



International Society of
Electrophysiology and Kinesiology

June 22–25, 2022
Québec City, Canada



ISEK XXIV



www.isek.org



#ISEK2022
@ISEKCongress

Time	Wednesday		Thursday		Friday		Saturday			
	22-Jun		23-Jun		24-Jun		25-Jun			
700			Student morning walk 07:00 - 07:30							
715										
730							Student morning walk 07:30 - 08:00			
745							Student morning walk 07:30 - 08:00			
800			Opening Address & Debate John Rothwell & Jens Bo Nielsen 08:00-09:30			Keynote #3/Basmajian Lecture Jayne Garland 08:30-09:30				
815			Break 09:30-10:00				Keynote #5 Richard Willy 08:30 - 09:30			
830			Sym 1	Sym 2	Oral 1	Oral 2	Break 09:30-10:00			
845			Sym 7	Sym 8	Oral 7	Oral 8	Break 09:30-10:00			
900			Sym 13	De Luca Sym	Oral 13	Oral 14				
915			Poster Session 1 with Lunch 11:30 - 13:00				Poster Session 3 with Lunch 11:30 - 13:00			
930			Sym 3	Sym 4	Oral 3	Oral 4	General Assembly 13:00 - 14:00			
945			Sym 9	Sym 10	Oral 9	Oral 10	Keynote #6 Siobhan Schabrun 14:00 - 15:00			
1000			Sym 14	Sym 15	Oral 15	Oral 16	Break 15:00 - 15:30			
1015			Transition				Awards & Closing			
1030			Keynote #2 Neila Mezghani 14:45 - 15:45			Transition				
1045			Sym 5	Sym 6	Oral 5	Oral 6	Transition			
1100			Sym 11	Sym 12	Oral 11	Oral 12				
1115			Workshop 1 13:00 - 15:00							
1130			Transition							
1145			Keynote #4 Junichi Ushiyama 14:45 - 15:45							
1200			Transition							
1215			Transition							
1230			Workshop 2 15:30 - 17:30							
1245										
1300			Opening Reception 18:00 - 19:30							
1315										
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1500			Break 15:00 - 15:30							
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1530			Workshop 2 15:30 - 17:30							
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1800			Opening Reception 18:00 - 19:30							
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2000										
2015										
2030										
2045										
					Congress Banquet 19:30 - 21:30					

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ABOUT ISEK

The International Society of Electrophysiology and Kinesiology (ISEK) is a multidisciplinary organization composed of members from all over the world in health-related fields, and basic science with a common desire to study human movement and the neuromuscular system.

The purpose of the Society is to promote research and teaching in the disciplines of Electrophysiology and Kinesiology in normal, experimental and pathological conditions of the sensory and motor systems, with emphasis on the interactive use of the two disciplines.

ISEK HISTORY

During the International Congress of Anatomy in the Rhein-Maine-Halle, Wiesbaden, Germany in the summer of 1965, several anatomists gathered for a luncheon to discuss the organization of a small society in electrophysiological kinesiology. This group agreed to found ISEK, the International Society of Electrophysiological Kinesiology. Since this meeting, ISEK has been providing a forum for professionals from health-related fields and basic science to discuss research and teaching in the disciplines of Electrophysiology and Kinesiology in normal, experimental and pathological conditions of the sensory and motor systems, with emphasis on the interactive use of the two disciplines.



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WELCOME TO ISEK 2022

Dear Participants and Colleagues,

We are honored to welcome you to Quebec City for this XXIV ISEK Congress. Quebec City is known and loved for its European charm, and, of course, for Old Québec—a treasured UNESCO World Heritage Site. Many activities will be taking place in our city, during your stay with us, for the celebrations surrounding our National Day (June 24). We hope our cheerful streets will offer you many opportunities to have a taste of and experience our unique French culture and make your passage in our city memorable. The heart of the research in the analysis of human movement and in rehabilitation in Quebec City is taking place at the Cirris (Center for Interdisciplinary Research in Rehabilitation and Social Integration). Cirris and ISEK's scientific research interests are strongly linked. Cirris have many niches of excellence in the research domain of motor control/learning, pain, neurorehabilitation, and accessibility in urban context, but also have exciting innovative and emerging fields of research. Our Local organizing committee have chosen "Science in motion" for this year's theme to particularly reflect this interest towards the new possibilities of our ever-changing field. In addition, we chose to start our keynote conference series with a debate. We hope that this unconventional congress onset will stimulate scientific reflections on fundamental questions in our field in a fun and dynamic way.

As in previous ISEK congresses, the next few days will be the occasion for exchange and discussion of new ideas within the broad field of electrophysiology and kinesiology and, we hope, the occasion to be the cradle of new collaborations. Our outstanding Keynote Lecturers will provide the frame for this program by covering the spectrum of this year's themes. We thank all of them for accepting our invitation. The remainder of the program was built around the numerous excellent symposia, workshops and individual submissions for orals and posters that you submitted. We would also like to thank the local scientific committee, who have helped, with their time as well as their scientific knowledge and network, to provide the scientific elements of this program. A big thank you also to the ISEK board members who have provided much support and encouragement during this entire process as well as the entire staff at Podium Conferences, who were of essential help in the realisation of such an event. We would also like to thank all members of our international scientific committee for help during the review process and all the members who accepted to act as moderators and session chairs. Thank you also to the students involved in the local student committee who worked together with the ISEK student committee to provide activities and networking occasions for student participants as well as the students who accepted to volunteer for the time of the congress. Finally, we would like to thank our sponsors, who contributed generously to this meeting. We hope that you have a productive meeting, meaningful encounters, and that you enjoy your time in Quebec City.

Sincerely,

Laurent Bouyer and Jean-Sebastien Roy



International Society
of Electrophysiology and Kinesiology

GENERAL INFORMATION

ISEK LEADERSHIP

The Society is administered by a Council consisting of a President, Vice-President, Secretary, Treasurer, and five other members, all of whom are elected for a two year term. The Society's Bylaws govern how the Board manages the Society.

The ISEK Council consists of the following positions (Elected for two years)

President	Eric Perreault, <i>Northwestern University</i>
Vice President	Madeleine Lowery, <i>University College Dublin</i>
Past President	Karen Sogaard, <i>Syddansk Universitet</i>
Secretary	Kylie Tucker, <i>University of Queensland</i>
Treasurer	Kohei Watanabe, <i>Chukyo University</i>

Council Members

Laurent Bouyer, Université Laval
Corrado Cescon, University of Applied Science of Southern Switzerland
Ales Holobar, University of Maribor
Dawn MacIsaac, University of New Brunswick
Francesco Negro, University Medical Center Gottingen
Jean-Sebastien Roy, Université Laval
Minoru Shinohara, Georgia Institute of Technology
Taian Vieira, Politecnico di Torino

Early Career Researcher Representative

Manuela Besomi, The University of Queensland

Niels Brouwer, Vrije Universiteit Amsterdam

2022 Local Organizing Committee

Alexandre Campeau-Lecours, Université Laval

Veronique Flamand, Université Laval

Hugo Massé-Alarie, Université Laval

Bradford James McFadyen, Université Laval

Catherine Mercier, Université Laval

Martin Simoneau, Université Laval

Katia Turcot, Université Laval

ISEK Secretariat

Podium Conference Specialists

Michelle Smith

Cendrine De Vis

Vivek Punwani

MEMBERSHIP INFORMATION

ISEK membership is open to all scientists, principal investigators and students from around the world, pursuing research whose goal is to understand human movement and the neuromuscular system. The ISEK membership term runs for 2 years from October 1 – September 30; the current term runs from October 1, 2021 – September 30, 2023. See below for the many benefits to becoming an ISEK Member.



BENEFITS

In addition to the connections you will make with fellow members, your ISEK membership also includes access to the following:

- Ability to register for the Biennial ISEK Congress at reduced registration rates
- Ability to submit abstracts for the ISEK Congress
- Free access to ISEK – JEK Tutorial videos and resources
- Ability to participate in society elections
- Opportunities for professional development and networking
- Regular email updates and notices

GENERAL CONFERENCE INFORMATION

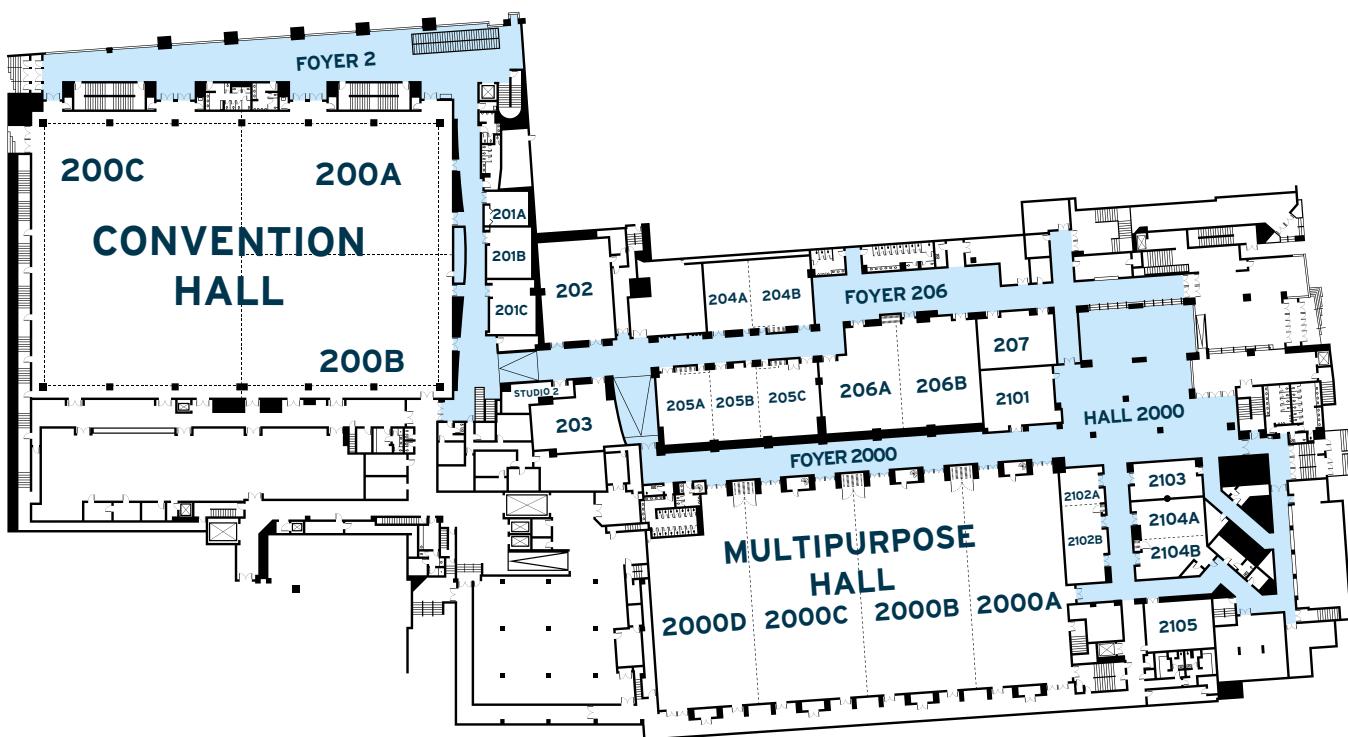
CONGRESS VENUE

Quebec City Convention Centre

1000, boul. René-Lévesque Est
Quebec City, Quebec G1R 5T8

All scientific conference sessions and the opening reception will take place at the Quebec City Convention Centre. The conference dinner will be held offsite and further information can be found in the social events page.

CONFERENCE CENTER FLOOR PLAN



REGISTRATION

The congress registration fees include access to all sessions including keynote speakers, symposium, contributed sessions, poster sessions and the welcome reception. Registration also includes daily refreshment breaks and lunches.

ADDITIONAL TICKETS

Tickets can be purchased separately for your guests to attend the Opening Reception or the Congress banquet. These additional tickets can be purchased from the staff at the ISEK's registration desk.

NAME BADGES

Your name badge is your admission ticket to the conference sessions, coffee breaks, lunch and poster sessions and reception. Please wear it at all times. At the end of the Congress we ask that you recycle your name badge in one of the name badge recycling stations that will be set out or leave it at the Registration Desk.

REGISTRATION AND INFORMATION DESK HOURS

The ISEK Registration and information desk, in the Foyer 2 of the Quebec City Convention Centre, will be open during the following dates and times:

Wednesday June 22, 2022	11:30 – 19:30
Thursday June 23, 2022	07:00 – 17:30
Friday June 24, 2022	08:00 – 17:30
Saturday June 25, 2022	08:00 – 17:30

If you need assistance during the conference, please visit the Registration Desk.

STAFF

ISEK 2022 staff from Podium Conference Specialists can be identified by orange ribbons on their name badges. Feel free to ask anyone of our staff for assistance. For immediate assistance please visit us at the Registration Desk.

INTERNET SERVICES

Wireless Internet is available to ISEK Congress delegates for no charge. Simply choose the **Centre des Congrès** network, scroll down the page, **enter your email** and accept the terms and conditions, and press the **connect button**. Kindly note, the WiFi strength is ideal for checking emails and websites but is not strong enough for streaming videos or heavy social media use.

If you are active on social media, make sure to hashtag **#ISEK2022 @ISEKCongress** when referring to the meeting. We ask all ISEK delegates to respect no live tweeting of presentations without prior approval from the speakers/authors. We encourage social tweets about the conference and look forward to growing our online community.

If you require assistance, please visit the registration desk and we will endeavour to assist you.

NO SMOKING POLICY

The Québec City Convention Centre is a completely non-smoking venue. Smoking is permitted in designated locations outside of the conference centre.



International Society
of Electrophysiology and Kinesiology

POSTER INFORMATION

SET UP/REMOVAL

There are three poster sessions during the conference and posters have been allocated to one of the sessions based on poster themes. Poster presenters must set-up and remove their posters during the following times.

Poster Session 1 – Thursday June 23

Set-up: Between 07:30 – 11:30
Poster hours: 11:30 – 13:00
Tear down: No later than 17:30

Poster Session 2 – Friday June 24

Set-up: Between 07:30 – 11:30
Poster hours: 11:30 – 13:00
Tear down: No later than 17:30

Poster Session 3 – Saturday June 25

Set-up: Between 07:30 – 11:30
Poster hours: 11:30 – 13:00
Tear down: Immediately following afternoon break at 15:30

Any posters that are not taken down by the removal deadline will be held at the registration desk until the end of the Congress. Any posters that remain unclaimed by the end of the Congress will be disposed of.

Information on Poster Authors (Lead), Poster Numbers and Poster Titles begins on page X. Digital copies can be downloaded from the ISEK website.

Easy reference Poster floor plans for each session can be found on the inside back cover of this program.

SOCIAL EVENTS

Wednesday June 22, 2022

OPENING RECEPTION

Location:

Quebec City Convention Centre, 2nd Floor Foyer

18:00 – 19:30

Join us to meet up with old friends, make new connections and celebrate the beginning of the ISEK Congress! Small food items and a cash bar will be available for all registered delegates.

Friday June 24, 2022

CONGRESS BANQUET DINNER

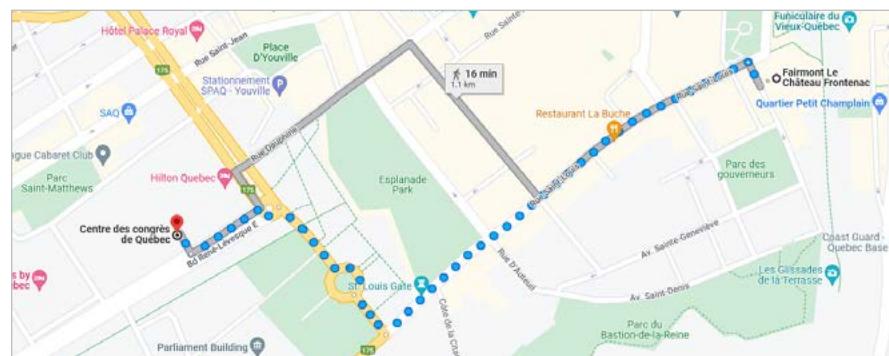
Location:

Fairmont Chateau Frontenac, Bellevue and Frontenac Rooms
1 rue des Carrières
Quebec City, Canada

19:30 – 21:30

This heritage hotel overlooking the St Lawrence River and the architecture of the Old Fortified City, a UNESCO world heritage site. This iconic Quebec City property will delight delegates with the beautiful architecture and history while providing a space for an elegant served dinner.

Tickets can be purchased from the Registration desk in advance of the dinner. Please note, limited seats are still available and pre-registration is required.



DETAILED PROGRAM

WEDNESDAY JUNE 22, 2022

11:30 – 19:30 ARRIVAL AND REGISTRATION

Foyer 2

13:00 – 15:00 WORKSHOP 1

Room 202

Recent progresses in EMG-based motor unit identification

Presenters: Ales Holobar¹, Dario Farina², Jakob Skarabot³, Simone Tanzarella²

¹University of Maribor, Faculty of Electrical Engineering and Computer Science, ²Imperial College London, ³Loughborough University

After explaining the concepts of EMG-based motor unit (MU) identification we will focus on recent achievements in MU identification during elicited, rapid isometric, and dynamic contractions. Tutorials on MU identification will be provided, along with practical examples.

15:30 – 17:30 WORKSHOP 2

Room 202

Planting the CEDE: Designing knowledge translation strategies to implement current expert-based recommendations on electromyography

Presenters: Paul Hodges¹, Emmah Doig¹, Manuela Besomi¹, Valter Devecchi², Alessandro Del Vecchio³, Eduardo Martinez-Valdes²

¹The University of Queensland, ²University of Birmingham, ³University of Erlangen-Nuremberg (FAU)

We aim to engage with the ISEK community in planning knowledge translation strategies for the CEDE matrices. In this workshop, we will actively work with participants to propose implementation strategies that can be achievable, and most importantly, relevant for the community and end-users.

