Title: Therapeutic effects of spinal cord and peripheral nerve stimulation in patients with the movement disorders.

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Purpose: In the presented study we have investigated the therapeutic results of the modified FES and TENS programs applied to the patients with the treated degenerative spine disorders and the discopathy at the cervical and lumbar regions (group A, N=12), as well as to the patients after injuries and with the mielopathies at the cervical region of the spinal cord (group B, N=9).

Methods: The parameters of the electrostimulation programs (the pulse width, frequency and the train duration) have been modified in order to maximise the quality coefficients associated with the following criteria: functional evaluation of the limbs (upper and lower), examination of the physiological reflexes, examination of the perception of the superficial and deep receptors, evaluation of the muscles tension. The electrotherapeutic results have also been verified by the diagnostic examinations: EMG, ENG (M-wave) and SEPs of the selected muscles and nerves in the upper and lower limbs.

Results and Conclusions: It has been observed, that the one-side spinal stimulation (with anode-electrode placed above cathode) had the following effects: improved efficiency of the selected muscles (in case of groups A and B), improved afferent transmission to the spinal centres at the cervical region (B), as well as a slight improvement of the peripheral nerves conductivity at the upper and lower limbs (B). The local transcutaneous stimulation (with anode placed above cathode) of the peroneal nerve was characterised by the improved efferent conductivity to the innervated muscles, but had no effects on the afferent conductivity (A). The opposite electrodes placement (cathode above anode) resulted in the analgesic effects (A).

The optimisation procedure considered in this study allows to determine the progress and the directions of the physiotherapeutic treatment, aimed at the restoration of the patients' sensomotoric capabilities in the shortest time.