ROBOT-ASSISTED THERAPY FOR GAIT TRAINING IN CEREBRAL PALSY, ALGORITHMS AND OUR 10 YEARS OF EXPERIENCE

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In the last decade, Robot-Assisted Therapy (RAT) has also entered the complex habilitation of children with cerebral palsy (CP), focusing on building and improving their gait, which until then was stimulated by conventional means of kinesitherapy and training by means of electric treadmills with/without weight bearing. CP is a non-progressive brain impairment, and all patients, depending on the form and degree of impairment, have disturbances in the organization of gait due to the presence of spasticity, reduced muscle strength, impaired coordination of movements and balance insufficiency. The varying severity and form of locomotor abnormalities of CP are often combined with differently expressed impairments of the child's speech-mental state. The use of rehabilitation robots is a highly motivating method, especially for the child, which allows a high repetitiveness of the planned movement, as well as a higher intensity of training, independent of the condition of the therapist. RAT devices according to their mechanical structure are divided into exoskeletons and end-effectors, stationary or mobile, and published results of their therapeutic application are mixed, especially in CP. In 2015, practical recommendations (indications, target planning, clinical application) for RAT in CP with Lokomat (Hokoma) were published for the first time within the WHO-ICF. In 2013, the hospital acquired the first RAT device for gait training - LokoHelp/Woodway (end-effector), and over the next few years, the hospital acquired 2 more RAT devices - Andago/Hokoma (overground gait) and Lokomat- Pediatr. Orth. /Hokoma (exoskeleton). The various RAT devices give different options and strategies in building and/or improving gait of the child with CP. Therefore, a therapy algorithm should be developed for each child tailored to their calendar age and anatomical features, the degree of spasticity determined by MTS, the passive range of motion available for the joints of the lower limbs, the muscular strength and endurance, as well as their intellectual potential (IQ), communication abilities, and desire for independent mobility. The correct selection of the appropriate RAT device at the appropriate time in the child's motor development and the consideration of their neuro-motor and mental potential within a specific algorithm is the basic prerequisite for positive results in the development and improvement of gait in children with spastic CP.