MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION

PENZA STATE UNIVERSITY

MEDICAL INSTITUTE

APPROVED
by director of the Medical Institute
Mitroshin A.N.
«19» 09 2018 г.

STUDY PROGRAMM

S1.1.29 Neurology, Medical Genetics, Neurosurgery

Program (specialty) - 31.05.01 General Medicine

Graduate's qualification - Medical doctor

Study format - full-time

Penza, 2018

1. Goals of the discipline

The primary goals of the discipline S1.1.34 Neurology, Medical Genetics, Neurosurgery in the specialty 31.05.01 Medicine are the study of the anatomical and physiological features of the structure and development of the nervous system, diseases of the central and peripheral nervous system.

The objectives of the discipline Neurology, Medical Genetics, Neurosurgery are as follows: studying the topical diagnosis of diseases of the nervous system, diagnostic methods (laboratory, neuroimaging, and functional tests); studying aetiology, clinic, pathogenesis and treatment of diseases of the nervous system.

2. Place of the discipline in Basic Professional Educational Programme (hereinafter – BPEP)

The academic discipline S1.1.34 Neurology, Medical Genetics, Neurosurgery refers to the basic part of the unit S1 "Subjects". The academic discipline is based on knowledge and skills obtained by students while completing the following cycles: Anatomy, Physiology, Clinical Pathophysiology, Clinical Pathological Anatomy, Clinical Pharmacology, Public Health and Health Care, Epidemiology, Internal and Surgical Diseases, Traumatology and Orthopaedics.

3. Student's competences acquired through successful completion of the discipline Neurology, Medical Genetics, Neurosurgery

The process of studying the discipline is aimed at forming the components of the following competences in accordance with Federal State Educational Standards of Higher Education (hereinafter – FSES HE) in this field of study:

Competence code	Title of competence	Structural elements of competence (having mastered the subject students should have knowledge, skills, working abilities)
1	2	3
SPC-5	be able to analyze patients complaints and medical history, results of medical examinations, laboratory tests, special equipment diagnostics and others; to determine the presence or absence of pathologies, medical disorders and diseases; to determine the pathological states and conditions, symptoms and syndromes, nosology forms according to the International Classification of Diseases (10 revision)	Knowledge: to know the basic principles of collecting complaints and patient history, to analyze the results of additional examination methods, to recognize the condition of patients, to establish the pretense of absence of a disease.
		Skills: be able to evaluate and apply the data obtained for recognizing the condition or establishing the presence or absence of a disease.
		Working abilities: be able to apply modern methods of collecting information, assessing the results of paraclinical methods of research, choosing medication and non-drug treatment.
SPC-6	be able to determine the optimum strategy for treating patients with different types of diseases	Knowledge: to know aetiology and pathogenesis, modern classification, clinical picture, features of the course and possible complications of neurological diseases.
		Skills: be able to conduct a patient examination and reflect the information received in the medical history in accordance with ICD-10.
		Working abilities: be able to apply the methods of diagnosis, medical terminology of the neurological diseases, nosological forms in accordance with ICD-10.

SPC-8	be able to analyze patients complaints and medical history, results of medical examinations, laboratory tests, special equipment diagnostics and others; to determine the presence or absence of pathologies, medical disorders and diseases	Knowledge: to know the main therapeutic measures for the most common neurological diseases and conditions among adult population.
		Skills: be able to assign adequate (therapeutic and surgical) treatment to patients in accordance with the diagnosed case.
		Working abilities: be able to apply the methods of managing patients with various neurological diseases.

4. Structure and content of the discipline Neurology, Medical Genetics, Neurosurgery

4.1 Structure of the discipline

The total workload of the discipline amounts to 6 credits units, 216 hours.

№	Subject's (module's) sections and topics	Semester	Cycle days	Types of earning, including students' out-of-class work and workload (in hours)									Current progress monitoring types *(by day of cycle)*							
				Work in class				Out-of-class work												
				Total	Lecture	Practice	Laboratory work	Total	Preparing for class work	Papers, essays etc.	Course work (project)	Preparing for exams	Interview	Spoken test	Test marking	Check work marking	Paper marking	Marking of essays and other creative works	Course work	Skill check
1.	Section 1. General Neurology.																			
1.1.	Topic 1.1. Arbitrary movements and their disorders. Types of reflexes. Korkovo-muscular path. Symptoms of defeat cortical and muscular pathway at different levels. Central and peripheral paresis.	8	1	8	2	6		2	2				1							1
1.2.	Topic 1.2. Sensitivity and its disorders. Research methods. Ways of superficial and deep sensitivity. Types and types sensitivity disorders. Central and	8	2	8	2	6		2	2				2		2					2

	peripheral pain mechanisms.																			
1.3.	Topic 1.3. The cranial nerves of couples I-VI: anatomical and physiological data, clinical research methods and lesion symptoms. Craniocerebral nerves VII-XII pairs: anatomical and physiological data, clinical research methods and lesion symptoms.	8	3	8	2	6		2	2				3		3					3
1.4	Topic 1.4. Extrapyramidal system and symptoms of its defeat. Coordination of movements and its disorders. Syndromes brain stem lesions, alternating syndromes.	8	4	8	2	6		2	2				4		4					4
1.5.	Topic 1.5. Syndromes of damage to the spinal cord and its roots. Syndromes of affection of peripheral nerves and plexuses. The autonomic nervous system: structure and function. Research methods. Neurogenic disorders of the pelvic organs.	8	5	8	2	6		2	2				5		5					5
1.6	Topic 1.6. Higher brain functions and their disorders. Syndromes of lesions of the brain. Brain shells, cerebrospinal fluid, cerebral ventricles. Research methods. Likvorodiagnostika.	8	6	8	2	6		2	2				6		6					6
2.	Section 2. Medical genetics.																			
2.1.	Topic 2.1 The object and methods of medical genetics. Genetic counselling. Principles of treatment and prevention of hereditary diseases.	8	7	8	2	6		2	2				7		7					7

2.2.	Topic 2.2. Gene diseases. Chromosomal diseases. Mitochondrial diseases. Diseases with hereditary predisposition. Congenital malformations.	8	8	8	2	6		2	2				8		8				8
3.	Section 3. Private neurology.																		
3.1.	Topic 3.1. Blood supply to the head and spinal cord. Classification of disorders of cerebral circulation. Sharp disorders of cerebral circulation. Transient ischemic attacks.	9	1	8	2	6		2	2				1		1				1
3.2	Topic 3.2. Ischemic stroke. Treatment of acute cerebral disorders blood circulation. Subarachnoid haemorrhage. Haemorrhagic stroke.	9	2	8	2	6		2	2				2		2				2
3.3	Topic 3.3. Disorders of spinal circulation. Encephalopathy. Vascular dementia. Treatment of chronic disorders of cerebral circulation.	9	3	8	2	6		2	2				3		3				3
3.4.	Topic 3.4. Multiple sclerosis. Acute disseminated encephalomyelitis.	9	4	7	2	5		2	2				4		4				4
3.5.	Topic 3.5. Vertebral neurological disorders. Diseases of the peripheral nervous system.	9	5	8	2	6		2	2				5		5				5
3.6.	Topic 3.6. Infectious diseases of the nervous system.	9	6	8	2	6		2	2				6		6				6
3.7.	Topic 3.7. Neuromuscular diseases. Degenerative diseases of the nervous system (amyotrophic lateral sclerosis, Alzheimer's disease, syringomyelia).	9	7	8	2	6		2	2				7		7				7
3.8.	Topic 3.8 Brain Tumours Spinal cord tumours	9	8	8	2	6		2	2				8		8				8

