Workshops

INRS Workshops

Robotics in the rehabilitation of upper limb function in SCI	**Monday 09:30 - 12:00**
Armin Curt, MD, Spinal Cord Injury Center, Balgrist University Hospital, University of Zurich, Switzerland Inge-Marie Velstra, MSc, Swiss Paraplegics Centre, Nottwil, Switzerland Milos Popovic, PhD, Rehabilitation Engineering Laboratory, Toronto, Canada Annick Timmermans, PhD;,Maastricht University, Netherland Michael L. Boninger, MD, University of Pittsburgh school of Medicine, Pittsburgh, USA José Zariffa, MSc, ICORD, University of British Columbia, Canada Doris Maier, MD; Trauma Center Murnau, Germany Deborah Backus, PhD, Spinal Cord Injury Research, Sheperd, Atlanta, USA John Steeves, PhD, ICORD, University of British Columbia, Canada	HPH, G1
Organizer: A. Curt, MD, Spinal Cord Injury Center, Balgrist University Hospital, University of Zurich, Switzerland	

Objective
The field of rehabilitation robotics has seen increasing interest over the last decades. Robotic devices are a promising solution to complement conventional therapy, and provide a unique platform for more objective and sensitive assessment. This workshop focuses on robotics in upper limb rehabilitation.

Workshop Program

- 09:30 - 09:40
  Welcome (Armin Curt)
- 09:40 - 09:55
  The advanced assessment of upper limb function (Inge-Marie Velstra)
- 09:55 - 10:15
  Advanced approaches in upper limb rehab (Milos Popovic)
- 10:15 - 10:30
  Task-oriented training of the upper extremity in SCI: Concepts and methods for rehabilitation technologies (Annick Timmermans, Annemie Spooren)
- 10:30 - 10:50
  How to identify targets and tools in upper limb SCI rehab (Michael L. Boninger)
- 10:50 - 11:05
  First insights into the Armeo application in tetraplegia (José Zariffa)
- 11:05 - 11:25
  Clinical standards: European perspective (Doris Maier)
- 11:25 - 11:45
  Clinical standards: North America perspective (Deborah Backus)
- 11:45 - 12:00
  Wrap up and lessons learned (John Steeves)

Very early rehabilitation	Monday 09:30 - 11:30
Andreas Luft, UniversitätsSpital Zurich, Zurich, Switzerland Joachim Liepert, Kliniken Schmieder Allensbach , Germany Lyudmila Chernikova, RAMS, Russia Margret Hund, Wald, Switzerland Dr. Friedemann Müller, Bad Aibling, Germany Dr. Karin Diserens, CHUV, Switzerland	HPH, G2
Organizer: Andreas Luft, Universitätsspital Zurich, Zurich, Switzerland	

Objective
The aim of this workshop is to provide an overview on standards and guidelines for very early mobilization in different pathologies like Stroke, TBI and SCI and to discuss recent and future developments within the field. Furthermore to provide an insight on how new technologies are currently integrated and applied into the clinical setting and their future potential.

- 09:30 - 09:50
  Background: Very early rehab, how early is early, main problems and future prospective (Andreas Luft)
- 09:50 - 10:10
  Early rehabilitation: What is proven, what is new (Joachim Liepert)
- 10:10 - 10:30
  Efficacy of very early mobilization in stroke, potential of new technologies (Lyudmilla Chernikova)
- 10:30 - 10:50
  An example of early rehab in post intensive care (Margret Hund)
- 10:50 - 11:10
  The German classification system for early rehab and its clinical implications (Friedemann Müller)
- 11:10 - 11:30
  Ischemic stroke management in the intensive care setting (Karin Diserens)

Implementation of robotics in clinical settings – best practice examples	Monday 09:30 - 10:30
Dr CHAN Kay Fei, Tan Tock Seng, Singapore Dr. Kerstin Baldauf, Helios Klinik, Switzerland Leslie VanHiel, BME, MSPT, Shepherd Center, USA	HPV, G4
Organizer: Hocoma, Switzerland	

Objective
In this workshop speakers from leading rehabiliation centers from over the world will present their experience with the implementation of robotics into their clinical settings.

