

**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)	Urgent Neurology 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 urgent conditions in neurology, the importance and methods of their recognition and emergency care; to overview the main neurological syndromes, clinical manifestations and pathophysiological mechanisms of urgent neurological conditions; to provide algorithms for the diagnosis and examination of urgent conditions and evidence-based treatment principles; to review new research and perspectives in research and clinical practice.</p>				
THE MAIN TOPICS OF COURSE UNIT				
<p><i>Acute cerebrovascular disorders: ischemic stroke, intracerebral haemorrhage, transient ischemic attack.</i></p> <p>Basic principles of diagnosis and examination. Stroke recognition. Pre-hospital treatment. Indications and contraindications of neuroimaging examinations, their comparative value in the diagnosis of different types of acute cerebrovascular disorder. Basic treatment of acute cerebrovascular disorder. Reperfusion treatment of acute ischemic stroke (intravenous thrombolysis, mechanical thrombectomy): indications, contraindications, choice of treatment, complications (risk factors, diagnosis, treatment). Principles of work organization. Complications of ischemic stroke: diagnosis, principles of treatment. Indications for decompression craniotomy. Etiology and pathogenesis of intracerebral hemorrhage. Investigation of patients with intracerebral hemorrhage. Conservative treatment of intracerebral hemorrhage, indications for surgical treatment. Examination of patients with transient ischemic attack (TIA). TIA stratification according to stroke risk. Neuroimaging and ultrasound examinations. Medical and surgical prevention. Guidelines of the Lithuanian Stroke Association, the European Stroke Organization, American Heart and Stroke Associations for the diagnosis, treatment and prevention of ischemic stroke and intracerebral hemorrhage.</p> <p><i>Acute muscle weakness.</i></p> <p>Etiological classification. Evaluation of the progress in clinical situation. Acute inflammatory demyelinating polyneuropathy (Guillain-Barré syndrome (GBS)). Myasthenia gravis: epidemiology, clinical signs and symptoms, classification, diagnostic criteria, differential diagnosis, instrumental studies, prognosis. Worsening of myasthenia gravis and myasthenic crisis. Differential diagnosis of myasthenic crisis, causes, risk factors, treatment: supportive measures,</p>				

immunosuppression, removal of circulating antibodies, improvement of neuromuscular transmission. Neuromuscular impairment in critically ill patients: concept, types, pathogenesis mechanisms. Critical illness polyneuropathy: definition, prevalence, clinical features, diagnostic criteria, differential diagnosis. Critical illness myopathy: definition, prevalence, pathogenesis mechanisms and types, diagnostic criteria, differential diagnosis. Acute neuromuscular respiratory failure: definition, symptoms, diagnostic criteria, differential diagnosis, treatment, prognosis.

Neurological symptoms of electrolyte imbalance.

Osmolarity and electrolytes: physiology, the concept of osmolarity, its calculation, the influence on brain function. Hyponatremia: causes, types, pathophysiology. Hyponatremic encephalopathy, its symptoms and treatment. Hypernatremia: causes, clinical signs, treatment. Hypokalemia and hyperkalemia: symptoms. Periodic paralysis: types, symptoms, differential diagnosis, treatment. Hypercalcemia: causes, symptoms, treatment. Hypocalcemia: causes, symptoms, treatment.

Seizures.

Definition, etiology, pathogenesis, first aid. Acute symptomatic (provoked) seizures: causes, diagnosis, treatment. Definition and classification of epilepsy. Classification of epileptic seizures. Emergency aid for epileptic seizures. Definition of status epilepticus, causes, classification, diagnosis. Treatment of status epilepticus. Peculiarities of diagnosis and treatment of non-convulsive status epilepticus. EEG abnormalities in status epilepticus, EEG role in the diagnosis and treatment of convulsive and non-convulsive status epilepticus. Semiology, diagnosis and treatment tactics of nonepileptic seizures.

Neuroinfections.

