

非侵入性腦刺激(透顱磁刺激法) 上肢康復新里程



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Non-invasive Brain Stimulation: Transcranial Magnetic Stimulation (TMS) - Milestones in Upper Limb Rehabilitation

非侵入性腦刺激法是調節大腦運動皮層中不平衡活動的一種方法。由於能促進運動神經的康復，因此臨床上能應用於如中風及其他神經系統疾病。有文獻指出，透過非侵入性腦刺激和大量功能訓練可提升上肢的恢復能力。透顱磁刺激治療是一種無痛治療，其原理是將磁力發射綫圈放於頭頂上，綫圈下大腦皮質的腦細胞受磁場變化再產生電流，從而達到治療效果。

The non-invasive brain stimulation provides a novel alternative to modulate the imbalanced activity between motor cortex. It would be used as an adjunct therapy in physiotherapy modalities for enhancing recovery of motor functions in various neurological conditions and stroke. Evidences showed that better recovery of upper limb functions would be achieved through the incorporation of non-invasive brain stimulation and intensive functional training. TMS is a non-invasive and painless method of exciting neurons using strong, time varying magnetic fields generated by a stimulating coil and held close to the intended site of stimulation. Energy can pass through the skull and induction current occurs directly at cortex level.

治療步驟 Procedures

1

讓病人放鬆，將肌電圖表面電極貼在目標肌肉上

Put the surface EMG electrodes on the targeted muscle. Ask the patient to stay in a relaxed position.



4

根據不同情況調整強度、頻率及重複次數，治療時間一般為20-30分鐘，並須配合上肢功能訓練。

Start doing rTMS with intended intensity, frequency and repetitions for around 20 - 30 minutes. Incorporate with upper limb functional training.

2

將磁力發射綫圈靠近目標大腦皮層

Place the magnetic coil at the targeted motor cortex.



3

找出正確的運動皮層刺激點；使用最小強度的運動誘發電位來刺激目標皮層，同時觀察波形以及肌肉收縮情況

Find out the targeted motor cortex spot; use the minimal intensity at which Motor Evoked Potential (MEP) waveform and targeted muscle movement are observed.

