preliminary results of a randomised controlled trial.
E Papi, PJ Rowe, RJ Bowers, S Solomonidis
University of Strathclyde, Glasgow, UK

15.10 Ankle-foot orthosis assessment through finite element modelling and gait analysis
L Muraru1,2, V Creylman1,2, J Pallari3, R Willemsen4, L Peeraer1,5
1 – Multidisciplinary Research Laboratory for Biomedical and Rehabilitation Technology (MOBILAB), K.H.Kempen University College, Belgium; 2 – Division of Biomechanics and Engineering Design (BMGO), K.U.Leuven, Belgium; 3 – Materialise NV, Haasrode, Belgium; 4 – Centrum Technische Orthopedie Division Pellenberg, Belgium; 5 – Faculty of

Kinesiology and Rehabilitation Sciences (FaBeR), K.U.Leuven, Belgium

15.30 The energy cost of walking can be optimized by choosing the correct ankle foot orthosis stiffness
DJJ Bregman, V de Groot, CGM Meskers, J Harlaar
MOVE Institute for Human Movement Research, VU University Medical Center, Amsterdam, The Netherlands

15.50 Impact of the knee-ankle foot orthosis on biomechanical parameters of gait: a study of adult patients with CNS injury
J Boudarham1, D Pradon1, N Vuillerme2, R Zory1, D Bensmail1, N Roche1
1Laboratoire d'analyse du mouvement, GRCTH EA 4497, CIC-IT 805, AP-HP, CHU Raymond Poincaré, Garches, France 2 Laboratoire TIMC-IMAG UMR UJF CNRS 5525, La Tronche, France

16.10 Are modifications observed during AFO fitting predictive of improvements after 3 weeks of wearing: a study of adult hemiplegic subjects.
D Pradon1, J. Boudarham1, R. Taiar2, N. Roche2
1Laboratoire d'analyse du mouvement, GRCTH EA 4497, CIC-IT 805, AP-HP, CHU Raymond Poincaré, Garches, France 2Laboratoire de Thermomécanique Gerspi, Faculté des Sciences, Reims, France

16.30 Break

Chairpersons: Pr J Cholewicki, Pr J Hertel

17.10 Lecture

Current knowledge about ….Ankle Orthoses

Pr Jay Hertel
University of Virginia, USA

18.10 Unloading strategies after sudden ankle inversions while walking with 20% or 80% of body weight applied on the destabilized leg
R Terrier, N Forestier
Laboratoire de Physiologie de l'Exercice (EA 4338), Université de Savoie, Domaine scientifique de Savoie-technolac, Le Bourget du Lac, France

18.30 Generation of subject-specific datasets to develop musculoskeletal-based models of foot and ankle for orthotic design and assessment
S Telfer, M Oosterwaal, S Tørholm, S Carbes, J Woodburn
A-Footprint Project

18.50 Effect of three different ankle braces on functional performance and ankle range of motion
A Parsley, SY Lee, L Chinn, CD Ingersoll, J Hertel
University of Virginia, USA

20.30 Gala Dinner

Friday, March 25th

Chairpersons: Pr D Chow, Pr T Birmingham

8.30 Lecture

Current knowledge about ….Knee Orthoses

Pr Trevor Birmingham
University of Western Ontario, Canada

9.30 Immediate effects of a knee brace on reaction time and movement time of the right leg: an experimental study with a perceptual motor task in a car simulator
CJ Marques1,2, J Barreiros1, J Cabri13
1Faculty of Human Kinetics, Technical University of Lisbon, Portugal; 2 Physical Medicine and Rehabilitation Department, Schön Klinik Hamburg-Eilbek, Hamburg, Germany; 3 Department of Physical Performance, Norwegian School of Sport Sciences, Oslo, Norway

9.50 An active knee joint orthosis to assist human lower limbs movements
S Mohammed, Y Amirat, W Hassani
LISSI , Université Paris Est Créteil Val De Marne, France

10.10 Reduction of joint loading with the use of knee orthosis and wedged insoles in patients with medial knee osteoarthritis
CH Fantini Pagani, M Hinrichs, GP Brüggemann
Institute of Biomechanics and Orthopaedics - German Sport University, Koln, Cologne, Germany

