Federal state budgetary educational institution

higher education

Orenburg State Medical University

Ministry of Health of the Russian Federation

**GUIDELINES**

**FOR THE TEACHER**

**FOR THE ORGANIZATION OF THE STUDY OF THE DISCIPLINE**

Neurology, medical genetics, neurosurgery

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(name of the discipline)

in the direction of training (specialty)

31.05.01 General Medicine (Faculty of Foreign Students)

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(code, name of the direction of training (specialty))

It is part of the main professional educational program of higher education in the direction of training (specialty)

31.05.01 General Medicine (Faculty of Foreign Students)

approved by the Academic Council of the FSBEI HE ORGMU of the Ministry of Health of Russia

Minutes No. 8 dated March 25 , 2016

Orenburg

**1. Methodical recommendations for the lecture course**

**Module No. 1**

General neurology

**Lecture number 1.**

**Topic**: Introduction to Neurology.

In water - aimed at awakening interest, the formation of positive motivation, orientation of students in literature.

**Purpose: to**formulate students' knowledge about anatomy, physiology, pathology of the central nervous system and peripheral, to familiarize with research methods in neurology

**Lecture abstract**

The historical milestones in the development of the Department of Neurology, starting from its formation (February 1944), are presented. Important points of neuroontogenesis. The development of symptoms over time, depending on the age periods of a person's life. Neurology is the science of the nervous system. In the general section of neurology, the laws of the functions of the nervous system, the basics of syndromology and topical diagnostics are studied, in the private section, individual diseases. The principles of the structural and functional organization of the nervous system are considered. Neurology: a) children, b) adults, c) neurogeriatrics. Research methods in neurology.

**Form of organization of the lecture:**motivational and stimulating (motivation for independent study of the subject, research work, self-education and professional development);

**Teaching methods used in the lecture**: traditional.

**Learning tools**:

- didactic ( *presentation);*

-material and technical ( *multimedia projector*).

**Lecture number 2.**

**Topic**: Pathology of movement.

**Purpose: to**formulate students' knowledge about anatomy, physiology, pathology of the motor system, to familiarize them with research methods in neurology.

**Lecture abstract**

The anatomical and physiological features of the motor system are presented.

The cerebellum performs: 1. the role of a computer, which allows accurate calculation of the time parameters of muscle contraction. 2. Thanks to the cerebellum, somatosensory, vestibular and visual reverse afferentation provides correction of the direction of hand movement, proportionality and smoothness of movements when approaching the target, and timely termination of movement. .3. The cerebellum determines the temporal parameters of motor programs, which are specified during training. 4. The cerebellum and basal ganglia are involved in the formation of motor skills and automation of movements. 5. Thanks to the cerebellum, the motor program adapts when the movement is repeated, as a result of which attempts to make it become more and more successful. The main purpose of the extrapyramidal system is the formation of muscle tone and posture, as well as automated movements. It prepares the skeletal muscles at every moment to perceive stimulating and inhibiting impulses. The methods of studying the motor system are considered.

**Form of organization of the lecture:**motivational and stimulating (motivation for independent study of the subject, research work, self-education and professional development);

**Teaching methods used in the lecture**: traditional.

**Learning tools**:

- didactic ( *presentation);*

-material and technical ( *multimedia projector*).

**Lecture number 3.**

**Topic**: Pathology of sensitivity.

**Purpose: to**formulate students' knowledge of the anatomy, physiology, pathology of the sensitive system, to familiarize them with research methods in neurology.

**Lecture abstract**

The anatomical and physiological features of the sensitive system are presented. Sensitivity is the ability of a living organism to perceive irritations emanating from the environment, its own tissues and organs. The types of sensory disorders, the concept of pain are considered. The methods of investigation of sensory disorders are considered.

**Form of organization of the lecture:**motivational and stimulating (motivation for independent study of the subject, research work, self-education and professional development);

**Teaching methods used in the lecture**: traditional.

**Learning tools**:

- didactic ( *presentation);*

-material and technical ( *multimedia projector*).

**Lecture number 4.**

**Topic**: Violations of higher cortical functions.

**Purpose: to**formulate students' knowledge about the anatomy, physiology, pathology of higher cortical (mental) functions and to familiarize them with neuropsychological methods of their research.