Classification, etiology, pathogenesis, diagnosis and principles of treatment of neuroinfections. Lumbar puncture: indications, contraindications. Cerebrospinal fluid changes depending on the type of neuroinfection. Immunological studies of cerebrospinal fluid and their clinical significance in the diagnosis of neuroinfections. Acute purulent meningitis: classification, peculiarities of etiology depending on age. Treatment of purulent meningitis: principles of empirical and targeted treatment, selection of empirical treatment in different clinical situations. Acute meningococcal meningitis: diagnosis, course, treatment, complications. Acute herpetic encephalitis: etiology, clinic, modern diagnostics. Complications of herpetic encephalitis. Tick-borne encephalitis.

Acute headache and facial pain.

International Classification of Headaches. Examination of patients with acute headaches based on the "red flags" principle. Significance and application of neuroimaging studies in acute headache. Migraine attack and status migrainosus: clinic, diagnosis, treatment. Cluster headache: clinic, diagnosis, treatment. Trigeminal neuralgia: causes, diagnosis, treatment. Indications for surgical treatment.

Impaired consciousness.

Classification of impaired consciousness. Causes and classification of coma. Coma Scales (Glasgow, Four). Examination of an unconscious patient: clinical tests, their sequence. Peculiarities of neurological symptoms depending on the etiology of coma. Emergency aid and principles of treatment.

Acute myelopathy and cauda equina syndrome.

Definition, etiology, classification of myelopathy and cauda equina syndrome. Peculiarities of neurological symptoms depending on the level of lesion. Examination of patients with suspected myelopathy and application of diagnostic methods. Laboratory tests for the diagnosis of myelopathies and their clinical value. Clinical importance of diagnostic methods, their sequence. Differential diagnosis of myelopathy. Drug treatment of myelopathy, its effectiveness. Indications for surgical treatment.

RECOMMENDED LITERATURE SOURCES

1. Urgentinė neurologija. Red. V. Budrys. Vilnius: UAB "Vaistų žinios", 2011.
2. Critical Care Neurology and Neurosurgery. Ed. J.I. Suarez. 2nd Edition. Humana Press, 2016.
3. Continuum - Lifelong Learning in Neurology. Neurocritical Care. October 2021, Vol.27, No.5. <https://journals.lww.com/continuum/toc/2021/10000>.
4. LaHue S, Levin M. Emergency Neurology (2 ed.). Oxford University Press, 2021.
5. Rana AQ, Morren JA. Neurological emergencies in clinical practice. Springer, 2013.
6. Layon AJ, Gabrielli A, Friedman WA. Textbook of Neurointensive Care. Springer, 2013.
7. Kobayashi A, Czlonkowska A, Ford GA, et al. European Academy of Neurology and European Stroke Organization consensus statement and practical guidance for pre-hospital management of stroke. European Journal of Neurology 2018; 25: 425-33.
8. Powers WJ, Rabinstein AA, Ackerson T, et al. 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke: A Guideline for Healthcare Professionals from the American Heart Association/American Stroke Association. Stroke 2019; 50: e344-e418.
9. Berge E, Whiteley W, Audebert H, et al. European Stroke Organisation (ESO) guidelines on intravenous thrombolysis for acute ischaemic stroke. European Stroke Journal 2021; 6(1): I-LXII.
10. Steiner T, Al-Shahi Salman R, Beer R, et al; European Stroke Organisation. European Stroke Organisation (ESO) guidelines for the management of spontaneous intracerebral hemorrhage. Int J Stroke 2014; 9(7): 840-55.
11. D. Jatužis, D. Rastenytė, A. Vilionskis, V. Matijošaitis, K. Ryliškienė. Galvos smegenų insulto diagnostikos, gydymo ir profilaktikos metodika. Metodinė mokymo priemonė. Trečioji pataisyta ir papildyta laida. Vilnius: Vilniaus universiteto leidykla, 2021.
12. Grotta JC, Albers GW, Broderick JP, et al. Stroke: pathophysiology, diagnosis, and management, 6th edition. Elsevier, 2016.

CONSULTING LECTURERS

1. Coordinating lecturer: Dalius Jatužis (Prof. Dr.).

2. Rūta Mameniškienė (Prof. Dr.).

3. Aleksandras Vilionskis (Assoc. Prof. Dr.).

4. Aušra Klimašauskienė (Assist. 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