

MINISTRY OF HEALTH OF THE REPUBLIC OF BELARUS
Educational Institution
BELARUSIAN STATE MEDICAL UNIVERSITY

**Контрольный
экземпляр**

APPROVED

by Rector of the Educational
Institution «Belarusian State
Medical University»

S.P. Rubnikovich

26.06.2024

Reg. #UD-09/1-01-16/2425/edu.

NEUROLOGY AND NEUROSURGERY

**Curriculum of the educational institution
in the academic discipline for the specialty**

1-79 01 01 «General Medicine»

Curriculum is based on the educational program «Neurology and Neurosurgery», approved 26.06.2024, registration # УПД-0911-01-16; on the educational plan in the specialty 1-79 01 01 «General Medicine», approved 15.05.2024, registration # 7-07-0911-01/2425/mf.

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RECOMMENDED FOR APPROVAL:

by the Department of Nervous and Neurosurgical Diseases of the educational institution «Belarusian State Medical University»
(protocol # 17 of 17.05.2024);

by the Scientific and Methodological Council of the educational institution «Belarusian State Medical University»
(protocol # 18 of 26.06.2024)

EXPLANATORY NOTE

«Neurology and Neurosurgery» – the academic discipline of the module «Therapy Module #2», which contains systematized scientific knowledge about etiology, pathogenesis, clinical manifestations, methods of diagnosis, treatment and prevention of diseases of the nervous system.

The aim of the discipline «Neurology and Neurosurgery» is the formation of specialized competency for providing medical care to patients with diseases of the nervous system.

The objectives of the academic discipline «Neurology and Neurosurgery» are to develop in students scientific knowledge about nervous diseases, skills and abilities necessary for:

- identifying the most common symptoms and syndromes of damage to the central and peripheral nervous system;

- studies of the functional state of the nervous system and diagnosis of diseases of the nervous system;

- interpretation of the results of clinical, laboratory and instrumental diagnostic methods used for neurological diseases;

- determining intervention strategies for emergency conditions in neurology.

The knowledge, abilities and skills acquired in the study of the academic discipline «Neurology and Neurosurgery» are necessary for the successful study of the academic disciplines: «Internal Medicine», «Infectious Diseases», «Radiation Diagnostics and Radiation Therapy», «Otorhinolaryngology and Dentistry», «Ophthalmology», «Psychiatry and Narcology».

Studying the educational discipline «Neurology and neurosurgery» should ensure the formation of students' specialized competency: use knowledge of clinical symptoms, apply methods of patient examination, diagnosis and differential diagnosis, principles of treatment and prevention, make clinical diagnosis of dermatovenerological pathology, tuberculosis, major neurological and infectious diseases.

As a result of studying the discipline «Neurology and Neurosurgery» the student should

know:

- etiology, pathogenesis, classification, clinical manifestations, diagnosis and differential diagnosis, methods of treatment and prevention of diseases and damage to the central and peripheral nervous system;

- the basics of medical examination and rehabilitation of patients, the principles of medical and social examination of diseases and injuries of the central and peripheral nervous system.

be able to:

- conduct a neurological examination of the patient;

- draw up a plan for examining patients with neurological and neurosurgical diseases;

- determine indications for laboratory and instrumental diagnostic methods;

interpret the results of clinical, laboratory and instrumental methods for studying diseases and injuries of the central and peripheral nervous system;

formulate a diagnosis of diseases of the central and peripheral nervous system;

carry out differential diagnosis of nervous diseases;

provide emergency medical care for stroke, epileptic seizure, myasthenic crisis, traumatic brain injury;

draw up medical documentation for diseases and injuries of the central and peripheral nervous system.

master:

methods of clinical examination of the central and peripheral nervous system;

methods of interpreting the results of instrumental and laboratory studies in neurological pathology (neuroimaging, neurophysiological research methods, laboratory diagnostic methods).

Total number of hours for the study of the discipline is 216 academic hours, of which 108 classroom hours and 108 hours of student independent work. Classroom hours according to the types of studies: lectures – 30 hours (including 9 hours of supervised student independent work (SSIW)), practical classes – 78 hours.

Intermediate assessment is carried out according to the syllabus of the specialty in the form of a credit (7 semester) and graded credit (8 semester).

Form of higher education – full-time.

ALLOCATION OF ACADEMIC TIME ACCORDING TO SEMESTERS OF STUDY

Code, name of the specialty	semester	Number of academic hours						Form of intermediate assessment
		total	in-class	Including			out-of-class self-studies	
				lectures	supervised student independent work	practical classes		
1-79 01 01 «General Medicine»	7	108	57	12	3	42	51	credit
	8	108	51	9	6	36	57	differentiated credit
		216	108	21	9	78	108	

THEMATIC PLAN

Name of the section (topic)	Number of hours of classroom classes	
	lectures (including SSIW)	practical
1. General Neurology	4,5	30
1.1. Motor system. Research methods and lesion syndromes	1,5	6
1.2. Sensory system. Research methods and lesion syndromes	1,5	6
1.3. Cranial nerves. Research methods and lesion syndromes	-	6
1.4. The cerebellum and the extrapyramidal system. Autonomic nervous system. Research methods and lesion syndromes	-	6
1.5. Higher nervous activity. Higher cortical (mental) functions. Syndromes of damage to the lobes of the brain	1,5	-
1.6. Cerebrospinal fluid. Meningeal syndrome. Lumbar puncture. Syndromes of brain and spinal cord lesions	-	6
2. Special Neurology	21	30
2.1. Methods for assessing the neurological status. Making topical and clinical diagnoses	-	6
2.2. Cerebral circulation disorders. Cerebral infarction. Intracerebral hemorrhage. Subarachnoid hemorrhage	1,5	6
2.3. Infectious diseases of the nervous system. Meningitis, encephalitis, poliomyelitis, myelitis. Demyelinating diseases of the central and peripheral nervous system. Acute disseminated encephalomyelitis. Multiple sclerosis. Guillain-Barré syndrome	3	6
2.4. Diseases of the peripheral nervous system. Neuropathies, neuralgia, polyneuropathies. Neurological manifestations of osteochondrosis of the spine	3	3
2.5. Epilepsy and other paroxysmal conditions	3	3
2.6. Degenerative diseases of the nervous system. Parkinson. Amyotrophic lateral sclerosis. Dementia. Neuromuscular diseases. Male. Diseases of the autonomic nervous system	7,5	6
2.7. Headaches: issues of diagnosis and treatment. Facial pain: algorithm of differentiated diagnosis, principles of treatment	3	-
3. Neurosurgery	4,5	18
3.1. General principles of neurosurgery. Neurosurgical treatment of lesions of the peripheral nervous system	-	6