**Lecture abstract**

The anatomical and physiological features of the higher cortical (mental) functions are presented: 1. Attention 2. Perception 3. Emotional activity 4. Volitional activity 5. Speech 6. Praxis 7. Gnosis 8. Memory 9. Thinking 10. Intelligence 11. Consciousness, Personality and intelligence. The methods of studying the motor system are considered.

**Form of organization of the lecture:**motivational and stimulating (motivation for independent study of the subject, research work, self-education and professional development);

**Teaching methods used in the lecture**: traditional.

**Learning tools**:

- didactic ( *presentation);*

-material and technical ( *multimedia projector*).

**Lecture number 5 .**

**Topic**: Pathology of the autonomic nervous system.

**Purpose: to**formulate students' knowledge of anatomy, physiology, pathology of the autonomic nervous system, to acquaint with research methods in neurology.

**Lecture abstract**

The anatomical and physiological features of the autonomic nervous system are presented. VNS provides and regulates trophotropic, endophylactic and ergotropic functions. The methods of VNS research are considered.

**Form of organization of the lecture:**motivational and stimulating (motivation for independent study of the subject, research work, self-education and professional development);

**Teaching methods used in the lecture**: traditional.

**Learning tools**:

- didactic ( *presentation);*

-material and technical ( *multimedia projector*).

**Lecture number 6 .**

**Topic**: Peripheral nervous system.

**Purpose: to**formulate in students knowledge about the etiology, pathogenesis, classification and diagnosis in case of damage to the peripheral nervous system.

**Lecture abstract**

The anatomical and physiological features of the structure of nerves, roots, plexuses are presented. Classification of diseases of the peripheral nervous system. Concepts: Ostechondrosis • Spondylosis • Spondylolisthesis • Spondylolysis • Spondylitis • Spondyloarthrosis • Dyscitis Polyneuropathy, neuropathy. The methods of studying the peripheral nervous system are considered. Differential diagnosis and treatment.

**Form of organization of the lecture:**motivational and stimulating (motivation for independent study of the subject, research work, self-education and professional development);

**Teaching methods used in the lecture**: traditional.

**Learning tools**:

- didactic ( *presentation);*

-material and technical ( *multimedia projector*).

**Lecture number 7 .**

**Topic**: Primary headache.

**Purpose: to**formulate in students the knowledge of common primary headaches, help with them, learn the ability to neurological examination and identify complaints, anamnesis, the ability to combine symptoms into a cephalgic syndrome, etiology, pathogenesis, clinic, diagnosis, treatment and prevention of primary headaches

**Lecture abstract**

The classification of primary headache is presented. Migraine:. aura without headache. basilar. equivalents. familial hemiplegic. hemiplegic. from: . an aura with an acute onset. long-lasting aura. typical aura. Complications of migraine are considered. Tension headache. Abuse headache. Migraine stroke. The International Classification of Headache 2018, research methods are considered.

**Form of organization of the lecture:**motivational and stimulating (motivation for independent study of the subject, research work, self-education and professional development);

**Teaching methods used in the lecture**: traditional.

**Learning tools**:

- didactic ( *presentation);*

-material and technical ( *multimedia projector*).

**Module No. 2**

Private neurology

Lecture number 1

**Topic**: Acute and chronic disorders of cerebral circulation.

**Purpose: to**formulate the students' knowledge about the anatomy, physiology, pathology of the vascular system of the head (arterial and venous), to familiarize with the research methods for strokes and encephalopathies.

**Lecture abstract**

The classification of ischemic stroke and chronic cerebrovascular accidents is presented. Classification of the severity of the condition of patients with subarachnoid hemorrhage (Hunt and Hess). Methods of research in stroke, subtypes of ischemic strokes and principles of undifferentiated and differentiated therapy of strokes are considered. CT and MRI diagnostics.

**Form of organization of the lecture:**motivational and stimulating (motivation for independent study of the subject, research work, self-education and professional development);

**Teaching methods used in the lecture**: traditional.

**Learning tools**:

- didactic ( *presentation);*

-material and technical ( *multimedia projector*).

**Lecture number 2**

**Topic**: Inflammatory diseases of the nervous system.

**Purpose: to**formulate in students the knowledge about the etiology, pathogenesis, classification and diagnosis in inflammatory diseases of the nervous system.

