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

APPROVED
by Rector of the Educational Institution «Belarusian State Medical University»
S.P.Rubnikovich
26.06.2024
Reg. # UD-091-048/2425 /edu.

NEUROLOGY AND NEUROSURGERY

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

1-79 01 07 «Dentistry»

2024

Curriculum is based on the educational program «Neurology and Neurosurgery», approved 25.04.2024, registration # УП-091-048/2425/уч.; on the educational plan in the specialty 1-79 01 07 «Dentistry», approved 15.05.2024, registration # 7-07-0911-03/2425/mf.

COMPILERS:

A.S.Fedulov, Head of the Department of Nervous and Neurosurgical Diseases of the Educational Institution «Belarusian State Medical University», DcS., Professor;

A.V.Borisov, Professor of the Department of Nervous and Neurosurgical Diseases of the Educational Institution «Belarusian State Medical University», DcS., Associate Professor;

A.G.Baida, Associate Professor of the Department of Nervous and Neurosurgical Diseases of the Educational Institution «Belarusian State Medical University», PhD, Associate Professor;

A.A.Borovsky, Associate Professor of the Department of Nervous and Neurosurgical Diseases of the Educational Institution «Belarusian State Medical University», PhD, Associate Professor

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 «General Clinical 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 basic professional 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;

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, skills, and abilities acquired during the study of the academic discipline «Neurology and Neurosurgery» are necessary for successful mastering of the following modules: «Therapeutic Dentistry», «Oral and Maxillofacial Surgery Module».

Studying the educational discipline «Neurology and Neurosurgery» should ensure the formation of students' basic professional competencies: use knowledge about the etiology and pathogenesis, clinical manifestations, complications, methods of diagnosis and differential diagnosis, apply the principles of treatment and prevention in diseases and injuries in adults and children, provide medical care in emergency conditions.

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

know:

etiology, pathogenesis, clinical manifestations, methods of diagnosis and treatment of the most common and socially significant diseases of the nervous system;

clinical manifestations and classification of neurodental diseases;

methods of neurosurgical treatment of trigeminal neuralgia;

indications for the use of diagnostic methods for neurological and neurosurgical diseases;

be able to:

examine and identify dysfunctions of the cranial nerves;

identify neurological symptoms;

carry out differential diagnosis of diseases of the facial area and oral cavity with toothache;

master:

methods of interpreting the results of radiation studies (radiography, tomography) of the skull, maxillofacial region, and spine.

Total number of hours for the study of the discipline is 46 academic hours, of which 27 classroom hours and 19 hours of student independent work. Classroom hours according to the types of studies: lectures - 9 hours (including 3 hours of supervised student independent work (SSIW)), practical classes - 18 hours.

Intermediate assessment is carried out according to the syllabus of the specialty in the form of a credit (7 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 07 «Dentistry»	7	46	27	6	3	18	19	credit

THEMATIC PLAN

Name of the section (topic)	Number of hours of classroom classes	
	lecture (incl. SSIW)	practical
1. Special Neurology	**6**	**12**
1.1. Propaedeutics and semiotics of diseases of the nervous system	1,5	2
1.2. Infectious, inflammatory and autoimmune lesions of the nervous system	1,5	2
1.3. Vascular diseases of the nervous system	-	2
1.4. Diseases of the peripheral nervous system	-	2
1.5. Headaches and facial pains	3	2
1.6. Epilepsy and convulsive states	-	2
2. Neurosurgery	**3**	**6**
2.1. General principles of neurosurgery	-	2
2.2. Traumatic brain injury	1,5	2
2.3. Fundamentals of neuro-oncology. Principles of diagnosis and neurosurgical treatment of patients with brain and spinal cord tumors	1,5	2
Total hours	**9**	**18**

CONTENT OF THE EDUCATIONAL MATERIAL

1. Special Neurology

1.1. Propaedeutics and semiotics of diseases of the nervous system

Method of clinical diagnosis of diseases of the nervous system.

