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Introduction

Recent issues of *NeuroRehabilitation* have focussed upon motor rehabilitation, a field which has expanded dramatically during the last 20 years. Early work on motor rehabilitation was primarily based upon empirical and individual observations. Following experimental studies in cats, the basis of motor control in humans was formed. For many years research was restricted to studies of reflex mechanisms and voluntary movements under completely artificial/non-functional conditions which provided insight into reflex connections and central commands during movement. However, with technological advances came the ability to record electrophysiological and biomechanical parameters and also to stimulate specific brain regions during natural movements. Thus the pathophysiological basis of movement disorders could be studied in patients with spasticity, rigidity or impaired cerebellar function. Such research has led to a better understanding and consequently a better treatment of movement disorders.

This issue of *NeuroRehabilitation* is the first of two dedicated entirely to the area of Motor Rehabilitation. The focus of the current issue is on basic research. The second issue (to be published in *NeuroRehabilitation*, volume 10/3, May 1998) is devoted to clinical applications and the introduction of new therapeutic approaches.

In this issue, motor control mechanisms in both human and animal models are considered. The potential significance of the behavior of mechano–receptor systems (Duysens and Pearson) and the recovery of motor functions following motor tract fibre lesions (Illert) in the cat are discussed. Hallett et al. and Roelcke et al. have studied the plasticity of human cerebral motor systems following cerebral lesions or spinal lesions using positron emission topography (PET) and transcranial magnetic stimulation (TMS). Nielsen et al. report findings of their research on input–output properties of the soleus stretch reflex in patients following stroke and a control group.

Better understanding of the basic pathophysiology and molecular mechanisms underlying the secondary effect of spinal cord lesion in the rat is of particular interest as it may aid in the development of early therapeutic treatments in human spinal cord injury. The current understanding of this field of research is summarized by van de Meent and Schwab.

All this basic research has a strong influence on current rehabilitation research. Only with a better understanding of plasticity, reorganization and regeneration after lesions of the central nervous system, are we able to develop new rehabilitation strategies.

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