3.9.	Topic 3.9 Traumatic brain injury. Spinal injury		9	5	1	4		2	2				9		9				9
3.10.	Topic 3.10. Paroxysmal disorders of consciousness. Epilepsy. Headache. Neurosis.	9	10	8	2	6		2	2				10		10				10
	Course work	8						4			4								
	Preparing for examination	9						36				36							
	General workload, in hours			140	35	105		76	36		4	36	Interim attestation						
													Type				Semester		
													Course work				8		
													Exam				9		

** Note:*

Classes are held in cyclic form

4.2 Content of the discipline

Section 1. General Neurology.

Topic 1.1. Arbitrary movements and their disorders. Types of reflexes. Korkovo-muscular path. Symptoms of the defeat of the musculoskeletal pathway at different levels. Central and peripheral paresis.

Cortico-muscular path: structure, functional significance. Central (upper) and peripheral (lower) motor neurons. *Reflex arc:* structure and operation.

Central and peripheral paresis: changes in muscle tone and reflexes, trophism of muscles.

Clinical features of the lesion of the musculoskeletal pathway at different levels: brain (precentral gyrus, radiant crown, internal capsule, brain stem), spinal cord (lateral cord, anterior horn), anterior root, plexus, peripheral nerve, neuromuscular synapse muscle.

Topic 1.2 Sensitivity and its disorders. Research methods. Ways of superficial and deep sensitivity. Types and types of sensitivity disorders. Central and peripheral mechanisms of pain.

Sensitivity: extraceptive, proprioceptive, interoceptive, complex types. Anatomy and physiology of conductors of superficial and deep sensitivity.

Types of sensitivity disorders: hypo- and hyperesthesia, paresthesia and pain, dysesthesia, hyperpathy, allodynia, causalgia.

Types of sensitivity disorders: peripheral, segmental, conductive, cortical. Dissociated sensitivity disorder.

Neuropathic physiological, neurochemical and psychological aspects of pain. Antinociceptive system. Acute and chronic pain. Central pain.

"Reflected" pain.

Topic 1.3. Cranial nerves of the I-VI pair: anatomical and physiological data, clinical methods of investigation and symptoms of lesion. Cranial nerves VII-XII pairs: anatomical and physiological data, clinical research methods and symptoms of damage.

Cranial nerves: anatomical and physiological data, clinical research methods and lesion symptoms.

I pair - the olfactory nerve and olfactory system; symptoms and lesion syndromes.

II pair - the optic nerve and the visual system, signs of damage to the visual system at different levels (retina, optic nerve, chiasm, optic tract, visual hillock, visual radiance, cortex).

III, IV, VI pairs - oculomotor, block, nerve and oculomotor system; lesion symptoms; medial longitudinal bundle and internuclear ophthalmoplegia; regulation of gaze, cortical and stem paresis of gaze; pupillary reflex and signs of its defeat; types and causes of anisocoria; Argyll-Robertson syndrome.

V pair - the trigeminal nerve, syndromes of sensitivity disorders (peripheral, nuclear, stem and hemispheric); chewing disorders.

VII pair - facial nerve, central and peripheral paresis of mimic muscles, clinic of lesion of the facial nerve at different levels. Taste and its frustration.

VII pair - pre-door-cochlear nerve, auditory and vestibular systems; the role of the vestibular apparatus in the regulation of motor coordination, balance and posture; signs of damage at different levels.

VIII and X pairs - glossopharyngeal and vagus nerves, autonomic functions of the vagus nerve; signs of damage at different levels, bulbar and pseudobulbar syndromes.

XI vapor - accessory nerve, signs of damage.

XII pair - hypoglossal nerve, signs of damage; central and peripheral paresis of the tongue muscles

Topic 1.4. Extrapyramidal system and symptoms of its defeat. Coordination of movements and its disorders. Syndromes of brain stem lesion, alternating syndromes.

Structure and main connections of the extrapyramidal system, the role in the organization of movements; participation in the organization of movements by providing posture, muscle tone and stereotypical automated movements. Hypokinesia (oligo- and bradykinesia), rigidity and muscular hypotonia. Hyperkinesis: tremor, muscular dystonia, chorea, tics, hemiballism, athetosis, myoclonias. Hypotonic-hyperkinetic and hypertensive-hypokinetic syndromes.

Anatomical and physiological data: cerebellum and vestibular system: anatomy and physiology, afferent and efferent connections, role in the organization of movements. Clinical methods for the

study of motor coordination.
Symptoms and syndromes of lesion of the cerebellum: ataxia, dyssynergia, nystagmus, dysarthria, muscular hypotonia.
Ataxy: cerebellar, vestibular, frontal, sensitive. Pathophysiology and pharmacological methods of correction.
The structure of the brain stem (medulla, pons and midbrain).
Alternating syndromes.

Topic 1.5. Syndromes of damage to the spinal cord and its roots. Syndromes of affection of peripheral nerves and plexuses. Autonomic nervous system: structure and function. Research methods. Neurogenic disorders of the pelvic organs.

Spinal cord: anatomy and physiology.
Sensitive and motor disorders in the defeat of the cervical, thoracic, lumbar and sacral segments of the spinal cord, anterior and posterior roots, plexuses. Brown-Sekar Syndrome. Syringomyelitis syndrome.
Peripheral nervous system: anatomy and physiology.
Syndrome of flaccid paralysis.
Defeat of the cervical, brachial plexus and nerves emanating from them.
Defeat of the lumbar, sacral plexus and nerves emanating from them.
Autonomic nervous system: structure and function. Research methods. Neurogenic disorders of the pelvic organs.
Structure and function of the autonomic (autonomic) nervous system: the sympathetic and parasympathetic systems; peripheral (segmental) and central parts of the autonomic nervous system. Limbic-hypothalamic-reticular complex. Symptoms and syndromes of the peripheral division of the autonomic nervous system: peripheral autonomic failure, Raynaud's syndrome.
Neurogenic disorders of the pelvic organs. Vegetative innervation of the bladder.

Topic 1.6. Higher brain functions and their disorders. Syndromes of lesions of the brain. Cells of the brain, cerebrospinal fluid, cerebral ventricles. Research methods. Likvorodiagnostika.