18:00 – 19:30 OPENING RECEPTION

Foyer 2



International Society
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THURSDAY JUNE 23, 2022

07:00 – 07:30 STUDENT MORNING WALK

Join us for a brisk walk to begin the day.

08:00 – 09:30 OPENING ADDRESS & DEBATE

Room 200A Join us to start off the congress with a welcome from our congress co-chairs, Jean-Sebastien Roy and Laurent Bouyer

Automatic vs. voluntary control – Which one predominates in sensorimotor processing? Voluntary!

John Rothwell, UCL Queen Square Institute of Neurology

Automatic vs. voluntary control – Which one predominates in sensorimotor processing? Automatic!

Jens Bo Nielsen, University of Copenhagen

Chairs: Laurent Bouyer, Université Laval & Véronique Flamand, Cirris

9:30 – 10:00 COFFEE BREAK

Room 200B

10:00 – 11:30 PARALLEL SESSIONS

Room 200A **SYMPOSIUM 1**

Aging and central nervous system ~Quantification of invisible changes in aged-human body~

Chair: Kohei Watanabe, Chukyo University

S1.1 Effects of aging on persistent inward currents of human motoneurons

Gregory Pearcey¹, Altamash Hassan¹, Melissa Fajardo¹, Mark Cummings¹, Francesco Negro², Laura Miller McPerson³, Julius Dewald¹, CJ Heckman¹

¹*Northwestern University*, ²*Università degli Studi di Brescia*, ³*Washington University in St. Louis*

S1.2 Motor unit activation properties in older adults and stroke patients

Allison Hyngstrom¹

¹*Marquette University*



S1.3 Does regional recruitment and differential control of motor units during postural control persist in older adults?

Joshua Cohen¹, Tanya Ivanova¹, Jayne Garland¹

¹*Western University*

S1.4 Low-intensity exercise and motor functions in older adults

Tetsuya Hirono¹

¹*Laboratory of Neuromuscular Biomechanics, School of Health and Sport Sciences, Chukyo University*

10:00 – 11:30 SYMPOSIUM 2

Room 202

Effect of muscle fatigue and joint loading on motor control and performance

Chair: Bernadette Murphy, Ontario Tech University

S2.1 Effect of footwear wedges on muscle function during running induced fatigue

Uwe Kersting¹, Ryo Morikawa¹, Natalie Mrachacz-Kersting²

¹*German Sport University Cologne, ²University of Freiburg*

S2.2 The influence of soccer induced central and peripheral fatigue on joint positioning sense

Natalie Mrachacz-Kersting¹, Uwe Kersting²

¹*University of Freiburg, ²German Sport University Cologne Am Sportpark Müngersdorf 6*

S2.3 Using robotics to evaluate the effects of forearm muscle fatigue on upper limb sensorimotor control

Mike Holmes¹, Jacopo Zenzeri², Davis Forman³, Garrick Forman¹

¹*Brock University, ²Istituto Italiano di Tecnologia, ³University of Guelph*

S2.4 Impact of neck fatigue on upper limb motor performance, sensory processing and cerebello-cortical excitability following novel motor task acquisition

Mahboobeh Zabihhosseiniyan¹, Paul Yielder¹, Michael Holmes², Bernadette Murphy¹

¹*University of Ontario Institute of Technology, ²Brock University*



S2.5 Using empirical and computational models of muscle fatigue to develop and validate repetitive work thresholds in ergonomics

Nicholas La Delfa¹, Ryan Foley¹

¹Ontario Tech University

10:00 – 11:30 ORAL 1 – REHABILITATION

Room 204AB *Chairs: Louis-David Beaulieu, Université du Québec à Chicoutimi & Nicole Paquet, University of Ottawa*

O1.1 The relationship between clinical examination measures and the fascia thickness surrounding trunk muscles or lumbar multifidus fatty infiltrations: An exploratory study

Christian Lariviere¹, Richard Preuss², Dany Gagnon³, Sharon Henry⁴

¹Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST), ²McGill University, ³Université de Montréal, ⁴The University of Vermont Medical Center

O1.2 Rotator cuff related shoulder pain: does the type of exercise influence the outcomes? A randomized controlled trial

Marc-Olivier Dubé¹, Jeremy Lewis², François Desmeules³, Jean-Sébastien Roy¹

¹Université Laval, ²University of Hertfordshire, ³Université de Montréal

O1.3 Integrating computer vision with electromyography for semi-autonomous control of robotic limbs

Milia Hasbani¹, Deren Barsakcioglu¹, Rachel Azulay¹, Moon Ki Jung¹, Dario Farina¹

¹Imperial College London

O1.4 Physical and psychological effects of combined motor control and isolated lumbar extension exercise versus general exercise for chronic low back pain: a randomized controlled trial

Alexa Roussac¹, Meaghan Rye¹, Neda Naghdi¹, Brent Rosenstein¹, Luciana Macedo², James Elliott³, Veronique Pepin¹, Richard DeMont⁴, Michael Weber⁵, Geoffrey Dover¹, Maryse Fortin⁴

¹Concordia University, ²McMaster University, ³University of Sydney, ⁴Concordia, ⁵McGill University Health Centre



O1.5 Metrological qualities of a new surface EMG based-index in Autosomal Recessive Spastic Ataxia of Charlevoix-Saguenay

Olivier Audet¹, Isabelle Lessard², Mathieu Bielmann³, Cynthia Gagnon⁴, Raphaël Saint-Gelais², Hubert Racine³, Rubens A. da Silva⁵, Luc J. Hébert⁶

¹Center for Interdisciplinary Research in Rehabilitation and Social Integration (CIRRISS),

²Groupe de recherche interdisciplinaire sur les maladies neuromusculaires (GRIMN), ³Center for Interdisciplinary Research in Rehabilitation and Social Integration, ⁴Université de Sherbrooke, ⁵Université du Québec à Chicoutimi, ⁶Université Laval

O1.6 Greater paraspinal muscle activity on the convex than concave side is more prevalent for adolescents with single right progressive idiopathic scoliosis. A narrative review of surface EMG studies.

Phoebe Ng¹, Andrew Claus², Maree Izatt³, Peter Pivonka³, Kylie Tucker⁴

¹KK Women's and Children's Hospital/ The University of Queensland, ²The University of Queensland/ Royal Brisbane Children's and Women's Hospital, ³Queensland University of Technology, ⁴The University of Queensland

O1.7 A textile-based electrode system for self-administered phantom limb pain treatment in the home environment

Anna Björkquist¹, Morten Kristoffersen², María Muñoz-Novo², Max Ortiz-Catalan³, Leif Sandsjö¹, Li Guo¹

¹University of Borås, ²Gothenburg University, ³Chalmers University of Technology

10:00 – 11:30 ORAL 2 – MUSCLE SYNERGY

Room 205 AB Chairs: Julie Coté, McGill University & Fabien Dal Maso, Université de Montréal

O2.1 To what extent does unilateral chronic Achilles tendinopathy affects lower extremity muscle synergies during gait at natural and fast speeds?

Mathieu Lalumière¹, Daniel Bourbonnais¹, Michel Goyette², Sarah Perrino¹, François Desmeules¹, Dany Gagnon¹

¹Université de Montréal, ²Centre for Interdisciplinary Research in Rehabilitation of Greater Montreal

O2.2 Cortical contributions to locomotor primitives in toddlers and adults

Coen Zandvoort¹, Andreas Daffertshofer¹, Nadia Dominici¹

¹Vrije Universiteit Amsterdam



O2.3 Independent walking is accompanied by cortico-synergy coupling

Coen Zandvoort¹, Andreas Daffertshofer¹, Nadia Dominici¹

¹Vrije Universiteit Amsterdam

O2.4 Neck muscle network topology analysis in people with chronic neck pain

David Jimenez-Grande¹, Eduardo Martinez-Valdes¹, Deborah Falla¹

¹University of Birmingham

O2.5 Muscle synergies for highly variable human manipulations

Hiroki Saito¹, Hikaru Yokoyama², Atsushi Sasaki², Tatsuya Kato², Kimitaka Nakazawa²

¹The Tokyo University of Technology, ²The University of Tokyo

O2.6 Sex-specific effects of fatigue on muscle synergies in a repetitive pointing task

Yiyang Chen¹, Chen Yang¹, Julie Côté¹

¹McGill University

O2.7 Static force feedback training recruiting muscle synergies improves strength and coordination of the paretic lower extremity and mobility in participants with stroke

Daniel Bourbonnais¹, Mathieu Lalumière¹, Michel Goyette¹

¹Université de Montréal

11:30 – 13:00 POSTER SESSION 1 WITH LUNCH

Room 200B

13:00 – 14:30 PARALLEL SESSIONS

Room 200A **SYMPOSIUM 3**

Motor unit population behaviour in humans: emerging avenues and challenges

Chair: Alessandro Del Vecchio, Friedrich-Alexander Universität, Erlangen-Nürnberg



13:00 – 14:30 S3.1 Synergistic motor neuron pools receive common synaptic input from at least two sources during voluntary isometric contractions

Alessandro Del Vecchio¹

¹Friedrich-Alexander Universität, Erlangen-Nürnberg

S3.2 Non-invasive estimate of muscle fibre cross-sectional area

Andrea Casolo¹

¹University of Padua

S3.3 Changes in the activity of spinal motor neurons following anterior cruciate ligament reconstruction.

Stefano Nuccio¹

¹University of Rome "Foro Italico"

S3.4 The response of a motor pool to peripheral nerve stimulation is underestimated when measured through surface electromyography.

Demetris Soteropoulos¹, Alessandro Del Vecchio²

¹Newcastle University, ²Friedrich-Alexander University Erlangen-Nürnberg

13:00 – 14:30 SYMPOSIUM 4

Room 202 **Neural mechanisms of cross-education: Have the 100-year old clinical promises been fulfilled?**

Chair: Tibor Hortobágyi, University of Groningen

S4.1 How the brain becomes activated bilaterally during unilateral motor actions: a neural mechanism for therapy

Tibor Hortobágyi¹

¹University Medical Center Groningen, University of Groningen

S4.2 The positives of negatives: Eccentric exercise and cross-education effect

Ken (Kazunori) Nosaka¹



S4.3 Sparing effects of cross-education during immobilization: Candidate mechanisms and clinical potential

Jonathan Farthing¹

¹*University of Saskatchewan*

S4.4 Bilateral M1 activations of top-level Paralympic athletes with prostheses

Kimitaka Nakazawa¹

¹*University of Tokyo*

13:00 – 14:30 ORAL 3 – FATIGUE

Room 204AB *Chairs: Jason Bouffard, Université Laval & Manuela Besomi, The University of Queensland*

O3.1 Enhanced availability of serotonin reduces voluntary muscle activation during high-intensity, but not during low-intensity, fatiguing contractions

Tyler Henderson¹, Janet Taylor², Jacob Thorstensen³, Murray Tucker⁴, Justin Kavanagh¹

¹*Griffith University, ²Edith Cowan University, ³University of Queensland, ⁴Barwon Health*

O3.2 Less common synaptic input between muscles from the same group allows for more flexible coordination strategies during a fatiguing task.

Julien Rossato¹, Kylie Tucker², Simon Avrillon³, Lilian Lacourpaille¹, Ales Holobar⁴, François Hug⁵

¹*Université de Nantes, ²The University of Queensland, ³Shirley Ryan AbilityLab, ⁴University of Maribor, ⁵Université Côte d'Azur*

O3.3 Identification of electromyographic indicators to assess the myoelectric manifestation of fatigue during a low-load repetitive pointing task.

Elvige Fegni Ndam¹, Etienne Goubault¹, Béatrice Moyen-Sylvestre¹, Fabien Dal Maso¹

¹*Université de Montréal*



13:00 – 14:30 O3.4 Trunk extensor muscle action potential conduction velocity estimated using high-density EMG

Room 204AB

Niels Brouwer¹, Ali Tabasi¹, Idsart Kingma¹, Dick Stegeman¹, Wietse van Dijk², Alejandro Moya-Esteban³, Massimo Sartori³, Jaap van Dieën¹

¹Vrije Universiteit, ²TNO, ³University of Twente

O3.5 Examining the influence of exertion/rest order effects on predicted muscle fatigue: a simulation study

Ryan Foley¹, Nicholas La Delfa¹

¹Ontario Tech University

O3.6 Peak rate of velocity development of electrically evoked contractions is impaired less than voluntary contractions in the plantar flexors following a dynamic fatiguing task

Michael Paris¹, Charles Rice¹

¹University of Western Ontario

O3.7 Modulation of intermuscular beta coherence for mental fatigue during treadmill walking is similar in younger and older

Paulo Cezar Santos¹, Fabio Barbieri², Claudine Lamoth³, Tibor Hortobágyi³

¹Weizmann Institute of Science, ²São Paulo State University, ³University Medical Center Groningen, University of Groningen

13:00 – 14:30 ORAL 4 – MOTOR DISORDERS

Room 205AB

Chairs: Pascal Madeleine, Aalborg University & Madeleine Lowery, University College Dublin

O4.1 Cortical activation of lower extremity recovery during inpatient stroke rehabilitation

Sue Peters¹, Chieh-ling Yang², Shannon Lim³, Janice Eng³

¹Western University, ²Chang Gung University, ³University of British Columbia

O4.2 Short term effects of modulating the excitability of the posterior parietal cortex with rTMS for freezing of gait in Parkison's disease

Alexandra Potvin-Desrochers¹, Alejandra Martinez Moreno¹, Julien Clouette¹, Henri Lajeunesse¹, Freddie Seo¹, Gleydiane Alexandra Fernandes¹, Frédérique Parent-L'Ecuyer¹, Audrey Parent¹, Michelle Cheng¹, Madeleine Sharp¹, Caroline Paquette¹

¹McGill University



O4.3 Fasciculation electromechanical latency is prolonged in amyotrophic lateral sclerosis

James Bashford¹, Domen Planinc¹, Cristina Cabassi¹, Nazifa Muhamood¹, Emma Hodson-Tole², Christopher Shaw¹

¹*King's College London, ²Manchester Metropolitan University*

O4.4 Proximal spinal stretch reflexes are not affected in individuals treated with neurotoxic chemotherapy

Allison Wang¹, Stephen Housley², Ann Flores¹, Timothy Cope², Eric Perreault¹

¹*Northwestern University, ²Georgia Institute of Technology*

O4.5 People with Multiple Sclerosis show evidence of reduced motor cortical voluntary activation during sustained maximal contractions

Emily Brotherton¹, Surendran Sabapathy¹, Justin Kavanagh¹

¹*Menzies Health Institute Queensland*

O4.6 Variability of Neural/Musculoskeletal-modelled Ankle Joint Torques during Gait in Children with Cerebral Palsy

Shui Kan Lam¹, Harri Piitulainen², Juha-Pekka Kulmala³, Ivan Vujaklija¹

¹*Aalto University, ²University of Jyväskylä, ³University of Helsinki and Helsinki University Hospital*

14:45 – 15:45 KEYNOTE PRESENTATION

Room 200A **Mechanical biomarkers identification using artificial intelligence**

Neila Mezghani, TELUQ

Chair: Katia Turcot, Université Laval

16:00 – 17:30 PARALLEL SESSIONS

Room 200A **SYMPOSIUM 5**

Innovative approaches for the neuromechanical characterization of muscle and tendon properties

Chair: Alberto Botter, Politecnico di Torino



S5.1 Concurrent assessment of motor unit firing properties and fascicle length changes with high-density surface electromyography ultrasound-transparent electrodes

Eduardo Martinez-Valdes¹, Francesco Negro², Alberto Botter³, Patricio Pincheira⁴, Giacinto Cerone³, Deborah Falla¹, Glen Lichtwark⁴, Andrew Cresswell⁴

¹*University of Birmingham, ²Universita` degli Studi di Brescia, ³Politecnico di Torino, ⁴University of Queensland*

S5.2 Identification of single motor units in the complex tissue dynamics of voluntary skeletal muscle contractions - using ultrafast ultrasound imaging and spatio-temporal decomposition

Christer Grönlund¹, Robin Rohlén¹, Erik Stålberg²

¹*Umeå University, ²Umeå Universitet*

S5.3 Detecting electrical and mechanical motor unit characteristics using high density electromyography and ultrafast ultrasound

Marco Carbonaro¹, Kristen Meiburger¹, Silvia Seoni¹, Emma Hodson-Tole², Taian Vieira¹, Alberto Botter¹

¹*Politecnico di Torino, ²Manchester Metropolitan University*

S5.4 Three-dimensional mapping of shear wave velocity of human tendons in health and pathological states: a proof of concept

Martino Franchi¹, Tobias Götschi², Jess Snedeker², Jörg Spörri³

¹*University of Padova, ²Balgrist University Hospital/ETH Zürich, ³Balgrist University Hospital/University of Zürich*

S5.5 Investigating the influence of age and sex on the activation-dependent stiffness of the pectoralis major using ultrasound shear-wave elastography

Tea Lulic¹, Cheryl Setlock², Joshua Leonardis², Madison Kulik², David Lipps²

¹*Universita degli Studi di Brescia, ²University of Michigan*



16:00 – 17:30 SYMPOSIUM 6

Room 202

Effect of altered sensory and cognitive processing on sensorimotor integration

Chair: Bernadette Murphy, Ontario Tech University

S6.1 Impact of chronic pain on the detection and behavioral response to sensorimotor conflicts

Catherine Mercier¹

¹Université Laval – Cirris

S6.2 Understanding the influence of cognitive factors in pain-related corticomotor modulations: what role for kinesiophobia and pain catastrophizing?

