

**DESCRIPTION OF COURSE UNIT FOR DOCTORAL STUDIES
AT VILNIUS UNIVERSITY**

Scientific Area/eas, Field/ds of Science (codes)	Medical and Health Sciences (M 000): Medicine (M 001)			
Faculty, Institute, Department/Clinic	Faculty of Medicine Institute of Clinical Medicine Clinic of Neurology and Neurosurgery			
Course unit title (ECTS credits, hours)	Movement Disorders 7 credits (189 hours)			
Study method	Lectures	Seminars	Consultations	Self-study
Number of ECTS credits	-	-	1	6
Method of the assessment (in 10 point system)	Examination. Oral form. Five questions are provided.			
PURPOSE OF THE COURSE UNIT				
<p>To provide the doctoral student with knowledge about the concept, epidemiology, etiology, pathogenesis, diagnostics, treatment, monitoring and prevention of neurological movement disorders; to provide th doctoral student with practical skills of examining and diagnosing the patient with neurological movement disorders, of interpreting (or in particular cases – evaluating) results of electrophysiological, imaging, laboratory, genetic and neuropsychological tests, recognizing adverse reactions to medications, creating an individualized patient-oriented plan of treatment and monitoring.</p>				
THE MAIN TOPICS OF COURSE UNIT				
<p><i>Introduction into neurology of movement disorders.</i> Neurodegenerative diseases and proteinopathies. Mitochondrial dysfunction, mechanisms of cell death and its prevention. Neurotransmitters and neurochemical deficits.</p> <p><i>Extrapyramidal system: anatomy, functions, terminology; syndromes of dysfunction, pathophysiology and semiotics.</i> Hypokinetic rigidic syndrome. Evaluation and differentiation of muscle tone: rigidity, spasticity, hypotonia, atonia. Hyperkinetic syndromes (tremor, myoclonus, chorea, ballismus, dystonia, atetosis, tics). Cognitive and psychiatric disorders in dysfunction of basal ganglia.</p> <p><i>System of coordination.</i> Anatomy and interactions of neurological units, involved in coordination of movements. Cerebellum. Disorders of speech, stance and gait. Ataxia: definition, types, manifestations, differential diagnosis.</p> <p><i>Approach to the patient with movement disorder.</i> Taking the history. Testing of motor function, stance, gait and postural stability. Clinical assessment scales.</p> <p><i>Neurophysiological testing of motor control and movement disorders.</i> Electrophysiological methods of objective evaluation of movement disorders. Surface and needle EMG. Videotelemetry and accelerography. Tests of autonomic system, ocular movement and brainstem reflexes. Kinematic motion analysis.</p> <p><i>Laboratory tests and brain imaging in movement disorders.</i> Specific biomarkers of alpha-synucleinopathies in serum and cerebrospinal fluid. Ultrasound, computer tomography, magnetic resonance (MR) imaging (MRI),</p>				

functional MRI, MR tractography, single photon and positron emission computered tomography, specific radionuclides. Genetic testing.

Pharmacotherapy of movement disorders.

Main groups of medications (dopaminergic drugs, dopamine antagonists and depletors, acting on NMDA glutamate receptors, myorelaxants, botulinum toxin, neuroprotective, psychotropic and investigational medications). Mechanisms of actions, indications, dosing, forms (oral, parenteral, standard, modified, continuous), adverse reactions of medications, monitoring. Evidence-based treatment recommendations. Disease-modifying treatment in neurodegenerative disorders: neurotrophic agents, monoclonal antibodies, vaccines, gene engineering-based interventions.

Surgery of movement disorders.

Methods, principles, scientific and clinical value. Deep brain stimulation: targets, management principles, special issues in design of clinical studies. Stereotactic destructive brain surgery.

Tremor: pathophysiological mechanisms, types, diagnostics and management principles. Essential tremor.

Parkinson's disease.

Epidemiology, etiopathogenesis, clinical and differential diagnostics of Parkinson's disease. Opportunities in early diagnosis, disease-modifying treatment and prevention. Medicamental, surgical, non-medicamental treatment.

Parkinson - plus syndromes.

Progressive supranuclear palsy (Steele-Richardson-Olszewski syndrome). Corticobasal syndromes (corticobasal ganglial degeneration). Multisystem atrophy. Diffuse Lewy body disease and other dementias with parkinsonism.