The speakers will introduce their centers and robotic devices with their target patients treated with robotics. Furthermore they will present the new working environment of their therapists, talk about their experience with reimbursement, and report from problems they were confronted with when they started with robotics and how they solved them.
There will be three talks a 15 minutes.

During the last 15 minutes of this workshop, all speakers are available for answering your questions.

Non invasive spinal assessment	Monday 09:30 - 10:30
Cesare Mannhart (MSc ETH HMS)	HPV, G4
Organizer: idiag, Switzerland	

Objective
This workshop will provide an overwiew on different non invasive spinal assessment methods with an emphasis on the SpinalMouse®.

The SpinalMouse® is an assessment device to determine shape and mobility of the spinal column (Th1 - S3) in the sagittal and frontal planes in a non invasive way. The device is rolled over the skin down the back as the mobile sensors independently follow the shapes and angles of the vertebrae. Based upon a scientifically valid and reliable computing method, the following clinically relevant parameters are computed:

- Mobility and posture of individual motion segments, anatomical regions and the overall spine in the sagittal and frontal planes
- Postural competence and sufficiency
- Sacral-hip joint positioning
- Length of the back

Understanding the position and mobility of vertebral segments helps to identify back specific findings, to define an individually tailored therapy and eventually to evaluate and report on the therapeutic progess. The participants will have the opportunity to use the SpinalMouse®.

Early mobilization: current standards enhanced using Erigo® advanced robotic movement therapy	Monday 11:30 - 12:30
Harald Kinzner Arash Dodge, PhD	HPH, G1
Organizer: Hocoma, Switzerland	

Objective
In recent years early mobilization of patients in acute care has proven to be an effective therapy for stroke and intensive care patients. For example helping stroke patients moving and loading their legs when in the upright position as early as 24h after onset has proven to be a safe procedure where patients can faster regain the ability to walk in a significant way. However this type of treatment requires 2-3 physiotherapists and is difficult to sustain for longer periods of training. The purpose of Erigo® therapy is to use an advanced robotic device to support this type of treatment by combining verticalization, mobilization of the hip, knee and ankle joints in a physiological manner, and cyclic loading of the legs in order to support therapists when performing early mobilization of moderate to severely affected patients as early as possible. The Erigo has proven to be an effective therapy for bringing patients faster in the upright position by keeping patients' cardiovascular system stable during verticalization.

In this workshop we will
- Give a brief overview of early mobilization standards in the scientific and clinical community today
- Demonstrate the Erigo product with an overview of its features and benefits
- Present Erigo therapy implementation in different acute care clinical settings such as a neurointensive ward for spinal chord injured patients, and in a stroke unit
- Discuss scientific results using Erigo in acute and post acute care for neurological patients

This workshop is targeted to physiotherapists and physicians working in acute care settings such as stroke units, intensive care units, or rehabilitation facilities where early rehabilitation is a mindset. We will help you take your early rehabilitation therapy concepts to the next level!

Enhanced functional locomotion therapy with the Lokomat®	**Monday 11:00 - 12:00**
Annick Schmartz, MSc Julia Buehlmeier, PhD	HPH, G3
Organizer: Hocoma, Switzerland	

Objective
Locomotion therapy supported by an automated gait orthosis on a treadmill has shown to be an effective intervention for improving over-ground walking function caused by neurological diseases and injuries in many cases. The Lokomat® system assists walking movements of gait-impaired patients and is used to improve mobility in individuals following stroke, spinal cord injury, cerebral palsy and multiple sclerosis as well as other neurological diseases and injuries. The LokomatPro has been on the market since 2001 and has been a crucial improvement in the art and science of locomotion therapy.