Guillaume Léonard¹, Arnaud Duport¹, René Pelletier², Marylie Martel³

¹Centre de recherche sur le vieillissement - Université de Sherbrooke, ²CBI-Concordia Physiosport, ³Université de Sherbrooke

S6.3 Commissural Interneurons and their role in humans

Natalie Mrachacz-Kersting¹

¹University of Freiburg

S6.4 Neck Fatigue and Neck pain affect upper limb motor learning with corresponding changes in early somatosensory evoked potentials and cerebellar disinhibition

Bernadette Murphy¹, Mahboobeh Zabihhosseiniyan¹, Julianne Baarbé¹, Danielle Andrew¹, Paul Yielder¹

¹Ontario Tech University

S6.5 The effect of spinal dysfunction on limb proprioception and cortical drive to muscles

Heidi Haavik¹

¹Haavik Research



16:00 – 17:30 ORAL 5 - CLINICAL NEUROPHYSIOLOGY

Room 204AB Chairs: Kohei Watanabe, Chukyo University & Victoria Chester, University of New Brunswick

O5.1 New analytical models to investigate sensory re-weighting mechanisms using vibration-induced postural reactions paradigm

Mohamed A. Kadri¹, Emilie Bouchard¹, Lydiane Lauzier¹, Hakim Mecheri², William Begin¹, Martin Lavallière¹, Hugo Massé-Alarie³, Rubens A. da Silva¹, Louis-David Beaulieu¹

¹Université du Québec à Chicoutimi, ²Institut de recherche Robert-Sauvé en santé et en sécurité de travail, ³Université Laval

O5.2 Antagonism of the 5-HT2 receptor reduces human motoneuron excitability measured with F-waves but not cervicomedullary motor evoked potentials

Jacob Thorstensen¹, Janet Taylor², Justin Kavanagh¹

¹Griffith University, ²Edith Cowan University

O5.3 Vibration-induced modulation of central nervous system excitability of the flexor carpi radialis muscle

Clara Pfenninger¹, Nathan Grosboillot², Enrico Roma¹, Guillaume Dlgonet¹, Thomas Lapole¹

¹Inter-university Laboratory of Human Movement Biology, University of Lyon, UJM Saint-Etienne, EA 742, ²HVAE, EA6310, Faculty of Science and Technology, University of Limoges, 87000 Limoges, France

O5.4 Altered surface electromyographic activation in breast cancer survivors during functional arm movements

Pascal Madeleine¹, Gorm H Rasmussen¹, Afshin Samani¹, Mathias Kristiansen¹

¹Aalborg University

O5.5 Effect of sex hormones on non-nociceptive flexion reflex at rest

Subaryani Soedirdjo¹, Yu-Chen Chung², Luis Rodriguez II², Hyungtaek Kim², Conner Hutcherson², Kathleen McGovern², Yasin Dhaher²

¹UT Southwestern Medical Center, ²University of Texas Southwestern Medical Center



O5.6 Alpha suppression as an electrophysiological biomarker of motor drive inhibition during programmed lifts with unexpected sensory consequences

Oscar Ortiz¹, Victoria Chester¹, Adam Wilson¹, Usha Kuruganti¹, Daniel Blustein²

¹University of New Brunswick, ²Acadia University

16:00 – 17:30 ORAL 6 – ELECTRICAL MYOSTIMULATION

Room 205AB Chair: Yosra Cherni, Université Laval/CIRRIS

O6.1 Cortical and spinal excitability adaptations following neuromuscular electrical stimulation applied to the triceps surae

Riccardo Borzuola¹, Federico Quinzi¹, Martina Scalia¹, Francesco Di Russo¹, Andrea Macaluso¹

¹Università di Roma “Foro Italico”

O6.2 Development of a coaching system for functional electrical stimulation rowing: a validation study

Shirin Tajali¹, Pirashanth Theventhiran², Gongkai Ye², Kai Lon Fok^{1,3}, Hikaru Yokoyama⁴, Kento Nakagawa⁵, Kei Masani²

¹University Health Network, ²University Health Network, University of Toronto, ³University Health Network, University of Toronto, ⁴University of Tokyo, ⁵Waseda University

O6.3 Acute and short-term effects of transcutaneous electrical nerve stimulation on motor unit discharge characteristics and corticospinal excitability

Simon Avrillon¹, Julio Cesar Hernandez Pavon¹, Jose Pons¹

¹Shirley Ryan AbilityLab

O6.4 Modelling in-vivo human motoneurons via high-density electromyography decomposition and metaheuristic optimization

Rafael Ornelas Kobayashi¹, Jan Buitenweg¹, Utku Yavuz¹, Massimo Sartori¹

¹University of Twente

O6.5 PIC a chair and relax: weaker Persistent Inward Currents in motoneurons during whole-body relaxation

Ricardo Mesquita¹, Janet Taylor¹, Gabriel Trajano², Jakob Skarabot³, Ales Holobar⁴, Basílio Gonçalves⁵, Anthony Blazevich¹

¹Edith Cowan University, ²Queensland University of Technology, ³Loughborough University,

⁴University of Maribor, ⁵Griffith University



16:00 – 17:30 **06.6 Streamlined approach to optimal estimation of time-varying emg standard deviation (a.k.a. EMG Processing)**

Edward Clancy¹, He Wang¹, Kiriaki Rajotte¹, Haopeng Wang¹, Chenyun Dai², Ziling Zhu¹, Xinming Huang¹

¹Worcester Polytechnic Institute, ²Fudan University

06.7 Multichannel magnetomyography provides robust separability of motor unit action potentials: a simulation study

Thomas Klotz¹, Lena Lehmann¹, Franceco Negro², Oliver Röhrle¹

¹University of Stuttgart, ²Università degli Studi di Brescia



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International Society
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FRIDAY, JUNE 24, 2022

07:30 – 08:00 STUDENT MORNING WALK

Join us for a brisk walk to begin the day.

08:30 – 09:30 KEYNOTE & BASMAJIAN LECTURE

Room 200A

Postural control: from motor units to motor recovery after stroke

Jayne Garland, University of Western Ontario

Chair: Eric Perreault, Northwestern University

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09:30 – 10:00 COFFEE BREAK

Room 200B

10:00 – 11:30 PARALLEL SESSIONS

Room 200A

SYMPORIUM 7

Decoding the human motor system: what have we learned so far?

Chair: Dario Farina, Imperial College London

S7.1 Decoding of motoneuron populations via invasive high-density EMG

Silvia Muceli¹, Ales Holobar², Dario Farina³

¹Chalmers University of Technology, ²University of Maribor, ³Imperial College London

S7.2 Networks of common inputs to motor neurons of the lower limb reveal neural synergies that only partly overlap with muscle innervation

Francois Hug¹, Simon Avrillon², Aurelie Sarcher³, Alessandro Del Vecchio⁴,
Dario Farina⁵

¹Université Côte d'Azur, ²Shirley Ryan AbilityLab, ³Nantes Université, ⁴Friedrich-Alexander University, ⁵Imperial College London

S7.3 Reverse engineering of motor unit firing patterns to identify the structure of motor commands

CJ Heckman¹

¹Northwestern University, Shirley Ryan AbilityLab



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10:00 – 11:30 S7.4 Lessons learned from high density EMG recordings in pathologic states

Room 200A

Nina Suresh¹, Zev Rymer¹

¹Shirley Ryan Ability Lab / Rehabilitation Institute of Chicago

S7.5 Motor unit firing identification in electrically elicited H reflexes of Soleus muscle

Ales Holobar¹, Matjaz Divjak¹, Filip Urh¹, Matej Kramberger¹, Matjaz Vogrin², Milos Kalc²

¹University of Maribor, Faculty of Electrical Engineering and Computer Science, ²University of Maribor, Faculty of Medicine

10:00 – 11:30 SYMPOSIUM 8

Room 202

Chemotherapy-induced motor impairments: mechanisms, functional deficits, and implications for rehabilitation

Chair: Eric Perreault, Northwestern University

S8.1 Central and peripheral mechanisms of motor impairment following cancer treatment

Nick Housley¹

¹Georgia Institute of Technology

S8.2 Individuals treated with oxaliplatin chemotherapy exhibit unique proprioceptive deficits in proximal limbs

Allison Wang¹

¹Northwestern University

S8.3 Scope of the problem of chemotherapy-induced neuropathy

Ann Marie Flores¹

¹Northwestern University

10:00 – 11:30 ORAL 7 – MOTOR CONTROL AND MOTOR LEARNING

Room 204AB Chairs: Marc Belanger, Université du Québec à Montréal & Leah Bent, University of Guelph

O7.1 Dyadic haptic training improves ankle tracking performance but does not accelerate learning of the task

Daniel Ludvig¹, Sangjoon Kim², Yue Wen², Emek Baris Küçüktabak¹, Matthew Short¹, Jose Pons²

¹Northwestern University, ²Shirley Ryan AbilityLab



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of Electrophysiology and Kinesiology

10:00 – 11:30 **07.2 Location-specific cutaneous electrical stimulation of the foot sole modulates corticospinal and spinal excitability to the plantar and dorsi-flexors during standing**

Davis Forman¹, Gagan Gill¹, Joanna Reeves², Janet Taylor³, Leah Bent¹

¹University of Guelph, ²University of Bath, ³Edith Cowan University

07.3 Does low back muscle fatigue task specific modify the recruitment pattern of lumbar muscles?

Emile Marineau¹, Justin Roy¹, Bastien Couëpel¹, Mathieu Tremblay¹, Martin Descarreaux¹, Jacques Abboud¹

¹Université du Québec à Trois-Rivières

07.4 Is acetylcholine a neuromodulator of muscle activation?

Justin Kavanagh¹

¹Griffith University

07.5 Motor learning and Sensorimotor Integration during a Novel Force-Matching Task in Young Adults with Attention-Deficit/Hyperactivity Disorder

Heather McCracken¹, Bernadette Murphy¹, Ushani Ambalavanar¹, Paul Yielder¹

¹Ontario Tech University/UOIT

07.6 Reliability of contralateral associated EMG activity during unilateral strength testing

Carli Mentzer¹, Alisa Soloveva¹, Blake Ruplinger¹, Caleb Voskuil¹, Joshua Carr¹

¹Texas Christian University



10:00 – 11:30 ORAL 8 – MOTOR UNITS

Room 205AB Chairs: **Yasin Dhaher**, University of Texas Southwestern Medical Center & **Sue Peters**, Western University

08.1 Reticulospinal contribution to maximal *in vivo* motoneuron output in humans

Jakob Skarabot¹, Jonathan Folland¹, Ales Holobar², Stuart Baker³, Alessandro Del Vecchio⁴

¹Loughborough University, ²University of Maribor, ³Newcastle University, ⁴Friedrich-Alexander University

08.2 Identifying and tracking motor units using a multi-dimensional representation of their action potentials

Jérémie Liegey¹, Lara McManus², Madeleine Lowery¹

¹UCD, ²Trinity College Dublin

08.3 Real-Time Motor Unit Action Potential Recognition

John Chiodini¹, Michael Twardowski¹, Bhawna Shiwani¹, Serge Roy¹, Paola Contessa¹, Gianluca De Luca¹, Joshua Kline¹

¹Delsys & Altec Inc.

08.4 Consensus for experimental design in electromyography (CEDE) project: High-density surface electromyography matrix

Alessio Gallina¹, Catherine Disselhorst-Klug², Dario Farina³, Merletti Roberto⁴, Manuela Besomi⁵, Paul Hodges⁵

¹University of Birmingham, ²Aachen University, ³Imperial College London, ⁴Politecnico di Torino, ⁵The University of Queensland

08.5 Influence of volume conductor and spatiotemporal properties of motor unit action potentials on the number of decomposed motor units from high-density EMG signals

Daniela Souza de Oliveira¹, Andrea Casolo², Thomas Balshaw³, Sumiaki Maeo⁴, Marcel Lanza⁵, Neil Martin³, Nicola Maffuli⁶, Thomas Kinfe¹, Bjoern Eskofier¹, Jonathan Folland³, Dario Farina⁷, Alessandro Del Vecchio¹

¹Friedrich-Alexander University Erlangen-Nürnberg, ²University of Padova, ³Loughborough University, ⁴Ritsumeikan University, ⁵University of Maryland, ⁶University of Salerno, ⁷Imperial College London



O8.6 Intramuscular recordings of biceps and triceps brachii motor unit activity during ramped, isometric contractions performed as an agonist or antagonist muscle

Justine Magnuson¹, Brian Dalton¹, Chris McNeil¹

¹*The University of British Columbia - Okanagan Campus*

11:30 – 13:00 POSTER SESSION 2 WITH LUNCH

Room 200B

13:00 – 14:30 PARALLEL SESSIONS

Room 200A **SYMPORIUM 9**

New solutions for taking care of major limb amputees: technological developments and use of natural phantom sensations

Chair: Jozina De Graaf, AMU-CNRS ISM UMR 7287

S9.1 Assessment of motor control over the phantom limb and its relationship with phantom limb pain after hand amputation

Catherine Mercier¹

¹*Université Laval – Cirris*

S9.2 Intuitive control of upper limb prostheses via phantom limb mobility

Jozina De Graaf¹, Olivier Rossel², Manon Chateaux², Amelie Touillet³,

Nathanaël Jarrassé⁴, Jean Paysant³

¹*AMU-CNRS ISM UMR7287, ²AMU-CNRS ISM UMR 7287, ³Institut Régional de Réadaptation (IRR),*

⁴*Sorbonne Université*

S9.3 Somatosensory feedback during walking with a prosthesis via phantom limb sensations

Lisa Bachini¹, Stéphane Lissez², Serge Mesure¹, Claire Mahé¹, Amélie Touillet³, Isabelle Loiret³, Jean Paysant³, Jozina De Graaf¹

¹*AMU-CNRS ISM UMR7278, ²Lagarrigue Orthopédie, ³Institut Régional de Réadaptation (IRR)*

S9.4 Toward intuitive hybrid sensorimotor control of a prosthetic arm

Aymar de Rugy¹, Sébastien Mick², Effie Segas¹, Matthieu Guemann³, Christophe Halgand¹, Jenny Benois-Pineau⁴, Rémi Klotz⁵, Daniel Cattaert¹

¹*Univ. Bordeaux, CNRS, EPHE, INCIA, UMR 5287, ²ETIS, UMR 8051, CY Cergy Paris Université, ENSEA, CNRS F-95000, ³IRBA, unit PEACE, dept ENOP, ⁴Univ. Bordeaux, CNRS, LABRI, UMR 5800,*

⁵*CMPR Tour de Gassies*



S9.5 Interest of multidisciplinary collaborations and personalization of care for improving the management of amputees

Amélie Touillet¹, Noël Martinet¹, Isabelle Loiret¹, Jean Paysan^{T1}, Jozina De Graaf²

¹IRR UGECAM NE, ²ISM Aix Marseille

13:00 – 14:30 SYMPOSIUM 10

Room 202 **Implications of correlated EMG oscillations in agonist and antagonist muscles**

Chair: Minoru Shinohara, Georgia Institute of Technology

S10.1 Anti-phase unbalanced co-contraction practice and correlated EMG oscillations

Minoru Shinohara¹, Nayef Ahmar¹, Jun Ueda¹

¹*Georgia Institute of Technology*

S10.2 Correlated EMG oscillations during intended cocontraction

Yasuhide Yoshitake¹, Minoru Shinohara²

¹*Japan/Shinshu University, ²Georgia Institute of Technology*

S10.3 Correlated EMG oscillations during walking

Julia Choi¹, Sumire Sato¹

¹*University of Florida*

13:00 – 14:30 ORAL 9 – ROBOTIC REHABILITATION

Room 204AB **Chairs: Laurent Bouyer, Université Laval & Sylvia Muceli, Chalmers University of Technology**

O9.1 Using transfer learning for generalized upper limb force modelling during dynamic contractions

Gelareh Hajian¹, Mehdi Ansari², Evelyn Morin¹

¹*Queen's University, ²Blue Hexagon Inc.*

O9.2 Intuitive prosthesis control based on residual movements and their goals enables amputees to pick and place objects as with their natural arm

Effie Segas¹, Sébastien Mick², Vincent Leconte¹, Rémi Klotz³, Daniel Cattaert¹, Aymar de Rugy¹

¹*Univ. Bordeaux, CNRS, INCIA, UMR 5287, ²ETIS, UMR 8051, CY Cergy Paris Université, ENSEA, CNRS F-95000, ³CMPR Tour de Gassies*



13:00 – 14:30 **09.3 Hand-assist robot with a deep learning model for the automatic determination of finger movement direction using surface electromyography: Proof of concept study for clinical applications in patients with stroke**

Wataru Kuwahara¹, Tatsuya Mizuguchi¹, Kenya Tanamachi¹, Megumi Okawada¹, Yu Miyawaki¹, Takayuki Kamimoto¹, Yuka Yamada¹, Michiyuki Kawakami¹, Fuminari Kaneko¹

¹Department of Rehabilitation of Medicine, Keio University School of Medicine

09.4 Quantifying changes in postural control related to robotic gait trainer use from home video data

Sunaina Rangarajan¹, Christa Diot¹, Kelly Larkin-Kaiser¹, Elizabeth Condliffe¹

¹University of Calgary

09.5 Robot assisted gait training reduces sleep disturbances for children with impaired mobility

Christa Diot¹, Anya Friesen¹, Kelly Larkin-Kaiser¹, Elizabeth Condliffe¹

¹University of Calgary

09.6 Effect of an assistive robotic system's compliance on muscular activity in the leg during caregiving tasks

Maximilian Siebert¹, Anna Wankum¹, Svenja Radek², Catherine Disselhorst-Klug³

¹Institute of Applied Medical Engineering, RWTH Aachen, ²Institute of Health and Nursing Science, MLU Halle-Wittenberg, ³Institute of Applied Medical Engineering

