

**LIST OF PRACTICE TOPICS ON NEUROLOGY AND NEUROSURGERY FOR THE 4TH-YEAR STUDENTS OF THE FACULTY OF FOREIGN STUDENTS (STUDYING IN ENGLISH) IN THE 7 SEMESTER**

**1. Introduction to the discipline. History of the development of neurology and neurosurgery. Motor system and motor disorders.**

1. Introduction to the discipline. History of the development of neurology and neurosurgery.
2. Corticospinal (pyramidal) tract.
3. Classification of reflexes. Reflex arcs. Deep and superficial and pathological reflexes (techniques for eliciting).
4. The characteristic and significance of pathological reflexes (foot, hand, axial).
5. Voluntary movements disorders: paresis, paralysis. Signs of central paralysis.
6. Signs of flaccid paralysis.
7. Syndromes of corticospinal tract lesion (precentral gyrus, corona radiata, internal capsule, brainstem, spinal cord, spinal roots, plexuses and peripheral nerves lesion).
8. Extrapyramidal system. Anatomy, physiology, functions.
9. Parkinson's syndrome.
10. Hyperkinetic syndrome. Types of hyperkinesia.

*Supervision of thematic patients; mastering practical skills; discussion of clinical cases.*

**2. Sensory system and its disorders.**

1. Concepts of reception, sensation, and perception. Pathways of superficial sensitivity.
2. Pathways of deep sensitivity.
3. Methods for examining deep and superficial sensitivity.
4. Kinds of sensory disorders.
5. Types of sensory disorders (peripheral, spinal, cerebral).
6. Sensory ataxia. Segmental dissociative sensory disorder.
7. Brown-Séquard syndrome.
8. Tension symptoms (Lasegue, Mackiewicz, Wassermann).
9. Cerebellum. Anatomy and functions. Anterior and posterior spinocerebellar tracts.
10. Cerebellar ataxia: types, symptoms, examination methods.

*Supervision of thematic patients; mastering practical skills; discussion of clinical cases.*

**3. Cranial nerves. Methods of examination and symptoms of lesion. Olfactory nerve. Anatomy, physiology, methods of examination, symptoms of lesion.**

1. Optic nerve. Anatomy, physiology, methods of examination, symptoms of lesion.
2. Oculomotor nerve. Anatomy, physiology, methods of examination, symptoms of lesion.
4. Vegetative innervation of the eye. Pupil reflex arc. Horner's syndromes, Pty syndrome.
5. Trochlear and abducens nerves. Anatomy, physiology, methods of examination, symptoms of lesion.
6. The trigeminal nerve. Anatomy, physiology, methods of examination, symptoms of lesion. Types of facial sensitivity disorders (peripheral and segmental).

*Supervision of thematic patients; mastering practical skills; discussion of clinical cases.*

**4. Cranial nerves. Methods of examination and symptoms of lesion. Brainstem. Alternating syndromes.**

1. Facial nerve. Anatomy, physiology, methods of examination. Symptoms of facial nerve damage at the different levels.
2. Central and peripheral facial paralysis. Etiology, differential diagnosis, treatment.
3. Anatomy of the vestibular analyzer. Symptoms of a lesion. Symptoms of vestibular ataxia.
4. Anatomy and function of the auditory analyzer. Methods of examination. Symptoms of a lesion.
5. Glossopharyngeal nerve. Anatomy, physiology, methods of examination, symptoms of lesion.
6. Vagus nerve. Anatomy, physiology, methods of examination, symptoms of lesion.
7. Accessory nerve. Anatomy, physiology, methods of examination, symptoms of lesion.
8. Hypoglossal nerve. Anatomy, physiology, methods of examination, symptoms of lesion.
9. Bulbar and pseudobulbar syndrome. Etiology, symptoms and diagnostics.
10. Alternating syndromes in midbrain and pons lesions: Weber, Miyar – Gubler and Foville's, Wallenberg – Zakharchenko, Jackson syndromes.

*Supervision of thematic patients; mastering practical skills; discussion of clinical cases.*

**5. Brain membranes, cerebrospinal fluid, meningeal syndrome, intracranial hypertension syndrome. Autonomic (autonomic) nervous system and syndromes of its defeat. Instrumental methods of research in the diagnosis of diseases of the nervous system. Blood supply of the brain and spinal cord**

1. Anatomy of the brain and spinal cord meninges. Cerebrospinal fluid circulation and resorption. Characteristics of normal cerebrospinal fluid.
2. Lumbar puncture. Indications, contraindications, complications.
3. Meningeal syndrome, meningism. Etiology, symptoms.