10.30 Break

11.10 3D numerical modeling of the compressed leg
L Dubuis, S Avril, J Debayle, P Badel
Ecole des Mines, Saint-Etienne, France

11.30 Influence of thickness of external angled wedge on the biomechanics of the knee during standing
A Pradels, N Vuillerme,, CMarchiori C, D Pradon
AGIM Laboratory, CNRS FRE UJF (La Tronche, France)
CIC-IT 805, INSERM/AP-HP, Raymond Poincaré Hospital, EA 4497, Garches, France
Centre de Podologie de l'Estacade, Grenoble, France

11.50 Combined effects of a valgus knee brace and lateral wedge orthotic on dynamic knee joint loading
R Moyer, T Birmingham, C Dombroski, R Walsh, T Jenkyn, R Giffin
School of Physical Therapy, Elborn College, University of Western Ontario, Canada

12.15 Lunch

Chairpersons: Pr J Hertel, Pr J Cholewicki

13.30 Lecture

Current knowledge about ….Lumbar Belts

Pr Jacek Cholewicki
Michigan State University, USA

14.30 Biomechanical evaluation of a newly designed lumbosacral orthosis with joints providing resistant force in static standing
J Katsuhira1, K Horiuchi2, H Nakajima2, T Yasui2, S Iijima1, S Kawaguchi1, S Yamamoto1
1 International University of Health and Welfare, Tokyo, Japan, 2 Kawamura Gishi Co., Ltd., Japan

14.50 Treatment of chronic low back pain with postural sagittal brace (Lordactiv)
JF Salmochi1, JC de Mauroy1, P Rougier2, F Munoz2, P Fouën3
1 Clinique du Parc, Lyon, France, 2 Laboratoire de Physiologie de l'Exercice (EA 4338), Université de Savoie, Domaine scientifique de Savoie-technolac, Le Bourget du Lac, France ; Prodergo, Lyon

15.10 Effect of different unstable sitting postures on lordotic lumbar brace testing
F Munoz1, JF Salmochi2, PR Rougier1
1 Laboratoire de Physiologie de l'Exercice (EA 4338), Université de Savoie, Domaine scientifique de Savoie-technolac, Le Bourget du Lac, France; 2 Clinique du Parc, Lyon, France

15.30 Effects of postural sensor feedback device on postural control
NML Lau, DHK Chow, CSC Choy, WY Chan
Department of Health Technology & Informatics, The Hong Kong Polytechnic University, Hong Kong

15.50 Efficacy of lumbosacral orthoses in the management of low back pain: biomechanical and clinical comparison of two designs
J Cholewicki, DC Morrisette, AS Lee, NP Reeves, GA Seif
Michigan State University and Medical University of South Carolina, USA

16.10 Break

Chairpersons: Pr T Birmingham, Pr D Chow

17.00 Lecture

Current knowledge about ….Spinal Orthoses

Pr Daniel Chow
Hong Kong Polytechnic University, Hong Kong

18.00 Is the cad-cam molding more effective than the traditional plastered molding?
JC de Mauroy1, C Lecante2, F Barral2
1 Clinique du Parc, Lyon, France; 2 Groupe Lecante, Lyon, France

18.20 Conservative treatment in scoliosis and vital capacity evolution
JC Bernard, J Deceuninck, C Kohn
Centre Médico-Chirurgical de Réadaptation des Massues, Service de Médecine Physique et de Réadaptation - Enfants et adolescents., Lyon, France

18.40 Effects of load carriage on trunk motor control
C Wang, DHK Chow, A Lai

Department of Health Technology & Informatics, The Hong Kong Polytechnic University, Hong Kong

19.00 End

Saturday, March 26th

Ski or snowshoes in one of the nearby ski resorts

2 <u>Posters</u>

TeXiSense: a portable device for real time, *long-term* and in-situ foot pressure monitoring
N Vuillerme, Y Payan, M Bucki M, B Diot, F Cannard
TIMC-IMAG, UMR UJF CNRS 5525, La Tronche, France, TXS, Montceau-les-Mines, France
AGIM Laboratory, CNRS FRE UJF, La Tronche, France, IDS, Montceau-les-Mines, France