13:00 – 14:30 **ORAL 10 – NEUROMECHANICS AND SPORTS SCIENCES AND MOTOR PERFORMANCE**

Room 205AB

Chairs: Tibor Hortobagyi, University of Groningen & Karen Sogaard, University of Southern Denmark

O10.1 No change in beta intermuscular coherence in agonist-antagonist leg muscle pairs after a two-day balance intervention despite improvements in balance performance

Lisanne Bakker¹, Claudine Lamoth¹, Tibor Hortobágyi¹

¹University Medical Center Groningen



13:00 – 14:30

Room 205AB

O10.2 Acute effects of the bench press exercise inclination on the neuromuscular and structural parameters of the clavicular and sternocostal regions of the pectoralis major muscle

José Albarello¹, Hélio Cabral², Bruno Leitão¹, Tea Lulic-Kuryllo³, Liliam Oliveira¹, Thiago Matta¹

¹Federal University of Rio de Janeiro, ²University of Birmingham, ³Università degli Studi di Brescia

O10.3 The effects of subclinical neck pain on cerebellar processing as measured by the cervico-ocular and vestibulo-ocular reflexes

Devonte Campbell¹, Paul Yielder¹, Bernadette Murphy¹, James Burkitt², Praveen Sanmugananthan¹, Rufeyda Cosgun¹, Laura Ruberto¹, Akash Toor¹

¹Ontario Tech University, ²McMaster University

O10.4 Mechanoreceptors become more sensitive to loading when skin temperature is elevated

Erika Howe¹, Michael Apollinaro¹, Joanna Reeves², Christopher Nester³, Leah Bent¹

¹University of Guelph, ²University of Bath, ³University of Salford

O10.5 Acute effects of blood flow restriction on activation of the vastus lateralis muscle

Eduard Kurz¹, Thomas Bartels², Stefan Pröger², Oliver Röhrle³, Karl-Stefan Delank¹, René Schwesig¹, Leonardo Gizzi³

¹Martin-Luther-University Halle-Wittenberg, ²Sports Clinic Halle, ³University of Stuttgart

O10.6 Analyzing muscular activation in response to effort matched low-intensity blood-flow restriction and moderate-intensity exercise protocol

Jinghui Yang¹, Rory O'Keeffe¹, Sarmad Mehrdad¹, Seyed Shirazi¹, S.Farokh Atashzar¹, Smita Rao¹

¹New York University

O10.7 Shoulder-trunk coordination and sequencing during slap shots in ice hockey players

Shawn Robbins¹, Philippe Renaud¹, Neil MacInnis², David Pearsall¹

¹McGill University, ²Curv Health



14:45 – 15:45 KEYNOTE PRESENTATION

Room 200A ***Neural communication between the cortex and muscle for motor control***

Junichi Ushiyama, Keio University School of Medicine

Chair: Martin Simoneau, Université Laval

16:00 – 17:30 PARALLEL SESSIONS

Room 200A ***SYMPOSIUM 11***

International Motoneuron Society: advances in motoneuron physiology for the translation to human movement

Chairs: Francesco Negro, Università degli Studi di Brescia & CJ Heckman, Northwestern University Feinberg School of Medicine

S11.1 Considerations in the estimation of human motoneuron excitability

Christopher Thompson¹, Manish Suryapalam¹, Francesco Negro²

¹Temple University, ²Università degli Studi di Brescia

S11.2 Situations in which persistent inward currents are an impediment to motor control

Gregory Pearcey¹, James (Drew) Beauchamp¹, Obaid Khurram¹, Francesco Negro², CJ Heckman¹

¹Northwestern University, ²Università degli Studi di Brescia

S11.3 Exploring sex-related differences in motor unit control strategies: Where do we stand?

Tea Lulic¹, J Greig Inglis²

¹Università degli Studi di Brescia, ²Brock University

S11.4 Motor unit properties during dynamic contractions

Charles Rice¹

¹The University of Western Ontario

S11.5 Stroke-related changes in motor unit firing behavior and motor performance

Allison Hyngstrom¹

¹Marquette University



16:00 – 17:30 SYMPOSIUM 12

Room 202

Clinical application of surface EMG in neurological and neuromuscular disorders

Chairs: Madeleine Lowery, University College Dublin & Giuseppe De Vito, University of Padova

S12.1 Assessment of aging and neurological disorders by high-density surface electromyography

Kohei Watanabe¹, Yu-ichi Noto², Yuichi Nishikawa³, Ales Holobar⁴

¹Chukyo University, ²Kyoto Prefectural University of Medicine, ³Kanazawa University,

⁴University of Maribor

S12.2 Harnessing the power of high-density surface EMG in amyotrophic lateral sclerosis

James Bashford¹

¹King's College London

S12.3 Utilization of real-time EMG feedback to improve muscle activation during physiotherapy in acute SCI patients

Nina Suresh¹, Guijin Li²

¹Shirley Ryan Ability Lab / Rehabilitation Institute of Chicago, ²University of Toronto

S12.4 Is Type 1 diabetes really causing a sort of accelerated muscle aging?

Giuseppe De Vito¹, Giacomo Valli¹, Rui Wu², Dean Minnock², Alessandro Del Vecchio³, Luana Toniolo¹, Giuseppe Sirago¹

¹University of Padova, ²University College Dublin, ³Friedrich-Alexander University Erlangen-Nürnberg

S12.5 Changes in motor unit firing and recruitment in response to deep brain stimulation and levodopa in Parkinson's disease

Madeleine Lowery¹, Ben O'Callaghan¹, Jeremy Liegey¹, Erlick Pereira², Richard Walsh³

¹University College Dublin, ²St George's, University of London, ³Tallaght University Hospital



16:00 – 17:30 ORAL 11 – BIOMECHANICS AND WEARABLE SENSORS & IOT

Room 204AB

IOT

*Chairs: Richard Willy, University of Montana &
Elizabeth Condliffe, University of Calgary*

O11.1 Feature selection techniques on biomechanical parameters from pressure mats for identifying elderly fallers

Ashirbad Pradhan¹, Karansinh Padhiar¹, Victoria Chester²

¹University of New Brunswick Fredericton, ²University of New Brunswick

O11.2 Changing neck posture during violin playing with an ergonomic chinrest used with and without a shoulder rest. A feasibility study

Stephanie Mann¹, Carsten Juhl¹, Helene Paarup¹, Karen Søgaard¹

¹University of Southern Denmark

O11.3 Coordination between synergistic muscles is highly variable within and between individuals in a tightly constrained isometric trunk extension task

Louise Tier¹, Sauro Salomoni¹, Francois Hug², Manuela Besomi¹, Paul Hodges¹

¹University of Queensland, ²Institut Universitaire de France (IUF), Paris, France/ LAMHESS, Universite Côte d'Azur, Nice, France

O11.4 Anatomy and biomechanics of gastrocnemius medialis and lateralis subtendons in different horizontal foot positions

Marion Crouzier¹, Félix Dandois¹, Stijn Bogaerts², Lennart Scheys², Benedict Vanwanseele¹

¹KU Leuven, ²University Hospitals Leuven

O11.5 Tongue HD-sEMG: design and test of an electrode grid for intraoral recordings

Alberto Botter¹, Federica Vitali¹, Giacinto Luigi Cerone¹

¹Politecnico di Torino

O11.6 Development and characterization of a wireless Body Sensor Network for integrated EEG and HD-sEMG acquisitions

Giacinto Luigi Cerone¹, Alessandra Giangrande², Marco Ghislieri¹, Marco Gazzoni¹, Harri Piitulainen³, Alberto Botter¹

¹Politecnico di Torino, ²Politecnico di Torino and University of Jyväskylä, ³University of Jyväskylä



16:00 – 17:30 ORAL 12 – PAIN

Room 205AB Chairs: **Marco Barbero**, University of Applied Sciences and Arts of Southern Switzerland & **Bernadette Murphy**, Ontario Tech University

O12.1 Subclinical neck pain leads to Differential Changes in Early and Middle-latency Somatosensory Evoked Potentials and Motor Performance in response to a novel force matching tracking task

Ushani Ambalavanar¹, Heather McCracken¹, Hailey Tabbert¹, Paul Yielder¹, Bernadette Murphy¹

¹Ontario Tech University

O12.2 Brain neuroimmune and sensorimotor function in mechanism-based subgroups of individuals with low back pain

Muath Shraim¹, Hugo Massé-Alari², Michael Farrell³, Marco Loggia⁴, Paul Hodges¹

¹The University of Queensland, ²Université Laval, ³Monash University, ⁴Harvard Medical School

O12.3 Motor adaptation to movement-evoked pain induced during lumbar flexion

Valter Devecchi¹, Deborah Falla¹, Helio Cabral¹, Jacques Abboud², Paul Hodges³, Alessio Gallina¹

¹University of Birmingham, ²Université du Québec à Trois-Rivières, ³The University of Queensland

O12.4 Task-relevant pain reduces knee extension torque more than tonic pain

Hélio Cabral¹, Valter Devecchi¹, Chelsea Oxendale¹, Ned Jenkinson¹, Deborah Falla¹, Alessio Gallina¹

¹University of Birmingham

19:30 – 21:30 CONFERENCE DINNER

Fairmont Chateau
Frontenac

Pre-registration is required



SATURDAY, JUNE 25, 2022

07:30 – 08:00 STUDENT MORNING WALK

Join us for a brisk walk to begin the day.

08:30 – 09:30 KEYNOTE PRESENTATION

Room 200A ***Wearable devices for monitoring biomechanics in the field: All that glitters is not gold***

Richard Willy, University of Montana

Chair: Jean-Sébastien Roy, Université Laval

09:30 – 10:00 COFFEE BREAK

Room 200B

10:00 – 11:30 PARALLEL SESSIONS

Room 200A **SYMPOSIUM 13**

Is neuroplasticity functionally related to exercise intensity in health and disease?

Chair: Tibor Hortobágyi, University of Groningen

S13.1 Do acute and chronic exercise-induced improvements in cognitive function scale with changes in neuroplasticity in healthy younger adults?

Paulo Cezar Santos¹, Tibor Hortobágyi²

¹Weizmann Institute of Science, ²University Medical Center Groningen, University of Groningen

S13.2 Exercise intensity and neuroplasticity in healthy older adults

Nárlon C Boa Sorte Silva¹, Guilherme Moraes Balbim¹, Teresa Liu-Ambrose¹

¹The University of British Columbia

S13.3 Exercise-induced neuroplasticity in Parkinson's disease: A summary of current evidence.

Hanna Johansson¹, Erika Franzén¹

¹Karolinska Institutet

S13.4 Do dementia brains sustain capacity for exercise-induced neuroplasticity and slow disease progression?

Tibor Hortobágyi¹, Urs Granacher²

¹University Medical Center Groningen, University of Groningen, ²University of Potsdam



10:00 – 11:30 DE LUCA SYMPOSIUM

Room 202 *Chair: Eric Perreault, Northwestern University*

DS1 Planting the CEDE: Advancing the use and reporting of EMG

Manuela Besomi¹

¹*The University of Queensland*

DS2 Spatial lower limb myoelectric activity during human locomotion via high-density electromyography

Bryan Schlink¹

¹*Emory University School of Medicine*

DS3 The brain in its body: Quantitative and non-invasive assessment of human motor control through muscle synergy theory

Marco Ghislieri¹

¹*Politecnico di Torino*

10:00 – 11:30 ORAL 13 – MODELLING AND SIGNAL PROCESSING

Room 204AB *Chair: Vicki Gray, University of Maryland School of Medicine*

O13.1 Towards fast and accurate portable technology for subject-specific neuromusculoskeletal assessment

Donatella Simonetti¹, Bart F. J. M. Koopman¹, Massimo Sartori¹

¹*University of Twente*

O13.2 The effect of sEMG amplitude estimation techniques on force tracking

Simone Ranaldi¹, Giovanni Corvini¹, Cristiano De Marchis¹, Silvia Conforto¹

¹*University Roma TRE*

O13.3 Automatic jitter measurement in electromyographic signals

Armando Malanda¹, Daniel Stashuk², Oscar Garnés³, César Valle¹, Javier Rodríguez-Falces¹, Javier Navallas¹

¹*Public University of Navarra, ²University of Waterloo, ³University Hospital of the Fundación Jiménez Díaz*

O13.4 A mixed integer linear programming model for the optimal resolution of complex superpositions of motor unit action potentials

Francesco Negro¹, Renata Mansini¹, Roberto Zanotti¹

¹*Universita' degli Studi di Brescia*



10:00 – 11:30 O13.5 Identifying optimum time delay embedding parameters for nonlinear surface emg analysis

Room 204AB

Matthew Flood¹, Lara McManus², Sageanne Senneff³, Diego Pereira Botehlo³, Madeleine Lowery³

¹Luxembourg Institute of Health, ²Trinity College Dublin, ³University College Dublin

O13.6 A spatio-temporal ICA framework to identify lumbar muscle activity from high density surface EMG

Amin Nasrabadi¹, Jacques Abboud², Alessio Gallina¹, Calvin Kuo¹, Jean-Sébastien Blouin¹

¹University of British Columbia, ²Université du Québec à Trois-Rivières

O13.7 Time series heatmaps as a visualization approach to clustering biological time series data

Kassy Raymond¹, Andrew Hamilton-Wright¹, Kristel Thomassin¹

¹University of Guelph

10:00 – 11:30 ORAL 14 – MOTOR CONTROL AND MOTOR LEARNING

Room 205AB

Chairs: Laurence Mouchino, Aix-Marseille University CNRS & Francois Hug, Université Côte d'Azur

O14.1 People with diabetic peripheral neuropathy exhibit deficits in predictive precision grip force

Marcio dos Santos¹, Abdalghani Yahya², Patricia Kluding²

¹University of St Augustine for Health Sciences, ²University of Kansas Medical Center

O14.2 Reduced lumbar extensor muscle torque steadiness is associated with increased activity of the lumbar erector spinae muscle during eccentric contractions in people with chronic low back pain

Michail Arvanitidis¹, David Jiménez-Grande¹, Nadège Haoudji-Javaux¹, Deborah Falla¹, Eduardo Martinez-Valdes¹

¹Centre of Precision Rehabilitation for Spinal Pain (CPR Spine), School of Sport, Exercise and Rehabilitation

O14.3 High-density surface electromyography is reliable in assessing characteristics of trunk extensors during static and dynamic tasks

Joeri van Helden¹, Shin-Yi Chiou¹, Eduardo Martinez-Valdes¹, Paul Strutton², Deborah Falla¹

¹University of Birmingham, ²Imperial College London



O14.4 Strategies of improving a concurrent force-trajectory matching skill with two fingers

Mitchell St. Pierre¹, Minoru Shinohara¹

¹Georgia Institute of Technology

O14.5 Motor units behavior and neural excitability of the gastrocnemii muscle in different horizontal foot positions

Thomas Cattagni¹, Simon Avrillon², François Hug³, Marion Crouzier⁴

¹Nantes Université, ²Department of Physical Medicine and Rehabilitation, Feinberg School of Medicine, Northwestern University, ³Université Côte d'Azur, ⁴KU Leuven

O14.6 Haptic guidance facilitates motor learning when visual feedback is not present during training

Thomas Augenstein¹, Christian Remy², Mary Kojé¹, Rajiv Ranganathan³, Chandramouli Krishnan¹

¹University of Michigan, ²University of Stuttgart, ³Michigan State University

O14.7 Short latency stretch reflexes depend on the balance of activity in agonist and antagonist muscles during ballistic elbow movements

Zoe Villamar¹, Daniel Ludvig¹, Eric Perreault¹

¹Northwestern University; Shirley Ryan AbilityLab

11:30 – 13:00 POSTER SESSION 3 WITH LUNCH

Room 200B

13:00 – 14:00 GENERAL ASSEMBLY

Room 200A Learn more about the society, hear about the financial position and hear from the 3MT Award winners!

14:00 – 15:00 KEYNOTE PRESENTATION

Room 200A *Individual differences in cortical activity and motor adaptation in the transition from acute to chronic pain*

Siobhan Schabrun, Neuroscience Research Australia

Chairs: Catherine Mercier, Université Laval & Hugo Massé-Alarie, Université Laval

sponsored by: Reseau Quebecois de Recherche sur la douleur (RQRD)



15:00 – 15:30 COFFEE BREAK

Foyer 2



International Society
of Electrophysiology and Kinesiology

15:30 – 17:00 PARALLEL SESSIONS

Room 200A **SYMPORIUM 14**

Understanding the impact of upper extremity fatigue on the motor system to better detect and manage it

Chair: Jason Bouffard, Université Laval

S14.1 Shoulder fatigue in the dominant arm impacts upper limb movement in both the dominant and non-dominant sides

Jean-Sebastien Roy¹, Frederique Dupuis¹

¹Université Laval

S14.2 Real-time wearable biomedical device based on IMU and EMG sensors to prevent musculoskeletal disorders in manual workers

Alexandre Campeau-lecours¹, Marianne Boyer¹, Jean-Sébastien Roy¹, Laurent Bouyer¹

¹Université Laval

S14.3 The effect of different fatigue location on repetitive pointing task performance: What novel information can we gain from uncontrolled manifold analyses?

Matthew Slopecki¹

¹McGill University

S14.4 Impacts of fatigue, sex and age on control of upper limb repetitive tasks: the useful and the harmful

Julie Côté¹

¹McGill University

S14.5 Use of minimally calibrated inertial motion units to efficiently detect fatigue during work-related upper extremity motor activities

Jason Bouffard¹, Béatrice Moyen-Sylvestre², Fabien Dal Maso², Étienne Goubault²

¹Université Laval, ²Université de Montréal



15:30 – 17:00 SYMPOSIUM 15

Room 202

Neural control of trunk muscles in healthy and clinical conditions

Chair: Hugo Massé-Alarie, Cirris – Université Laval

S15.1 Neural interaction between upper limbs and the trunk and its clinical application

Shin-Yi Chloe Chiou¹

¹University of Birmingham

S15.2 Neural control of cervical muscles in pain-free, experimental and chronic pain conditions.

