

June 14, 2019

## EM129: Motor Skill Learning and Neuroplastic Change in the Neurological Patient



LARA BOYD

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Prof. Lara Boyd, PT, PhD

### **Description and objectives of the course.**

Neuroplasticity is the ability of the CNS to change, from a structural and functional point of view, in response to experience. This potentiality is present for the whole life but becomes maximal in some specific periods as developmental age or after brain injury. Driving and supporting neuroplasticity is today the main goal of neurorehabilitation: hence the importance of knowing the most effective strategies to better guide this process, in the light of recent scientific discoveries. Dr. Lara Boyd has a long clinical and research experience in this field and is now considered one of the leading international experts in this area, especially in suggesting the most appropriate pathways in guiding functional recovery after stroke. At the end of the course the participant will acquire knowledge in relation to the new approaches of high-dose stimulation in rehabilitation practice, behavioral principles that support neural reorganization, positive and mal-adaptive plasticity, the importance of sleep in supporting the processes of recovery, the role of sensory feedback and all the other aspects that support the neural reorganization process such as intensive and specific task practice and aerobic exercise.



60 Seats



€300.00



16 Hours



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#### INTENDED FOR

Doctors, Physiotherapists and Occupational Therapists, Neuropsychologists, Students III year C.d.L. Physiotherapy and Occupational Therapy

#### PAYMENTS

Balance €300.00 + VAT 22% (€366.00) within 7 days from the registration  
**Total: €300.00 + VAT 22% (€366.00)**

#### CALENDAR

14-15 June 2019

#### LANGUAGE

English with simultaneous italian translation

Registration fee reserved for Students III Year C.d.L. Physiotherapy and Occupational Therapy:

100.00 € (VAT included)

Maximum 7 seats

## SCHEDULE

### Friday June 14th, 2019

9.00 - 12.00:

Introduction

To frame the discussion, we will begin with a conversation about compensation vs. recovery. Please consider the following paper.

• Mindy F. Levin, Jeffrey A. Kleim and Steven L. Wolf. What Do Motor "Recovery" and "Compensation" Mean in Patients Following Stroke? *Neurorehabil Neural Repair* 2009; 23; 313.

1) Motor skill acquisition: how do dose and cognition impact functional recovery?

**Objective:**

To discuss and define parameters of practice that best stimulate neuroplastic change and motor learning. Data suggesting the importance of cognition for motor learning will also be presented. At the conclusion of this section the participant will know what dose of practice is delivered in conventional neurological rehabilitation and be able to contrast this to the amount of practice that stimulates neuroplastic change in animal and experimental models. Novel approaches to the delivery of high dose practice in rehabilitation will be presented.

*Lunch 12:00 – 13:00*

*13.00 - 15.00*

## 2) Neuroplasticity principles

### **Objective:**

To review the behavioral principles that underpin neuroplastic change associated with learning and recovery of function after neurological injury. Emphasis will be placed on behavioral constructs that stimulate neuroplastic change. By the conclusion of the section the participant will know the main behavioral organizing principles that support neural reorganization.

*15.00 - 17.00*

## 3) What is the physiology underpinning neuroplastic change?

### **Objective:**

To discuss the neurobiological principles that underpin neuroplastic change associated with learning and recovery of function after neurological injury. Emphasis will be on the neurobiology of neural reorganization. By the end of the session the participant will be familiar with both the positive and negative changes by which the brain reorganizes to support recovery.

*Wrap-up 17:00 – 17:30*

## **Saturday June 15th, 2019**

*9.00 – 10.30*

## 4) What is the role of sleep in recovery of function?

### **Objective:**

To review current knowledge regarding the role of sleep in neuroplastic change and motor learning after stroke. Normal sleep and changes in the sleep cycle associated with both aging and brain damage will be discussed. The discussion will include methods by which sleep may be enhanced or altered including the impacts of exercise, sleep deprivation and medications on the sleep cycle. At the conclusion of the session the participant will have a working knowledge of the organization and importance of sleep on neuroplastic change.

10.30 - 12.00

5) How does sensation contribute to learning?

**Objective:**

To review the role of sensation in motor learning. Data demonstrating the unique roles of peripheral vs. central proprioception and cutaneous sensation will be presented. Current research that is seeking to facilitate sensation both via peripheral and central interventions will be discussed. By the conclusion of the session the participant will be familiar with the relationship between sensory feedback and motor learning as it pertains to the recovery of motor function.

*Lunch 12.00 – 13.00*

13.00 – 16.30

6) How can neuroplastic change be manipulated positively?

**Objective:**

To outline the methods (other than dose) that are known to promote positive neuroplastic change. These include: massed practice, task specific use, brain priming, and aerobic exercise.

16.30 – 17.00

Wrap –up and final thoughts