Name of the section (topic)	Number of hours of classroom classes	
	lectures (including SSIW)	practical
3.2. Traumatic brain injury and spinal cord injury	1,5	6
3.3. Vascular diseases of the central nervous system	1,5	3
3.4. Brain tumors	1,5	3
Total Hours	30	78

CONTENT OF THE EDUCATIONAL MATERIAL

1. General Neurology

1.1. Motor system. Research methods and lesion syndromes

Characteristics of the motor pathway. Central and peripheral motor neurons. The motor sphere as an interaction of the system of voluntary movements, the extrapyramidal system and the system of coordination of movements. Definition of the concept of «reflex». Classification of reflexes. Reflex arc. Phasic and tonic reactions. Gamma loop. Characteristics and features of surface reflexes. Characteristics and significance of pathological reflexes: foot, hand, axial. Movement disorders: paralysis and paresis. Symptoms of central (spastic) paresis. Symptoms of peripheral (flaccid) paresis. Disorders of voluntary movements. Mono-, hemi-, tetra-, paraparesis. Syndromes of movement disorders with lesions of the hemispheres, brainstem, spinal cord, roots and plexuses, peripheral nerves.

Methods of studying the motor sphere. Methods for determining the strength, volume and nature of movements, assessing muscle tone, and inducing reflexes.

1.2. Sensitive system. Research methods and lesion syndromes

Concepts of reception, sensation, perception. Structure of a sensitive analyzer. Clinical classification of types of sensitivity.

Conductive pathways of superficial and deep sensitivity. Types and types of sensitive disorders. Syndromes of sensitivity disorders in lesions of the cerebral hemispheres, brain stem, spinal cord, peripheral nerves, plexuses, spinal roots.

Methods of sensitivity research. Symptoms of tension in diseases and injuries of nerve trunks.

1.3. Cranial nerves. Research methods and lesion syndromes

Clinical neuroanatomy of the olfactory analyzer, its functions. Levels of damage and variants of smell disorders. Methods of studying the olfactory analyzer.

Clinical neuroanatomy of the visual analyzer. Changes in visual acuity and fields when various parts of the visual analyzer are affected. Variants of hemianopsia. Damage to the cortical part of the visual analyzer. Methods of studying the visual analyzer.

Clinical neuroanatomy of the oculomotor nerves – III, IV and VI pairs; innervation of the oculomotor muscles. Symptoms of oculomotor disorders. Autonomic innervation of the eye. Pupils' reactions to light, accommodation and convergence. Posterior longitudinal beam system. Innervation of the gaze. Variants of

disorders in lesions of various parts of the nervous system. Methods of studying oculomotor nerves.

Clinical neuroanatomy of the trigeminal nerve. Zones of sensitive innervation and ensuring the functions of the masticatory muscles. Corneal, brow and mandibular reflexes. Types of sensitivity disorders on the face. Methods of trigeminal nerve examination.

Clinical neuroanatomy of the facial nerve. Innervation of mimic muscles. Structure and functions of the intermediate nerve. Features of facial nerve damage at different levels. Differential diagnosis of central and peripheral paresis of the mimic muscles. Methods of examining the facial nerve.

Clinical neuroanatomy of the vestibular system. Symptoms of lesions of the vestibular system at different levels. Variants of dizziness and nystagmus. Methods of examination of the vestibular system. HINTS (Head Impulse, Nystagmus, Test of Skew) test. Dix-Hallpike test. Epley's maneuver.

Clinical neuroanatomy of the glossopharyngeal, vagus, hypoglossal nerves, their functions, research methods, symptoms of damage. Bulbar and pseudobulbar syndromes.

Clinical neuroanatomy of the accessory nerve, nerve function, research methods, symptoms of damage.

1.4. The cerebellum and the extrapyramidal system. Autonomic nervous system. Research methods and lesion syndromes

Morphological and functional organization of the extrapyramidal system. Striopallidar system. Participation of the extrapyramidal system in human movements. Pallidar and striatal syndromes: parkinsonism syndrome and hyperkinetic syndrome. Criteria for parkinsonism. Variants of hyperkinesia: chorea, athetosis, torsion dystonia, hemiballism, tics, myoclonus, others.

Cerebellum. Functional significance of the connections of the cerebellum with other structures of the nervous system. Symptoms of cerebellar damage. Ataxia. Types of ataxias: cerebellar (static, dynamic), sensitive, vestibular, cortical, psychogenic.

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 divisions of the autonomic nervous system.

Methods of studying the vegetative sphere (tone, reactivity, vegetative support of activity). Syndromes of autonomic disorders with damage to various parts of the autonomic nervous system. Regulation of pelvic organ functions, variants of disorders.

1.5. Higher nervous activity. Higher cortical (mental) functions. Syndromes of damage to the lobes of the brain

Neuroanatomy and physiology of the cerebral cortex. Structural and functional organization of higher cortical (brain) functions. Structure of analyzers. The concept of signaling systems. Theory of functional systems. Localization of functions in the cerebral cortex. Motor and sensory representations in the cortex. The concept of functional asymmetry of the cerebral hemispheres.

Speech as the highest function of the human nervous system. Localization of speech centers. Participation of various parts of the nervous system in the implementation of speech functions. Impression and expressive speech. Aphasia: afferent motor, efferent motor, dynamic motor, sensory, amnesic, acoustic-mnesic, semantic. Total aphasia. Methods of studying speech functions. Alexia, agraphia, acalculia, amusia.

Gnosis. Variants of agnosia: visual, auditory, olfactory, gustatory, sensitive (astereognosia, autotopagnosia, anosognosia, prosognosia). Methods of gnosis research.

Praxis, research methods. Types of apraxia: ideatory, ideomotor, spatial, constructive, motor.

Structural and functional support of memory, assessment methods. Amnesia and its variants.

Definition of consciousness and criteria of its state. Scale of quantitative changes in consciousness: stunning, sopor, coma. Glasgow Coma Scale. Coma scale FOUR (Full Outline of Unresponsiveness). Psychomotor agitation, delirium, twilight confusion, dementia, chronic vegetative state.

Assessment of higher brain functions (gnosis, praxis, reading, writing, speech, memory, thinking)

1.6. Cerebrospinal fluid. Meningeal syndrome. Lumbar puncture. Syndromes of brain and spinal cord lesions

Meninges of the brain and spinal cord. Subdural and subarachnoid spaces, venous sinuses of the dura mater.

Blood-brain barrier. Circulation and resorption of cerebrospinal fluid. Meningeal syndrome. Features of the meningeal symptom complex in children. Intracranial hypertension syndrome.