Edith Elgueta-Cancino¹

¹University of Birmingham

S15.3 Adolescents with idiopathic scoliosis exhibit decreased common neural oscillations in the lumbar paraspinal muscles

Martin Simoneau¹, Jean-Philippe Pialasse¹, Mercier Pierre¹, Jean-Sébastien Blouin²

¹Université Laval, ²The University of British Columbia

S15.4 Vestibular control of balance

Jean-Sébastien Blouin¹

¹University of British Columbia

S15.5 Neural control of low back muscles in health and low back pain

Hugo Massé-Alarie¹

¹Cirris – Université Laval

15:30 – 17:00 ORAL 15 – BIOMECHANICS

Room 204AB

Chairs: Corrado Cescon, University of Applied Sciences and Arts of Southern Switzerland & Catherine Disselhorst-Klug, Aachen University

O15.1 Evolution of neuromechanical, physiological and clinical changes throughout pregnancy: a prospective cohort study

Catherine Daneau¹, François Nougarou¹, Stephanie-May Ruchat¹, Martin Descarreaux¹

¹Université du Québec à Trois-Rivières (UQTR)



15:30 – 17:00 O15.2 Contribution of shear wave elastography to better characterization of skeletal muscles in vivo

Room 204AB

Filiz Ates¹, Manuela Zimmer¹, Benedict Kleister², Justus Marquetand²

¹University of Stuttgart, ²University of Tuebingen

O15.3 Normal variability of common orthopaedic morphology-based metrics of the patellofemoral joint: a dynamic CT imaging study on healthy subjects

Luca Buzzatti¹, Benyameen Keelson², Jona Van den Broeck², Thierry

Scheerlinck³, Gert Van Gompel³, Jean-Pierre Baeyens², Michel De

Maeseneer³, Johan De Mey³, Jef Vandemeulebroucke², Savanah Hereus², Nico
Buls³, Erik Cattrysse²

¹Vrije Universiteit Brussel (VUB), ²Vrije Universiteit Brussel, ³Universitair Ziekenhuis Brussel
(UZ Brussel)

O15.4 The relationship between pain catastrophizing, pain sensitivity, and inter-joint coordination during a lifting task in people with chronic low back pain.

Patrick Ippersiel¹, Richard Preuss¹, Timothy Wideman¹, Shawn Robbins¹

¹McGill University

O15.5 A subject-specific musculoskeletal model of the spine for estimating lumbar internal forces and stability: its convergent validity with local dynamic stability measures

Amirhossein Eskandari¹, Farshid Ghezelbash¹, Aboufazl Shirazi-Adl¹,
Christian Larivière¹

¹IRSST

O15.6 Lower-limb joint-coordination and coordination variability during gait in children with cerebral palsy.

Cloé Dussault-Picard¹, Patrick Ippersiel², Philippe Dixon¹

¹University of Montreal, ²McGill University

O15.7 Reliability and minimal detectable change of ankle impedance parameters in standing and walking

Luis Cubillos¹, Elliott Rouse¹, Varun Joshi¹, Chandramouli Krishnan¹

¹University of Michigan



15:30 – 17:00 ORAL 16 – AGING AND NEUROMUSCULAR IMAGING

Room 205AB Chairs: Kiley Tucker, University of Queensland & Shawn Beaudette, Brock University

O16.1 Shoulder muscle activity is less directionally specific in older compared to younger adults: a potential contributor to age-related shoulder weakness

Emma Baillargeon¹, Daniel Ludvig², Amee Seitz², Constantine Nicolozakes², Margaret Coats-Thomas², Eric Perreault²

¹University of Pittsburgh, ²Northwestern University

O16.2 Age- and sex-specific effects in paravertebral surface electromyographic back extensor muscle fatigue in chronic low back pain recorded during submaximal cyclic back extension exercises

Gerold Ebenbichler¹, Richard Habenicht², Josef Kollmitzer³, Patrick Mair⁴, Paolo Bonato⁵, Peter Blohm², Thomas Kienbacher²

¹Vienna Medical University, ²Karl-Landsteiner-Institute for Outpatient Rehabilitation Research, ³TGM - School of Engineering, ⁴Harvard University, ⁵Spaulding Rehabilitation Hospital

O16.3 Age-related decreases in ankle impedance are associated with a decrease in reflex activity

Kristen Jakubowski¹, Daniel Ludvig¹, Sabrina Lee², Eric Perreault¹

¹Northwestern University, ²Simon Fraser University

O16.4 Child-adult differences in motor-unit activation strategy during submaximal wrist flexion - preliminary findings

Stacey Woods¹, Andrew McKiel¹, Trent Herda², Raffy Dotan¹, Panagiota Klentrou¹, Michael Holmes¹, David Gabriel¹, Bareket Falk¹

¹Brock University, ²University of Kansas

O16.5 Quantifying muscle size (a)symmetry in adolescent idiopathic scoliosis

Phoebe Duncombe¹, Maria Antico², Maree Izatt², Paige Little², Peter Pivonka², Andrew Claus³, Kylie Tucker¹

¹The University of Queensland, ²Queensland University of Technology, ³The University of Queensland/Royal Brisbane and Women's Hospital



O16.6 Morphological changes of deep extensor neck muscles in relation to the maximum level of Compression and canal compromise in patients with degenerative cervical myelopathy

Neda Naghdi¹, James Elliott², Michael Weber³, Michael Fehlings⁴, Maryse Fortin⁵

¹Concordia University, ²University of Sydney, ³McGill University Health Centre, ⁴University of Toronto, ⁵Concordia

17:00 – 17:30 AWARDS & CLOSING

Room 200A



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About the Poster Sessions:

ISEK is pleased to present a wide range of current research through the poster sessions. The posters have been divided over three sessions, with each session on display for a dedicated period of time.

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Thursday June 23

Session Time: 11:30 – 13:00

POSTER SESSION 2

Friday June 24

Session Time: 11:30 – 13:00

POSTER SESSION 3

Saturday June 25

Session Time: 11:30 – 13:00

The poster board numbers work in the following way:

Session – Theme – Board Number (ex. 1-A-1)

POSTER THEMES

A – Aging

B – AI, Data Fusion, and Machine Learning

C – Biomechanics

D – Brain Imaging

E – Clinical Neurophysiology

F – Electrical Myostimulation

G – Fatigue

H – Modelling and Signal Processing

I – Motor Control and Motor Learning

J – Motor Disorders

K – Motor Units

L – Muscle Synergy

M – Neuromechanics

N – Neuromuscular Imaging

O – Pain

P – Rehabilitation

Q – Robotic Rehabilitation

R – Sports Science and Motor Performance

S – Wearable Sensors & IoT

POSTER SESSION 1

THURSDAY JUNE 23, 2022

A – AGING

P1-A-1 *The impact of equine-assisted therapy on the stomatognathic system and self-perceived oral health in older adults*

Edneia de Mello¹, Lígia Maria Gonçalves¹, Paulo de Vasconcelos¹, Christiane Martins², Elaine Cristina Soares², Octávio Barbosa Neto³, Edmar Mendes³, Simone Cecílio Regalo¹, Selma Siessere¹

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³Federal University of Triângulo Mineiro

P1-A-2 *Hand-eye Coordination performance according to physical activity level in older individuals*

Saleh Hammad¹, Layale Youssef², Rami Hammad³, Ibrahim Dababneh⁴, Philippe Noirez⁵, Haidar Djemai⁶

¹Al-Ahliyya Amman University, ²Université de Montréal,

³UQAM, ⁴University of Jordan, ⁵University of Reims,

⁶Université de Paris

P1-A-3 *The effects of slow breathing on postural muscles during unexpected standing perturbations in older adults*

Patrick Siedlecki¹, Tanya Ivanova¹, Jayne Garland¹

¹Western University



P1-A-4 Impact of prolonged bed rest on lower limb strength and electromyographic activity

Philippe St-Martin¹, Jean-Christophe Lagacé¹, Mathil Ruel¹, Guillaume Léonard², Karen Lambert-Cordillac³, Eléonor Riesco¹, Jamie McPhee⁴, Isabelle Dionne¹

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P1-A-5 iPhone accelerometry provides a sensitive in-home assessment of age-related changes in standing balance

Elizabeth Coker¹, Anat Lubetzky²

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B – AI, DATA FUSION, AND MACHINE LEARNING

P1-B-6 Preseason elite female soccer subgroups recognition based on multiple injury risk biomechanical markers is improved using non-linear instead of linear dimension reduction: A short communication

Carlos De la Fuente¹, Rony Silvestre¹, Macarena Soldan¹

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C – BIOMECHANICS

P1-C-11 The effect of the peculiar shape of Japanese wooden clogs (geta) on gait

Kazuya Matsushita¹, Hiroki Saito², Sakiko Ohnishi², Takashi Nakayama²

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P1-C-12 Ankle joint stiffness during quiet standing is greater in individuals with incomplete spinal cord injury

Jonguk Lee¹, Kaylie Lau¹, Kai-Lon Fok¹, Jae Woung Lee¹, Katherine Chan², Janelle Unger³, Kristin Musselman¹, Kei Masani¹

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P1-C-13 The medial longitudinal arch height is determined primarily by the stiffness of the plantar aponeurosis

Momoka Nakamura¹, Jota Suzuki¹, Moeka Samoto¹, Yasuhide Yoshitake¹

¹Shinshu University

P1-C-7 Electromyographic follow-up of the consequences of buccal fat pad removal in the masseter and temporalis muscles

Alice Helena de Lima Santos Cardoso¹, Thamyres Branco¹, Nicole Barbosa Bettoli¹, Isabela Hallak Regalo¹, Paulo Batista Vasconcelos¹, Marcelo Palinkas¹, Selma Siéssere¹, Simone Cecílio Hallak Regalo¹

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P1-C-8 Concurrent validity and test-retest reliability of a wearable inertial sensor to measure the active range of motion on healthy subjects

Corrado Cescon¹, Simone Ballerini¹, Nicolò Castellini², Anna Folli¹, Giulia Masoni¹, Giulia Mazzi¹, Andrea Tettamanti², Marco Barbero¹

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P1-C-9 Evaluation of knee Helical Axis dispersion during walking after isometric muscle training

Corrado Cescon¹, Paola Adamo², Francesco Oddenino², Federico Temporiti², Roberto Gatti², Marco Barbero¹

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E – CLINICAL NEUROPHYSIOLOGY

P1-E-15 Estradiol increases cortical inhibition in primary motor cortex

Subaryani Soedirdjo¹, Luis Rodriguez II¹, Hyuangtaek Kim¹, Conner Hutcherson¹, Bailyn Piecewicz¹, Kathleen McGovern¹, Caitlin Kumala¹, Navoda Perikala¹, Lynn Rogers², Yasin Dhaher¹

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P1-E-16 Analysis of electromyographic activity of respiratory muscles and accessories of individuals with stroke

Camila Gonçalves¹, Isabela Regalo¹, Gabriel Silva¹, Guilherme Gallo Gomes¹, Edson Verri¹, Robson Felipe Lopes¹, Selma Siéssere¹, Simone Cecilio Regalo¹

¹FORP USP

F – ELECTRICAL MYOSTIMULATION

P1-F-17 Paired associative stimulation on the soleus H-reflex using motor point and peripheral nerve stimulation

Kai Lon Fok¹, Naotsugu Kaneko², Shirin Tajali³, Kei Masani¹

¹University of Toronto, ²University of Tokyo, ³KITE



P1-F-18 Conduction velocity during electrically stimulation contraction at various joint angles and during joint movements with different angular velocities

Tetsuya Hirono¹, Kohei Watanabe¹

¹Laboratory of Neuromuscular Biomechanics, School of Health and Sport Sciences, Chukyo University

P1-F-19 In-vivo measurement of the Block-Activation Window for sinusoidal Low Frequency Alternating Current (LFAC) stimulation

Michael Horn¹, Awadh Alhawwash², Ken Yoshida¹

¹IUPUI, ²Purdue University

P1-F-20 Eliciting the soleus H-reflex through multi-electrode stimulation of the posterior tibial nerve: effects of the number and configuration of cathode electrodes

Markus Melvin¹, Roland Cote¹, Michael McKinnon², Daniel Hochman², Jeremy Hill³, Jonathan Wolpaw⁴, Isaac Clements², Aiko Thompson¹

¹Medical University of South Carolina, ²Biocircuit Technologies, ³National Center for Adaptive Neurotechnologies, ⁴National Center for Adaptive Neurotechnologie

P1-F-21 The effect neuromuscular electrical stimulation using the StimaWELL 120MTRS system on multifidus muscle morphology and function in patients with chronic low back pain: A pilot study

Daniel Wolfe¹, Geoffrey Dover¹, Mathieu Boily², Maryse Fortin³

¹Concordia University, ²McGill University Health Centre, ³Concordia

G - FATIGUE

P1-G-22 Discriminant validity of fatigue indicators in stroke rehabilitation activities - A Pilot Study

Sarah Amoura¹, Marie-Hélène Milot², Andréanne Blanchette¹, Alexandre Campeau-Lecours¹, Anne Durand³, Jason Bouffard¹

¹Université Laval, ²Université de Sherbrooke, ³CIUSSS de la Capitale Nationale

P1-G-23 Impact of fatigue at the shoulder on the contralateral upper limb kinematics and performance

Frédérique Dupuis¹, Gisela Sole², Catherine Mercier¹, Jean-Sébastien Roy¹

¹Université Laval, ²University of Otago

P1-G-24 Central and peripheral fatigue induced by a sustained isometric contraction are not different between young healthy males and females for ankle plantarflexor muscles.

Donguk Jo¹, Miriam Goubran¹, Martin Bilodeau¹

¹University of Ottawa

P1-G-25 The effects of alternating computer work postures on upper trapezius muscle activity, discomfort and performance

Samuel Lamanuzzi¹, Erika Renda¹, Julie Côté¹

¹McGill University

P1-G-26 The effect of concurrent mental and physical fatigue on physical endurance performance and strength

Rahul Pabla¹, Jeffrey Graham¹, Nicholas La Delfa¹

¹University of Ontario Institute of Technology (Ontario Tech)

I – MOTOR CONTROL AND MOTOR LEARNING

P1-I-27 Methodological analysis of finite helical axis behaviour to assess trunk motor variability during repetitive movements

Amal Alsubaie¹, Corrado Cescon², Eduardo Martinez-Valdes¹, Marco Barbero², Deborah Falla¹

¹Centre of Precision Rehabilitation for Spinal Pain (CPR Spine), School of Sports, Exercises and Reha, ²Rehabilitation Research Laboratory 2rLab, Department of Business Economics, Health and Social Care,

P1-I-29 Both hands EMG activity at cooking work between student and instructor

Kimie Nakajima¹, Takeshi Sato², Mizuki Nakajima², Miyu Kayama³, Kenichi Egawa¹

¹Tokyo Kasei Gakuin University, ²Jissen Women's University, ³Junior College of Kiryu

P1-I-30 Effects of static head position on unintentional body rotation and displacement during stepping in place without vision

Flavia De Andrade e Souza Mazuchi¹, Lucas Michaud¹, Nicole Paquet¹

¹University of Ottawa

P1-I-31 On the origin of triceps surae EMG activity increase in response to increased walking speed and loaded weight

Bridgette Pouliot¹, Aiko Thompson¹

¹College of Health Professions, Medical University of South Carolina

P1-I-32 Inability to suppress physiological mirror activity during sustained and discrete maximal unilateral handgrip contractions

Doug Renshaw¹, Jason DeFreitas², Shawn Reese³, Rob MacLennan², Jonathan Farthing¹

¹University of Saskatchewan, ²Oklahoma State University, ³Oklahoma State University

P1-I-33 Proprioceptive contribution to motor learning in an elbow flexion-extension task

Martin Vaurs¹

¹Université de Poitiers



P1-I-34 Influence of lumbar alignment and masseter muscle activity during stance posture on forward stepping motion

Keio Ishiguro¹, Shunsuke Adachi¹, Mizuki Saito¹, Manaka Baba¹, Yoshinobu Hosoya¹, Tomoki Ishimori¹
¹Tokyo University of Technology

J – MOTOR DISORDERS

P1-J-34 Limits of stability and postural control stability in children with learning disorders

Sirine Guetiti¹, Geneviève Cadoret¹, Mariève Blanchet¹
¹UQAM

P1-J-35 Alteration of sensorimotor integration mechanisms in presence of subacromial impingement syndrome

Lydiane Lauzier¹, Louis-David Beaulieu¹, Stéphane Sobczak², Mathieu Boudier-Revérêt³, Laurence Munger¹
¹UQAC, ²UQTR, ³CHUM

P1-J-36 Parkinson's disease with freezing of gait alters the influence of the posterior parietal cortex on the tibialis anterior muscle

Frédérique Parent-L'Ecuyer¹, Alexandra Potvin-Desrochers¹, Alejandra Martinez Moreno¹, Julien Clouette¹, Henri Lajeunesse¹, Freddie Seo¹, Gleydiane Alexandre Fernandes¹, Audrey Parent¹, Alexander Fulford¹, Michelle Cheng¹, Caroline Paquette¹
¹McGill University

K – MOTOR UNITS

P1-K-37 The tendency for sustained motor unit discharge is increased at short muscle lengths in the human lower limb

James Beauchamp¹, Obaid Khurram¹, Julius P A Dewald¹, CJ Heckman¹, Gregory E P Pearcey²
¹Northwestern University, ²Northwestern University/SRALab

P1-K-38 Morphological and mechanical properties of the Achilles tendon and their relationship with triceps surae motor unit firing properties during isometric contractions