4. Intracranial hypertension syndrome
5. X-ray radiography of cranium and spine, computer-assisted tomography, magnetic resonance imaging (MRI) positron emission tomography, subtraction selective angiography: their importance in the diagnosis of neurological, neurosurgical diseases and injuries.
6. Ultrasound diagnosis in neurology and neurosurgery: ultrasound examination of the brachiocephalic arteries and nerve trunks. Transcranial Doppler. Echoencephalography.
7. Neurophysiological research methods (electroencephalography, electroneuromyography, evoked potentials).
8. Clinical neuroanatomy of the autonomic nervous system. Structure and functional organization of the limbic-reticular complex and segmental apparatus of the autonomic nervous system. Sympathetic and parasympathetic sections of the autonomic nervous system.
9. Methods of research of the vegetative sphere (tone, reactivity, vegetative support of activity).
10. Blood supply of the brain. Arterial circle of cerebrum (circle of Willis), its physiological significance.
11. Spinal cord blood supply.

*Supervision of thematic patients; mastering practical skills; discussion of clinical cases.*

**6. Fundamentals of clinical neuroanatomy and functional organization of the cerebral hemispheres. Higher brain functions and syndromes of their lesions. Topical diagnosis of spinal cord lesions.**

1. Anatomy and physiology of the frontal, temporal, parietal, occipital cerebral cortex.
2. Agnosia, apraxia. Types, symptoms.
3. Types and symptoms of speech disorders (aphasia, dysarthria, alalia, mutism).
4. Structural and functional mechanisms of memory. Amnesia and its types.
5. The scale of quantitative changes of consciousness: deafening, sopor, coma (moderate, deep, terminal). Glasgow Coma Scale.
6. Syndrome of complete transverse lesion of the upper cervical spinal cord (C1 – C4).
7. Syndrome of complete transverse lesion of the cervical spinal cord (C5 – Th2).
8. Syndrome of complete transverse lesion of the thoracic spinal cord (Th3 – Th12).
9. Syndrome of complete transverse lesion of the lumbar spinal cord (L1 – S2).
10. Syndrome of an epiconus (S1 – S2), a cone (S3 – S5), and a horse tail (L2 – S5) of a spinal cord lesion.
11. Examination of patients with diseases of the nervous system. Topical, differential and clinical diagnosis and its substantiation. Prognosis for life and recovery.

*Supervision of thematic patients; mastering practical skills; discussion of clinical cases.*

**7. Brain and spinal cord tumors. Purulent and parasitic diseases.**

1. Prevalence and classification brain and spinal cord tumors.
2. Main neurological syndromes in brain tumors: initial (focal) and secondary (intracranial hypertension, dislocation).
3. Closed (occlusive) and open (resorptive) hydrocephalus. Etiology, pathogenesis, symptoms, diagnosis, treatment.
4. Symptoms of brain tumors with localization in the frontal, temporal, parietal, occipital lobes
5. Tumors of the chiasmatic-sellar and subtentorial regions. Symptoms, diagnosis, treatment.
6. Principles, facilities and results of the surgical treatment. Radiotherapy, chemotherapy, symptomatic treatment.
7. Extramedullary spinal cord tumors. Classification, clinic, diagnostics, treatment.
8. Intramedullary spinal cord tumors. Classification, clinic, diagnostics, treatment.
9. Brain tumors in children. Metastatic brain and spinal cord lesions.
10. Neurocysticercosis. Etiology, clinic, diagnosis, treatment. Bruns syndrome.
11. Neurotoxoplasmosis. Etiology, clinic, diagnosis, treatment.
12. Echinococcosis. Etiology, clinic, diagnosis, treatment.
13. Brain abscess. Etiology, pathogenesis, clinic, diagnosis, surgical treatment.

*Supervision of thematic patients; discussion of clinical cases. **Exam on practical skills in neurology***

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**LIST OF PRACTICE TOPICS ON NEUROLOGY AND NEUROSURGERY FOR THE 4TH-YEAR STUDENTS OF THE FACULTY OF FOREIGN STUDENTS (STUDYING IN ENGLISH) IN THE 8 SEMESTER**