In this workshop, we will
- perform a product demonstration
- explain the advantages of Lokomat therapy compared to conventional gait training, such as longer and more intensive training, real time feedback for a higher motivation and compliance, physiological gait pattern provided by individually adjustable orthoses, assessment and reporting functionality
- present the field of application of the Lokomat
- give insight into current scientific evidence

Clinical application specialists will be present to discuss and answer your questions.
This workshop targets therapists as well as medical doctors interested in bringing gait therapy to the next level using novel technologies, and it will provide an overview over the clinical benefits and the field of application of the Lokomat.

No experience with the device necessary.

Virtual reality-based rehabilitation with YouGrabber and YouKicker	**Monday 11:00 - 12:00**
PD Dr. Daniel Kiper, Co-Founder, YouRehab AG Oliver Ullmann, Co-Founder & CEO, YouRehab AG	HPV, G4
Organizer: YouRehab, Switzerland	

Objective
YouGrabber is a new virtual reality-based tool for upper limb rehabilitation. It is unique in its ability to measure bimanual reaching and grasping in 18 degrees of freedom, combined with class-leading gaming software. Using YouGrabber, therapists can implement several therapy forms with one system, e.g. functional training, constraint-induced therapy, virtual mirror therapy. This workshop will demonstrate the clinical use of YouGrabber and its companion YouKicker for lower-limb rehabilitation.

Robot-supported locomotor training in pediatric neurorehabilitation: application, assessment and achievements	**Monday 13:00 - 15:15**
Huub van Hedel, PhD, PT Karin Brütsch, PhD, Corinne Ammann, MPTSc Tabea Schuler MSc	HPH, G1
Organizer: Huub van Hedel, Childrens Hospital, University of Zurich, Affoltern, Switzerland	

Objective
The goal of this workshop is to provide an insight into our approach at the Rehabilitation Center Affoltern am Albis to train children with neurological disorders with the pediatric driven gait orthosis Lokomat. In addition, we present the tests we use to evaluate changes in walking ability and we will present an up-to-date overview about the scientific achievements in this field.

The target audience we aim for are therapists who are working in a pediatric setting and (are interested in working) with the pediatric Lokomat

Your hosts for this workshop are Corinne Amman, physiotherapist, Karin Brütsch, psychologist, Tabea Schuler, movement scientist and Huub van Hedel, physiotherapist and movement scientist.

This workshop will consist of several presentations, as well as some practical exercises.

The programm looks as follows:
- Introduction to our center and expectations of the workshop participants
- Robotic Body Weight Supported Treadmill Training (BWSTT) in children from a practical point of view: Target population, inclusion/exclusion criteria, adjusting training parameters
- Biofeedback and virtual reality for robotic BWSTT in children
- Clinical results of robotic BWSTT in children
- Standardized Assessments: Timed walking tests and feasibility of the electronic walkway system “GaitRite”
- 3D Gait Analysis to monitor improvement in quality of walking – A clinical example

Introducing the Armeo®Power: Guiding severely affected patients towards clinical success	**Monday 13:00 - 14:00**
Nicole Schüpfer, MSc Alexander Duschau-Wicke, PhD	HPH, G2
Organizer: Hocoma, Switzerland	

Objective
In this workshop, we will present the Armeo®Power to an international public for the first time. The ArmeoPower completes Hocoma’s established Armeo Therapy Concept and was specifically designed for patients with severe movement impairment who have no voluntary activation of their arm muscles yet. In addition to the Arm Weight Support, those severely affected patients specifically require assist-as-needed support for goal-directed movements. The motors of the ArmeoPower arm exoskeleton fulfill these needs by supporting and guiding patients as needed during the training of functional movements in a large 3D workspace.

Get to know the ArmeoPower in a hands-on seminar, and learn about experiences and best practices with the ArmeoPower research prototype (ARMin III, ETH Zurich) during a stroke multicenter trial in 4 Swiss rehabilitation hospitals

No experience with the device necessary.