Re-weighting of somatosensory inputs from the feet and the ankles in control of balance of persons with low back pain: implications for optimizing footwear interventions
A *Pradels,, P Hlavackova., D Pradon, N Vuillerme.*
AGIM Laboratory, CNRS FRE UJF, La Tronche, France, CIC-IT 805, INSERM/AP-HP, Raymond Poincaré Hospital, EA 4497 , Garches, France, Centre de Podologie de l'Estacade, Grenoble, France

Orthotic management of bilateral partial foot amputations: a case study
A *Pradels, C Franco., P Hlavackova, B Diot, N Vuillerme*, AGIM Laboratory, CNRS FRE UJF, La Tronche, France, CIC-IT 805, INSERM/AP-HP, Raymond Poincaré Hospital, EA 4497, Garches, France, Centre de Podologie de l'Estacade, Grenoble, France

Understanding how foot pain affects balance control to design foot orthotics for patients suffering from foot pain
A *Pradels, D Pradon, N Vuillerme*
AGIM Laboratory, CNRS FRE UJF, La Tronche, France, CIC-IT 805, INSERM/AP-HP, Raymond Poincaré Hospital, EA 4497, Garches, France, Centre de Podologie de l'Estacade, Grenoble, France

Effects of foot orthoses in local plantar pressure relief during high-heeled gait
YD Gu1; JS Li1; XJ Ren2; MJ Lake3; ZY Li4
1.Human movement research centre, Zhejiang College of Sports, Hangzhou, China 2.School of Engineering, Liverpool John Moores University, Liverpool, UK 3.School of Sport and Exercise Sciences, Liverpool John Moores University, Liverpool, UK 4.School of Biological Science and Medical Engineering, Southeast University, Nanjing, China

A low-cost system for ankle-foot orthoses CAD
P Abellard, C Cassin, A Abellard
IUT – Handibio EA 4322, Université du Sud Toulon Var, France

What orthosis for walking in the mountains with an hemiplegia ?
I Hausmann, N Gillabert, J Lenoir
Handisport Genève, Michel Laeser & Jean Lenoir Orthopédie, Suisse

Spring-like ankle foot orthoses reduce energy cost of walking by taking over ankle work
DJJ Bregman, V de Groot, CGM Meskers, J Harlaa
MOVE Institute for Human Movement Research, VU University Medical Center, Amsterdam, The Netherlands

Do ankle-foot orthoses improve kinematic segmental covariation among stroke patients?
C Bleyenheuft, T Deltombe, C Detrembleur
Université catholique de Louvain - Cliniques universitaires de Mont-Godinne, Belgium

Effect of AFO material on gait parameters
V Creylman1,2, HVertommen1, L Muraru1,2, J Palari3, L Peeraer1,4
1.Mobilab, University College Kempen, Belgium 2.Division of Biomechanics and Engineering Design, KULeuven, Belgium 3.Materialise, Haasrode, Belgium 4.Faculty of Kinesiology and Rehabilitation Sciences, KULeuven, Belgium

Timing and therapeutic effects of ankle-foot orthoses after stroke
CDM Simons; JH Buurke, MJ Nederhand, JS Rietman, HJ Hermens
Roessingh Research & Development, Enschede, the Netherlands

Intelligent monitoring of ankle-foot and functional foot orthoses through embedded sensors
L Peeraer1,2, L Muraru1,3, R Sevit1, J Munguia4, K Dalgarno4
1-Multidisciplinary Research Laboratory for Biomedical and Rehabilitation Technology (MOBILAB), K.H.Kempen University College, Geel, Belgium; 2-Faculty of Kinesiology and Rehabilitation Sciences (FaBeR), K.U.Leuven, Leuven, Belgium; 3-Division of Biomechanics and Engineering Design (BMGO), K.U.Leuven, Leuven, Belgium; 4-School of Mechanical and Systems Engineering, Newcastle University, Newcastle, UK