Ignacio Contreras¹, Michail Arvanitidis¹, Joeri van Helden¹, Deborah Falla¹, Eduardo Martinez-Valdes¹
¹University of Birmingham

P1-K-39 Reliability of measurement for the investigation of serotonergic effects on motor unit discharge characteristics

Benjamin Goodlich¹, Alessandro Del Vecchio², Sean Horan¹, Justin Kavanagh¹
¹Griffith University, ²Friedrich-Alexander-University

P1-K-40 Motor unit firing behavior following mental fatigue in static and variable-force contractions

Michael Marsala¹, Anita Christie¹
¹University of Western Ontario

P1-K-41 Mean power frequency of boys and men during discrete, progressive, isometric contractions carried to exhaustion

Jordan Langille¹, Stacey Woods¹, Raffy Dotan¹, Craig Tokuno¹, David Gabriel¹, Bareket Falk¹

¹Brock University

L – MUSCLE SYNERGY

P1-L-42 Investigation of muscle synergy asymmetry during walking in individuals with cerebral palsy

Yosra Cherni¹, Nicolas Turpin², Simon Laurendeau¹, Maxime Robert¹, Katia Turcot¹
¹Université Laval / CIRRIS, ²Université de la réunion

P1-L-44 Shoulder muscle activation synergy changes with load, arm rotation, and plane of arm elevation

Spencer Nehls¹, James Michaud¹, Traci Bush¹, Vassilios Vardaxis¹
¹Des Moines University

M – NEUROMECHANICS

P1-M-45 Estimation of dynamically consistent joint stiffness during joint rotations via EMG-driven musculoskeletal modelling

Christopher Pablo Cop¹, Alfred C. Schouten², Bart F.J.M. Koopman¹, Massimo Sartori¹
¹University of Twente, ²Delft University of Technology

P1-M-46 Behavioral exploration of musculoskeletal systems integrating spinal regulations for natural and artificial controls

Daniel Cattaert¹, Matthieu Guémann², Bryce Chung³, Pierre-Yves Oudeyer⁴, Aymar de Rugy⁵
¹INCIA, UMR5287, CNRS et Université de Bordeaux, ²IRBA, unit PEACE, dept ENOP, ³Emory University, ⁴INRIA Bordeaux Sud-Ouest, ⁵Univ. Bordeaux, CNRS, EPHE, INCIA, UMR 5287

P1-M-47 Facilitation of the abductor hallucis Hoffman reflex when walking in textured foot orthoses

Kelly Robb¹, Lara Green¹, Stephen Perry¹
¹Wilfrid Laurier University

P1-M-48 An investigation of the role of plantar-surface cutaneous sensation on dynamic balance control during slip perturbations

Keara Sutherland¹, Rachel Billo¹, Jessica Berrigan¹, Stephen Perry¹
¹Wilfrid Laurier University



O - PAIN

P1-O-49 *The precision of people with chronic low back pain in locating nociceptive stimuli on a body chart*

Marco Barbero¹, Deborah Falla², Matteo Agnelliotti³, Davide Trenta³, Alberto Gallace⁴, Corrado Cescon¹, Davide Corbetta³

¹University of Applied Sciences and Arts of Southern Switzerland, ²University of Birmingham, ³Vita-Salute San Raffaele University, ⁴University of Milano-Bicocca

P1-O-50 *Adaptation of scapular kinematics and trapezius's muscle activity to movement-evoked shoulder pain*

Giacomo Nardese¹, Deborah Falla¹, Valter Devecchi¹, Alessio Gallina¹

¹University of Birmingham

P1-O-51 *Degenerative diseases of the intervertebral discs: an approach to electromyographic activity of masticatory muscles*

Marcelo Palinkas¹, Flávia Cecilio¹, Nicole Bettoli¹, Claire Gauch¹, Lilian Andrade¹, Isabela Regalo¹, Ligia Gonçalves¹, Selma Siéssere¹, Simone Regalo¹

¹School of Dentistry of Ribeirão Preto, University of São Paulo, Ribeirão Preto

P - REHABILITATION

P1-P-52 *Association between gait and walking lower limb force control in stroke patients*

Yan-Ting Chen¹, Li-Yu Lin², Hui-Yu Tseng², Chih-Hung Chen¹, Pei-Yun Lee¹, Sang-I Lin¹

¹College of Medicine, National Cheng Kung University, ²Tainan Hospital, Ministry of Health and Welfare

P1-P-53 *Operant conditioning of extensor carpi radialis motor evoked potential after neurological injury*

Blair Dellenbach¹, Jinsook Roh², Alan Phipps¹, Aiko Thompson¹

¹Medical University of South Carolina, ²University of Houston

P1-P-54 *The relationship between soleus and gastrocnemius muscles length and static and dynamic balance control*

Marcio dos Santos¹, Hermes Romero¹, Tatiana Bobbio¹, Scott Sullivan¹

¹University of St Augustine for Health Sciences

P1-P-55 *Strength and HDEMG features of the quadriceps during slow, moderate and fast isokinetic knee extensions in men and women*

Usha Kuruganti¹, Jacqueline Toner², Brayan Daniel Caldera Rosas³

¹University of New Brunswick, ²Dalhousie University, ³Universidad de Guadalajara

P1-P-56 *Effects of multi-session tDCS on the excitability of corticospinal and spinal pathways for the soleus*

Lynn McCane¹, Jonathan Wolpaw², Susan D'Andrea³, Aiko Thompson⁴

¹National Center for Adaptive Neurotechnologies and The University of Rhode Island, ²National Center for Adaptive Neurotechnologies, Stratton VA, ³The University of Rhode Island, ⁴Medical University of South Carolina

P1-P-57 *Exploring electrodermal activity (EDA) as a tool for measuring balance exercise intensity in stroke rehabilitation*

Aishwarya Shenoy¹, Towela Tembo¹, Rebecca Todd¹, Janice Eng¹, Noah Silverberg¹, Tzu-Hsuan Peng¹, Courtney Pollock¹

¹University of British Columbia

R - SPORTS SCIENCES AND MOTOR PERFORMANCE

P1-R-58 *An eight-week, twice-weekly no-load resistance training program promoted neuromuscular adaptations in upper limbs of older adults after detraining period due to COVID-19 lockdown*

Rafael Fujita¹, Marina Villalba¹, Kristin Campbell², Matheus Gomes¹

¹University of São Paulo, ²The University of British Columbia

P1-R-59 *Puck speed is related to trunk rotation during ice hockey slap shots*

Shawn Robbins¹, Philippe Renaud¹, Neil MacInnis², David Pearsall¹

¹McGill University, ²Curv Health

P1-R-60 *Influence of low back pain history on lumbopelvic motor control, kinematics and muscle activation during the loaded squatting task in recreational weight lifters*

Shih-Tang Su¹, Yi-Fen Shih¹

¹National Yang-Ming Chiao-Tung University

P1-R-61 *Effects of eight-week of a lower limbs no-load resistance training on neuromuscular parameters in older adults after a COVID -19 detraining period - Pilot study.*

Marina Villalba¹, Rafael Fujita¹, Matheus Gomes²

¹University of São Paulo - Ribeirão Preto College of Nursing, ²School of Physical Education and Sport of Ribeirão Preto, University of São Paulo



POSTER SESSION 2

FRIDAY, JUNE 24, 2022

A - AGING

P2-A-1 *The effects of age and walking environment on quantitative and qualitative gait measures*

Iris Hagoort¹, Nicolas Vuillerme², Tibor Hortobágyi¹, Claudine Lamoth¹

¹University Medical Center Groningen, ²Université Grenoble Alpes

P2-A-2 *Early muscle activation of the hip abductors in older adults with fall risk*

Marcel Lanza¹, Nathan Fakes¹, Vicki Gray¹

¹University of Maryland Baltimore

P2-A-3 *Motor unit firing rates in young and very old adults during isokinetic fatigue and recovery*

Alexander Zero¹, Eric Kirk¹, Kevin Gilmore², Charles Rice¹

¹University of Western Ontario, ²University of Toronto

C - BIOMECHANICS

P2-C-10 *Evaluation of knee Helical Axis dispersion during walking after isometric muscle training*

Corrado Cescon¹, Paola Adamo², Francesco Oddenino², Federico Temporiti², Roberto Gatti², Marco Barbero¹

¹University of Applied Sciences and Arts of Southern Switzerland, ²Humanitas University

P2-C-4 *The effect of adjusting frontal plane knee alignment when scaling patient-specific neuromusculoskeletal models in patients with knee osteoarthritis*

Dominique Cava¹, Trevor Birmingham¹, Kristyn Leitch¹, Ryan Willing¹

¹Western University

P2-C-5 *Investigating the effect of gait speed on joint loading distribution in knee osteoarthritis (KOA) individuals during walking: preliminary results*

Hananeh Younesian¹, Katia Turcot¹

¹Faculty of Medicine, Laval University, Quebec, Canada; Center for Interdisciplinary Research in Reha

P2-C-6 *Waveform analysis of forearm muscle activity during dynamic wrist flexion and extension: Effects of forearm posture and torque direction*

James Parkinson¹, Davis Forman², Garrick Forman¹, Alan Cudlip¹, Shawn Beaudette¹, Mike Holmes¹

¹Brock University, ²University of Guelph

P2-C-7 *Influence of gravity on control strategies of the muscles of the upper limb*

Elisa Romero Avila¹, Wolfgang Potthast², Catherine Disselhorst-Klug¹

¹Institute of Applied Medical Engineering, RWTH Aachen, ²Institute of Biomechanics and Orthopaedics, German Sport University Cologne

P2-C-8 *Kinematic difference between right and left turns (Pirouette) in a classical ballet with pointe shoes*

Yurina Tsubaki¹, Yui Kawano², Connie Lin³, Mayumi Kuno-Mizumura¹

¹Ochanomizu University, ²Japan Institute of Sports Sciences, ³National Cheng Kung University

P2-C-9 *Detecting differences in gait initiation between older adult fallers and non-fallers through time-series principal component analysis (PCA)*

Kaya Yoshida¹, Drew Commandeur², Sandra Hundza², Marc Klimstra²

¹Rehabilitation Research Program, University of British Columbia, ²University of Victoria

D – BRAIN IMAGING

P2-D-10 *Lateralized beta modulation is related to arm swing in human gait*

Marzieh Borhanazad¹, Nadia Dominici¹, Andreas Daffertshofer¹

¹Vrije Universiteit Amsterdam

P2-D-11 *From lab to nature: assessment of brain-body interactions in naturalistic conditions using wireless EEG-EMG amplifier*

Alessandra Giangrande¹, Giacinto Luigi Cerone², Alberto Botter², Harri Piitulainen¹

¹University of Jyväskylä, ²Politecnico di Torino

P2-D-12 *Standing on a biomimetic surface forces the involvement of sensorimotor cortical territories*

Chloe Sutter¹, Marie Fabre¹, Jean Blouin¹, Laurence Mouchnino¹

¹CNRS Aix Marseille Université

E – CLINICAL NEUROPHYSIOLOGY

P2-E-13 *Corticomotor control of lumbar erector spinae in preparation of a postural motor tasks*

Mikaël Desmons¹, Amira Cherif¹, Antoine Rohel¹, Catherine Mercier¹, Hugo Massé-Alarie¹

¹CIRRIS

P2-E-14 *Effect of subcortical neuromodulation on cortical stimulation induced motor output: a probe of subcortical motor pathways*

Paul Stapley¹, Jonathan Shemmell¹

¹University of Wollongong



P2-E-15 Does obesity interfere with the stomatognathic system of children?

Isabela Regalo¹, Ligia Gonçalves¹, Paulo Vasconcelos¹, Jaime Hallak¹, Paula Castelo², Marcelo Palinkas¹, Simone Regalo¹, Selma Siessere¹

¹USP, ²UNIFESP

P2-E-16 Acute exercise effects on response to spinal paired associative stimulation

Jayd Savage¹, Eduardo Toledo-Aldana¹, Cameron Mang¹

¹University of Regina

P2-E-17 Contributions of intermuscular coherence to balance in persons with Parkinson's disease

Rowan Smart¹, Owen Harris¹, Anis Toumi¹, Jennifer Jakobi¹

¹University of British Columbia Okanagan

P2-E-18 Muscle fiber conduction velocity of the quadriceps vastus medialis oblique after an anterior cruciate ligament reconstruction.

Fernando Lira¹, Ignacio Barra¹

¹Universidad Mayor

G - FATIGUE

P2-G-19 Muscle fatigue indicator in complexe tasks

Marianne Boyer¹, Laurent Bouyer¹, Jean-Sebastien Roy¹, Alexandre Campeau-Lecours¹

¹Laval University

P2-G-20 The effect of fatigue on the central activation ratio in young and older adult men

Rami Hammad¹, Vincent Marcangeli², Jordan Granet¹, Marina Cefis¹, Justine Lai¹, Pierrette Gaudreau³, Richard Robitaille³, José A. Morais⁴, Gilles Gouspillou², Mylène Aubertin-Leheudre¹, Marc Bélanger¹

¹UQAM, ²UQAM - Département des sciences biologiques, ³Université de Montréal, ⁴McGill University

P2-G-21 Ankle muscle fatigue as a similar effect on static postural control and H-reflex modulation in young healthy males and females.

Donguk Jo¹, Martin Bilodeau¹

¹University of Ottawa

P2-G-22 Sex-specific effects of fatigue on inter-joint coordination during a repetitive pointing task

Chen Yang¹, Yiyang Chen¹, Julie Côté¹

¹McGill University

H – MODELLING AND SIGNAL PROCESSING

P2-H-24 Artefact detection and elimination in high density surface electromyograms by independent component analysis and activity index

Aljaz Francic¹, Ales Holobar¹, Milan Zorman¹

¹University of Maribor, Faculty of Electrical Engineering and Computer Science

P2-H-25 Identifying the postural control system for quiet standing in individuals with spinal cord injury

Jae Lee¹, Katherine Chan², Janelle Unger³, Kristin Musselman⁴, Kei Masani²

¹Institute of Biomedical Engineering, University of Toronto, ²KITE-Toronto Rehabilitation Institute,

³Western University, ⁴University of Toronto

I – MOTOR CONTROL AND MOTOR LEARNING

P2-I-26 Breaking barriers to designing online experiments: A novel open-source platform for supporting procedural skill learning experiments

Luis Cubillos¹, Thomas Augenstein², Rajiv Ranganathan³, Chandramouli Krishnan²

¹NeuRRo Lab, ²University of Michigan, ³Michigan State University

P2-I-27 Gymnastics experience modulates default response of inter-limb reflex during postural maintenance by upper limbs

Hirotaka Sugino¹, Junichi Ushiyama¹

¹Keio University

P2-I-28 Differential changes in short and middle-latency somatosensory evoked potentials and motor performance: effects of neck muscle vibration on sensorimotor integration & motor learning

Hailey Tabbert¹, Ushani Ambalavanar¹, Bernadette Murphy¹

¹Ontario Tech University

J – MOTOR DISORDERS

P2-J-29 Analysis of surface EMG features during wrist flexion and extension in Huntington's disease

Vitoria Fahed¹, Emer Doheny¹, Caitlin McDonald¹, Monica Busse², Jennifer Hoblyn³, Madeleine Lowery¹

¹University College Dublin, ²Cardiff University, ³Trinity College Dublin and, Bloomfield Health Services



P2-J-30 Coherence between muscle activations and tremor in the upper limb of persons with essential tremor

Daniel Free¹, Ian Syndergaard¹, Adam Pigg¹, Silvia Muceli², Johanna Thompson-Westra³, Karin Mente⁴, Carine Maurer⁵, Dietrich Haubenberger³, Mark Hallet³, Dario Farina⁶, Steven Charles¹

¹Brigham Young University, ²Chalmers University of Technology, ³National Institute of Neurological Disorders and Stroke, NIH, ⁴Case Western Reserve University, ⁵Stony Brook University, ⁶Imperial College London

P2-J-31 Inter- and intra-individual variability in hand and leg motor cortices excitability in Parkinson's disease and freezing of gait

Alexandra Potvin-Desrochers¹, Alejandra Martinez Moreno¹, Julien Clouette¹, Henri Lajeunesse¹, Freddie Seo¹, Gleydiane Alexandra Fernandes¹, Frédérique Parent-L'Ecuyer¹, Audrey Parent¹, Alexander Fulford¹, Michelle Cheng¹, Caroline Paquette¹

¹McGill University

P2-J-32 Reduced rate of torque development during ballistic isometric contraction of plantar flexors in chronic stroke survivors

Jongsang Son¹, William Rymer²

¹Shirley Ryan AbilityLab (formerly Rehabilitation Institute of Chicago), ²Northwestern University

K – MOTOR UNITS

P2-K-33 Estimation of motor unit-specific activation properties in the intact human in vivo

Antonio Gogeascoechea¹, Antonio de Jesus Gogeascoechea Hernandez¹, Massimo Sartori¹

¹University of Twente

P2-K-34 Estimates of persistent inward currents in the lower limb are larger in females than males

Sophia Jenz¹, James Beauchamp¹, Matheus Gomes², C.J. Heckman¹, Gregory Pearcey¹

¹Northwestern University, ²University of São Paulo

P2-K-35 Relationship between force fluctuation and motor unit activities in the peroneus muscles

Shun Kunugi¹, Ales Holobar², Akane Yoshimura¹, Tetsuya Hirono¹, Kohei Watanabe¹

¹Chukyo University, ²University of Maribor

P2-K-36 Reliability of volitional muscle activation determination using the interpolated twitch technique in boys and men

James Maynard¹, Nicole Jenicek¹, Raffy Dotan¹, Michael Holmes¹, David Gabriel¹, Bareket Falk¹

¹Brock University

P2-K-37 Neural control of the motor units innervating the extrinsic muscles of the hand during individual and combined digit movements at different speeds

Marius Oßwald¹, Andre Cakici¹, Daniela Souza De Oliveira¹, Alessandro Del Vecchio¹

¹Friedrich-Alexander-Universität Erlangen-Nürnberg

L – MUSCLE SYNERGY

P2-L-38 Predicting 3D reaching direction through synchronous muscle synergies

Simone Ranaldi¹, Cristiano De Marchis¹, Silvia Conforto¹

¹University Roma TRE

P2-L-39 The analysis of the muscle synergies during an incremental pedaling exercise

Kengo Wakui¹, Yukihiko Ushiyama¹, Shuhei Kamyama², Kazuto Kamitaira³

¹Niigata University, ²Niigata University of Management / Niigata University, ³Graduate School of Modern Society and Culture, Niigata University

M – NEUROMECHANICS

P2-M-40 Upper limb and eye movement coordination during goal-directed aiming in a subclinical neck pain population

Navika Cheema¹, Praveen Sanmuganathan¹, Akash Toor¹, Laura Ruberto¹, Paul Yielder¹, Bernadette Murphy¹

¹Ontario Tech University

P2-M-41 Frequency characteristics and orientation of the vestibular-evoked postural response in adolescents with and without idiopathic scoliosis

Jean-Philippe Cyr¹

¹Université Laval

P2-M-42 Lumbar muscle adaptations to external perturbations are modulated by its mechanical advantage

Julien Ducas¹, Émile Marineau-Bélanger¹, Alessio Gallina², Jacques Abboud¹

¹Université du Québec à Trois-Rivières, ²University of Birmingham

P2-M-43 Stretch reflex excitability and the role of texture as non-electrical cutaneous afferent facilitation

Kelly Robb¹, Lara Green¹, Jordan Hyde¹, Stephen Perry¹

¹Wilfrid Laurier University



N – NEUROMUSCULAR IMAGING

P2-N-44 Lumbar multifidus characteristics in university level athletes: Possible predictors of low back pain and lower limb injury

Meagan Anstruther¹, Stephanie Valentin², Geoffrey Dover¹, Maryse Fortin¹

¹Concordia University, ²University of the West of Scotland

P2-N-45 Behavior of biceps brachii shear modulus in well-trained men after exercise-induced muscle damage

Maria Clara Brandão¹, Lino Matias¹, Liliam Oliveira¹

¹Federal University of Rio de Janeiro

O - PAIN

P2-O-46 Painful electrical stimulation of the low back: What is the best configuration to limit stimulation artefacts on the electromyographic signals?