Lumbar (suboccipital, ventricular) puncture: indications, contraindications, methodology, complications. Examination of cerebrospinal fluid. Features of lumbar puncture in young children. Parameters in the cerebrospinal fluid are normal and in neurological diseases. Syndromes of cell-protein and protein-cell dissociation. Monitoring of intracranial pressure.

Damage to the frontal lobe. Lesion of the parietal lobe. Damage to the temporal lobe. Occipital lobe lesions.

Damage to the corpus callosum. Damage to the internal capsule. Damage to the hypothalamic-pituitary region. Damage to the thalamic area. Damage to the basal nuclei area. Damage to the cerebellum.

Damage to the roof of the midbrain. Lesions of the cerebral legs. The bridge was hit. Damage to the medulla oblongata.

Lesion of the upper cervical spinal cord (CI-CIV). Lesion of the lower cervical spinal cord (CV-CVIII). Lesion of the thoracic spinal cord. Lesion of the lumbar spinal cord. Damage to the conus of the spinal cord. Lesion of the spinal cord cone. Defeat of the «horse tail».

Damage to the brachial plexus. Damage to the median nerve. Ulnar nerve damage. Damage to the radial nerve. Lumbar plexus lesion. Damage to the femoral

nerve. Damage to the sciatic nerve. Damage to the tibial nerve. Peroneal nerve damage.

Determination of indications for lumbar puncture and interpretation of the results of the cerebrospinal fluid examination.

2. Special Neurology

2.1. Methods for assessing the neurological status. Making topical and clinical diagnoses

Complaints of patients with neurological diseases. Medical history. Life history. Somatic status data. Neurological status data. Motor sphere: muscle tone, deep and superficial reflexes, pathological reflexes. Sensitivity: the scheme of segmental innervation of the human body, types and types of sensitivity disorders. Examination of cranial nerve functions. Coordination of movements. Meningeal symptoms. Autonomic nervous system. Additional research methods for neurological diseases. Topical diagnostics of diseases of the nervous system. Differential diagnosis. Clinical diagnosis of diseases of the nervous system. Principles of treatment.

Interpretation of neuroimaging results (X-ray, computed tomography, magnetic resonance imaging) and ultrasound examination for underlying neurological pathology.

Rules of Medical Ethics and Deontology.

Collection of complaints and anamnesis from a patient with neurological diseases.

Assessment of the patient's condition according to the Glasgow Coma Scale.

Assessment of the neurological status of a patient with diseases of the central and peripheral nervous system

2.2. Cerebral circulation disorders. Cerebral infarction. Intracerebral hemorrhage. Subarachnoid hemorrhage

Major arteries of the head and neck. Arterial circle of the brain, its physiological significance. Features of the structure of cerebral vessels. Blood supply zones of the anterior cerebral arteries, middle cerebral arteries and posterior cerebral arteries. Blood supply to the cerebellum and brainstem. Main pathways of venous outflow. Collateral circulation systems of the brain. Features of innervation of cerebral vessels. Mechanisms of autoregulation of cerebral blood flow. The concept of perfusion cerebral pressure.

Blood supply to the spinal cord. Features of the formation of the upper, middle and lower arterial spinal basins. Pathways of venous outflow.

Morbidity, structure, prevalence of vascular diseases of the nervous system. Etiology and main pathogenetic mechanisms of cerebral circulation disorders, correlation of etiological and pathogenetic factors, classification.

Definition and classification of stroke risk factors. Modifiable (correctable) and non-modifiable (non-correctable) risk factors for stroke.

Clinical manifestations of transient cerebral circulation disorders: transient ischemic attack, cerebral hypertensive crisis, transient global amnesia.

Cerebral infarctions: atherothrombotic, cardioembolic, lacunar, other established etiology. Cryptogenic cerebral infarction. Features of cerebral infarction

in lesions of the vessels of the carotid system (anterior, middle and posterior cerebral arteries). Features of cerebral infarction with damage to the vessels of the vertebro-basilar system. Acute impairment of cerebral circulation in antiphospholipid syndrome. Features of the assessment of the neurological status and supervision of patients with cerebral infarction. BE FAST Screening Scale. National Institutes of Health Stroke Scale (NIHSS).

Intracerebral (parenchymal) hemorrhage. Non-traumatic subarachnoid hemorrhage (hypertensive, aneurysmal, etc.). Ventricular hemorrhage. Mixed (subarachnoid-parenchymal hemorrhage, parenchymal-ventricular) hemorrhage. Etiology, pathogenesis, features of clinical manifestations of intracerebral hemorrhage depending on localization. Features of the assessment of the neurological status and supervision of patients with intracerebral and subarachnoid hemorrhage. Indications for surgical treatment.

Instrumental research methods for acute cerebral circulation disorders: computed tomography, magnetic resonance imaging, angiography. Duplex scanning of precerebral arteries. Transcranial Dopplerography.

Scheme of examination and diagnosis of patients with acute cerebral circulation disorders.

Features of the management of patients with acute cerebral circulation disorders. Emergency medical care for acute cerebral circulation disorders. Basic (undifferentiated) and special (differentiated) therapy of acute cerebral circulation disorders. Reperfusion technologies: intravenous thrombolytic therapy, X-ray endovascular surgery: indications and contraindications for use.

Primary and secondary prevention of acute cerebral circulation disorders. Stroke prediction capabilities.

Chronic disorders of cerebral circulation. Dyscirculatory encephalopathy: classification, clinical manifestations, diagnosis and treatment. Features of the assessment of the neurological status and supervision of patients with chronic cerebral circulation disorders.

Spinal circulation disorders: classification, variants of the clinical course, diagnosis, treatment. Features of the assessment of the neurological status and supervision of patients with spinal circulation disorders.

Assessment of the neurological status of a stroke patient.

Interpretation of neuroimaging and ultrasound results in major diseases of the nervous system.

2.3. Infectious diseases of the nervous system. Meningitis, encephalitis, poliomyelitis, myelitis. Demyelinating diseases of the central and peripheral nervous system. Acute disseminated encephalomyelitis. Multiple sclerosis. Guillain-Barré syndrome

Classification of meningitis. Purulent and serous meningitis. Bacterial, viral, fungal, protozoal meningitis. Primary and secondary meningitis. The main characteristic of meningeal syndrome. Clinical manifestations of meningitis. Changes in cerebrospinal fluid.

Purulent meningitis. Meningococcal meningitis: clinical manifestations, forms, features of the course, diagnosis. Meningitis caused by *Haemophilus influenzae*

Afanasyev-Pfeiffer, *Pseudomonas aeruginosa*, *Proteus*, pneumococcal, staphylococcal. Orogenic meningitis.