**Lecture abstract**

The following inflammatory diseases of the NS are presented: 1. Meningitis 1.1. Bacterial meningitis 1.2. Meningitis in other infectious and parasitic diseases 1.3. Meningitis due to other causes 2. Encephalitis and myelitis 3. Intracranial and intravertebral abscesses, granulomas and phlebitis. 4. Neurological manifestations of HIV infection 5. Syphilis of the nervous system (neurosyphilis) 6. Tuberculosis of the nervous system 7. Slow infections of the central nervous system 8. Parasitic diseases of the central nervous system 9. Consequences of infectious and parasitic diseases of the central nervous system. The methods of studying the motor system are considered.

**Form of organization of the lecture:**motivational and stimulating (motivation for independent study of the subject, research work, self-education and professional development);

**Teaching methods used in the lecture**: traditional.

**Learning tools**:

- didactic ( *presentation);*

-material and technical ( *multimedia projector*).

**Lecture number 3.**

**Topic**: Epilepsy.

**Purpose: to**formulate knowledge of the etiology, pathogenesis, classification of epilepsy among students, to acquaint with research methods in neurology.

**Lecture abstract**

The classification of epilepsy is presented. Symptomatic, idiopathic and cryptogenic epilepsy. Genetic, pre- and perinatal disorders. Infections. The action of toxic substances and allergens. TBI. ONMK. Dysmetabolic disorders. Tumors. Hereditary diseases. Fever. Degenerative diseases. Pathogenetic moments. Methods for the study of epilepsy are considered. Differential diagnosis.

**Form of organization of the lecture:**motivational and stimulating (motivation for independent study of the subject, research work, self-education and professional development);

**Teaching methods used in the lecture**: traditional.

**Learning tools**:

- didactic ( *presentation);*

-material and technical ( *multimedia projector*).

**Lecture number 4.**

**Topic**: Demyelinating diseases.

**Purpose: to**formulate knowledge of the etiology, pathogenesis, classification of demyelinating diseases among students, to familiarize them with research methods in neurology.

**Lecture abstract**

The classification of multiple sclerosis is presented. Demyelinating diseases are diseases associated with the destruction of myelin, the protein-lipid membrane that covers the axons of neurons. In this case, neurons and their axons are affected. Etiology and pathogenesis of the development of the disease. Foci 1) demyelination and the presence in these foci 2) remyelination, 3) reactive astrogliosis and 4) inflammatory changes. Differential diagnosis. The research methods for the scattered system are considered.

**Form of organization of the lecture:**motivational and stimulating (motivation for independent study of the subject, research work, self-education and professional development);

**Teaching methods used in the lecture**: traditional.

**Learning tools**:

- didactic ( *presentation);*

-material and technical ( *multimedia projector*).

**Lecture number 5.**

**Topic**: Neuromuscular diseases.

**Purpose: to**formulate students' knowledge of the anatomy, physiology, pathology of the sensitive system, to familiarize them with research methods in neurology.

**Lecture abstract**

Presented are Neuromuscular diseases - disorders of neuromuscular transmission are manifested by weakness and pathological fatigue of skeletal muscles. Diseases with impaired transmission in the neuromuscular synapse . Muscle diseases. Diseases with impaired transmission in the neuromuscular synapse are subdivided. Myasthenia gravis, development of symptoms. Classification. M iasthenic crises : 1. generalized and 2. partial. Cholinergic crisis, diagnosis and emergency care. Differential diagnosis of myasthenia gravis. Lambert-Eaton syndrome. Ophthalmoplegic and ophthalmobulbar forms of myopathy. The methods of studying the neuromuscular system are considered.

**Form of organization of the lecture:**motivational and stimulating (motivation for independent study of the subject, research work, self-education and professional development);

**Teaching methods used in the lecture**: traditional.

**Learning tools**:

- didactic ( *presentation);*

-material and technical ( *multimedia projector*).

**Lecture number 6.**

**Topic**: Brain tumors.

**Purpose: to**formulate knowledge of the etiology, pathogenesis, classification of tumors of the central nervous system among students, to familiarize them with research methods in neurology and neurosurgery.