**8. Infection-inflammatory diseases of the nervous system.**

1. Classification of the meningitis. Meningococcal meningitis. Etiology, pathogenesis, symptoms, diagnosis, differential diagnosis, complications, treatment.
2. Enteroviral, parotitic meningitis: etiology, pathogenesis, symptoms, diagnosis, treatment.
3. Tuberculous meningitis. Etiology, pathogenesis, symptoms, diagnosis, complications, treatment.
4. Classification of the encephalitis. Herpetic encephalitis. Etiology, pathogenesis, symptoms, diagnosis, treatment.
5. Tick-borne encephalitis: eastern and western variants. Etiology, pathogenesis, symptoms, diagnosis, treatment, prevention.
6. Epidemic encephalitis Economo. Etiology, pathogenesis, symptoms, diagnosis, treatment.
7. Poliomyelitis. Etiology, pathogenesis, symptoms, diagnosis, treatment.
8. Parainfectious encephalomyelitis. Etiology, pathogenesis, symptoms, diagnosis, treatment.
9. Lesions of the nervous system in syphilis. Classification, symptoms, diagnosis, treatment.
10. Damage of the nervous system in HIV infection, pathogenesis, symptoms, diagnosis, treatment.
11. Creutzfeldt-Jacob disease. Etiology, pathogenesis, clinic, diagnosis, treatment.
12. Neuroborreliosis. Etiology, pathogenesis, stages, symptoms, diagnosis, treatment, prevention.

*Supervision of thematic patients; discussion of clinical cases.*

**9. Vascular disorders of the nervous system.**

1. Clinical classification of the cerebrovascular disorders.
2. Transient ischemic attack, acute hypertensive crisis, transient global amnesia and acute hypertensive encephalopathy. Etiology, pathogenesis, symptoms, diagnosis, treatment.
3. Cerebral infarction. Etiology, risk factors, pathogenetic types (aterotrombotic, cardioembolic, hemodynamic, lacunar, hemorheologic).
4. Symptoms of cerebral infarction in the carotid, vertebral and basilar arteries.
5. Basic stroke therapy. Emergency medical treatment of the stroke. Primary and secondary prevention.
6. Differentiated therapy of cerebral infarction. Thrombolysis, surgical treatment.
7. Intracerebral hemorrhage. Etiology, pathogenesis, symptoms, diagnosis, drug therapy, surgical treatment.
8. Subarachnoid non-traumatic hemorrhage. Etiology, pathogenesis, symptoms, diagnosis, treatment. Indications for surgical treatment.
9. Instrumental methods for the diagnosis of vascular diseases of the nervous system.
10. Chronic cerebral ischemia (cerebrovascular encephalopathy). Stages, clinical features, diagnosis, and treatment.
11. Spinal blood supply disorders: classification, clinical courses, diagnosis, treatment.

*Supervision of thematic patients; discussion of clinical cases.*

**10. Autoimmune diseases of the nervous system.**

1. Multiple sclerosis. Etiology, pathogenesis, symptoms, diagnosis, diagnostic criteria of McDonald, differential diagnosis
2. Multiple sclerosis. Principles of treatment (drugs, criteria for prescribing).
3. Acute disseminated encephalomyelitis. Etiology, pathogenesis, symptoms, diagnosis, treatment.
4. Myasthenia. Etiology, pathogenesis, classification, symptoms, diagnosis, differential diagnosis, treatment.
5. Myasthenic and cholinergic crises, symptoms, emergency care.
6. Acute inflammatory demyelinating polyradiculoneuropathy Guillain – Barré. Etiology, pathogenesis, symptoms, diagnosis, treatment.
7. Chronic inflammatory demyelinating polyradiculoneuropathy. Etiology, pathogenesis, symptoms, diagnosis, treatment.

*Supervision of thematic patients; discussion of clinical cases.*

**11. Degenerative diseases of the nervous system.**

1. Parkinson's disease and parkinsonism syndrome. Etiology, pathogenesis, clinic, diagnosis. Drug therapy (principles of prescription and groups of drugs) and surgical treatment.
2. Amyotrophic lateral sclerosis. Etiology, pathogenesis, symptoms, diagnosis, treatment.
3. Alzheimer's disease. Etiology, pathogenesis, clinic, diagnosis, treatment, prevention.
4. Syringomyelia. Etiology, pathogenesis, symptoms, diagnosis, treatment.
5. Huntington's disease. Etiology, clinic, diagnosis, treatment.
6. Wilson disease. Etiology, pathogenesis, clinic, diagnosis, treatment.

*Supervision of thematic patients; discussion of clinical cases.*

**12. Hereditary diseases of the nervous system.**

1. Classification of the hereditary diseases of the nervous system. Genetic counseling, medical care for patients with genetic pathology.
2. Duchenne's myodystrophy. Etiology, pathogenesis, symptoms, diagnosis, treatment.
3. Limb girdle Erb's muscular dystrophy. Distal muscular dystrophy with the late onset (Welander type). Mode of inheritance, clinical features, diagnosing, differential diagnostics.
4. Spinal amyotrophy of childhood: types, clinic, diagnosis, treatment.
5. Hereditary polyneuropathy: classification, clinic, diagnosis, therapy.