Design systems for additive fabrication of foot and ankle-foot orthoses
JHP Pallari1, J Munguia2, J Oosterkamp3, T Putseys1, F Holtkamp3, KW Dalgarno2
1 Materialise NV, 2 Newcastle University, 3 Fontys University of Applied Sciences

Effect of the dynamic Ankle-Foot orthosis on hemiplegic patients gait
J Boudarham1, N Vuillerme2, D Bensmail1, N Roche1, D Pradon1
1Laboratoire d'analyse du mouvement, GRCTH EA 4497, CIC-IT 805, AP-HP, CHU Raymond Poincaré, Garches, France 2 Laboratoire TIMC-IMAG UMR UJF CNRS 5525, La Tronche, France

Development of active ankle-foot orthosis: simulation and validation.
R. Taiar1, D. Pradon2, N. Roche2 F. Boyer3
1 Laboratoire de Thermomécanique Gerspi, Faculté des Sciences, Reims, France. 2 Laboratoire d'analyse du mouvement, GRTCH EA 4497, CIC-IT 805, AP-HP, CHU Raymond Poincaré, Garches, France 3 Pôle de Médecine Physique et de Réadaptation, CHU Reims, Hôpital Sébastopol, Reims, France

Effect of the short knee-ankle foot orthosis on gait parameters of hemiplegic patients: a clinical case study
D Pradon1, J Boudarham1, R Zory1, N Vuillerme2, F Genet1, N Roche1
1Laboratoire d'analyse du mouvement, GRCTH EA 4497, CIC-IT 805, AP-HP, CHU

Raymond Poincaré, Garches, France 2 Laboratoire TIMC-IMAG UMR UJF CNRS 5525, La Tronche, France

Analysis of the effect of an ankle-foot orthosis on balance control using sample entropy
C Franco, B Diot, N Vuillerme
IDS SA, Montceau-les-Mines, France ; AGIM Laboratory, CNRS FRE UJF, La Tronche, France
TIMC IMAG Laboratory, UMR UJF CNRS 5525, La Tronche, France

Case report: accommodated dinamic afo and orthopedic shoes for the posttraumatic foot and ankle deformity
V Muzic1, O Zivkovic1, ERadovic2
Organization :1University Hospital Centre Zagreb, Department of Rehabilitation and Orthopeadic Devices, 2 University Hospital Centre Rijeka, Department of Physical and Rehabilitation Medicine, Croatia

Biomechanical constraints and motor program adaptation to experimental hypomobility of ankle during gait
A. Delafontaine, J-L Honeine, M-C Do
Laboratoire CIAMS, Equipe RIME, UFR STAPS Orsay, Université de Paris-Sud, France

Changes in the EMG activity with the use of a knee orthosis in patients with medial knee osteoartritis
CH Fantini Pagani, B Kleis, GP Brüggemann
Institute of Biomechanics and Orthopaedics - German Sport University, Cologne, Germany

A fluoroscopic investigation of valgus knee bracing
K Whitney, T Birmingham, R Walsh, R Giffin, T Jenkyn
School of Physical Therapy, Elborn College, University of Western Ontario, London, Canada

Psychological aspects of patient scoliotic
MR Claudepierre, C Cheniot
Association Scoliose et Partage, Seloncourt, France

The effect of neoprene shoulder supports on joint reposition sense in men with unstable shoulders
B Hassan Beygi, M Mousavi, M Giti, A Nodehi, M Rahgozar
Orthotics and Prosthetics Department, University of Social Welfare and Rehabilitation, Iran

The sagittal realignment brace in the treatment of chronic postural low back pain
HR Weiss, M Werkmann, S Bohr
Orthopedic Rehabilitation Services, Gensingen, Germany

In-patient rehabilitation - A systematic PubMed review
HR Weiss
Orthopedic Rehabilitation Services, Gensingen, Germany

In-brace corrections using a new brace design in the treatment of thoracic kyphosis
HR Weiss, M Werkmann, S Bohr
Orthopedic Rehabilitation Services, Gensingen, Germany

Best Practice standard of brace in the treatment of scoliosis
HR Weiss, M Werkmann, S Bohr
Orthopedic Rehabilitation Services, Gensingen, Germany