**Lecture abstract**

The classification of tumors of the central nervous system, phases of tumor development is presented. The frequency of manifestations of meningiomas in the Orenburg region. Neurinomas. Research methods in neurology and neurosurgery. Focal and secondary symptoms. Surgical treatment. 1) Indications: a) emergency with increasing hypertensive syndrome, progressive decrease in vision; b) relative - if the operation can aggravate the existing severe motor, speech and other deficits; with no less effective radiation therapy (pituitary adenoma). 2) The operation is impractical: in case of inoperable tumors, deep malignant gliomas (especially in the case of recurrence), in elderly patients in the phase of severe clinical decompensation and in the terminal state. The opinion of the patient himself and his relatives matters.

**Form of organization of the lecture:**motivational and stimulating (motivation for independent study of the subject, research work, self-education and professional development);

**Teaching methods used in the lecture**: traditional.

**Learning tools**:

- didactic ( *presentation);*

-material and technical ( *multimedia projector*).

**2. Methodical recommendations for conducting practical exercises**

**Module 1**.

General neurology

**Topic 1.**Pathology of movements

**Type of training session**(practical training).

**Purpose:**1. To present the semiotics of central and peripheral paralysis, methods of clinical research of the motor sphere, the ability to make a syndromological and topical diagnosis of lesions of the cortical-muscular pathway, research skills of a patient with movement disorders: a) studies of the volume of active and passive movements; b) research and assessment of muscle strength; c) research and assessment of muscle tone; d) evoking tendon, periosteal, skin reflexes, reflexes from the mucous membranes. e) evoking and evaluating the interpretation of the results of electrodiagnostics

**Lesson plan**

|  |  |
| --- | --- |
| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**( *written survey).* |
| 3 | **The main part of the training session.**Consolidation of theoretical materialQuestions:1) Clinical anatomy and physiology of the motor analyzer (it is necessary to pay attention to the peculiarities of the course of the pyramidal pathway in the brain and spinal cord, types of motor neurons and their functions).2) Levels of arc closure of the main unconditioned reflexes.3) Unconditioned reflexes and their changes (tendon, periosteal, skin reflexes and their assessment).4) Muscle tone and its changes (pay attention to the characteristic change in muscle tone when the pyramidal pathway is affected).5) Active purposeful movements and their changes (pay attention to a five-point assessment of the severity of paresis).6) Muscle trophism and its change.7) Changes in gait (pay attention to the change in gait with various types of paresis).8) Pathological reflexes (pay attention to the mechanism of occurrence of pathological reflexes and the most constant hand and foot pathological reflexes).9) Clinical variants of synkinesis.10) defensive reflexes11) Clinical signs of peripheral paralysis (pay attention to the state of reflexes, tone, muscle trophism).12) Clinical signs of central paralysis (pay attention to the peculiarities of changes in reflexes, muscle tone, the presence of pathological reflexes, protective reflexes and synkinesis).13) Differential diagnosis of various types of paresis (central, peripheral, mixed, reflex, functional).14) Symptom complexes with lesions of the cortical-muscular pathway at various levels (cortical, subcortical, brainstem, spinal at the upper palatal level, at the level of the cervical thickening, at the thoracic level, at the level of the lumbar thickening, cauda equina roots, neural).**Practical skills development**When examining the motor sphere, attention should be paid to: whether there are atrophy or hypertrophy of muscles and limbs (shoulder, forearm, thigh, lower leg). Fibrillar and fascicular twitching (whether or not, their localization). The range of active movements in the joints of the extremities is a limitation of movements in the joints. Muscle strength from the arms, from the legs (in points). Barre test (upper and lower). Passive movements are possible in full (limited). The presence of stiffness in the joints (yes, no). Contracts (yes, no). Muscle tone (normal, decreased, increased). Increased muscle tone (pyramidal or extrapyramidal). The "cogwheel" phenomenon (yes, no). Synkinesia (yes, no). Hyperkinesis: trembling, chorea, athetosis, choreo-athetosis, convulsions, tics, torsion spasm, myoclonus (present, absent, constant, only at rest or during movement). Hypokinesia (yes, no).Practical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students *.*                  |

**Means of education:**

- didactic ( *tables, posters.);*

-material and technical ( *multimedia projector).*

**Topic 2.**Pathology of sensitivity.

**Type of training session**(practical training).

**Objective: To**present the semiotics of sensory disorders; research skills: - superficial sensitivity (pain, temperature, tactile); - deep sensitivity (muscular-articular feeling, vibration sensitivity); - complex types of sensitivity (two-dimensional spatial sense, topognasia, kinetic and discriminatory sensitivity, sense of localization, stereognosy); - pain points and symptoms of tension; differentiation of certain types of sensory disorders; syndromological and topical diagnosis of affection of sensitive formations; practical tasks on the pathology of sensitivity.