The cerebral cortex: the basic principles of structure and function, the problem of localization of functions in the brain. Functional asymmetry of the brain hemispheres. Idea of the systemic organization of mental functions.
Higher brain (mental) functions: gnosis, praxis, speech, reading, writing, counting, memory, attention, intelligence, and their disorders; aphasia (motor, sensory, amnestic, semantic); apraxia (constructive, spatial, ideomotor); agnosia (visual, auditory, olfactory); astereognosia, anosognosia, auto-inflammation; dismnesichesky syndrome, Korsakovsky syndrome; dementia, oligophrenia. Syndromes of lesions of the frontal, parietal, temporal and occipital lobes of the brain.
Cells of the brain, cerebrospinal fluid, cerebral ventricles. Research methods. Likvorodiagnostika.
Structure and function of the membranes of the spinal cord and brain. Cerebrospinal fluid: functional significance, formation, circulation, reabsorption.
Cerebrospinal fluid examination: lumbar puncture, pressure measurement, Queckenstedt sample, the composition of cerebrospinal fluid in normal and basic pathological conditions, protein-cell and cell-protein dissociation.
Meningeal syndrome: manifestations, diagnosis.
Hypertension syndrome: the main clinical and paraclinical signs.
Dislocation syndrome.

Section 2. Medical Genetics

Topic 2.1. Object and methods of medical genetics. Genetic counseling. Principles of treatment and prevention of hereditary diseases

The subject of medical genetics. Hereditary and congenital diseases,
Family and sporadic. Nosological form and disease. Types of classification of hereditary diseases. Classification of hereditary diseases: gene, chromosomal and multifactorial. Man as an object of medical genetics.
General characteristics of the human genome: the volume of DNA in nucleotide pairs, karyotype, number of genes. International projects of human genome research: "Human Genome Project", Human Genome Diversity ".

Methods of medical genetics: clinical genealogy, twin, cytogenetic, population-statistical, biochemical, recombinant DNA methods, RFLP, PCR, nucleic acid hybridization. Methods of primary identification of point mutations and methods for diagnosing mutations. "Genomic fingerprinting".

Genetic counseling. Tasks of genetic counseling, indications. Stages: diagnosis, assessment of genetic risk, conclusion. Assessment of genetic risk for different groups of hereditary pathologies. Eugenics. Blood relations. Screening genetic examinations. Prenatal Diagnosis. Tasks of the Regional Medical Genetic Center.

Principles of treatment and prevention of hereditary diseases

Symptomatic treatment (drug therapy, surgical treatment, physical methods).

Pathogenetic treatment: 1. correction at the substrate level; 2. correction at the product level; 3. Correction at the enzyme level.

Etiological treatment: gene therapy. The concept of corrective and replacement gene therapy. Delivery of genes into human cells based on viruses, suppression of expression by means of antisense oligonucleotides. Experiments on gene therapy of TKID, familial hypercholesterolemia, hemophilia A and B. Prospects of gene therapy methods for monogenic pathologies. Genotherapy of oncogenic diseases.

The role of spontaneous and induced mutational processes in hereditary pathology. Mutagens: mechanisms of action of different types of mutagens. Stages of mutagenesis. Testing of substances for mutagenicity: screening and full program.

Topic 2.2. Genetic diseases. Chromosomal diseases. Mitochondrial diseases. Diseases with hereditary predisposition. Congenital malformations.

General characteristics of gene diseases: number, frequency, classification, causes.

Amino acid metabolism disorders: phenylketonuria, albinism, tyrosinosis, alkaponuria, maple syrup disease, cystinuria, homocystinuria, cystathionuria.

Disorders of carbohydrate metabolism: galactosemia, lactose intolerance, mucopolysaccharidosis, glycogenesis.

Disorders of lipid metabolism: sphingolipidosis, dyslipoproteinemia.

Violations of the exchange of purines and pyrimidines: Lesha-Nihan syndrome, as well as TKID, a hereditary etiology of gout.

Metabolic disorders of metals: Wilson-Konovalov's disease.

Defects of hormone exchange: adrenogenital syndrome, testicular feminization.

Hemoglobinopathies: thalassemia, sickle cell anemia, unstable hemoglobins. Disorders of the coagulation system: haemophilia A and hemophilia B.

Porphyria: acute intermittent porphyria, congenital erythropoietic porphyria, other porphyria (coproporphyria, mosaic porphyria).

Hyperbilirubinemia. Gilbert's syndrome.

Collagen diseases: Ehlers-Danlos syndrome, imperfect osteogenesis, Marfan syndrome.

Myodystrophy (Duchenne and Becker).

Other monogenic diseases: cystic fibrosis; achondroplasia.

Diseases of expansion: a general characteristic of dynamic mutations; syndrome of fragile X chromosome, Huntington's chorea and other examples.

Chromosomal diseases. General characteristics: frequency, classification, causes. Mosaicism. Microcytogenetic syndromes. Trisomy: 13, 18, 21. Partial trisomy: 9p +. Monosomy: 4p-, 5p-, 13q-. Anomalies of sex chromosomes: trisomy X, Klinefelter's syndrome, Shereshevsky-Turner syndrome.

Mitochondrial diseases. Characteristics of the mitochondrial genome. Examples of mitochondrial diseases.

Schizophrenia, psoriasis, diabetes mellitus. HLA-associated diseases.

Pharmacogenetics (G6PDH deficiency, malignant hyperthermia, "slow acetylators", reaction to barbiturates in porphyria).

Ecogenetics (insufficiency of α1-antitrypsin, pigment xeroderma, reaction to food, food additives and biological agents).

Polymorphism of "environmental genes": genes of biotransformation of xenobiotics and genes - receptors. Concept of genogeography.

Classification of vices. Mechanisms of teratogenesis in hereditary diseases and exogenous vices. Embryotoxic and teratogenic effects of environmental factors. Cleft lip and palate, defects of the central nervous system, congenital hypothyroidism.
Teratogenic effect of drugs: thalidomide syndrome; effects of other drugs.
Alcoholic fetal syndrome; influence of smoking and drugs. Teratogenic effects of maternal and environmental factors; herbicides.
Principles of testing substances for teratogenicity.
Craniocerebral and spinal hernia (anencephaly, encephalocele, meningocele, myelomeningocele).
Hydrocephalus: classification, clinic, diagnosis, treatment.
Microcephaly. The microcranium. Macrocephaly. Aplasia of the corpus callosum. Dandy Walker Syndrome. Congenital anomalies of cranial nerves (Mobius syndrome, neurosensory deafness).

Section 3. Private Neurology.

Topic 3.1. Blood supply to the brain and spinal cord. Classification of disorders of cerebral circulation. Acute disorders of cerebral circulation. Transient ischemic attacks.

Blood supply to the brain: anatomy and physiology. Classification of cerebrovascular diseases. Etiology of cerebrovascular diseases.
Transitory impairment of cerebral circulation (transient ischemic attack): etiology, pathogenesis, clinic, diagnosis, therapy and indications for surgical treatment.

Topic 3.2. Ischemic stroke. Treatment of acute disorders of cerebral circulation. Subarachnoid hemorrhage. Hemorrhagic stroke.