Hélio Cabral¹, Giacomo Nardese¹, Jacques Abboud², Paul Hodges³, Deborah Falla¹, Alessio Gallina¹

¹University of Birmingham, ²Université du Québec à Trois-Rivières, ³The University of Queensland

P2-O-47 Functioning of motor neural circuits in chronic low back pain

Amira cherif¹, Antoine Rohel¹, Mikaël Desmons¹, Guillaume Leonard¹, Amelie Desgagnes¹, Rubens Da Silva¹, Martin Simoneau¹, Catherine Mercier¹, Hugo Masse-Alarie¹

¹CIRRIS

P2-O-48 The effect of chronic, non-specific low back pain on superficial lumbar muscle activity: A systematic review

Andy Sanderson¹, Alison Rushton², Eduardo Martinez-Valdes³, Nicola Heneghan³, Alessio Gallina³, Deborah Falla³

¹Manchester Metropolitan University, ²Western University, ³University of Birmingham

P - REHABILITATION

P2-P-49 Mechanical versus manual impulse for the propagation of shear wave along the Achilles tendon: a congruent validity study

Alessandro Schneebeli¹, Deborah Falla², Corrado Cescon¹, Marco Barbero¹

¹University of Applied Sciences and Arts of Southern Switzerland, ²School of Sport, Exercise Rehabilitation Sciences, College of Life Environmental Sciences, Universit

P2-P-50 Intra-rater reliability of a shear wave tensiometer in the evaluation of Achilles tendon mechanical properties

Alessandro Schneebeli¹, Deborah Falla², Corrado Cescon¹, Marco Barbero¹

¹University of Applied Sciences and Arts of Southern Switzerland, ²School of Sport, Exercise Rehabilitation Sciences, College of Life Environmental Sciences, Universit

P2-P-51 Quantitative evaluation of muscle function in Parkinson's Disease patients undergoing LSVT-BIG® Therapy

Gregorio Dotti¹, Marco Ghislieri¹, Ben O'Callaghan², Samanta Rosati¹, Gabriella Balestra¹, Madeleine Lowery²

¹Politecnico di Torino, ²University College Dublin

P2-P-52 Post-operative body composition changes after orthopedic knee surgery

Ashley Herda¹, Christopher Cleary¹, Bryan Vopat²

¹University of Kansas, ²University of Kansas Medical Center

P2-P-53 The differences of muscle activation patterns during cervical flexion movement pattern test between torticollis and control

Hirofumi Sageshima¹, Tereza Pospíchalová¹, Patrik Vymyslický¹, David Pánek¹, Dagmar Pavlů¹

¹Faculty of Physical Education and Sport, Charles University

R – SPORTS SCIENCES AND MOTOR PERFORMANCE

P2-R-54 Muscle activation of the medial and lateral head of the gastrocnemius muscle during isometric plantar flexion in university level runners and non-runners

Timothy Green¹, Jacqueline Toner², Usha Kuruganti¹

¹University of New Brunswick, ²Dalhousie University

P2-R-55 Does an increase in maximal upper body strength lead to enhanced sprint kayak performance?

Mathias Kristiansen¹, Ann-Marie Pedersen¹, Ghita Sandvej¹, Patrick Jørgensen¹, Jarl Jakobsen², Kent Klitgaard¹

¹Aalborg University, ²Team Danmark

P2-R-57 Muscle synergy of grading ability in table tennis

Yuki Sato¹, Yukihiko Ushiyama¹, Shuhei Kameyama², Kengo Wakui¹, Kazuto Kamitaira¹

¹Niigata University, ²Niigata university of management / Niigata University



S – WEARABLE SENSORS & IOT

P2-S-58 Artificial intelligence based muscle activity and muscle monitoring tracker with wireless sensor system

R Majidi¹, A Kiapour², V Entezari³, M Ghasemi⁴, Z Zhang⁵, E Clancy⁵

¹OrthoKinetic Track LLC, ²Massachusetts General Hospital, Harvard Medical School, ³Cleveland Clinical Foundation, ⁴University of Massachusetts Chan Medical School, ⁵Worcester Polytechnic Institute

P2-S-59 Markerless motion capture systems in pediatric sports medicine: A scoping review

Erica Bitektine¹, Samuel Lamanuzzi¹, Marianne Gagnon¹, Louis-Nicolas Veilleux¹

¹McGill University/Motion Analysis Center, Shriners Hospital for Children

P2-S-60 Effect of electrode configuration on the quality of surface electromyography signals detected with dry electrodes

Elmar Junker¹, Catherine Disselhorst-Klug¹, Elisa Romero Avila¹

¹Institute of Applied Medical Engineering, RWTH Aachen

P2-S-61 Accelerometry-based metrics to characterize upper extremity motor deficits during a kitchen task among adult living with cerebral palsy

Isabelle Poitras¹, Jade Clouâtre¹, Alexandre Campeau-Lecours¹, Catherine Mercier¹

¹Laval University

POSTER SESSION 3

SATURDAY, JUNE 25, 2022

A - AGING

P3-A-1 The effects of mechanical, postural and cognitive manipulations on stability measures of dynamic balance during beam walking in older adults

Andréia Abud da Silva Costa¹, Tibor Hortobágyi¹, Rob den Otter¹, Andrew Sawers², Renato Moraes³

¹University Medical Center Groningen, ²University of Illinois at Chicago, ³University of São Paulo

P3-A-2 The relations between postural stability of elderly females living independently and their physical characteristics

Mayumi Kuno-Mizumura¹, Yui Kawano², Junko Kikuchi¹, Chiharu Oka¹, Ayako Ito³, Kaoruko Iida¹

¹Ochanomizu University, ²Japan Institute of Sports Science, ³Nagoya City University

P3-A-3 Impact of prolonged bed rest on H-Reflex response and strength in older adults

Mathil Ruel¹, Jean-Christophe Lagacé¹, Philippe St-Martin¹, Karen Lambert², Éléonor Riesco¹, Mathil McPhee³, Guillaume Léonard¹, Isabelle Dionne¹

¹Centre de recherche de l'Université de Sherbrooke, ²PhyMedEx, ³Manchester Metropolitan University

P3-A-4 Aging of skeletal muscles: A shear wave elastography approach to detect changes in mechanical properties in vivo

Manuela Zimmer¹, Benedict Kleiser², Justus Marquetand², Filiz Ates¹

¹University of Stuttgart, ²University of Tübingen

B – AI, DATA FUSION, AND MACHINE LEARNING

P3-B-5 Analysis of walking characteristics between genders, based on full-body kinematic gait data

Svonko Galasso¹, Renato Baptista², Mario Molinara¹, Rocco Calabro³, Alessandro De Nunzio²

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P3-B-6 Segmentation of sEMG using time-series analysis

Julia Meneley¹, Dawn MacIsaac¹, Erik Scheme¹

¹University of New Brunswick

P3-B-7 Arthrogenic muscle inhibition biomarker extraction using explainable machine learning techniques

Macarena Soldan¹, Rony Silvestre¹

¹MEDS Clinic



C - BIOMECHANICS

P3-C-10 Variability and stability of triceps surae M-wave and ankle joint motion during walking, running, and hopping

Michelle McLeod¹, Roland Cote¹, Bridgette Pouliot¹, Aiko Thompson¹

¹Medical University of South Carolina

P3-C-11 Relationship between shear elastic modulus and passive muscle force in human hamstring muscles: a Thiel soft-embalmed cadaver study

Gakuto Nakao¹, Keigo Taniguchi¹, Takuya Kato¹, Taiki Kodesho¹, Yu Yokoyama¹, Yuhei Saito¹, Masaki Katayose¹

¹Sapporo Medical University

P3-C-12 Effect of load and arm rotation on scapular initial position, kinematics, and 3d scapulohumeral rhythm

James Michaud¹, Spencer Nehls¹, Traci Bush¹, Vassilios Vardaxis¹

¹Des Moines University

P3-C-8 Shoulder muscle synergy influenced by filter type of EMG during high-speed overhead stroke

Hamidreza Barnamehei¹, Abolfazl Panahi²

¹Washington State University, ²Science and Research branch, Islamic Azad University

P3-C-9 Walking with a passive exoskeleton during everyday obstacles

Cristina Pirs Coveanu¹, Mads Pedersen¹, Jacob Hansen¹, Pascal Madeleine¹

¹Aalborg University

E - CLINICAL NEUROPHYSIOLOGY

P3-E-13 Correlation between functional and electrophysiological measures in COVID-19 post-intensive care syndrome patients

Marco Benedini¹, Marta Cogliati¹, Tea Lulic¹, Kelvin Jones², Nicola Latronico¹, Simone Piva¹, Claudio Orizio¹, Francesco Negro¹

¹University of Brescia, ²University of Alberta

P3-E-14 Immediate effects of lower limb electrical stimulation and cycling on cortical activities and functional performance in individuals with stroke

Chia Fang Chiang¹, Li Wei Chou¹, Liang Hsuan Lu², Shang Lin Chiang²

¹National Yang Ming Chiao Tung University, ²Tri-Service General Hospital

P3-E-16 Effects of low back pain on postural control under different conditions of tendon vibration and muscle fatigue

William Gelinas¹, Louis-David Beaulieu¹, Richard Preuss², Hugo Massé-Alarie³, Leonardo Vieira Neto⁴, Jérémie Désilets-Paquet¹, Elisabeth Gauthier-Levesque¹, Florence Lamontagne¹, Marie-Pier Lemay¹, Véronique Tremblay¹, Rubens A. da Silva¹

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³Université Laval, ⁴CIUSSS-SLSJ

G - FATIGUE

P3-G-17 Correlation between motor unit synchronization estimated through intramuscular and surface EMG in the vastus medialis obliquus: a validation study

Corrado Cescon¹, Ausilia Vistarini², Caterina Pisegna³, Beatrice Vannini³, Cristian Zampella², Luca Calanni², Emiliano Soldini¹, Giuseppe D'Antona²

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P3-G-18 Energy consumption during treadmill walking in adults with cerebral palsy as compared to neurologically intact adults

Christian Forman¹, Christian Forman², Christian Svane², Jens Bo Nielsen², Jakob Lorentzen¹

¹University of Copenhagen, ²Elsass Foundation

P3-G-19 The effects of handedness on muscle activation during a repetitive overhead fatiguing task

Erika Renda¹, Samuel Lamanuzzi¹, Julie Côté¹

¹McGill University

P3-G-20 Between-day reliability of common muscle fatigue measures

Michael Watterworth¹, Jeffrey Graham¹, Nicholas La Delfa¹

¹Ontario Tech University

P3-G-21 Neuromuscular fatigue is dependent on the amount of active muscle mass in cycling tasks across discrete intensity domains

Jenny Zhang¹, Danilo Iannetta¹, Saied Aboodarda¹

¹University of Calgary

H - MODELLING AND SIGNAL PROCESSING

P3-H-23 Kalman filter based motor unit identification in dynamic muscle contractions

Matej Kramberger¹, Ales Holobar¹

¹University of Maribor, Faculty of Electrical Engineering and Computer Science



I – MOTOR CONTROL AND MOTOR LEARNING

P3-I-25 Cutaneous reflexes during walking, jogging, and running

Alan Phipps¹, Aiko Thompson¹

¹Medical University of South Carolina

P3-I-26 Neural interaction between the sensorimotor cortex and ankle joint muscles during standing in varying stance widths

Sylmina Alkaff¹, Junichi Ushiyama¹

¹Keio University

P3-I-27 Effect of a complex locomotor task on corticospinal excitability and muscle coordination

Yosra Cherni¹, Laurent Bouyer¹, Catherine Mercier¹

¹University Laval/CIRRIS

P3-I-28 Feedback for the prevention and rehabilitation of musculoskeletal disorders.

Antoine Frasie¹, Charles Plourde¹, Maxime Houry², Maxime.T Robert¹, Laurent Bouyer¹, Jean-Sébastien Roy¹

¹Université Laval, Cirris, ²Université de Rouen, Centre d'Études des Transformations des Activités Physiques et Sportives (CETAP)

P3-I-29 The modulation of corticospinal excitability and short-interval intracortical inhibition during the preparation of an individualized finger motor task

Kaven Hamel¹, Alexandre Campeau-Lecours¹, Catherine Mercier¹, Véronique Flamand¹

¹Université Laval and Cirris

P3-I-30 Precision stepping during a visuomotor gait task

Helle Hüche Larsen¹, Mikkel Damgaard Justiniano², Jens Bo Nielsen¹

¹University of Copenhagen, ²Elsass Foundation

P3-I-32 Seeing our actual hand enhances the cortical processes related to sensorimotor adaptation when tracing with incongruent visual and proprioceptive feedbacks

Benjamin Mathieu¹, Antonin Abillama¹, Simon More¹, Catherine Mercier², Martin Simoneau², Laurence Mouchnino¹, Jean Blouin³

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P3-I-33 Step height effects on double leg support time during stepping in place without vision

Nicole Paquet¹, Lucas Michaud¹, Yves Lajoie¹

¹University of Ottawa

P3-I-34 Bimanual coordination of filleting fish by the cutting movement of a kitchen knife in Japanese student

Takeshi Sato¹, Kimie Nakajima², Mizuki Nakajima¹, Kenichi Egawa¹, Eiji Watanabe¹, Miyu Kayama³

¹Jissen Women's University, ²Tokyo Kasei Gakuin University, ³Junior College of Kiryu

J – MOTOR DISORDERS

P3-J-35 Increasing excitability of the PPC increases gait speed and stride length in patients with Parkinson's Disease with Freezing of Gait

Julien Clouette¹, Alexandra Potvin-Desrochers¹, Alejandra Martinez Moreno¹, Henri Lajeunesse¹, Freddie Seo¹, Gleydiane Alexandre Fernandez¹, Frédérique Parent-L'Écuyer¹, Audrey Parent¹, Alexander Fulford¹, Michelle Cheng¹, Caroline Paquette¹

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P3-J-36 Hand strength and force steadiness asymmetries in patients with Parkinson disease

Caleb Voskuil¹, Zoe Thijss¹, Adam King¹, Ryan Porter¹, Chris Watts¹, Joshua Carr¹

¹Texas Christian University

K – MOTOR UNITS

P3-K-37 Uncovering the neural drive of the human stretch reflex through motor unit activity and realistic simulations

Francesco Negro¹, Christopher Thompson²

¹Università degli Studi di Brescia, ²Temple University

P3-K-38 Mean power frequency of boys and men during discrete, progressive, isometric contractions carried to exhaustion

Jordan Langille¹, Stacey Woods¹, Raffy Dotan¹, Craig Tokuno¹, David Gabriel¹, Bareket Falk¹

¹Brock University

P3-K-39 Local vibration decreases the contribution of persistent inward currents in voluntary contractions

Thomas Lapole¹, Ricardo Mesquita², Stéphane Baudry³, Robin Souron⁴, Callum Brownstein¹, Vianney Rozand¹

¹Interuniversity Laboratory of Human Movement Biolgy, ²Centre for Human Performance, School of

Medical and Health Sciences, Edith Cowan University, ³Laboratory of Applied Biology, Research Unit in Applied Neurophysiology, ⁴UFR STAPS de Toulon, Unité de recherche IAPS (n°201723207F)



P3-K-40 The effects of high-intensity without and low-intensity resistance training with blood flow restriction on the slopes of motor unit action potential amplitude versus recruitment threshold relationship