Lamentation. Medical history. Life history. Somatic status data. Examination of cranial nerve functions. Motor sphere. Assessment of strength in the limbs and muscle tone. Deep and superficial reflexes. Pathological reflexes. Sensitivity. Types and types of sensitivity disorders. Autonomic nervous system. Coordination of movements. Meningeal symptoms. Additional methods of studying the nervous system. Syndromic diagnosis. Prognosis for life and recovery.

Collection of complaints and anamnesis in patients with diseases of the nervous system.

Medical ethics and deontology. Features of ethics and deontology in neurology and neurosurgery. Moral and ethical standards of behavior of medical workers, including in relationships with patients and other persons, colleagues, as well as representatives of state bodies and organizations.

1.2. Infectious, inflammatory and autoimmune lesions of the nervous system

Meningitis. Classification of meningitis: purulent, serous; bacterial, viral, fungal; primary, secondary. The main characteristic of meningeal syndrome. Clinical

manifestations of meningitis, changes in the clinical and laboratory analysis of cerebrospinal fluid.

Purulent meningitis. Meningococcal meningitis, clinical manifestations, forms, features of the course, diagnosis, principles of treatment. Meningitis caused by Haemophilus influenzae Afanasiev-Pfeiffer, Pseudomonas aeruginosa, Proteus, pneumococcal, staphylococcal. Otogenic meningitis.

Serous meningitis (bacterial and viral), enteroviral meningitis, mumps meningitis: clinical manifestations, diagnosis, principles of treatment. Tubrculous meningitis: clinical manifestations, diagnosis and principles of treatment. Brucellosis, ornithotic meningitis; lymphocytic choriomeningitis.

Complications of meningitis.

Assessment of the neurological status of patients with meningitis. Differential diagnosis of meningitis by the analysis of cerebrospinal fluid. Principles of antibacterial therapy for meningitis.

Encephalitis. Classification of encephalitis. Primary and post- or 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. Assessment of the neurological status of patients with encephalitis.

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

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

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

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

Acute disseminated encephalomyelitis: etiology, pathogenesis, clinical manifestations, diagnosis, differential diagnosis, principles of treatment. Assessment of the neurological status of patients with acute disseminated encephalomyelitis.

Multiple sclerosis: modern ideas about etiology and pathogenesis, basic neurological syndromes, clinical forms, diagnostic criteria, informative value of instrumental research methods, differential diagnosis. Assessment of the neurological status of patients with multiple sclerosis. Modern principles of treatment of exacerbations, technologies that modify the clinical course of the disease, cell technologies.

1.3. Vascular diseases of the nervous system

Etiology and main pathogenetic mechanisms of cerebral circulation disorders, correlation of etiological and pathogenetic factors, classification.

Definition, classification, modifiable and non-modifiable risk factors for stroke.

Clinical manifestations of transient cerebral circulation disorders: transient ischemic attacks, cerebral hypertensive crises, transient global amnesia.

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. Assessment of the neurological status of patients with cerebral infarction.

Intracerebral hemorrhage. Etiology, pathogenesis, features of clinical manifestations of intracerebral hemorrhage depending on localization. Non-traumatic subarachnoid hemorrhage (aneurysmic, hypertensive, etc.). Assessment of the neurological status of patients with intracerebral and subarachnoid hemorrhages.

Special research methods for acute cerebral circulation disorders: computed tomography, magnetic resonance imaging, angiography. Scheme of examination of patients with acute cerebral circulation disorders.

Medical care for acute cerebral circulation disorders. Principles of treatment of acute cerebral circulation disorders. Primary and secondary prevention of acute cerebral circulation disorders.

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

Spinal circulation disorders: classification, variants of the clinical course, diagnosis, principles of treatment. Assessment of the neurological status of patients with spinal circulation disorders.