Ischemic stroke: etiology, pathogenesis, clinic, diagnosis, therapy and indications for surgical treatment.
Subarachnoid nontraumatic hemorrhage: etiology, pathogenesis, clinic, diagnosis, therapy and indications for surgical treatment. Paraclinic methods for diagnosis of acute disorders of cerebral circulation - CT and MRI, ultrasonic dopplerography and duplex scanning, transcranial dopplerography, angiography. Rehabilitation of patients who have suffered a stroke.
Surgical treatment of vascular lesions of the brain, indications and principles of surgical interventions in case of cerebral hemorrhage, cerebral aneurysm, stenosis and occlusions of the main arteries of the head. Primary and secondary prevention of stroke.

Topic 3.3. Disturbances of the spinal circulation. Encephalopathy. Vascular dementia. Treatment of chronic disorders of cerebral circulation.

Blood supply to the spinal cord. Disturbances of the spinal circulation.
Discirculatory encephalopathy: *etiology, pathogenesis, clinical forms, diagnosis, treatment and prevention. Hypertensive crisis and hypertensive encephalopathy.*
Vascular dementia: pathogenesis, clinic, diagnostics (neuropsychological research, neuroimaging methods of research), prevention; differential diagnosis with Alzheimer's disease.
Treatment of chronic disorders of cerebral circulation.

Topic 3.4. Multiple sclerosis. Acute disseminated encephalomyelitis.

Multiple sclerosis: pathogenesis, clinic, diagnosis, types of flow. *Paraclinic methods of investigation in the diagnosis of multiple sclerosis:* MRI of the brain and spinal cord, investigation of evoked potentials of the brain, liquorological studies. Treatment.
Acute disseminated encephalomyelitis: clinic, diagnosis, treatment.

Theme 3.5. Vertebrogenic neurological disorders. Diseases of the peripheral nervous system.

Biomechanics of the spine, the function of intervertebral discs and facet joints.
Osteochondrosis of the spine: discopathy, compression and reflex syndromes. Lumboschialgia and cervico-brachialgia. Myofascial syndrome. Fibromyalgia. Clinic and pathogenetic treatment. Indications for surgical treatment.
Differential diagnosis for pain in the back and extremities: epidural abscess, primary and metastatic spinal tumors, dyshormonal spondylopathy, tuberculous spondylitis, reflected pain in diseases of internal organs, ankylosing spondylitis.
Classification of diseases of the peripheral nervous system.
Mononeuropathies and polyneuropathies: etiology, pathogenesis, clinical forms, diagnosis, treatment. Neuropathy of the median, elbow, ray, peroneal, tibial nerves. Tunnel syndromes, conservative therapy and indications for surgical treatment. Syndrome of the carpal canal, the cubital canal.

Polyneuropathy: with somatic diseases (diabetes, uremia, hepatic insufficiency, diffuse connective tissue diseases, vasculitis, etc.), infectious and parainfect, alcoholic, hereditary (hereditary somatosensory and vegetative, amyloid, porphyria, etc.), acute inflammatory demyelinating.
Neuropathies of the facial nerve: clinic, diagnosis, treatment. Neuralgia of the trigeminal nerve: clinic, diagnosis, treatment.

Topic 3.6. Infectious diseases of the nervous system.

Encephalitis: classification, etiology, clinic, diagnosis, treatment. Herpetic encephalitis. Tick-borne encephalitis. Parainfection encephalitis in measles, chicken pox, and rubella. Rheumatic lesions of the nervous system, small chorea.
Meningitis: classification, etiology, clinic, diagnosis, treatment.
Primary and secondary purulent meningitis: meningococcal, pneumococcal, caused by a hemophilic rod. *Serous meningitis:* tuberculosis and viral meningitis.
Neurosyphilis. The defeat of the nervous system in AIDS.

Topic 3.7. Neuromuscular diseases. Degenerative diseases of the nervous system (amyotrophic lateral sclerosis, Alzheimer's disease, syringomyelia).

Classification of neuromuscular diseases.
Progressive muscular dystrophy. Myopathy Duchenne, Becker, Landusi-Dejerine.
Clinic, diagnosis, differential diagnosis, medical and genetic aspects.
Myasthenia gravis: pathogenesis, clinic, diagnosis, treatment.
Myotonia Thomsen and dystrophic myotonia: clinic, diagnosis, prognosis.
Pathogenesis of degenerative diseases of the nervous system.
Syringomyelia: clinic, diagnosis, treatment.
Amyotrophic lateral sclerosis: clinic, diagnosis, prognosis.

Topic 3.8. Tumors of the brain. Tumors of the spinal cord.

Tumors of the brain: classification, clinic, diagnosis; sub- and supratentorial tumors, features of the course.
Tumors of the spinal cord: a clinic, diagnostics; extra- and intramedullary tumors of the spinal cord. Paraclinical methods. Indications and principles of surgical interventions for tumors of the brain and spinal cord.

Topic 3.9. Craniocerebral injury. Spinal trauma.

Classification of closed craniocerebral injury. Light, moderate and severe craniocerebral injury.
Brain concussion. Contusion of the brain. Intracranial traumatic hematomas. Medical tactics. Consequences of traumatic brain injury. Postcommentary syndrome.
Trauma of the spinal cord: pathogenesis, clinic, diagnosis, medical tactics. Rehabilitation of patients with spinal trauma.

Topic 3.10. Paroxysmal disorders of consciousness. Epilepsy. Headache. Neuroses.

Classification of epilepsy and epileptic seizures. Etiology and pathogenesis of epilepsy and epileptic syndrome. Treatment of epilepsy. *Epileptic status:* clinic, pathogenesis, treatment.
Neurogenic syncope - classification, pathogenesis, diagnosis, treatment, prevention. *Paraclinical methods in the diagnosis of paroxysmal disorders of consciousness* - electroencephalography, CT and MRI of the head.
Neuroses: etiology, pathogenesis, classification, clinic, diagnosis, treatment.
Vegetative dystonia, vegetative crisis (panic attack): etiology, pathogenesis, clinic, diagnostics.
Classification of headache. Headache pathogenesis. Examination of patients with a headache.
Migraine: classification, pathogenesis, clinical forms, course, diagnosis. Treatment of a migraine attack. Prevention of migraine attacks.
Beam headache: clinic, diagnosis, treatment.
Tension headache: pathogenesis, diagnosis, treatment.

5. Educational technologies

• Practical classes in the traditional form;
• test control on the topic of practical training;
• multimedia lectures;
• solution of situational tasks;
• independent work with literature;
• Execution of coursework

In order to implement an individual approach to teaching students undergoing special learning process within the framework of an individual work plan, the study of this discipline is based on the following opportunities: providing students' individual work, including work in the electronic educational environment using appropriate software equipment, forms of distance learning, Internet resources, individual consultations, etc.

5.1. Active methods of teaching
The method of analyzing specific situations

8-semester

The motor sphere.
Sensitive sphere.
Coordination of
movements.
Extrapyramidal system.
Cranial-cerebral innervation.
Vegetative innervation.

9-semester

Blood supply to the brain and spinal cord.
Peripheral nervous system.

Solution of situational tasks

8-semester

Topical diagnosis of diseases of the nervous system.
Medical genetics.

9-semester

Diseases of the brain and spinal cord. Vertebrogenic diseases.
Infectious diseases of the central nervous system.

