

Scientific/Educational Workshop

Workshop title

Learn how to use functional electrical stimulation (FES) garments to generate relevant movements

Workshop organizer

Bastien Moineau (Toronto Rehabilitation Institute - University Health Network)

Speakers

Bastien Moineau

Milad Alizadeh-Meghbrazi

Workshop goals

At the end of this workshop, attendants will be able to setup a stimulation garment (FES-shirt) containing electrodes, position them according to a clinical objective, and select the intensity of stimulation necessary. They will have to use anatomical and biomechanical principles. The final brainstorming will require critical thinking in order to appraise the scientific, medical, industrial, and societal aspects relevant to the introduction of a new rehabilitation technology.

Abstract

Functional electrical stimulation (FES) is used to restore function in individuals with paralysis due to spinal cord injury (SCI) or stroke (ST). Patients are often incapable of independently applying FES with adhesive gel electrodes. A novel FES-garment with embedded stimulating electrodes was developed by Myant Inc. and the Rehabilitation Engineering Laboratory of the Toronto Rehabilitation Institute to address this problem. During the workshop, after an introduction and explanation about the principles behind the technology, attendees will form groups. Each group will be given a briefcase containing: one stimulator, one FES-shirt, an anatomical chart of muscles, and one clinical scenario. For each group, an able-bodied volunteer will act as the client in need of stimulation (e.g., someone with a C6 incomplete spinal cord injury who cannot close their hand, or someone who has had an ischemic stroke in the middle cerebral artery and cannot open their fingers). Each volunteer will be given a sleeve-less undergarment to cover their trunk before putting on their FES-shirt. The group will have to use the information and equipment provided to decide how to use the FES-shirt to help the "client" fulfil their functional goal(s) (e.g. grasping a bottle, reaching further away). The speakers will visit each group to answer questions and to verify proper set-up before stimulation delivery. After this hands-on experience, all participants will come together to discuss and share their opinions about the strengths, weaknesses, potentials, and opportunities of improvements to these garments. The workshop will be organized as follow: 20 min introduction – 5 min volunteers selection and groups creation – 40 min hands-on experience in sub-groups – 25 min brainstorming on the technology.