1.4. Diseases of the peripheral nervous system

Classification of diseases of the peripheral nervous system. Clinical phenotypes of damage to various parts of the peripheral nervous system and modern terminology (radiculopathy, dorsalgia, plexopathy, neuropathy, neuralgia, polyneuropathy). Assessment of the neurological status of patients with diseases of the peripheral nervous system.

Classification of polyneuropathies (infectious, autoimmune, toxic, dysmetabolic, idiopathic and hereditary). Acute inflammatory demyelinating Guillain-Barré polyradiculoneuropathy: clinical manifestations, diagnosis, principles of treatment. Chronic inflammatory demyelinating polyradiculoneuropathy: clinical manifestations, principles of treatment. Diphtheria polyneuropathy: clinical manifestations and prevention. Diabetic polyneuropathy: clinical manifestations, principles of treatment. Alcoholic polyneuropathy: clinical manifestations, principles of treatment.

Compression-ischemic 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». Vertebral motor segment. X-ray signs of osteochondrosis of the spine. Neuroimaging (X-ray computed tomography/magnetic resonance imaging) picture of osteochondrosis of the spine.

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. 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 viscero-vertebral pain syndromes. Lumbosacral radiculopathy. Vertebrogenic and discogenic radiculomyeloischemia. 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: drugs, therapeutic blockades (indications and contraindications for use), methods of physiotherapy, manual therapy, massage, therapeutic exercises, acupuncture. Indications for surgical treatment of neurological manifestations of osteochondrosis of the spine. Prevention of osteochondrosis of the spine and its neurological manifestations.

1.5. Headaches and facial pains

Clinical neuroanatomy of the face. Neurovascular topography of the area of the cerebellopontine angle and the adjacent zone. Innervation of the face. Features of assessing the neurological status of patients with headache and facial pain.

Modern 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 diseases and injuries 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. Modern ideas about the etiopathogenesis of neuralgia, clinical manifestations, criteria for diagnosis, differential diagnosis, principles of conservative treatment. Surgical methods for the treatment of neuralgia: 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.

Assessment of the neurological status of a patient with facial pain. Examination and assessment of the functional state of a patient with glossalgia, stomalgia.

1.6. Epilepsy and convulsive states

Definition of the concept of «epilepsy». Etiology, frequency and prevalence of epilepsy, hereditary factor. Mechanisms of epileptogenesis of epilepsy.

Classification of Epilepsy and Epileptic Seizures (ILAE, 2017). Semiology of epileptic seizures. Febrile convulsions in children.

Epileptic seizures: a specific class of paroxysmal states; the problem of differential diagnosis of epileptic seizures, syncopal and crisis states, psychogenic seizures. Factors and conditions that provoke the development of epileptic seizures.

Electroencephalography (EEG) in the diagnosis of epilepsy (EEG mapping, EEG video monitoring), examination plan for patients with epileptic seizures. Emergency medical care for generalized convulsive seizure. Medicines for the treatment of epilepsy.

Status epilepticus, definition of the concept, 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.

2. Neurosurgery

2.1. General principles of neurosurgery

Basic principles of neurosurgical operations. Craniocerebral topography. Lumbar puncture. The idea of trefination and craniotomy (resection and osteoplastic). Methods of stopping bleeding.

General ideas about microsurgical, stereotactic, endoscopic and endovascular technologies in neurosurgery.

2.2. Traumatic brain injury

Traumatic brain injury, classification. 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. 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.

Plan of examination of patients with craniocerebral injuries. Principles of conservative therapy of craniocerebral injuries, indications for surgical treatment. Optimal terms of treatment and temporary disability in the most common forms of craniocerebral injuries. Organization of neurotraumatological care.

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

2.3. Fundamentals of neuro-oncology. Principles of diagnosis and neurosurgical treatment of patients with brain and spinal cord tumors

Classification of neoplasms of the brain and spinal cord: 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 chiasmal-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, principles of symptomatic therapy 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 for tumor lesions of the spinal cord.