6. Educational and methodological support of students' out-of-class work.
Assessment means for current progress monitoring, interim attestation of subject mastering results

6.1. Plan for independent work of students

Cycle days	Topic	Out-of-classwork type	Task	Recommended literature	Amount of hours
1	Section 1. Topic 1.1. Arbitrary movements and their disorders. Types of reflexes. Cork-muscle path. Symptoms of damage to the cortico-muscle path at different levels. Central and peripheral paresis.	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2
2	Topic 1.2. Sensitivity and its disorders. Methods of research. Ways of superficial and deep sensitivity. Types and types of sensitivity disorders. Central and peripheral mechanisms of pain.	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. . 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2

3	Topic 1.3. Cranial nerves of the I-VI pair: anatomical and physiological data, clinical methods of investigation and symptoms of lesion. Cranial nerves of VII-XII pairs: anatomical and physiological data, clinical methods research and symptoms of defeat.	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2
4	Topic 1.4. Extrapyramidal system and symptoms of its defeat. Coordination of movements and its disorders. Syndromes of brain stem lesion, alternating syndromes.	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2
5	Topic 1.5. Syndromes of damage to the spinal cord and its roots. Syndromes of affection of peripheral nerves and plexuses. The autonomic nervous system: structure and function. Methods of research. Neurogenic disorders of the pelvic organs.	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 1. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2

6	Topic 1.6. Higher cerebral functions and their disorders. Syndromes of lesions of brain lobes. The shells of the brain, cerebrospinal fluid, ventricles of the brain. Methods of research. Liquorodiagnostics.	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 1. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2
7	Section 2. Topic 2.1. Object and methods of medical genetics. Genetic counseling. Principles of treatment and prevention of hereditary diseases	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson..	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 1. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2
8	Topic 2.2. Genetic diseases. Chromosomal diseases. Mitochondrial diseases. Diseases with hereditary predisposition. Congenital malformations.	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 1. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2

1	Section 3. Topic 3.1. Blood supply to the brain and spinal cord. Classification of acute disorders of cerebral circulation. Acute disorders of cerebral circulation. Transient ischemic attacks.	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2
2	Topic 3.2. Ischemic stroke. Treatment of acute disorders of cerebral circulation. Subarachnoid hemorrhage. Hemorrhagic stroke.	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 1. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2
3	Topic 3.3. Disturbances of the spinal circulation. Encephalopathy. Vascular dementia. Treatment of chronic disorders of cerebral circulation.	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 1. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2

4	Topic 3.4. Multiple sclerosis. Acute disseminated encephalomyelitis.	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2
5	Topic 3.5. Vertebrogenic neurological disorders. Diseases of the peripheral nervous system.	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 1. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2
6	Topic 3.6. Infectious diseases of the nervous system.	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 1. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2

7	Topic 3.7. Neuromuscular diseases. Degenerative diseases of the nervous system (amyotrophic lateral sclerosis, Alzheimer's disease, syringomyelia).	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2
8	Topic 3.8. Tumors of the brain. Tumors of the spinal cord	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 1. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2
9	Theme 3.9. Craniocerebral injury. Spinal trauma	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 1. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2

13	Topic 3.10. Paroxysmal disorders of consciousness. Epilepsy. Headache. Neuroses.	Preparation for the classroom in class	1. Study the theoretical material on the topic of the lesson. 2. Answer the test questions to the lesson.	1. Neurology and neurosurgery. In 2 volumes. Tom 1. Neurology: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 2. Neurology and Neurosurgery. In 2 volumes. Tom 2. Neurosurgery: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. 3. General neurology / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013.	2

6.2. Instructional guidelines on students' out-of-class work organization

Preparation for classroom activities is carried out according to the topics studied, the material taught by the lecturer, as well as using the main and additional literature on the topic.

Preparation for the exam is carried out at the end of the semester, on questions for the exam.

6.3. Materials to carry out current monitoring and interim attestation of students' knowledge

Competence mastering assessment

№	Assessment type	Monitored topics (sections)	Competences that include components under assessment
1.	Interview	Section 1: Topic 1-6. Section 2: 1 - 2. Section 3. Topic 1-10	SPC -5, SPC -6, SPC -8
2.	Testing	Section 1: Topic 1-6. Section 2: 1 - 2. Section 3. Topic 1-10	SPC -5, SPC -6, SPC -8
3.	Practical skills testing	Section 1: Topic 1-6. Section 2: 1 - 2. Section 3. Topic 1-10	SPC -5, SPC -6, SPC -8
4.	Course work	Section 1: Topic 1-6. Section 2: 1 – 3.	SPC -5, SPC -6, SPC -8

Demonstrative test variant

1. **What are the receptors that perceive heat?**
   A) Krause flasks
   B) calf Ruffini
   C) Meissner's body
   D) Fatera-Pacini body
2. **What is the name of receptors that perceive cold?**
   A) Krause flasks
   B) calf Ruffini
   C) Meissner's body
   D) Fatera-Pacini body
3. **What are the receptors perceiving touch?**
   A) Krause flasks
   B) calf Ruffini
   C) Meissner's body
   D) Fatera-Pacini body
4. **What are the receptors that perceive deep pressure?**
   A) Krause flasks
   B) calf Ruffini
   C) Meissner's body
   D) Fatera-Pacini body
5. **Where are the exteroceptors located?**
   A) in the skin
   B) in the mucous membranes
   C) in the muscles
   D) in internal organs

6. Where are the interoceptors located?

A) in the skin
B) in the mucous membranes
C) in the muscles
D) in internal organs

7. Where are the proprioceptors located?

A) in the skin
B) in the mucous membranes
C) in the muscles
D) in internal organs

8. What kind of sensitivity is difficult?

A) tactile
B) painful
C) Muscular-articular feeling
D) stereogenic feeling

9. What kinds of sensitivity are related to deep types?

A) painful
B) musculo-articular feeling
C) temperature
D) vibration

10. What types of sensitivity are related to surface types?

A) painful
B) musculo-articular feeling
C) Stereotype
D) vibration

11. Where is the first neuron of the path of pain and temperature feeling?

A) in the posterior horn of the spinal cord
B) in the cells of the spinal ganglion
C) in anterior horns of the spinal cord
D) in the ventro-lateral nucleus of the thalamus

12. Where is the first neuron of the path of deep sensitivity?

A) in the posterior horn of the spinal cord
B) in the cells of the spinal ganglion
C) in anterior horns of the spinal cord
D) in the ventro-lateral nucleus of the thalamus

13. Where is the second neuron of the path of pain and temperature feeling located?

A) in the posterior horn of the spinal cord
B) in the cells of the spinal ganglion
C) in anterior horns of the spinal cord
D) in the nuclei of Gaull and Burdach in the medulla oblongata

14. Where is the second neuron of the pathway of deep sensitivity?

A) in the posterior horn of the spinal cord
B) in the cells of the spinal ganglion
B) in anterior horns of the spinal cord
D) in the nuclei of Gaull and Burdach in the medulla oblongata