Tanner Reece¹, Mackenzie Bohn¹, Tera Hawes¹, Catherine Arnold¹, Gabrielle Dorsen¹, Bryan Vopat¹, Philip Gallagher¹, Trent Herda¹

¹University of Kansas

P3-K-41 Earlier recruitment of motor units during isometric plantarflexion with restriction of blood flow is pronounced in the gastrocnemius muscles

Moeka Samoto¹, Jota Suzuki¹, Momoka Nakamura¹, Yasuhide Yoshitake¹

¹Shinshu University

L - MUSCLE SYNERGY

P3-L-42 Motor cortical responses during movement planning of reaching reflects excitation of flexor synergies

Thomas Augenstein¹, Chandramouli Krishnan¹

¹University of Michigan

P3-L-43 Motor control strategy of double leg circles in pommel horse

Kazuto Kamitaira¹, Shuhei Kameyama², Kengo Wakui¹

¹Niigata university, ²Niigata university of management / Niigata university

M - NEUROMECHANICS

P3-M-44 The Cutaneous Rabbit Effect, interstimulus interval, and direction influence the subjective evaluation of quality and velocity of electrotactile sequences at the foot sole

Michael Apollinaro¹, Leah Bent¹

¹University of Guelph

P3-M-45 Reflex latencies in shoulder muscles differ when recorded with surface and fine-wire EMG electrodes

Constantine Nicolozakes¹, Margaret Coats-Thomas¹, Daniel Ludvig¹, Amee Seitz¹, Eric Perreault¹

¹Northwestern University

P3-M-46 Determining the contributions of specific descending neural pathways in postural control

Cassandra Russell¹, Paul Stapley¹, Jonathan Shemmell¹, Nathan Difford¹, Alexander Stamenkovic², Caitlin Arpel¹

¹University of Wollongong, ²Virginia Commonwealth University

P3-M-47 Sex differences in trunk muscle activity using multichannel surface electromyography during pushing tasks

Jacqueline Toner¹, Usha Kuruganti²

¹Dalhousie University, ²University of New Brunswick

N - NEUROMUSCULAR IMAGING

P3-N-48 Effect of knee rehabilitation exercise with and without blood flow restriction on quadriceps femoris muscle size

Christopher Cleary¹, Trent Herda², Ashley Herda²

¹University of Kansas Edwards Campus, ²University of Kansas

P3-N-49 Automatic analysis of ultrasound images for assessing lumber muscle thickness

Xiaoli Zhang¹, Shane Coppenhaver², Kian Mosleh¹, Minoru Shinohara³

¹Intelligent Fiber Optic Systems Corporation (IFOS),

²Baylor University, ³Georgia Institute of Technology

O - PAIN

P3-O-50 Somatic pain distribution and its association with the clinical features in women with fibromyalgia

Marco Barbero¹, Margarita Cigarán-Méndez², Edurne Úbeda-D'Ocasar³, José Luis Arias-Buría², Gracia María Gallego-Sendarrubias³, Juan Antonio Valera-Calero³, César Fernández-de-las-Peñas²

¹University of Applied Sciences and Arts of Southern Switzerland, ²Universidad Rey Juan Carlos,

³Universidad Camilo José Cela

P3-O-51 Effect of Physical Therapy protocol on pain, function, posterior capsule tightness and range of motion in individuals with posterior capsule tightness and rotator cuff related shoulder pain - A Prospective Cohort Study

Dayana Rosa¹, John Borstad², Júlia Ferreira³, Vander Gava³, Paula Camargo³

¹Université Laval, ²The College of St. Scholastica,

³Universidade Federal de São Carlos

P - REHABILITATION

P3-P-53 The effect of Thermal Therapy and Exercises in Acute Low Back Pain: A protocol for a Randomized Controlled Trial

Claudia Côté-Picard¹, Jean Tittley¹, Catherine Mailloux², Kadija Perreault³, Catherine Mercier³, Clermont E. Dionne⁴, Jean-Sébastien Roy³, Hugo Massé-Alarie³

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Q – ROBOTIC REHABILITATION

P3-Q-56 Powered lower-limb exoskeleton for human gait analysis dataset

Renato Baptista¹, Svonko Galasso², Serena Pizzocaro³, Francesco Salvaggio⁴, Micaela Schmid⁵, Alessandro De Nunzio¹

¹LUNEX International University of Health, Exercise & Sports, ²Department of Electrical and Information Engineering, University of Cassino and Southern Lazio,

³Department of Electrical, Computer and Biomedical Engineering, University of Pavia, ⁴Department of Public Health, Experimental and Forensic Medicine, Department of Sport Science, Univer, ⁵University of Pavia

P3-Q-57 Intuitive prosthesis control based on residual (stump) motion tested with valid subjects and amputees on the robotic platform REACHY

Bianca Lento¹, Océane Dubois², Effie Segas¹, Vincent Leconte¹, Pierre Rouanet³, Matthieu Lapeyre³, Rémi Klotz⁴, Daniel Cattaert¹, Aymar de Rugy¹

¹Univ. Bordeaux, CNRS, EPHE, INCIA, UMR 5287, ²CNRS, UMR 7222, ISIR / INSERM, U1150 Agathe-ISIR, Sorbonne Université, ³Pollen Robotics, ⁴CMPR Tour de Gassies

R – SPORTS SCIENCES AND MOTOR PERFORMANCE

P3-R-58 Application of muscle synergy in skills assessment of gymnastics

Shuhei Kameyama¹, Yukihiko Ushiyama², Takehito Mori³, Yuki Sato², Kengo Wakui², Kazuto Kamitaira³

¹Niigata university of management / Niigata university, ²Niigata university, ³Niigata university of management

P3-R-59 Altered gastrocnemius activation in individuals with Achilles tendinopathy revealed using high density electromyography in dynamic functional tasks

Smita Rao¹, Vaibhavi Rathod¹, Seyed Yahya Shirazi¹, Rory O'Keeffe¹, S. Farokh Atashzar¹

¹NYU

P3-R-60 Low back pain in student circus artists: An exploratory study and comparison between the Oswestry Disability Index and the Athlete Disability Questionnaire

Bianca Rossini¹, Meagan Anstruther¹, Maryse Fortin¹

¹Concordia University

P3-R-61 Cutaneous stimulation of the foot sole does not alter rate of torque development during maximal effort, plantarflexion contractions

Tushar Sharma¹, Giacomo Passarelli¹, Davis Forman¹, Avery Hinks¹, Vincenzo Contento¹, Geoffrey Power¹, Leah Bent¹

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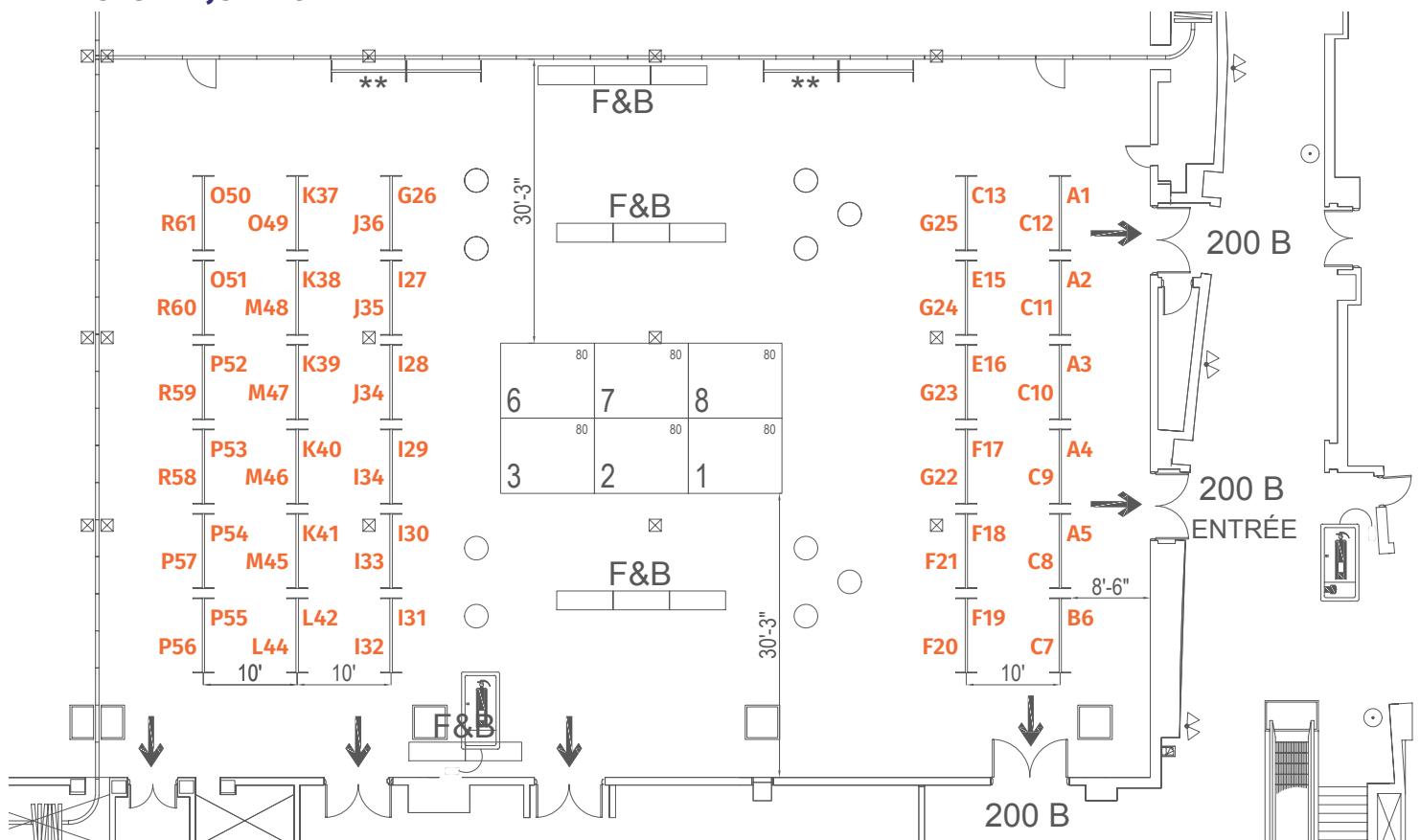


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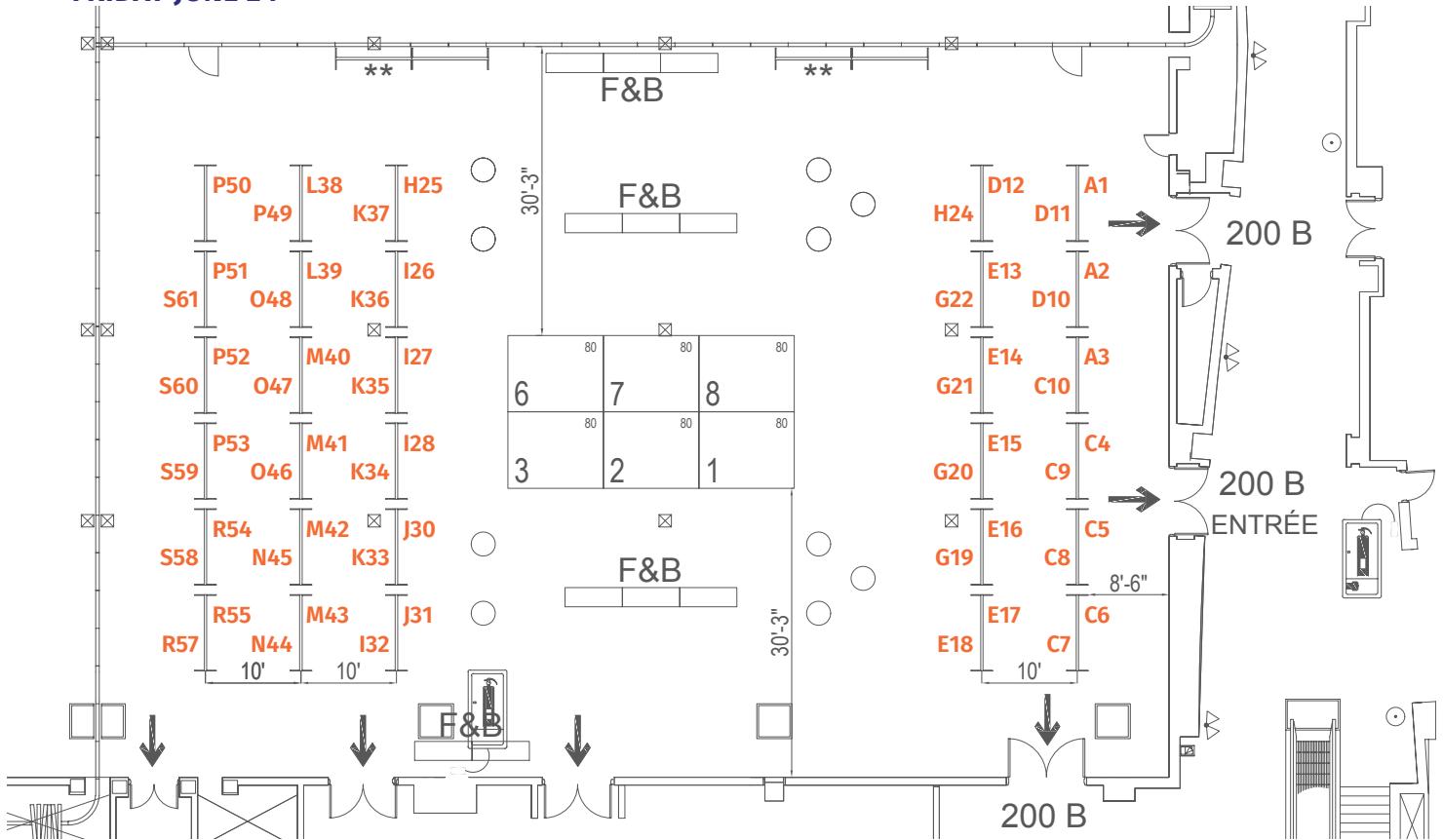
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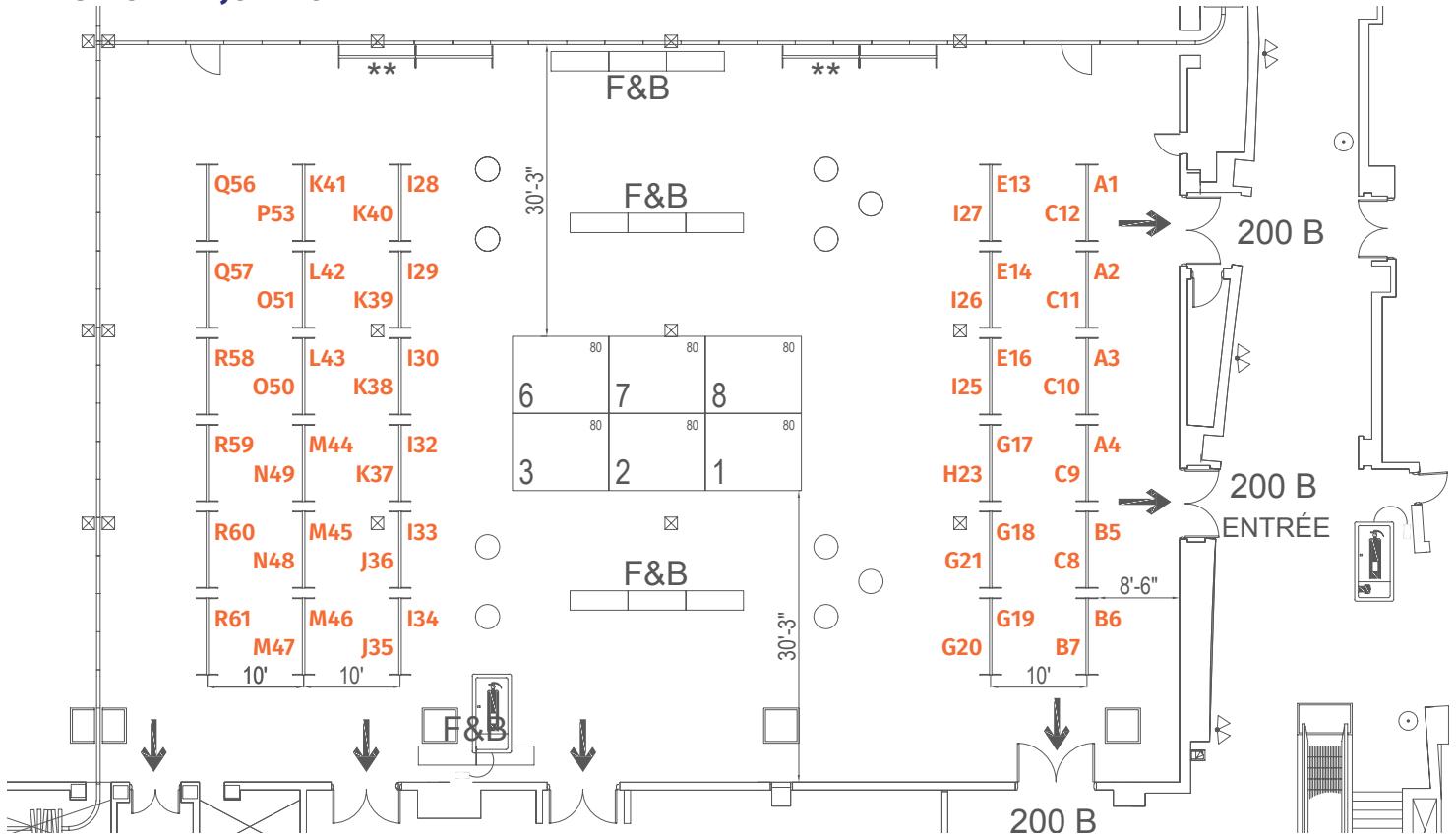
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POSTER SESSION 3

SATURDAY JUNE 25



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