

Scientific/Educational Workshop

Workshop title

Advances in Neurorobotics and Neuroprosthetics in Rehabilitation from Technology to Physiology

Workshop organizer

Ines Bersch (Swiss Paraplegic Centre Nottwil)

Speakers

1. Prof Roger Gassert
2. Prof Winfried Mayr
3. Prof Glen Davis
4. Dr Tamsyn Street
5. Dr Paul Taylor
6. Ms Ines Bersch

Workshop goals

Within the workshop the following objectives will be covered:

1. An overview about existing robotics will highlight the breadth of the field.
2. The engineers' point of view will detail how needs are identified and realized.
3. The combination of clinical application and research will reveal how the gap between development and application can be closed.
4. A specific example will demonstrate how a foot drop neuromuscular stimulator can be re-deployed for multifunctional clinical applications.
5. Non-implantable versus implantable stimulation devices will be critically appraised, particularly with reference to future clinical directions.
6. A proposal for a decision pathway will reveal how clinicians and therapists can combine the high number of robotic approaches with or without neuromuscular stimulation in patient treatment, without losing sight of strategic goals during the rehabilitation process.

Abstract

This workshop will focus on the on the topic of assistive technologies in rehabilitation, particularly neurorobotics, neuroprosthetics and functional electrical stimulation approaches to improve patient outcomes. For clinicians and therapists, the broad diversity of new devices entering the marketplace can often lead to uncertainty or insecurities around choosing a particular system or a combination of technologies for their patients' rehabilitation. Recent developments by engineers offers novel machine-human synergistic technologies with promising potential. Yet, researchers need to carefully investigate the efficacy of these in translation to application within clinical trials. In this workshop, professionals in various fields will present their ideas, perspectives and expectations for current and future technologies and how these will work synergistically with users. The workshop will also highlight some of the challenges to combine different professional perspectives to achieve the best outcome for clients to improve their quality of life. Presentations will take a client-centered focus of the interprofessional group comprising engineers, researchers, clinicians and therapists.

This workshop consists of two parts - part I will focus the technological and physiological perspectives, whereas part II will emphasize on the translation-to-best practice for therapists, clinicians and clients.

In the panel discussion following board point statements will be addressed and discussed with the audience:



- Less technical equipment is more, neurorobotics and neuroprosthetics are mostly not used by therapists and clinicians.
- Every profession has historically focused on the its own goals, interprofessional team is a “slogan”.
- Clinicians and therapists are often poorly supported by developers and commercial distributors.
- The future in neurorehabilitation will consist of robotics. Classical ‘hands on’ approaches will be less required.