15. Where does the cross between the conductors of temperature and pain sensitivity occur?

A) in the front gray spike
B) at the level of the lower olive of the medulla oblongata
C) at the level of the legs of the brain
D) at the level of the bridges bridge

16. Where is a cross between the conductors of the musculo-articular feeling located?

A) in the front gray spike
B) at the level of the lower olive of the medulla oblongata
C) at the level of the legs of the brain
D) at the level of the bridges bridge

17. Where is the third neuron of the path of pain and temperature sensitivity?

A) cells of the spinal ganglion
B) in the posterior horn of the spinal cord
C) in the nuclei of Gaul and Burdach
D) in the ventro-lateral nucleus of the thalamus

18. Where is the third neuron of the pathway of the muscle-articular feeling?

A) cells of the spinal ganglion
B) in the posterior horn of the spinal cord
B) in the nuclei of Gaul and Burdach
D) in the ventro-lateral nucleus of the thalamus

19. In which part of the inner capsule does the path of pain and temperature sensitivity pass?

A) anterior thigh
B) the knee
B) front 2/3 hind
femora
D) posterior third of
posterior thigh

20. In which part of the inner capsule does the pathway of the musculo-articular feeling pass?

A) anterior thigh
B) the knee
B) front 2/3 hind
femora
D) posterior third of
posterior thigh

21. How are the fibers of pain and temperature sensitivity located in the spinotalamic tracts?

A) lateral fibers from the leg, medial - by hand
B) lateral fibers from the hand, the medial from the leg
B) medial fibers - from the trunk, lateral - from the limbs
D) without regularity

22. How are the fibers of the pathway of the muscle-articular feeling located in the posterior columns of the spinal cord?

A) lateral fibers from the leg, medial - by hand
B) medial fibers from the foot, lateral - by hand
B) without regularity

23. Where does the pain and temperature sensitivity end?

A) Precentral gyrus
B) postcentral convolution

C) the gyrus of Geshel
D) lingual convolution

24. Where does the way of the musculo-articular feeling end?
A) Precentral gyrus
B) postcentral convolution
C) the gyrus of Geshel
D) lingual convolution

25. What is the total loss of any kind of sensitivity?
A)Hypesesia
B) Anesthesia
C) hyperesthesia
D) polyesthesia

26. What is the name of a decrease in sensitivity?
A) Hypesesia
B) Anesthesia
C) hyperesthesia
D) polyesthesia

27. What is the name of an isolated violation of some types of sensitivity while preserving others?
A) polyesthesia
B) Hypesesia
C) dissociation
D) dysesthesia

28. What happens when sensitive conductors are irritated?
A) Hypesesia
B) Anesthesia
C) asteroognosis
D) hyperesthesia

29. What are the signs of hyperpathy?
A) increase in the threshold of perception of pain
B) lowering the threshold of perception of pain
C) the presence of a latent period from the application of
irritation to its perception
D) the absence of a latent period
E) a long aftereffect
F) absence of aftereffect

30. What is astereognosis?
A) loss of the ability to recognize familiar objects by feeling
B) perception of one stimulus as sets
C) distortion of perception of irritation
D) Sensation of irritation not only at the place of application, but also in another area

Criteria for evaluating the test

"Excellent" ("5") - 91% and more correct answers to test tasks.
"Good" ("4") - 81-90% of correct answers to test tasks.
"Satisfactory" ("3") - 71-80% of correct answers to test tasks.
"Unsatisfactory" ("2") - 70% or less of the correct answers to test tasks.

Interview questions

Arbitrary movements and their disorders.

a. Classification of reflexes.
b. Reflex arc.
c. Symptoms of defeat of the peripheral motor neuron.
d. Symptoms of involvement of the central motor neuron.
e. Main pathological stop reflexes.
f. Pyramid way.
g. Syndromes of defeat of the pyramidal path at different levels.

Sensitivity and its disorders.

1. Conducting the path of pain and temperature sensitivity.
2. Conducting the path of deep sensitivity.
3. Clinical classification of types of sensitivity.
4. Clinical types of sensitive disorders.
5. Types of sensitivity disorders.

Criteria for assessing the interview in practical classes

"Excellent" - the answer is complete, literate, logical; the anatomical formations on the preparations are shown quickly and confidently; free possession of anatomical terminology; the answers to the additional questions are concise.

"Good" - the answer is not logical enough with single errors in details; lack of confidence and speed in demonstrating anatomical formations on drugs; single errors in the Latin terminology; the answers to additional questions are correct, not clear enough.

"Satisfactory" - the answer is not literate, incomplete, with errors in details; uncertainty when demonstrating anatomical formations; errors in the Latin terminology; the answers to additional questions are not clear enough, with errors in details.

"Unsatisfactory" - the answer is illiterate, incomplete, with gross mistakes; errors in the demonstration of anatomical formations; ignorance of the Latin terminology; answers to additional questions are incorrect.

Approximate questions of practical skills

1. Collect anamnesis of the patient's life, anamnesis of the disease.
2. Conduct a physical examination of the patient.
3. Describe the patient's neurological status.
4. Identify the syndromic and topical diagnosis.
5. For diagnosed syndromes, put a clinical diagnosis

Criteria for assessing practical skills:

"Excellent" ("5") - 91% and more correct answers to tasks.
"Good" ("4") - 81-90% of correct answers to tasks.
"Satisfactory" ("3") - 71-80% of correct answers to tasks.
"Unsatisfactory" ("2") - 70% and less correct answers to assignments.

Exemplary list of examination questions on the discipline Neurology, Medical Genetics, Neurosurgery

General Neurology

1. Classification of reflexes.
2. Reflex arc.
3. Symptoms of defeat of the peripheral motor neuron.
4. Symptoms of involvement of the central motor neuron.
5. Main pathological stop reflexes.
6. Pyramid way.

7. Syndromes of defeat of the pyramidal path at different levels.
8. Conducting the path of pain and temperature sensitivity.
9. Conducting a path of deep sensitivity.
10. Clinical classification of types of sensitivity.
11. Clinical types of sensitive disorders.
12. Types of sensitivity disorders.
13. Olfactory nerve. Symptoms of olfactory pathway.
14. Visual path.
15. Symptoms of oculomotor nerve damage.
16. Symptoms of affection of the nerve block.
17. Symptoms of afferent nerve failure.
18. What are the symptoms of irritation of the cortical parts of the visual analyzer?
19. What are the symptoms of defeat of the Gasser node?
20. What kind of sensitivity disorders are detected when the core of the surface sensitivity of the trigeminal nerve is affected.
21. Bell's paralysis.
22. What symptoms will be revealed when the facial nerve is damaged in the bridge-cerebellum corner?
23. What symptoms will be revealed if the facial nerve is damaged below the n.petrosus major?
24. When any structures are damaged, central facial nerve palsy occurs.
25. Name the symptoms of bulbar paralysis.

