



## Service Priorities and Programmes Electronic Presentations

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**Submitting author:** Ms M Y LO

**Post title:** Senior Physiotherapist, United Christian Hospital, KEC

### **Pioneering the repetitive transcranial magnetic stimulation in promoting functional recovery after stroke**

*Ling WYJ1, Yau WM1, Yeung TH1, Ho LOL2, Wong SK3, Tsui MF3, Lo MYH3, Mak MKY4*

*1. Physiotherapy Department, Princess Margaret Hospital 2. Physiotherapy Department, Tuen Mun Hospital 3. Physiotherapy Department, United Christian Hospital 4. Department of Rehabilitation Sciences, Hong Kong Polytechnic University*

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#### **Introduction**

Stroke is a global health-care problem which is the main causes of acquired adult disability. Rehabilitation is a major component of patient care. In last few years, repetitive transcranial magnetic stimulation (rTMS) has emerged as add-on interventions to standard physiotherapy. The use of this noninvasive brain stimulation technique to stimulate adaptive plasticity is very appealing, and the results obtained are impressive. A physiotherapy working group leading by researchers and clinical experts has developed clinical guidelines of the use of rTMS in patients with neurological conditions to ensure the safe, standardized treatment as well as evidence-based practice of interventions.

#### **Objectives**

To study the effectiveness of using the new technology rTMS as adjunct physiotherapy interventions in promoting upper limb functional recovery post stroke

#### **Methodology**

Given the technological advances, issues of risk and safety of rTMS treatment addressing the undesired effects, limits of stimulation parameters, precautions of applications, expertise of the rTMS team were discussed and consensus was made in the working group. Three physiotherapy centers including Princess Margaret Hospital, Tuen Mun Hospital and United Christian Hospital adopted the clinical guidelines. rTMS was implemented in conjunction with conventional physiotherapy in patients with upper limb impairment post stroke. Patients were included with diagnosis of Stroke from Sept 2014 to Dec 2015. Those patients with contraindications to rTMS were excluded. Subjects provided informed consent prior to rTMS. All patients

received low frequency (1Hz) rTMS to non-lesion hemisphere for 1200 pulses, and followed by 30- to 45-minute upper limb functional training for a total of 5 to 10 sessions. The upper limb function was evaluated using Fugl-Meyer assessment at baseline (D0), day 5 (D5) and day 10 (D10). Patients were monitored during and after treatment for any harmful effect particularly seizures.

### **Result**

A total of 28 patients were recruited. When compared with baseline, a significant improvement were found in the Fugl-Meyer upper limb score in D5 (26.9±16.4 to 33.3±18.4,  $p<0.01$ ) and D10 (26.9±16.4 to 37.9±19.7,  $p<0.01$ ). No adverse effect including seizure was reported. Combined rTMS and physiotherapy intervention is likely to obtain positive results in the upper limb functional recovery after stroke. In addition, rTMS is safe and feasible in the clinical application and to promote adaptive plasticity. In future, randomized controlled trials are needed to validate the efficacy of this technology advances.