Serous meningitis, enteroviral meningitis, mumps meningitis: clinical manifestations, diagnosis, principles of treatment. Tuberculous meningitis: clinical manifestations, diagnosis and principles of treatment. Lymphocytic choriomeningitis. Complications of meningitis.

Features of the assessment of the neurological status and supervision of patients with meningitis. Differential diagnosis of meningitis by the analysis of cerebrospinal fluid. Modern principles of antibacterial therapy of meningitis.

Classification of encephalitis. Primary and secondary (post- and parainfectious) encephalitis, main clinical manifestations. Changes in cerebrospinal fluid.

Herpetic encephalitis: clinical manifestations, diagnosis, principles of treatment. Tick-borne encephalitis: forms of the disease, clinical manifestations, diagnosis, principles of treatment and prevention. Features of the assessment of the neurological status and supervision of patients with encephalitis.

Autoimmune encephalitis (encephalitis with antibodies to NMDA receptors, limbic encephalitis, Hashimoto's encephalopathy, PANDAS syndrome (Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal infections), CLIPPERS (Chronic lymphocytic inflammation with pontine perivascular enhancement responsive to steroids): clinical manifestations, diagnosis, principles of therapy.

Poliomyelitis: clinical forms, diagnosis, principles of treatment, prevention. Features of the assessment of the neurological status and supervision of patients with poliomyelitis. Poliomyelitis-like diseases.

Measles, chickenpox, rubella, mumps encephalomyelitis. Post-vaccination lesions of the nervous system.

Intrauterine infections (TORCH infections): rubella, toxoplasmosis, herpes infection, cytomegalovirus infection.

Damage to the nervous system in influenza, HIV infection and syphilis: clinical forms, diagnosis, treatment, prevention.

Prion diseases of the nervous system. Creutzfeldt-Jakob disease and others: clinical forms, diagnosis, treatment, prevention.

Damage to the nervous system in parasitic diseases. Damage to the nervous system in toxoplasmosis, cysticercosis, echinococcosis: clinical forms, diagnosis, principles of treatment, prevention. Features of assessment of the neurological status and supervision of patients with parasitic diseases.

Damage to the nervous system in neuroborreliosis. Etiology of neuroborreliosis, characteristics of clinical forms, damage to the central and peripheral nervous system. Diagnosis, principles of treatment, prevention of neuroborreliosis. Features of the assessment of the neurological status and supervision of patients with neuroborreliosis.

Neurological manifestations and clinical and laboratory diagnosis of COVID-19 infection.

Ensuring epidemiological safety in the provision of medical care.

Demyelinating diseases. Acute disseminated encephalomyelitis: etiology, pathogenesis, clinical manifestations, diagnosis, differential diagnosis, principles of treatment. Features of neurological status assessment and curation of patients with acute disseminated encephalomyelitis.

Multiple sclerosis: modern ideas about etiology and pathogenesis, main neurological syndromes, clinical forms, Expanded Disability Status Scale (EDSS), diagnostic criteria (MacDonald criteria), informative value of instrumental research methods, differential diagnosis. Features of neurological status assessment and supervision of patients with multiple sclerosis. Modern principles of exacerbation treatment. Technologies that modify the clinical course of the disease. Immunomodulators. Immunosuppressive drugs. Cell technologies in the treatment of multiple sclerosis. Diseases of the spectrum of neuromyelitis optica. MOG-IgG-associated demyelinating disease: criteria, clinical manifestations, diagnosis, principles of therapy.

Guillain-Barré syndrome: clinical manifestations, diagnosis, treatment. Chronic inflammatory demyelinating polyradiculoneuropathy: clinical manifestations, diagnosis, treatment.

Assessment of the neurological status of a patient with infectious and inflammatory disease of the nervous system.

2.4. Diseases of the peripheral nervous system. Neuropathies, neuralgia, polyneuropathies. Neurological manifestations of osteochondrosis of the spine

Structure of morbidity and classification of diseases of the peripheral nervous system. Forms of damage to various parts of the peripheral nervous system. Radiculopathy, dorsopathy, plexopathy, neuropathy, neuralgia, polyneuropathy. Features of the assessment of the neurological status and supervision of patients with diseases of the peripheral nervous system.

Classification of polyneuropathies (infectious, autoimmune, toxic, dysmetabolic, idiopathic and hereditary). Diphtheria polyneuropathy: clinical manifestations and prevention. Diabetic polyneuropathy: clinical manifestations, treatment. Alcoholic polyneuropathy: clinical manifestations, treatment. Differential diagnosis of inflammatory demyelinating and dysmetabolic polyneuropathies.

Neuropathies of the radial, ulnar, median, peroneal, tibial and sciatic nerves: etiology, pathogenesis, clinical manifestations, diagnosis, differential diagnosis, principles of treatment, prevention.

Definition of the concept of «osteochondrosis of the spine». Functions of the intervertebral disc. Vertebral motor segment. Theories of osteochondrosis of the spine. Herniated discs: protrusion (protrusion), prolapse (prolapse). Median, paramedian, posterolateral, lateral (foraminal) herniated discs. X-ray signs of osteochondrosis of the spine (severity of osteochondrosis according to Zecker). Neuroimaging picture of osteochondrosis of the spine (classification of vertebral changes according to the Modic type 1, 2, 3). Dimensions of the spinal canal.

Classification of neurological manifestations of osteochondrosis of the spine (reflex, radicular and radicular-vascular syndromes at the cervical, thoracic and lumbosacral levels). Clinical phases of the course of osteochondrosis of the spine. Differential diagnosis of reflex and radicular syndromes of osteochondrosis of the

spine. Cervical reflex and radicular syndromes (cervicalgia, cervicocranialgia, cervicobrachialgia, radiculopathy). Thoracalgia. Reflex syndromes at the lumbosacral level (lumbago, lumbalgia, lumbosciatica). Reflex and reflected vertebro-visceral and viscerovertebral pain syndromes. Lumbosacral radiculopathy. Vertebrogenic and discogenic radiculomyeloidemia. Differential diagnosis of vertebrogenic lesions of the nervous system. Ideas about myofascial pain syndrome and fibromyalgia. Methods and possibilities of instrumental diagnostics of vertebrogenic lesions of the nervous system.

Principles of treatment of neurological manifestations of osteochondrosis of the spine: conservative therapy, therapeutic drug blockades (indications and contraindications for use). Methods of physiotherapy, massage, therapeutic exercises, acupuncture. Surgical treatment of neurological manifestations of osteochondrosis of the spine. Indications for surgical treatment. Examination of temporary disability. Prevention of osteochondrosis of the spine and its neurological manifestations. Sanatorium-resort treatment.