Medical Genetics

1. Methods of studying human genetics (cytogenetic, genealogical).
2. Methods of studying human genetics (twin, biochemical).
3. Structure and functions of the protein.
4. Model of the DNA molecule structure of D. Watson, F. Crick.
5. Classification of variability. Non-hereditary variability.
6. Classification of variability. Hereditary variability.
7. Mutagen and mutagenesis.
8. Classification of mutations at the chromosome level.
9. Classification of hereditary diseases.
10. Chromosomal diseases due to anomalies of autos (Daun village, Patau village, Edwards village).
11. Chromosomal diseases due to abnormalities of female sex chromosomes (Shereshevsky-Turner village, XXX syndrome).
12. Chromosomal diseases due to abnormalities of male sex chromosomes (from Klinefelter, pp. HUU).
13. Chromosomal diseases due to chromosomal mutations (Cat's Crying Syndrome).
14. Genetic diseases. The syndrome of Waardenburg
15. Genetic diseases. Marfan's syndrome.
16. Genetic diseases. Recklinghausen's syndrome.
17. Genetic diseases. Phenylketonuria.
18. Genetic diseases. Homocystinuria.
19. Genetic diseases. Galactosemia.
20. Genetic diseases. Usher's Syndrome.

Private Neurology

1. Blood supply to the spinal cord. Disturbances of the spinal circulation.
2. Classification of diseases of the peripheral nervous system: mononeuropathy and polyneuropathies.
3. Neuropathy of the median nerve: etiology, pathogenesis, clinic, treatment.
4. Neuropathy of the ulnar nerve: etiology, pathogenesis, clinic, treatment.
5. Neuropathy of the radial nerve: etiology, pathogenesis, clinic, treatment.
6. Neuropathy of the peroneal nerve: etiology, pathogenesis, clinic, treatment.
7. Tunnel syndromes: the carpal canal, the cubital canal. Conservative therapy and indications for surgical treatment.
8. Neuropathy of the facial nerve: clinic, diagnosis, treatment.
9. Neuralgia of the trigeminal nerve: clinic, diagnosis, treatment.

10. Acute inflammatory demyelinating polyneuropathy (Guillain-Barre syndrome): pathogenesis, clinic, treatment.
11. Polyneuropathies: diabetic polyneuropathy, alcoholic polyneuropathy, diphtheria polyneuropathy (clinical features, treatment).
12. Vertebrogenic diseases of the nervous system: classification. Osteochondrosis of the spine: reflex and compression syndromes. Pathogenesis, clinic, paraclinical methods in diagnosis.
13. Reflex syndromes of osteochondrosis of the spine: pathogenesis, clinic, treatment.
14. Compression syndromes of osteochondrosis of the spine: pathogenesis, clinic, treatment. Indications for surgical treatment.
15. Neurological syndromes of cervical osteochondrosis. Syndrome of the vertebral artery: pathogenesis, clinic, treatment.
16. Parkinson's disease, parkinsonism: pathogenesis, clinic, diagnosis, treatment.
17. Multiple sclerosis: pathogenesis, clinic, diagnosis, treatment. Paraclinic methods of investigation in the diagnosis of multiple sclerosis.
18. Encephalitis: classification, clinic, diagnosis, treatment. Herpetic encephalitis. Tick-borne encephalitis.
19. Meningitis: classification, etiology, clinic, diagnosis, treatment.
20. Primary and secondary purulent meningitis (meningococcal, pneumococcal): clinic, diagnosis, treatment.

Criteria for assessing the interview at the exam

"Excellent" - the answer is complete, literate, logical; the anatomical formations on the preparations are shown quickly and confidently; free possession of anatomical terminology; the answers to the additional questions are concise.

"Good" - the answer is not logical enough with single errors in details; lack of confidence and speed in demonstrating anatomical formations on drugs; single errors in the Latin terminology; the answers to additional questions are correct, not clear enough.

"Satisfactory" - the answer is not literate, incomplete, with errors in details; uncertainty when demonstrating anatomical formations; errors in the Latin terminology; the answers to additional questions are not clear enough, with errors in details.

"Unsatisfactory" - the answer is illiterate, incomplete, with gross mistakes; errors in the demonstration of anatomical formations; ignorance of the Latin terminology; answers to additional questions are incorrect.

Exemplary list of examination tasks

No. 1. A young man, 15 years old, was admitted to hospital with complaints of headache in the forehead on the right. He is ill for several months. Recently, strange behavior of the patient, foolishness, untidiness is noted. Objectively: somewhat stunned, languid, sometimes euphoric, sometimes commits unmotivated acts, untidy. The right side of the nose is absent. The vision of the right eye is light, the left one - 0,8. On the fundus: atrophy of the right optic nerve, left stagnant nipple. The pupils are uniform, the reaction to the light of the right pupil is extremely flaccid, the left-to-live. The pupils' reaction to convergence is preserved. Eye movements are not limited. Nystagmus is not present. The flattening of the left nasolabial fold, the left corner of the mouth is slightly lowered. Hearing disorders, phonation, swallowing is not revealed. The tongue protrudes along the middle line. The movements of the arms and legs are normal. Muscle tone is not changed. Coordination of left hand movements is slightly disturbed. All tendon reflexes are higher on the left. In cerebrospinal fluid: protein - 1,4% o, sharply positive protein reactions, cytosis 2/3. Craniography: increased finger impressions, osteoporosis of the back of the Turkish saddle. Ventriculography revealed: displacement of the ventricular system to the left, deformation of the anterior horn of the right ventricle, it was pushed upward. The left lateral ventricle is enlarged.

Questions:

1. Is it possible to consider all symptoms without exception as strictly focal?
2. How can you explain the absence of smell?
3. How can you explain the mechanism of the Foster-Kennedy syndrome?
4. Where is the focus of defeat? Specify it on the diagram.
5. What clinical diagnosis can be made based on anamnestic and objective data?

6. How do you explain the data obtained during ventriculography?
7. Have all diagnostic methods been used to examine the patient?
8. How can you investigate the smell?

No. 2. Patient, 68 years old. In the last 2-3 years he became irritable, tired quickly, there was a noise in his ears, and occasionally he was troubled by a headache. Waking up in the morning, I felt that "Numb" and weakened the right leg, and then the right arm also weakened. This weakness grew for several hours, especially the right foot. On the 15th day of the disease, the right nasolabial fold was smoothed, the tongue was deflected to the right. The function of other cranial nerves is not disturbed. Restriction of the right arm movements, mainly in the shoulder joint and to a lesser extent in the elbow, wrist and small joints of the hand. Slight increase in the flexion of the right hand flexor. Weakness of the right leg, a sharp increase in the tone of the extensor muscles. A slight disturbance of the sense of discrimination on the right foot. Tendon reflexes on the right are higher. Ventrals - right weakened. On the right are the positive symptoms of Oppenheim and Babinsky. Sharply expressed grasping reflex of the right hand, palm-chin reflex on both sides. In subsequent studies it was found that the movements and strength of the right hand are almost the same as those of the left one. In the right leg, the movements became limited, and in the distal parts of the paresis phenomenon is much sharper than in the proximal ones. Blood pressure is 105/60 mm Hg. Prothrombin index 116%. The heart sounds are muffled. On the roentgenogram of the skull pathology is not revealed.
Questions:
1. Where is the pathological process localized? What evidences the localization you are suggesting?
2. Name the clinical diagnosis. Give its justification.
3. Which artery vascularizes the affected area? From which artery does it depart? How it is connected to the artery of the same name on the other hand?
4. How can the central paresis of the facial and hyoid nerve be explained in this case?
5. What is discriminatory sensitivity?

