**Masterclass ‘Hand and brain’**

**An evidence-based rehabilitation approach to peripheral nerve injuries**

This masterclass presents an evidence-based management of peripheral nerve injuries (PNI) based on neuroscientific research on the interaction between the hand and the brain from day one after an injury. Knowledge about the effect of a peripheral nerve injury on the CNS opens new perspectives to treatment by guided plasticity where rapid as well as slow plasticity mechanisms can be used therapeutically to support and improve function.

* The brain has a tremendous capacity to undergo plastic reorganization and adapt, i.e. plasticity, due to environmental changes or injury. The plastic capacity decreases with age but is never lost.
* Following a peripheral nerve injury there is a within minutes-hours reorganization.
* Due to misdirection of regenerating axons the signalling from the hand to the brain is changed, resulting in a second line of reorganization in the brain.
* With the early and later reorganization in mind, the rehabilitation should also be divided in an initial period, *phase 1*, where no afferent signals are sent from the injured nerve to the brain. *Phase 2* starts when axons have reinnervated their mechanoreceptors and muscles.
* The goal of relearning is to improve sensory and motor function by using the dynamic capacity of the brain, and it is thus our belief that the relearning should start immediately after nerve repair – in *phase 1.*

**Objectives**

After attending this masterclass, the therapist will have a deeper understanding of:

* The neuroscientific base for new strategies for re-learning/re-education based on the rapid plasticity of the brain, and how to apply them in clinical practice;
* The importance of sensory and motor re-learning/re-education and use of guided plasticity in early and late postoperative phase following a PNI (phase 1 before any reinnervation has occurred, phase 2 when some reinnervation has occurred);
* Basic components in assessment of hand function after PNI and practical guidance through the use of the Model Instrument for outcome after Nerve Repair - ”Rosen score”.

**Program**

09.00 uur Coffee/tea and registration

09.30 uur Hand and Brain – recent research

11.00 uur Coffee en tea

11.15 uur Use of guided plasticity in sensory re-learning - theory and case discussions

12.30 uur Lunch

13.30 uur Outcome – theory and calculation of Rosen-score

15.00 uur Coffee en tea

15.15 uur Long term recovery following PNI

16.45 uur Questions and final discussion

17.00 uur End of the day

**Brigitta Rosén**, Associate Professor, OT is an experienced occupational therapist. She graduated 1977 and started working with hand therapy1981, and has a special interest in outcome after nerve injuries and in rehabilitation after nerve injuries – sensory re-learning using guided plasticity or extrinsic modulation of brain plasticity mechanisms, and sensory feedback in hand prostheses. She has 83 original scientific articles and 6 book chapters in the field. Her PhD thesis (2000) was entitled ”The Sensational Hand: clinical assessment after nerve repair”.

She is course leader and organizer of a commissioned education 15 ECTS at Lund University “Rehabilitation in Hand Surgery” since 2000. She is an experienced speaker nationally and internationally since 20 years back. Since 2009 she has a position at Lund University, with a combination of clinical work at Dpt of Hand Surgery Malmö, Lecturing at Dpt of Health Science Lund University and Research.

She has been invited speaker to the Philadelphia hand meeting twice and was awarded The Inaugural Cristina Alegri Award, IFSHT Congress, Buenos Aires 2016 for her contribution to the understanding of the hand and sensibility.