Dystonias.

Concept, classification, etiopathogenesis of dystonia. Torsionic, juvenile levodopa responsive, cervical, professional dystonias, blepharospasm, hemifacial spasm. Paroxysmal dyskinesias.

Choreas.

Developmental and inherited choreas. Huntington's disease. Overview of modern experimental and clinical trials on disease modification and prevention in Huntington's chorea. Neuroacantocytosis. Sydenham's chorea. Autoimmune, metabolic, drug-induced choreas.

Myoclonus

Classification, differentiation, symptomatic treatment of myoclonus. Opsoclonus-myoclonus syndrome. Syndromes of exaggerated startle response. Hyperekplexia.

Tics and stereotypies. Tourette's syndrome.

Neurodegenerative disorders associated with brain copper and iron accumulation.

Wilson's disease (hepatolenticular degeneration). Brain iron toxicity. Pantothenate kinase-associated neurodegeneration (PKAN). Neuroaxonal dystrophy. Aceruloplasminemia.

Ataxias.

Types. Cerebellar ataxias: autosomal dominant, autosomal recessive, X-linked, idiopathic late-onset. Paraneoplastic ataxias. Differential diagnostics of acquired ataxia. Spongiform encephalopathies. Treatment of ataxia.

Restless legs syndrome. Akatysia. Sleep-related movement disorders.

Movement disorders of other etiology.

Vascular, traumatic, metabolic, drug-induced, paraneoplastic, toxic, immune, other central or peripheral nervous system dysfunction, psychogenic.

Emergency in movement disorders.

Hypokinetic (neuroleptic malignant syndrome, parkinsonism-hyperpyrexia syndrome, serotonergic syndrome) and hyperkinetic (dystonic storm, acute dystonic reaction, ballismus, tic status, non-epileptic myoclonal status).

RECOMMENDED LITERATURE SOURCES

1. Principles and Practice of Movement Disorders: Expert Consult. Ed. Jankovic J, Hallet M., Okun M., Cornella S., Fahn S. Elsevier, 2021.
2. Therapy of Movement Disorders: a Case-based Approach. Ed. Reich S., Factor S. Springer, 2019.
3. Deep Brain Stimulation: a Case-based Approach. Ed. Chitnis S., Khemani P., Okun M. Oxford University Press, 2020.
4. Adams and Victor's Principles of Neurology. A.Ropper, M.Samuels, J.Klein, S.Prasad. McGraw-Hill. 11th ed., 2019.
5. Movement Disorders Curricula. Ed. Falup-Pecurariu C., Ferreira J., Martinez-Martin P., Chaudhuri K.R. Springer, 2017.
6. Neurology : A Queen Square textbook. Ed. C.Clarke, R.Howard, M.Rossor and S.Shorvon – 2nd ed., Blackwell Publishing Ltd., 2016.
7. Parkinson's Disease and Movement Disorders. Ed. Jankovic J., Tolosa E. Wolters Kluwe, 6th ed., 2015.
8. Oxford Textbook of Movement Disorders. Ed. Burn D. Oxford University Press, 2013.
9. Movement Disorders in Neurological and Systemic Disease. Ed. Poewe W., Jankovic J. Cambridge University Press, 2014.
10. Movement Disorder Genetics. Ed. S.Schneider, J.Bras. Springer, 2016
11. Magnetic Resonance Imaging in Movement Disorders. A Guide for Clinicians and Scientists. Ed. P.Tuite, A.Dagher. Cambridge University Press, 2013.
12. Movement Disorders Rehabilitation. Ed. Chien H.F., Barsottini O. Springer, 2016.
13. <http://www.movementdisorders.org/MDS/Education/Latest-E-Learning.htm>
14. Klinikinė neurologija. Red. V.Budrys. 2-as leid. Vilnius, Vaistų žinios, 2009.

CONSULTING LECTURERS

1. Coordinator of the course: Rūta Kaladytė Lokominienė (Assist. Prof. Dr.).

2. Gintaras Ferdinandas Kaubrys (Prof. Dr.).

3. Dalius Jatužis (Prof. Dr.).

APPROVED:

By Council of Doctoral School of Medicine and Health Sciences at Vilnius University:
29th of September 2022

Chairperson of the Board: Prof. Janina Tutkuvienė