Summary:

Movement disorders are caused by impairment of the basal ganglia and extrapyramidal connections. The most common is Parkinson's disease (PD), characterised by hypokinesia together with resting tremor and / or rigidity, which may be influenced by dopaminergic therapy or invasive methods, including deep brain stimulation (DBS). Gait and balance disorders are part of the Parkinson's syndrome, progress during the disease course and limit daily activities, quality of life, may lead to falls and contribute to higher mortality of the patients in the late stages. Therapy is difficult. Gait disorders and parkinsonism may occur also in other diseases, including intoxications which may also lead to basal ganglia impairment.

The theoretical part include the physiology of gait, gait disorders and examination. The section devoted to movement disorders focuses on Parkinson's disease and methanol intoxication.

The practical part consists of 3 studies evaluating gait disorder in patients with advanced PD and possibilities of the treatment, the 4th study documents gait disorder in survivors after mass methanol poisoning with outbreak between 2012 and 2014 in the Czech Republic.

The result confirm the effect of DBS in step length prolongation and gait speed increment in patients with PD. Compensation strategies using visual stimuli (cueing) were more effective in normalization of the prolonged double support phase of the gait cycle of PD patients. Beneficial were large transverse visual stimuli, which can be incorporated into floor patterns in public spaces or interiors. Also the validity of the Czech version of the screening Freezing of gait questionnaire was verified, which may help to investigate freezing in the clinical practice despite its episodic and unpredictable nature.

Methanol poisoning is characterized by development of metabolic acidosis, visual disturbances, and basal ganglia damage, which can be documented by MRI. The gait disorder, however, corresponds to the frontal type, probably due to impaired connection between basal ganglia and frontal cortex.