



**Health Sciences Centre**  
Winnipeg

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## **Functional Electrical Stimulation (FES): Neurorehabilitation of the Upper Limb and Trunk**

Presented by the Occupational Therapy Department - Health Sciences Centre Winnipeg

Dr. Kristin Musselman

*Sunday, June 3, 2018*

*Winnipeg, Manitoba*



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The Occupational Therapy Department at Health Sciences Centre Winnipeg is pleased to partner with Dr. Kristin Musselman in offering this exciting 1-day course in neuromuscular electrical stimulation.

Dr. Kristin Musselman is a Physical Therapist and Scientist with the Neural Engineering and Therapeutics Team at the Toronto Rehabilitation Institute – Lyndhurst Centre, and an Assistant Professor in the Dept. of Physical Therapy, University of Toronto. She completed a BSc (Life Sciences) and BSc PT at Queen's University, followed by a MSc (Neurosciences) and PhD (Rehabilitation Science) at the University of Alberta. Kristin was a CIHR Post-Doctoral Fellow at the Johns Hopkins School of Medicine and Kennedy Krieger Institute from 2010-2013. Kristin's research focus is on optimizing everyday functional movements, such as walking and reaching, in adults with spinal cord injury and young children with cerebral palsy. This includes using functional electrical stimulation (FES) to improve upper limb function and balance in standing.

### **Introduction to Functional Electrical Stimulation**

There is a rapidly expanding body of evidence in support of electrical stimulation for rehabilitation of the neurologically impaired upper limb and trunk. FES involves the use of neuromuscular electric stimulation to enhance motor control and maximize the performance of functional activities. Through repetitive, task-oriented muscle activity, FES is able to effect neuro-plastic changes and improve motor learning in various upper motor neuron lesions (e.g., spinal cord injury, MS, TBI, Stroke, etc.). Applications may include strengthening of weak upper limbs and trunk, movement re-education, spasticity and pain management, and the management of subluxed shoulders.

## **Course Objectives**

Completion of this course will allow you to:

- Identify neurological clients who may benefit from and be appropriate for FES
- Understand the different stimulation parameters and how each effect the neurophysiological response
- Effectively manipulate stimulation parameters
- Apply one and two-channel FES appropriately
- Apply FES with confidence as part of a comprehensive upper extremity treatment program

## **Location**

Health Sciences Centre Winnipeg – 800 Sherbrook St. Occupational Therapy Department, RR180.

## **Program & Distributed Learning Approach**

8:30 – 9:00 Registration

9:00 – 12:00 Course content

### **Lunch**

1:00 – 4: 00 Course content

- *Lunch and afternoon beverages will be provided on-site*
- *Participants are encouraged to bring in electrical stimulation units used at their facility if available. If you do not have an FES machine, one will also be supplied for participant use during interactive components of the course*

This course will also offer a distributed learning approach, in which participants are provided with a self-directed activity to complete over 2 weeks following the 1-day course. Dr. Musselman will then be available via webinar to complete a short FES review with those who wish to participate following an application of FES in practice.

## **Registration Deadline**

Registration and payment must be received by **May 1, 2018**. Please do not make any travel arrangements until the course is confirmed with sufficient registrants.

Cheques should be made payable to: **HSC OT Department**

***Enrollment is limited to 30 participants***

## **Registration Fee and Cancellation Policy**

\$ 250.00

Registration fee includes course manual, lunch and afternoon beverages

Cheques may be post-dated to May 1, 2018; NSF cheques are subject to a \$25.00 administration fee. Credit cards are not accepted.

Withdrawals for registered participants must be made in writing, prior to May 21, 2018 and are subject to an administration fee of \$30.00. No refunds will be provided after May 21, 2018 but an alternate may be sent in your place. In the event of course cancellation, a full refund will be issued.

## **Additional Course Information/Questions**

Contact Elisha at [ewatanabe@hsc.mb.ca](mailto:ewatanabe@hsc.mb.ca) or (204) 787-8530 to leave a message

800 Sherbrook Street (RR180), Winnipeg, Manitoba R3A 1M4 / **Phone 204-787-8530** / Fax 204-787-1101

# Registration Form

## Functional Electrical Stimulation (FES): Neurorehabilitation of the Upper Limb and Trunk

Sunday, June 3, 2018

Name: \_\_\_\_\_

Discipline: \_\_\_\_\_

Organization: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Tel. Work: \_\_\_\_\_

Tel. Home: \_\_\_\_\_

Email: \_\_\_\_\_

Accommodation Information Required:  Yes  No

Dietary Restrictions: \_\_\_\_\_

Is a personal or facility use FES/e-stim unit available?  Yes  No

Please forward completed registration, including payment to:

**Health Sciences Centre OT Department**  
**c/o Lauren Hamrlik**  
**RR180 - 820 Sherbrook St.**  
**Winnipeg, MB**  
**R3A 1R9**

Cheques should be made payable to: **HSC OT Department**

*Note: Participants are encouraged to bring an electric stimulation unit currently used in their practice or at their facility, if available. Units will also be supplied for those who do not have access to one*

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Winnipeg Regional  
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UNIVERSITY  
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# Functional Electrical Stimulation (FES): Neurorehabilitation of the Upper Limb and Trunk

June 3, 2018

Agenda (subject to minor change)

Lecture material will be interspersed with small group activities

## MORNING

1. The basics of electrical stimulation 1.5 hours
  - Electrical currents
  - Neurophysiological response
  - Precautions and contraindications
  - Stimulation parameters
  - Electrode placement and application

## BREAK

2. Experiential Learning # 1 1.0 hours
  - Setting and manipulating parameters

Small group lab activity to reinforce content covered in section #1

3. Introduction to FES 0.5 hours
  - Who is appropriate?
  - Goals: orthotic versus therapeutic
  - FES decision-making framework
  - Strengthening, endurance, hypertonicity

Lecture format interspersed with small group activities

4. Experiential Learning # 2 0.5 hours
  - One 1-channel upper extremity case study
  - Application of FES decision-making framework

Small group lab activity to reinforce content covered in section 3

## LUNCH

5. Upper Extremity Applications and Evidence 0.75 hours
  - Electrode placement
  - FES systems
  - Hemiplegic shoulder, reaching and hand movements
  - Overview of research evidence

Lecture format interspersed with small group activities

6. Experiential Learning # 3 0.75 hours

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- 1- and 2-channel applications in the upper extremity
- 1-2 case studies

Small group lab activities to reinforce content covered in section #5

7. Trunk Applications and Evidence 0.75 hours
- Electrode placement
  - FES systems
  - Overview of research evidence

Lecture format interspersed with small group activities

8. Experiential Learning # 4 0.75 hours
- 1- and 2-channel applications in the trunk
  - 1-2 case studies

Small group lab activities to reinforce content covered in section 7

#### DISTRIBUTED LEARNING (POST 1-DAY COURSE)

Participants will be given a self-directed activity to complete over 2 weeks. This will involve choosing an appropriate client for FES, planning the FES intervention using the decision-making framework and then implementing. If the therapist does not currently carry a caseload, he/she will be encouraged to create a case and then practice on a colleague/family member or him/herself instead. Dr. Musselman will create a web-based meeting space for a 1-hour session each week (2 sessions in total) where course participants can connect to ask questions, discuss learning or work through challenges encountered. FES content covered during the course and self-directed activities will be discussed.