Assessment of the neurological status of a patient with non-specific back pain. Determination of clinical phenotypes of pain syndromes.

2.5. Epilepsy and other paroxysmal conditions

Definition of epilepsy. Etiology of epilepsy. Incidence and prevalence of epilepsy. The role of hereditary factors in the development of epilepsy. Mechanisms of epileptogenesis.

Classification of Epilepsies and Epileptic Seizures (ILAE, 2017) Semiology of Epileptic Seizures. Febrile convulsions in children. Factors and conditions that provoke the development of epileptic seizures.

Electroencephalography (EEG) in the diagnosis of epilepsy, examination plan for patients with epileptic seizures. Computer methods of EEG analysis, EEG mapping, EEG monitoring.

Primary medical care for generalized convulsive seizure. Principles of epilepsy treatment. Indications for surgical treatment of epilepsy.

Status epilepticus: definition, causes, principles of treatment.

Non-epileptic paroxysmal states. Differential diagnosis of epilepsy and similar conditions (syncopal, psychogenic conditions, sleep-related disorders, non-epileptic myoclonus, migraine and similar conditions, extrapyramidal disorders). Features of assessing the neurological status of patients with epilepsy. Ability to work in patients with epilepsy.

Assessment of the neurological status of a patient with status epilepticus.

2.6. Degenerative diseases of the nervous system. Parkinson. Amyotrophic lateral sclerosis. Dementia. Neuromuscular diseases. Male. Diseases of the autonomic nervous system

The concept of clinical polymorphism. Genealogical analysis. Screening for hereditary diseases. Medical genetic counseling. Nanobiotechnological methods for diagnosing hereditary pathology. DNA sequencing. DNA diagnostics: direct and indirect. Providing medical care to patients with genetic pathology. Prevention of genetic pathology in the Republic of Belarus.

Classification of neuromuscular diseases. Myasthenia gravis: etiology, pathogenesis, clinical manifestations, diagnosis, differential diagnosis, treatment. Features of the assessment of the neurological status and supervision of patients with myasthenia gravis.

Progressive muscular dystrophies. Dystrophinopathies (Duchenne and Becker muscular dystrophies): types of inheritance, clinical manifestations, diagnostic criteria, differential diagnosis. Emery-Dreyfus muscular dystrophy: types of inheritance, clinical manifestations, diagnostic criteria, differential diagnosis. Landouzy-Dejerine facial scapulohumeral muscular dystrophy: types of inheritance, clinical manifestations, diagnostic criteria, differential diagnosis. Davidenkov's scapuloperoneal muscular dystrophy: types of inheritance, clinical manifestations, diagnostic criteria, differential diagnosis. Erb-Roth limb-cingulate muscular dystrophy: types of inheritance, clinical manifestations, diagnostic criteria, differential diagnosis. Distal muscular dystrophy with late onset (Welander type): types of inheritance, clinical manifestations, diagnostic criteria, differential diagnosis. General approaches to the treatment of muscular dystrophies.

Spinal amyotrophies. Proximal spinal amyotrophies in childhood: type I, or acute malignant infantile spinal amyotrophy Werdnig-Hoffmann; type II, or chronic infantile spinal amyotrophy (intermediate type); type III, or Kugelberg-Welander juvenile spinal amyotrophy. Types of inheritance, clinical manifestations, diagnostic criteria, differential diagnosis. Spinal amyotrophies of adults: types of inheritance, clinical manifestations, diagnostic criteria, differential diagnosis. Kennedy-Stephanie-Chukagoshi bulbospinal amyotrophy: types of inheritance, clinical manifestations, diagnostic criteria, differential diagnosis. Principles of treatment of spinal amyotrophies. Features of the assessment of the neurological status and supervision of patients with hereditary, degenerative and neuromuscular diseases.

Miotonius Thomson and Becker. Myotonic dystrophy. Clinical manifestations, diagnostic criteria, differential diagnosis, approaches to the treatment of myotonias. Features of the assessment of the neurological status and supervision of patients with myotonia.

Classification of hereditary polyneuropathies. Hereditary motor-sensory neuropathies (NMSN). Charcot-Marie-Tooth disease: demyelinating and axonal forms. Types of inheritance, clinical manifestations, diagnostic criteria, differential diagnosis, approaches to the treatment of NMSN. Features of the assessment of the neurological status and supervision of patients with hereditary polyneuropathies.

Hereditary spastic paraplegia (Strumpel's disease): isolated hereditary spastic paraplegia and «plus» paraplegia. Types of inheritance, clinical manifestations, diagnostic criteria, differential diagnosis, principles of treatment. Features of the assessment of the neurological status and supervision of patients with hereditary spastic paraplegia.

Spinocerebellar ataxias. Friedreich's disease: types of inheritance, clinical manifestations, diagnostic criteria, differential diagnosis, principles of treatment. Sporadic forms of spinocerebellar degenerations (Olivopontocerebellar atrophy of Dejerine-Thomas, late cortical cerebellar atrophy of Marie-Foix-Alajouanin): clinical manifestations, diagnostic criteria, differential diagnosis, principles of treatment.

Parkinson's disease: etiology, pathogenesis, clinical manifestations, diagnosis, differential diagnosis, treatment. The degree of movement disorders according to the Hen-Yar scale. Principles of Parkinson's disease treatment. Indications for surgical treatment. Features of the assessment of the neurological status and supervision of patients with Parkinson's disease.

Huntington's disease: types of inheritance, etiology, pathogenesis, clinical manifestations, diagnosis, differential diagnosis, treatment. Features of the assessment of the neurological status and supervision of patients with Huntington's disease.

Wilson's disease (hepatolenticular degeneration): types of inheritance, forms, clinical manifestations, diagnostic criteria, differential diagnosis, treatment approaches. Features of the assessment of the neurological status and supervision of patients with hepatolenticular degeneration.

Classification of dementias. Alzheimer's disease: etiology, pathogenesis, clinical manifestations, diagnosis, differential diagnosis, principles of treatment and prevention. Features of the assessment of the neurological status and supervision of patients with neurodegenerative diseases.

Definition and classification of motor neuron disease (MND). Amyotrophic lateral sclerosis (ALS), progressive bulbar palsy, progressive muscle atrophy, primary lateral sclerosis. ALS: terminology, modern ideas about etiology and pathogenesis, main neurological syndromes, clinical forms, types of course, stages. Examination for ALS. El Escorial criteria for the diagnosis of ALS. Differential diagnosis. Pathogenetic and palliative therapy for ALS. Features of the assessment of the neurological status and supervision of patients with MND.

