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Introduction

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This issue of *NeuroRehabilitation* is the second of two issues dedicated entirely to the area of motor rehabilitation. The previous issue (volume 10/2 of *NeuroRehabilitation*) was devoted to basic research in the area. This issue provides information on clinical applications and the introduction of new therapeutic approaches in the area of motor rehabilitation.

Two articles address the ability to assess the extent of spinal cord and brainstem lesions. Electrophysiological techniques were used in conjunction with an understanding of the underlying pathophysiological processes. These two studies provide a basis for the choice of an appropriate rehabilitation program in patients with dysphagia due to brainstem lesion (Schröter-Morasch and Bartholome) and in patients with para/tetraplegia due to spinal cord lesion (Curt). Similarly, pathophysiological investigations of spastic movement disorders in children with cerebral palsy (Berger) can serve as a basis for goal-directed physiotherapy depending upon the existing neuronal integrity at cortical, spinal and peripheral levels.

As yet there is no direct therapy available for the improvement of central paresis. That is to say disconnection of lower from higher motor centers cannot yet be remedied. Functional electrical stimulation (FES) of paralyzed muscles may compensate for certain aspects of the paresis. Although such an approach is well established, technical advances have improved the treatment of bladder dysfunction after spinal cord injury (Schurch). This, together with the modification of spastic muscle tone of the external sphincter by botulinum toxin, has resulted in adequate treatment of most cases of detrusor-sphincter dyssynergia currently encountered. The use of FES to improve mobility in paraplegic patients is still at the experimental stage (Quintern). Nevertheless, the secondary complications in leg muscles of such patients can be partially prevented by FES. Progress in microelectronic research promises further improvement. Research into FES-prosthetics is still in its infancy, the goal being EMG-controlled FES of forearm and intrinsic hand muscles which would allow grasping movements to be performed (Keller et al.). The results of such research so far are encouraging as it would ultimately allow tetraplegics to lead more independent lives.

Overall, considerable progress has been made in the understanding of basic motor control mechanisms and the pathophysiological changes

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observed following central motor lesions. Thus, new rehabilitation techniques for the treatment of motor dysfunction can be developed. However, many questions still need to be answered as we still do not fully understand the processes that occur following central motor lesions and it is this understanding that determines the framework for effective and appropriate therapeutic treatment.