

## **PRE-CONFERENCE COURSE: SPINAL CORD STIMULATION**

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**The goal** is to present a non-invasive method of transcutaneous spinal cord stimulation based on surface electrodes placed over the lower back and abdomen. The workshop will include the demonstration of the methodology in volunteers with intact nervous system.

Two potential applications of will be discussed:

- Elicitation of “H reflexes” in multiple lower limb muscles bilaterally and simultaneously
- Neuromodulation applications in spinal cord injured people (control of spasticity, augmentation of neural control of locomotion)

### **Details:**

#### **Background Information**

- Studies with epidural spinal cord stimulation
  - Motor effects from single muscle twitches to locomotor-like automatic activities in paralyzed lower limbs
- Theory of spinal cord stimulation
  - Immediate electrical phenomena of stimulation: Computer simulations
- Anatomical information relevant for spinal cord stimulation
  - Neuroanatomy of the terminal spinal cord and lumbar spinal roots

#### **Transcutaneous spinal cord stimulation**

- General aspects, information on activated neuronal structures
- Presentation of the application of this method in neurophysiological studies (H reflex studies extended to multiple lower limb muscles) and outlook on its utilization as neuromodulation tool (facilitation of treadmill stepping in spinal cord injured people)
- Practical demonstration of elicitation of muscle twitches (so-called posterior root-muscle reflexes) in multiple lower limb muscles in a person with intact nervous system, comparison with the classical H reflex

Participants will be encouraged to apply and practice transcutaneous spinal cord stimulation by as well as on themselves.

#### **General discussion**