Syringomyelia: etiology and pathogenesis, classification, clinical forms, diagnosis, differential diagnosis, principles of therapy. Syringobulbia. Features of the assessment of the neurological status and supervision of patients with syringomyelia.

Interpretation of the results of electroencephalography, electromyography, electroneuromyography.

2.7. Headaches: issues of diagnosis and treatment. Facial pain: algorithm of differentiated diagnosis, principles of treatment

Relevance of the problem. Clinical neuroanatomy of the face. Neurovascular topography of the area of the cerebellar bridge angle and the adjacent zone. Innervation of the facial skin. Features of the assessment of the neurological status and supervision of patients with headache and facial pain.

International Classification of Headaches and Facial Pains. Primary headaches. Migraine: etiology, pathogenesis, classification, clinical manifestations, diagnosis, differential diagnosis, principles of treatment and prevention. Tension-type headache: etiology, pathogenesis, classification, clinical manifestations, diagnosis, differential diagnosis, principles of treatment and prevention. Cluster headache and other trigeminal autonomic (autonomous) cephalgias: etiology, pathogenesis, classification, clinical manifestations, diagnosis, differential diagnosis, principles of treatment and prevention. Secondary headaches. Headaches and facial pains associated with pathology of the skull, neck, eyes, ears, nasal cavity, sinuses, teeth, oral cavity or other structures of the skull and face: etiology, pathogenesis, clinical manifestations,

diagnosis, differential diagnosis, principles of treatment and prevention. Headache or facial pain associated with pathology of the temporomandibular joint: etiology, pathogenesis, clinical manifestations, diagnosis, differential diagnosis, principles of treatment and prevention.

Cranial neuralgia and central causes of headache. Trigeminal neuralgia. Classic trigeminal neuralgia. Symptomatic trigeminal neuralgia. Etiology and pathogenesis of neuralgia, clinical manifestations, diagnostic criteria, differential diagnosis, principles of conservative treatment. Surgical approaches: microvascular decompression of the trigeminal nerve root, percutaneous radiofrequency destruction, stereotactic radiosurgery (gamma knife). Facial psychalgia. Stomaalgia, glossalgia, glossodynia: etiology, pathogenesis, clinical manifestations, diagnosis, differential diagnosis, principles of treatment and prevention.

Determination of clinical phenotypes of pain syndromes.

3. Neurosurgery

3.1. General principles of neurosurgery. Neurosurgical treatment of lesions of the peripheral nervous system

Basic principles of neurosurgical operations. Craniocerebral topography. Lumbal, suboccipital and ventricular punctures. Myelography. Ventriculography. X-ray computed tomography (RCT). RCT angiography. RCT ventriculography. Magnetic resonance imaging (MRI). MRI angiography. MRI myelography. Single-photon emission tomography and positron emission tomography.

The idea of trephination and craniotomy (resection and osteoplastic). Methods of stopping bleeding.

General ideas about microsurgical, stereotactic, endoscopic and endovascular technologies in neurosurgery. Laminectomy technique. Main accesses to peripheral nerves. Neurolysis and nerve suture technique.

Modern possibilities of surgical treatment of trigeminal neuralgia: microvascular decompression of the trigeminal nerve root, percutaneous radiofrequency destruction, stereotactic radiosurgery (gamma knife).

Traumatic injury of the brachial plexus: mechanisms, clinical manifestations, diagnosis, treatment. Mechanisms of traumatic injuries of peripheral nerves, functional and morphological variants of injuries, main neurological syndromes. Terminology and formulation of the diagnosis. Methods of instrumental diagnostics, electromyography, electroneuromyography. Conservative and surgical treatment of traumatic injuries of peripheral nerves. Rehabilitation of victims with peripheral nerve injuries. Outcomes of traumatic injuries of peripheral nerves, examination of temporary disability.

Surgical treatment of neurological manifestations of osteochondrosis of the spine: options for surgical interventions, outcomes, rehabilitation of patients after surgical treatment, examination of temporary disability.

3.2. Traumatic brain injury and spinal cord injury

Clinical epidemiology of traumatic brain injury, classification. Pathological anatomy and pathogenesis of craniocerebral injuries: the idea of primary and secondary, diffuse and focal injuries. Traumatic brain disease.

Clinical manifestations and diagnosis of concussion and contusion. Features of clinical manifestations of diffuse axonal brain damage. Clinical manifestations and diagnosis of the main forms of brain compression: epidural, subdural and intracerebral hematomas, depressed fractures of the skull bones. Compression of the head. Features of craniocerebral injuries in children, the elderly and injuries against the background of alcohol intoxication. Complications and consequences of craniocerebral injuries. Formulation of the diagnosis.

X-ray of the skull and spine.

Examination plan for victims with craniocerebral injuries. Conservative treatment of patients with traumatic brain injuries. Principles of surgical treatment. Optimal terms of treatment and temporary disability for the most common forms of craniocerebral injuries. Rehabilitation of patients with traumatic brain injuries. Organization of neurotraumatological care. Features of the assessment of the neurological status and supervision of patients with traumatic brain injury.

Craniofacial traumatic injuries. Classification, clinical manifestations, diagnosis, principles of neurosurgical treatment.

Prevalence and mechanisms, classification, pathogenesis of spinal cord injury. Diagnosis of the level and degree of spinal cord injury (concussion, contusion, compression of the spinal cord). The concept of spinal shock.

Features of the provision of emergency medical care and transportation. Patient examination plan. Principles of conservative and surgical treatment. Correction of pelvic organ dysfunction and trophic disorders. Features of the assessment of the neurological status and supervision of patients with spinal cord injury. Rehabilitation of patients with spinal cord injuries.

3.3. Vascular diseases of the central nervous system

Arterial aneurysms of the brain: structure and localization. Pathogenesis and features of clinical manifestations of prehemorrhagic and hemorrhagic periods. Instrumental methods of diagnosis. Carotid and vertebral angiography. Digital selective subtraction angiography.

Management of patients with spontaneous subarachnoid hemorrhage. Clinical manifestations, principles of surgical and conservative treatment of post-hemorrhagic constrictive angiopathy (arterial spasm). Arteriovenous aneurysms (malformations): pathophysiological essence, clinical manifestations and diagnosis. Carotid-cavernous anastomoses: etiology, main clinical manifestations, diagnosis, principles of surgical treatment. Occlusive processes of the great vessels of the brain: indications and technologies of surgical treatment.

Surgical treatment of intracerebral hemorrhages. Indications and contraindications for open neurosurgery and endoscopic operations.