Lokomat® advanced: Provoking best therapy efficiency in every therapy period	**Monday 13:00 - 14:00**
Candy Tefertiller, Director of Physical Therapy Julia Buehlmeier, PhD	HPH, G3
Organizer: Hocoma, Switzerland	

Objective
This workshop targets therapists as well as medical doctors who are already familiar with the basics of the Lokomat.
In this workshop, we will provide best practice examples with the Lokomat.

Furthermore we will focus on the following:
- how to challenge the patients with their specific needs during the course of the disease
- how to adapt and modulate training parameters in order to provoke best possible outcomes

Experience with device essential.

Pablo®Plus - upper limb rehabilitation	**Monday 13:00 - 14:00**
Msc. Maik Hartwig, OT	HPV, G4
Organizer: Tyromotion, Austria	

Objective
Introducing the evidence-based therapy system Pablo®Plus for patients with sub-acute and chronic arm-paresis with plegic, paretic and spastic handicaps.

The practice oriented workshop shows a great variety of training methods with both the Pablo®Multiball and Pablo®Multiboard, which not only allow to train upper limb movements, strength and tonus-control but also record each and every assessment for documentation and evaluation.

Enhancing arm and hand rehabilitation with Armeo®Spring	**Monday 14:15 - 15:15**
Tom Vanderhenst, MSc Peter Schenk, PhD	HPH, G2
Organizer: Hocoma, Switzerland	

Objective
Since its introduction in 2007, the Armeo®Spring has gained a lot of attention and has been introduced successfully into leading centres worldwide. Through the combination of the passive Arm Weight Support and Augmented Feedback, it facilitates intensive, repetitive, self-initiated movement exercies even for patients with severe motor impairments. The Augmented Feedback provides game-like exercies and functional tasks, but also Assessment Tools.
In this workshop, we will
- introduce the rationale for the ArmeoSpring therapy,
- present the Armeo Therapy Concept,
- present current scientific evidence,
- perform a live demonstration.

Clinical application specialists will be present to discuss and answer your questions.

This workshop targets therapists as well as medical doctors interested in bringing upper extremity therapy to the next level using novel technologies, and it will provide an overview over the clinical benefits and the field of application of the ArmeoSpring.

No experience with the device necessary.

Valedo™ Therapy Concept - Low back pain treatment with motivating functional movement therapy	Monday 14:15 - 15:15
Jan Kool, PhD Eelco Sengers, PT	HPH, G3
Organizer: Hocoma, Switzerland	

Objective
Chronic low back pain is a major and occupational public health problem, which is associated with high medical costs mainly through the loss of productivity due to sick leave. Research suggests that many back injuries and incidences of low back pain can be improved by active functional movement therapy. Nevertheless, the main problems in low back pain therapy are insufficient patient motivation as well as the patient's difficulty to exercise independently.

The ValedoMotion is a medical back training device for professional hospital and clinical use. It consists of three lightweight orientation and motion sensors and a tablet PC providing the Augmented Feedback software as well as audio and visual feedback. Therapeutic exercises mainly focuses on three areas: Stabilization, Mobilization and Movement awareness.
With the ValedoMotion we offer clinical relevant exercises to patients, engaging them in a self guided therapy program and improve the therapy and assessment for compliances.

Within the workshop we will give you an overview of the features and benefits of the Valedo Therapy Concept. The difference the ValedoMotion makes in daily practice with patients will be addressed by Eelco Sengers of the Sophia Rehabilitation Centre, The Hague, Netherlands

There will be the opportunity to experience the ValedoMotion yourself.

Amadeo® - Advanced fingerrehabilitation	Monday 14:15 - 15:15
Goncalo Goncalves, PT	HPV, G4
Organizer: Tyromotion, Austria	

Objective
There are just as many different hands as there are people. The Amadeo® creates a system for all phases of neurologic rehabilitation.

Target oriented exercises on the device help to improve motor functions of patients with restricted movement in individual fingers or in the whole hand.

The varied training and the clear feedback evaluations are very motivating for the patient. The therapy progress is made measurable and can be explained easily when discussing the effect of the therapy.