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
7 semester							
	Lecture	**6**	-	**3**			
1.1.	Propaedeutics and semiotics of nervous system diseases	1,5	-	-			
1.2.	Infectious-inflammatory and autoimmune lesions of the nervous system	-	-	1,5			Electronic testing
1.5.	Headaches	1,5	-	-			
1.5.	Facial pain	1,5	-	-			
2.2.	Traumatic brain injury	1,5	-	-			
2.3	Fundamentals of neuro-oncology. Principles of diagnosis and neurosurgical treatment of patients with brain and spinal cord tumors	-	-	1,5			Electronic testing
	Practical exercises	-	**18**	-			
1.1. 1.2. 1.3	Propaedeutics and semiotics of diseases of the nervous system. Infectious-inflammatory and autoimmune lesions of the nervous system. Vascular diseases of the nervous system	-	6	-	Collection of complaints and anamnesis in patients with diseases of the nervous system Examination of the	Solving situational problems Solving	Solving situational problems* Interview. Electronic testing

					pharyngeal reflex, soft palate reflex Examination and assessment of the functional state of a patient with glossalgia, stomalgia	situational problems Solving situational problems	
1.4. 1.5. 1.6.	Diseases of the peripheral nervous system. Headaches and facial pains. Epilepsy and convulsive states	-	6	-	Examination and assessment of the functional state of the sensory and motor portions of the trigeminal nerve Examination and assessment of the function of facial muscles Assessment of the neurological status of a patient with facial pain	Solving situational problems* Solving situational problems Solving situational problems	Solving situational problems. Interview. Electronic testing*
2.1. 2.2. 2.3.	General principles of neurosurgery. Traumatic brain injury. Fundamentals of neuro-oncology. Principles of diagnosis and neurosurgical treatment of patients with brain and spinal cord tumors	-	6	-			Credit
		6	**18**	**3**			

*This 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.

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:
preparing for lectures and practical classes;
studying the topics (issues) designed for independent work;
problem solving.

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.

LIST OF AVAILABLE DIAGNOSTIC TOOLS

The following forms are used for competence assessment:
interview;
situational tasks;
electronic tests.

LIST OF AVAILABLE TEACHING METHODS

Traditional method;
Active (interactive) methods:
training based on simulation technologies;
Problem-Based Learning (PBL);
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 a disease of the nervous system	Solving situational problems
2. Assessing the neurological status of a patient with facial pain	Solving situational problems
3. Study and assessment of the functional state of the sensitive and motor portions of the trigeminal nerve	Solving situational problems
4. Study and assessment of the function of facial muscles	Solving situational problems
5. Study of the pharyngeal reflex, reflex from the soft palate	Solving situational problems
6. Study and assessment of the functional state of a patient with glossalgia, stomalgia	Solving situational problems

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 #)
Module «Therapeutic Dentistry»	Conservative Dentistry	No suggestions or comments	protocol # 17 of 17.05.2024
	Endodontics	No suggestions or comments	protocol # 17 of 17.05.2024
Module «Maxillofacial surgery and dental surgery»	Surgical	No suggestions or comments	protocol # 17 of 17.05.2024
	Dentistry	No suggestions or comments	protocol # 17 of 17.05.2024

COMPILERS/AUTHORS:

Head of the Department of Nervous and Neurosurgical Diseases of the educational institution «Belarusian State Medical University», Dc.S, Professor _____ A.S.Fedulov

Professor of the Department of Nervous and Neurosurgical Diseases of the educational institution «Belarusian State Medical University», Dc.S, Associate Professor _____ A.V.Borisov

Assistant professor of the Department of Nervous and Neurosurgical Diseases of the educational institution «Belarusian State Medical University», PhD, Associate Professor _____ A.G.Baida

Assistant professor of the Department of Nervous and Neurosurgical Diseases of the educational institution «Belarusian State Medical University», PhD, Associate Professor _____ A.A.Borovsky

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