**Lesson plan**

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| --- | --- |
| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**(written survey). |
| 3 | **The main part of the training session.**Consolidation of theoretical material (forms of organization of educational activities, used questions and tasks).1. What three types of receptors are distinguished?2. Which doctor is responsible for the pathology of interoreceptors?3. The function of which part of the nervous system must be preserved for sensation to arise? What types of sensitivity are synthesized by the proprioceptive analyzer?4. What types of sensitivity are synthesized by the exteroreceptive analyzer?5. How many neurons make up the exteroreceptive pathway?6. Location of the cell of the first neuron of the exteroreceptive pathway7. Location of the cell of the second neuron of the exteroreceptive pathway.8. Where is the third neuron of the exteroreceptive pathway located?9. Where is the cell of the first neuron of the proprioceptive pathway? Second? Third?10. Which neuron of exteroreceptive sensitivity makes its transition to the opposite side? At what level?11. In what part of the nervous system do exteroreceptive and proprioceptive pathways go separately?12. At what level is the medial loop formed, what is its conductive composition?13. Where is the cortical analyzer of exteroreceptive sensitivity located? Where is the proprioceptive sensitivity analyzer located?Practical skills training (questions for consideration, practical tasks, situational tasks, exercises, etc. are indicated):To successfully master the following **practical skills and abilities**in the diagnosis of pathology of the sensitive system, the student must repeat the following questions: - the method of collecting anamnesis from the patient; - research methodology for the neurological status of the sensitive sphere: superficial sensitivity (pain, temperature, tactile); deep sensitivity (muscular-articular feeling, vibrational elbow sensitivity); complex types of sensitivity (two-dimensional spatial sense, topognasia, kinetic and discriminatory sensitivity, sense of localization, stereognosia); pain points and symptoms of tension - paraclinical research methods. - organization of care for neurological patients.Practical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students.                  |

**Means of education:**

- didactic (tables, posters,);

-material and technical (multimedia projector) .

**Topic 3. Pathology of higher cortical functions.**

**Type of training session**(practical training).

**Purpose: To**present the main functions of the cerebral cortex and symptoms of damage to individual lobes of the brain; methods of clinical research of higher cortical functions; syndromological and topical diagnosis of disorders of higher cortical functions; study of a patient with impaired higher cortical functions.

**Lesson plan**

(compiled based on the type and structure of the lesson, its goals; therefore, the stages, content and time frames may vary).

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| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**(written survey). |
| 3 | **The main part of the training session.**(stages are selected from those proposed in accordance with the type and purpose of the training session)Consolidation of theoretical material (forms of organization of educational activities, used questions and tasks).1) Do cortical speech disorders occur when the right hemisphere of the brain is affected?2) Does the lesion of the speech muscles occur in patients with motor aphasia?3) Is hearing preserved in a patient with sensory aphasia?4) Can a patient with astereognosis describe the properties of an object?5) Is the center of stereognosis one-sided?6) Are there any phenomena of paresis in a patient with alexia?7) Can a patient with amnestic aphasia describe the properties and purpose of the object?8) Does the patient with sensory aphasia understand the speech addressed to him?9) Can a patient with alexia retell the read text?10) Is the correct sequence of action possible in a patient with ideatorial apraxia?11) Are there sensitivity disorders in patients with astereognosis?12) What type of aphasia occurs when the left frontal lobe is affected? - motor aphasia - sensory aphasia - amnestic aphasia?13) What type of speech disorders occurs when the cortical speech centers are damaged? - aphonia - anarthria - aphasia?14) For what type of aphasia are paraphasias characteristic? - motor aphasia - sensory aphasia - amnestic aphasia?15) What occurs when the left angular gyrus is affected? -graphia - alexia - acalculia?Practical skills training (questions for consideration, practical tasks, situational tasks, exercises, etc. are indicated):The study of higher cortical functions and their disorders in local brain lesions is an important component of neurological research. The importance of studying the higher cortical functions (gnosis and praxis, speech, writing and reading, counting and the simplest intellectual processes) is especially great in those cases when we are dealing with focal lesions located within the most complexly organized zones of the cerebral cortex, first of all, dominant hemisphere.Practical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students.                  |

**Means of education:**

- didactic (tables, posters,);

-material and technical (multimedia projector).