3.4. Brain tumors

Classification: primary and secondary tumor lesions. Clinical manifestations and features of tumor lesions of the nervous system. The main neurological syndromes in brain tumors are cerebral and focal. Intracranial hypertension syndrome.

Clinical manifestations and diagnosis of tumors of hemispheric and subtentorial localization. Clinical manifestations and diagnosis of tumors of the

chiasmatal-sellar region. Features of metastatic brain lesions. Methods for diagnosing brain tumors, patient examination plan. Principles, possibilities and outcomes of surgical treatment. Radiation therapy, chemotherapy, symptomatic treatment of brain tumors.

Classification, main neurological syndromes in tumor lesions of the spinal cord and its membranes (transverse spinal cord injury syndrome, radicular-membrane syndrome, impaired patency of the spinal subarachnoid space).

Clinical manifestations and diagnosis of extramedullary and intramedullary tumors, cauda equina tumors. Features of clinical manifestations and diagnosis of metastatic lesions of the spinal cord and its membranes. Methods of instrumental diagnostics and a plan for examining patients, principles of surgical treatment.

ACADEMIC DISCIPLINE CURRICULAR CHART OF THE ACADEMIC DISCIPLINE «NEUROLOGY AND NEUROSURGERY»

Section, topic #	Section (topic) name	Number of classroom hours		Supervised student independent work	Practical skill	Forms of control	
		lectures	practical			practical skill	current/intermediate certification
Semester 7							
	Lectures	12	-	3			
1	Clinical neuroanatomy of the motor and sensory systems. Research methods and lesion syndromes	1,5	-	1,5			electronic testing
2	Higher nervous activity. Higher cortical (mental) functions. Syndromes of damage to the lobes of the brain	1,5	-	-			
3	Headaches: Issues of Diagnosis and Treatment. Facial pain: algorithm of differentiated diagnosis, principles of treatment	1,5	-	1,5			electronic testing
4	Cerebral circulation disorder	1,5	-	-			
5	Infectious diseases of the nervous system	1,5	-	-			
6	Demyelinating diseases of the nervous system	1,5	-	-			
7	Traumatic brain injury	1,5	-	-			
8	Brain tumors	1,5	-	-			
	Practical exercises	-	42	-			
1.1	Clinical neuroanatomy of the spinal cord. Motor system. Research methods and lesion syndromes	-	6	-	Motor system assessment	performing a practical skill at the patient's bedside	ability to identify the main syndromes; solving situational problems

1.2	Clinical neuroanatomy of the spinal cord. Sensitive system. Research methods and lesion syndromes	-	6	-	Sensitivity assessment	performing a practical skill at the patient's bedside	ability to identify the main syndromes; solving situational problems
1.3	Cranial nerves. Anatomical and physiological aspects. Research methods and lesion syndromes. Bulbar and pseudobulbar syndromes	-	6	-	Assessment of cranial nerve function	performing a practical skill at the patient's bedside	ability to identify the main syndromes; solving situational problems
1.4	The cerebellum and the extrapyramidal system. Autonomic nervous system. Anatomical and physiological aspects. Research methods and lesion syndromes	-	6	-	Assessment of the functions of the cerebellum, extrapyramidal system and autonomic nervous system	performing a practical skill at the patient's bedside	ability to identify the main syndromes; solving situational problems
1.6	Cerebrospinal fluid. Meningeal syndrome. Lumbar puncture. Syndromes of brain and spinal cord lesions	-	6	-	1. Determination of indications for lumbar puncture and interpretation of the results of the study of cerebrospinal fluid. 2. Assessment of higher brain functions	performing a practical skill at the patient's bedside*	ability to identify the main syndromes; reports at practical classes; solving situational problems*; electronic tests
3.1	General principles of neurosurgery. Neurosurgical treatment of lesions of the peripheral nervous system	-	6	-			interview
3.2	Craniocerebral and spinal cord injury	-	6	-			Credit
Semester 8							
	Lecture	9	-	6			
1	Epilepsy and convulsive states	1,5	-	1,5			electronic testing
2	Neurological manifestations of osteochondrosis of the spine	1,5	-	1,5			electronic testing
3	Neuromuscular diseases	1,5	-	1,5			electronic testing
4	Neurodegenerative diseases	1,5	-	1,5			electronic testing

5	Dementia	1,5	-	-			
6	Neurosurgical treatment of cerebrovascular diseases	1,5	-	-			
	Practical exercises	-	36	-			
2.1	Methods for assessing the neurological status. Medical history of a patient with a neurological disease. Making topical and clinical diagnoses	-	6	-	1. Collection of complaints and anamnesis from a patient with neurological diseases. 2. Assessment of the patient's condition according to the Glasgow Coma Scale. 3. Assessment of the neurological status of a patient with diseases of the central and peripheral nervous system	performing a practical skill at the patient's bedside	assessment of skills using a standardized patient; conference reports; solving situational problems; tests; electronic tests
2.2	Cerebral circulation disorders. Cerebral infarction. Intracerebral hemorrhage. Subarachnoid hemorrhage	-	6	-	1. Assessment of the neurological status of a stroke patient. 2. Interpretation of neuroimaging and ultrasound results in major diseases of the nervous system	performing a practical skill at the patient's bedside	assessment of skills using a standardized patient; abstracts; solving situational problems electronic tests
2.3	Infectious diseases of the nervous system. Meningitis, encephalitis, poliomyelitis, myelitis. Demyelinating diseases of the central and peripheral nervous system. Acute disseminated encephalomyelitis. Multiple sclerosis. Guillain-Barré syndrome	-	6	-	Assessment of the neurological status of a patient with infectious and inflammatory disease of the nervous system	performing a practical skill at the patient's bedside	assessment of skills using a standardized patient solving situational problems tests; electronic tests

2.4	Diseases of the peripheral nervous system. Neuropathies, neuralgia, polyneuropathies. Neurological manifestations of osteochondrosis of the spine. Epilepsy and other paroxysmal conditions	-	6	-	1. Assessment of the neurological status of a patient with non-specific back pain. 2. Determination of clinical phenotypes of pain syndromes. 3. Assessment of the neurological status of a patient with status epilepticus	performing a practical skill at the patient's bedside*	assessment of skills using standardized patient reports in practical sessions; solving situational problems; electronic tests
2.6	Degenerative diseases of the nervous system. Parkinson. Amyotrophic lateral sclerosis. Neuromuscular diseases. Male	-	6	-	Interpretation of the results of electroencephalography, electromyography, electroneuromyography	performing a practical skill at the patient's bedside	assessment of skills using a standardized patient; abstracts; solving situational problems electronic tests*
3.3	Vascular diseases of the central nervous system.	-	6	-			Differentiated credit
3.4	Brain tumors						
		21	78	9			

* is a mandatory form of current certification

INFORMATION AND INSTRUCTIONAL UNIT

LITERATURE

Basic (relevant):

1. Кулеш, С. Д. Неврология и нейрохирургия : пособие для студентов факультета иностранных учащихся / = Neurology and neurosurgery : tutorial for students of the faculty of foreign students – Гродно : ГрГМУ, 2016. – 488 с.