6. Myotonia congenital. Etiology, pathogenesis, clinic, diagnosis, treatment.
7. Hereditary spastic paraplegia (Strumpell disease). Etiology, pathogenesis, clinic, diagnosis, treatment.
8. Spinocerebellar ataxia. Clinic, diagnosis, treatment.
9. Friedreich's disease. Etiology, clinic, diagnosis, treatment.

*Supervision of thematic patients; discussion of clinical cases.*

### **13. Disorders of the peripheral and autonomic nervous system.**

1. Epidemiology and classification of diseases of the peripheral nervous system.
2. Classification of the polyneuropathies.
3. Diphtheritic polyneuropathy. Etiology, pathogenesis, symptoms, diagnosis, treatment.
4. Diabetic polyneuropathy. Pathogenesis, symptoms, diagnosis, treatment.
5. Alcoholic polyneuropathy. Pathogenesis, symptoms, diagnosis, treatment.
6. Backbone osteochondrosis: etiology, pathogenesis.
7. Classification of the neurological disorders at the backbone osteochondrosis. Stages of the disease: reflex, radicular, compressive- ischemic.
8. Reflex and radicular syndromes of neurological manifestations of the backbone osteochondrosis at the cervical, thoracic and lumbosacral level: clinic, differential diagnosis
9. Compressive-ischemic syndrome C5 – C6, C7 – C8, L2 – L4, L5 – S1. Clinic, diagnosis.
10. Combined therapy and prevention of neurological manifestations of the backbone osteochondrosis. Indications for surgical treatment and its types.
11. Compression ischemic mononeuropathies of the median, ulnar, radial, femoral, sciatic, peroneal, tibial nerves: etiology, symptoms, diagnosing, treatment, prevention.
12. The syndrome of autonomic dysfunction. Diagnosis and treatment of diseases of the autonomic nervous system.

*Supervision of thematic patients; discussion of clinical cases.*

### **14. Epilepsy and seizures. Facial pain and headache.**

1. Epilepsy. Epidemiology, classification, etiology, pathogenesis. Classification of epileptic seizures. Symptoms of focal and generalized epileptic seizures.
2. Diagnosis of epilepsy. Differential diagnostics of the epileptic seizures, syncope and hysterical seizures.
3. Status epilepticus. Emergency care for epileptic seizure and status.
4. Anticonvulsant therapy. Absolute and relative contraindications to work. Treatment of pharmaco-resistant epilepsy: drug therapy, ketogenic diet, surgical.
5. International classification of the facial pain and headache.
6. Migraine. Pathogenesis, classification, clinic, diagnosis, treatment, prevention.
7. Tension headache. Etiology, pathogenesis, clinic, diagnosis, differential diagnosis, treatment and prevention.
8. Cluster headache. Etiology, pathogenesis, clinic, diagnosis, differential diagnosis, treatment and prevention.
9. Trigeminal neuralgia. Etiology, pathogenesis, clinic, diagnosis, differential diagnosis, treatment. Surgical treatment and its types.

*Supervision of thematic patients; discussion of clinical cases.*

### **15. Traumatic brain and spinal cord injury. Neurosurgical treatment of vascular diseases of nervous system.**

1. Epidemiology, classification, etiology, pathogenesis of the brain and spinal cord injury.
2. Mild traumatic brain injury: concussion and contusion of the brain. Clinic, diagnosis, treatment.
3. The moderate traumatic brain injury. Clinic, diagnosis, treatment.
4. Severe traumatic brain injury. Clinic, diagnosis, treatment.
5. Intracranial traumatic hemorrhages. Clinic, diagnosis, methods of surgical treatment.
6. Peculiarities of the traumatic brain injury in children, elderly and old ages and injuries due to alcohol intoxication.
7. Prevalence, mechanisms, classification, pathogenesis of spinal cord injury. Diagnosis of the level and degree of the spinal cord lesion (concussion, contusion, compression). The principles of conservative and surgical treatment.
8. Complications and sequelae of the traumatic brain and spinal cord injury. Emergency care and transportation of the patients. The principles of rehabilitation.
9. Carotid-cavernous anastomosis. Etiology, symptoms, diagnosis, treatment.
10. Cerebral aneurysms. Etiology, symptoms, diagnosis, surgical treatment.
11. Arteriovenous malformations. Symptoms, diagnosis, surgical treatment.
12. Surgical treatment of occlusive processes of extra- and cerebral vessels.

*Supervision of thematic patients; discussion of clinical cases. Computer testing in neurology and neurosurgery*

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