

發展應用於多醫學中心功能性電刺激踩車系統

# **Development of FES-cycling System with Network Capability for Multi-Center Clinical Studies**

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摘要

功能性電刺激踩車已證實對於脊髓損傷者具有增加肌力與其耐受性、改善心肺功能與下肢循環及痙攣等其他生理及心理上的優點。目前上有許多商品化之復健中心用之踩車系統。然而，其所需之費用也相對地較為昂貴無法為國內脊髓損傷患者廣泛利用。本研究的目的在使我們所研發之功能性電刺激踩車系統能推展至臨床使用，並且利用整體服務數位網路(ISDN)之視訊會議系統與臨床醫學中心進行線上討論及交換訓練方式及經驗。期望能提供脊髓損傷者功能電刺激踩車訓練量化及合理訓練模式完成復健之過程改善生活品質之目的。

**Abstract**

The beneficial effects of cycling exercise via functional electrical stimulation (FES) have been demonstrated with the increase of muscle strength and endurance, increase of bone density, suppression of spasticity, improvement of cardiopulmonary function, and many other physiological and psychological effects for spinal cord injured (SCI) subjects. Several modified ergometers are commercially available in clinical rehabilitative treatment. However, those devices are relatively expensive and hardly affordable for the local SCI subjects. The aim of this research is to extend our FES-cycling prototype system for multicenter controlled studies. A telemeeting system has been built for online discussion and exchange of training protocols clinical centers via public Integrated Services of Digital Network (ISDN). This study is expected to provide the quantitative assessment criteria, more rational planning of patient-tailored therapeutic and rehabilitation procedures for SCI subjects participating in FES-cycling training.