Criteria for assessing the solution of situational problems

"Excellent" - the answer is complete, literate, logical; free possession of medical terminology.
"Good" - the answer is not logical enough with single errors in details; single errors in medical terminology.
"Satisfactory" - the answer is not literate, incomplete, with errors in details; errors in medical terminology.
"Unsatisfactory" - the answer is illiterate, incomplete, with gross mistakes; ignorance of medical terminology.

Sample course work topics

1. Higher cortical functions. Dementia (cortical, subcortical).
2. Hemorrhagic stroke (etiology, pathogenesis, clinic, diagnosis, treatment).
3. Ischemic stroke (etiology, pathogenesis, clinic, diagnosis, treatment).
4. Dyscirculatory encephalopathy (chronic cerebral circulatory failure): etiology, pathogenesis, stages of clinical manifestations, treatment.
5. Subarachnoid hemorrhage (etiology, pathogenesis, clinic, diagnosis, treatment).
6. Shells of the brain, syndrome of intracranial hypertension, complications.
7. Lesions of the central part of the autonomic nervous system. Hypothalamic syndromes.
8. Lesions of the peripheral part of the autonomic nervous system (Raynaud's disease and syndrome, phantom pains, causalgia, autonomic neuritis, polyneuritis).
9. Neuromuscular diseases: myopathies, neural and spinal amyotrophies.
10. Myasthenia gravis (pathogenesis, forms, clinical manifestations, treatment).
11. Paraclinical research methods (ECHO-encephaloscopy, electroencephalography, ultrasonic vascular dopplerography) in the clinic of nervous diseases.
12. Neuroimaging methods of investigation (CT, MRI) in the clinic of nerve diseases.
13. Alternating syndromes of brain stem lesion.
14. Facial pains (trigeminal neuralgia, Slender's syndromes, Charlene): etiology, pathogenesis, clinic, treatment.
15. Migraine, tension headache (etiology, pathogenesis, diff / diagnosis, treatment).

Estimated activities in the course work

Activities	**Points**
Analyzing the task formulated in the form of a technical need and all available raw data for its implementation, screening out redundant and definition of missing characteristics	15
Choosing methods for solving problems and justifying the choice	15
Performing the task	15
Analyzing the solution obtained and its qualitative evaluation	15
Total	**60**
Defending course work	40
In all	**100**

7. Educational, methodological and informational means provided for the discipline Neurology, Medical Genetics, Neurosurgery

a) basic literature:

1. Neurology and neurosurgery. In 2 volumes. Volume 1. Neurology [Electronic resource]: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. - http://www.studmedlib.ru/book/ISBN9785970426043.html
2. Neurology and Neurosurgery. In 2 volumes. Volume 2. Neurosurgery [Electronic resource]: a textbook / Gusev EI, Konovalov AN, Skvortsova VI - 2 nd ed., Rev. and additional. - M.: GEOTAR-Media, 2013. - http://www.studmedlib.ru/book/ISBN9785970426050.html
3. General neurology [Electronic resource] / AS Nikiforov, EI Gusev. - 2 nd ed., Rev. and additional. - Moscow: GEOTAR-Media, 2013. - http://www.studmedlib.ru/book/ISBN9785970426616.html

b) additional literature:

1. Children's neurology. In 2 volumes. Volume 1. General neurology [Electronic resource]: a textbook / Petrukhin AS - Moscow: GEOTAR - Media, 2012.- http://www.studmedlib.ru/book/ISBN9785970422625.html
2. Children's neurology. In 2 volumes. Volume 2. Clinical neurology [Electronic resource]: a textbook / Petrukhin A.S. - Moscow: GEOTAR - Media, 2012.- http://www.studmedlib.ru/book/ISBN9785970422632.html
3. Chronic vascular diseases of the brain: discirculatory encephalopathy [Electronic resource] / AS Kadykov, LS Manvelov, NV Shakhparonova - M .: GEOTAR-Media, 2014. - http://www.studmedlib.ru/book/ISBN9785970428528.html
4. Neurological complications of the spinal osteochondrosis [Electronic resource] / AS Nikiforov, GN Avakyan, OI Mendel - 2 nd ed. - Moscow: GEOTAR-Media, 2015. - http://www.studmedlib.ru/book/ISBN9785970433331.html
5. Cerebral stroke: neuroimaging in the diagnosis and evaluation of the effectiveness of various treatments. Atlas of research [Electronic resource] / Novikova LB, Sayfullina EI, Skoromets AA - Moscow: GEOTAR-Media, 2012. - http://www.studmedlib.ru/book/ISBN9785970421871.html

Software and Online resources:

"Microsoft Windows" (subscription DreamSpark / Microsoft Imagine Standart); registration number 00037FFEBACF8FD7, contract No. SD-130712001 of 12.07.2013;

"Kaspersky Anti-Virus" 2016-2017, registration number KL4863RAUFQ, agreement No. XII-567116 of August 29, 2016;

free software: Open Office; Mozilla Firefox; Google Chrome Adobe Acrobat Reader; 7zip.

http://elibrary.ru/defaultx.asp - digital library

http://www.studmedlib.ru – site "Student consultant"

http://www.neurology.ru – official site of the Scientific Center of Neurology

8. Material and technical means provided for
the discipline Neurology, Medical Genetics, Neurosurgery

To implement the educational process, educational rooms are used to conduct practical classes;

№	**Name of special premises and premises for independent work**	**The equipment of special rooms and premises for independent work**
1.	Premises in accordance with the agreement with the LU of the NOU "OKB on st. Penza JSC Russian Railways" educational room №6	A set of furniture: tables, chairs, a board, a screen. Multimedia projector A laptop Video materials (presentations)
2.	Audiences for self-study: CCU corp. 10, aud.. № 204, 209	A set of educational furniture: tables, chairs, training board, computers

The work program of the discipline S1.1.29 Neurology, Medical Genetics, Neurosurgery was composed in compliance with requirements of FSES HE taking into account recommendation of EMEP for the educational program 31.05.01 General Medicine.

The program was compiled by:
Baranova G.A, PhD, Associate Professor of the department of Neurology and Neurosurgery.

The program was approved at a meeting of the department of Neurology and Neurosurgery

Record No. 1 dated «01» September 2018

Head of the department _____ Petrova E.V.
The program was approved by
Dean of the Faculty of General Medicine _____ Moiseeva I.Y.

The program was approved by the methodological committee of the Medical Institute

Record No. 1 dated «13» 09 2018

Head of the methodological committee of the
Medical Institute _____ Kalmin O.V.

Data on re-approval of the program for consecutive academic years and record of alterations

Academic year	Departments' decision (Report№, date, signature of sub-department's head)	Introduced alterations	Page numbers		
			changed	new	annulled
2019-2020	Report №13 28.06.19	without changes			