

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

Scientific Area/eas, Field/ds of Science	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)	Dementia and Cognitive Neurology 7 (189 hours)			
Study method	Lectures	Seminars	Consultations	Self-study
Number of ECTS credits	-	-	1	6
Method of the assessment (in 10 point system)	Examination. Assessed orally, five questions are asked.			
PURPOSE OF THE COURSE UNIT				
To provide the doctoral student with knowledge about the modern concept of dementia, diagnostics and treatment methods of diseases causing dementia, practical skills of examining a patient with dementia or cognitive impairment.				
THE MAIN TOPICS OF COURSE UNIT				
<p><i>Introduction.</i> Object, problems and methods of cognitive neurology. Relationships with general clinical neurology, cognitive science, neuroanatomy, neurophysiology, neurochemistry. Neurodegenerative diseases and proteinopathies. Neurotransmitters and neurochemical deficits in dementia.</p> <p><i>Cognitive functions.</i> The concept of cognitive function. Localized and distributive cognitive functions. Attention, orientation, memory, language, perceptual functions, calculation, praxis, executive functions. Types of memory (explicit and implicit; episodic and declarative, semantic and procedural; verbal and nonverbal), types (retrograde and anterograde), stages (working, short-term, long-term)</p> <p><i>Anatomy, localization and neurophysiology of cognitive functions.</i> Anatomy and connectivity of brain structures involved in cognitive processes. Neurotransmitters of cognitive processes. Neurophysiological mechanisms of cognitive processes.</p> <p><i>Disorders of cognitive function and their pathophysiology.</i> Causes of cognitive impairment. Types of memory disorders. Types of aphasia and their differentiation methods. Apraxia. Acalculia. Dyslexia. Apraxia characteristics, clinical significance. Agnosia. Symptoms of dysexecutive syndrome.</p> <p><i>Cognitive neurological examination.</i> Cognitive neurological examination methods, clinical evaluation of individual cognitive processes. Clinical cognitive tests and scales (MMSE, BDS, ADAS, SIB, etc.). Indications, methodologies, diagnostic value. Practical training in clinical cognitive research.</p> <p><i>Electrophysiological cognitive studies.</i> Electrophysiological methods used to assess cognitive impairment. Evoked potentials: principles, types. Endogenous and cognitive potentials. N200, P300, N400, P600 - methodologies, interpretation, clinical significance. Utilization of cognitive potentials for the diagnosis of dementia and evaluation of treatment effectiveness.</p> <p><i>Laboratory and neurovisual studies in dementia.</i></p>				

Laboratory and neurovisual studies in international dementia diagnostic criteria. Requirements for laboratory and neurovisual examination in Lithuania. Specific biochemical markers of Alzheimer's disease and other dementias in serum and cerebrospinal fluid. Neurovisual methods used in the diagnosis of dementias: CT, MRI, SPECT, PET, fMRI. Methodology, indications, scientific and clinical significance.

Pharmacotherapy of cognitive disorders and dementias.

The main groups of drugs (acetyl- and butyryl-cholinesterase inhibitors, drugs acting on NMDA glutamate receptors, nootropics, neuroprotectors, psychotropic drugs, other investigational drugs). Mechanisms of action of drugs. Indications for use and dosage, adverse reactions. Long-term drug treatment. Disease-modifying therapy, secretase inhibitors, monoclonal antibodies, vaccines, and other treatment perspectives.

Disorders of consciousness.

The concept of consciousness, definitions, cognitive and neurobiological theories. The main syndromes of impaired consciousness. The role of consciousness in cognitive processes. Influence of the state of consciousness in the assessment of cognitive disorders.

Alzheimer's disease.

Epidemiology of Alzheimer's disease, etiology, genetics, pathogenesis, pathomorphology, neurochemistry, clinic, diagnostics, differential diagnosis, international diagnostic criteria, paraclinical investigation, treatment, prevention, prognosis. The concept of mild cognitive impairment, criteria, types, significance for cognitive science and clinical practice. The early stage of Alzheimer's disease and the problems of early treatment and prevention of Alzheimer's disease. Review of experimental and clinical studies in the prevention and modification of Alzheimer's disease.

Vascular dementia.

Classification of vascular dementia, epidemiology, etiology, genetics, pathogenesis, pathomorphology, neurochemistry, clinic, diagnostics, differential diagnosis, international diagnostic criteria, paraclinical investigation, treatment, prevention, prognosis.

Dementias with parkinsonism syndrome.

Epidemiology, etiology, genetics, pathogenesis, pathomorphology, neurochemistry, clinic, diagnosis, differential diagnosis, international diagnostic criteria, paraclinical investigation, treatment, prevention, prognosis of diffuse Lewy body disease and other dementias with parkinsonism.

Frontotemporal dementia.

Epidemiology, etiology, genetics, pathogenesis, pathomorphology, neurochemistry, clinic, diagnostics, differential diagnosis, international diagnostic criteria, paraclinical investigation, treatment, prevention, prognosis.

Spongiform encephalopathies.

Epidemiology, etiology, genetics, pathogenesis, pathomorphology, neurochemistry, clinic, diagnostics, differential diagnosis, international diagnostic criteria, paraclinical investigation, treatment, prevention, prognosis.

Rare diseases with dementia syndrome.

Epidemiology, etiology, genetics, pathogenesis, pathomorphology, neurochemistry, clinical features, diagnosis, differential diagnosis, international diagnostic criteria, treatment, prevention, prognosis of rare diseases with dementia.

RECOMMENDED LITERATURE SOURCES

1. Klinikinė neurologija. Red. V.Budrys. 2-as leid. Vilnius, Vaistų žinios, 2009.
2. A.Ropper, M.Samuels, J.Klein, S.Prasad. Adams and Victor's Principles of Neurology. McGraw-Hill. 11th ed., 2019.

3. M.Weiner, A.Lipton. Clinical Manual of Alzheimer Disease and Other Dementias. American Psychiatric Publishing; 1st ed., 2012.
4. A.Larner. Neuropsychological Neurology: The Neurocognitive Impairments of Neurological Disorders. Cambridge University Press; 2nd ed., 2013.
5. Neurology: A Queen Square textbook. Ed. C.Clarke, R.Howard, M.Rossor and S.Shorvon – 2nd ed., Blackwell Publishing Ltd., 2016.
6. M.Gazzaniga, G.Mangun. The Cognitive Neurosciences. MIT Press; 5th Revised ed., 2014.
7. A.Larner. Cognitive Screening Instruments: A Practical Approach. Springer, 2014.
8. B.Dickerson, A.Atri. Dementia: Comprehensive Principles and Practices. Oxford University Press; 1 ed., 2014.
9. A.Larner. Dementia in Clinical Practice: A Neurological Perspective: Studies in the Dementia Clinic. Springer, 2012.
10. M.Husain, J.Schott. Oxford Textbook of Cognitive Neurology and Dementia. Oxford University Press, 2016

CONSULTING LECTURERS

1. Coordinating lecturer: Gintaras Ferdinandas Kaubrys (Prof. Dr.).

2. 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