Additional:

2. Oxford handbook of neurology / Manji, Hadi [и др.]. - 2 ed. - New York : Oxford University Press, 2015. – 623 p.

3. Alberstone, C. D. Anatomic Basis of Neurologic Diagnosis / Alberstone C. D., Benzel E. C., Jones S. E., Wang Z. I., Steinmetz M. P. – NY : Thieme, 2023. – 650 p.

4. Leo, J. Medical Neuroanatomy for the Boards and the Clinic / Leo J. – Springer, 2023. – 254 p.

5. Tarulli, A. Neurology / Tarulli A. – Springer, 2021. – 418 p.

6. Thaler, A. I. The only Neurology Book / Thaler A. I., Thaler M. I. – Wolters Kluwer, 2023. – 611 p.

METHODOLOGICAL RECOMMENDATIONS FOR THE ORGANIZATION AND PERFORMANCE OF STUDENT INDEPENDENT WORK IN THE ACADEMIC DISCIPLINE

The time allocated for independent work can be used by students for:
 preparation for lectures and practical classes;
 elaboration of topics (questions) submitted for independent study;
 problem solving;
 performing research and creative tasks;
 preparation of thematic reports, abstracts, presentations;
 compiling a review of scientific literature on a given topic;
 compiling a thematic selection of literary sources and Internet sources.

Basic forms of organizing independent work:

writing and presentation of an abstract;
 giving a report;
 studying topics and problems that are not covered in lectures and practical classes;
 computerized testing;
 preparation and participation in active forms of learning.

Control of independent work can be carried out in the form of:

discussions of abstracts;
 assessment of an oral answer to a question, message, report or solution to a problem in practical classes;
 checking abstracts, written reports, reports;
 individual conversation.

METHODOLOGICAL RECOMMENDATIONS FOR THE ORGANIZATION AND PERFORMANCE OF SUPERVISED STUDENT INDEPENDENT WORK IN THE ACADEMIC DISCIPLINE

Main forms of supervised student independent work:
 electronic testing;
 writing and presentation of an abstract;
 giving a report;
 studying topics and problems that are not covered in lectures;
 compiling tests for students to organize mutual control;
 preparation and participation in active forms of learning.

LIST OF AVAILABLE DIAGNOSTIC TOOLS

The following forms are used for competence assessment:
 solving situational problems.
 tests;
 abstracts;
 electronic tests.
 assessment of practical skills using checklists;
 assessment of skills using a standardized patient.

LIST OF AVAILABLE TEACHING METHODS

Traditional method;
 Active (interactive) methods:
 training based on simulation technologies;
 Problem-Based Learning (PBL);
 Team-Based Learning (TBL);
 Case-Based Learning (CBL);
 Research-Based Learning (RBL).

LIST OF PRACTICAL SKILLS

Name of practical skills	Form of practical skills control
1. Collection of complaints and medical history from a patient with neurological diseases	performing a practical skill at the patient's bedside
2. Assessment of the patient's condition using the Glasgow Coma Scale	performing a practical skill at the patient's bedside
3. Assessment of higher brain functions (gnosis, praxis, reading, writing, speech, memory, thinking)	performing a practical skill at the patient's bedside
4. Assessment of the neurological status of a patient with diseases of the central and peripheral nervous system	performing a practical skill at the patient's bedside
5. Determination of clinical phenotypes of pain syndromes	performing a practical skill at the patient's bedside


6. Assessment of the neurological status of a patient with status epilepticus	performing a practical skill at the patient's bedside
7. Assessing the neurological status of a patient with nonspecific back pain	performing a practical skill at the patient's bedside
8. Assessment of the neurological status of a patient with an infectious-inflammatory disease of the nervous system	performing a practical skill at the patient's bedside
9. Assessing the neurological status of a patient with a stroke	performing a practical skill at the patient's bedside
10. Interpretation of the results of neuroimaging (radiography, computed tomography, magnetic resonance imaging) and ultrasound examination for major diseases of the nervous system	performing a practical skill at the patient's bedside
11. Interpretation of the results of electroencephalography, electromyography, electroneuromyography	performing a practical skill at the patient's bedside
12. Determination of indications for lumbar puncture and interpretation of the results of cerebrospinal fluid examination	performing a practical skill at the patient's bedside

**PROTOCOL OF THE CURRICULUM APPROVAL
BY OTHER DEPARTMENTS**

Title of the discipline requiring approval	Department	Amendments to the curriculum in the academic discipline	Decision of the department, which designed the curriculum (date, protocol #)
1. Internal diseases	2nd Internal Diseases	No suggestions or comments	protocol # 12 of 06.02.2024
2. Infectious diseases	Infectious Diseases	No suggestions or comments	protocol # 12 of 06.02.2024
3. Radiation diagnostics and radiation therapy	Radiation Diagnostics and Radiation Therapy	No suggestions or comments	protocol # 12 of 06.02.2024
4. Psychiatry and narcology	Psychiatry and Medical Psychology	No suggestions or comments	protocol # 12 of 06.02.2024

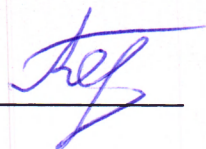
COMPILERS/AUTHORS:

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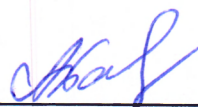
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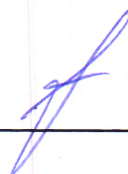
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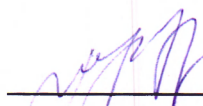
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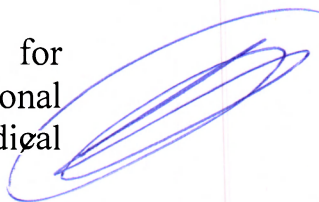
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Curriculum content, composition and the accompanying documents comply with the established requirements.

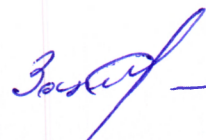
Dean of the Medical Faculty for International Students of the educational institution «Belarusian State Medical University»



O.S.Ishutin

24.06.2024

Methodologist of the Educational and Methodological Department of the Office of Educational Activities of the educational institution «Belarusian State Medical University»



S.V.Zaturanova

24.06.2024