**Topic 4. Pathology of the cranial nerves. 1 part.**

**Type of training session**(practical training).

**Purpose: To**present the topographic location of the cranial nerves from pairs 1 to 6; skills of examining the neurological status of a patient with pathology of 1,2,3,4,5,6 pairs of cranial nerves; differentiation of central and peripheral lesions of the cranial nerves; topical diagnosis; practical tasks in the pathology of the cranial nerves

**Lesson plan**

(compiled based on the type and structure of the lesson, its goals; therefore, the stages, content and time frames may vary).

|  |  |
| --- | --- |
| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**(written survey). |
| 3 | **The main part of the training session.**(stages are selected from those proposed in accordance with the type and purpose of the training session)Consolidation of theoretical material (forms of organization of educational activities, used questions and tasks).1. Draw a diagram of the conductors, subcortical centers and cortical localization of the olfactory system.2. Describe the symptoms of damage to the olfactory nerve3. Draw a diagram of the pathways of the visual system4. What symptoms occur with damage to the optic nerve, chiasm, optic tract, Graziole's bundle, occipital cortex?5. Explain the mechanism of formation of homonymous and heteronymous hemianopsia6. What kind of energy is specific to the visual analyzer?7. In what formations is the energy of light waves transformed into a nerve impulse?8. What is the name of the site of formation of the optic nerve?9. Do all the fibers intersect in the chiasm?10. Does the optic tract contain fibers from one eye or from two?11. What are the main layers of the retina?12. What formations perform the function of primary visual centers?13. Where are the cortical parts of the visual analyzer14. Does the Graziole bundle contain fibers from one eye or two?15. At what localization of the lesion (transection of the nerve or optic tract) cause anopsia, hemianopsia.16. Where is the pupil light reflex arc closed?17. What morphological formations make up the sensory and motor parts of this arch?18. Where is the nucleus of the oculomotor nerve and what is its anatomical structure?19. What is the functional organization of the nucleus of the oculomotor nerve? 20. Name the muscles that innervate the oculomotor nerve. 21. Tell us about the clinic of isolated oculomotor nerve palsy and show this pathology variant on the simulator stand?22. What are the clinical differences between lesions of the oculomotor nerve and its nuclei?23. Where is the nucleus of the abducens nerve?25. How to identify an isolated lesion of the blocky nerve?26. Tell us the mechanism of gaze regulation?27. In what direction does gaze paralysis occur when the posterior longitudinal fascicle and the cortical center of gaze are affected?28. What is the phenomenon of "doll eyes"?29. At what localization of the pathological process does vertical gaze paralysis occur?30. Indicate the location of the nuclei and the course of the peripheral neuron of the oculomotor nerve.31. Describe the reflex arc of the pupillary reflex32. What symptoms characterize external and internal ophthalmoplegia?33. What are the symptoms of Argyll Robertson syndrome?34. The location of the nuclei, the course of the peripheral neuron of the trochlear and abducent nerves. Their main functions and symptoms are paralysis.35. What muscles are innervated by the motor portion of the trigeminal nerve? 36. Tell the signs of damage to the motor portion of the trigeminal nerve37. The location of the nuclei, the course of the peripheral and central neurons of the trigeminal nerve.38. List the clinical signs of damage to the trigeminal nerve. The difference between segmental and peripheral sensory innervation on the face?39. List the clinical signs of the superior orbital fissure syndrome.40. Explain the pathophysiology of the Weber and Wallenberg-Zakharchenko syndrome.Practical skills developmentThe student is faced with the task of studying the anatomy, pathology of 1, 2, 3, 4, 5, 6, pairs of cranial nerves, learn to differentiate different forms of disorders (central and peripheral), make a syndromological and topical diagnosis depending on the level of the lesion.Practical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students.                  |

**Means of education:**

- didactic (tables, posters);

-material and technical (multimedia projector) .

**Topic 5.**Pathology of 7, 8, 9, 10, 11, 12 pairs of cranial nerves

**Type of training session**(practical training).

**Purpose: To**present the clinical picture of the lesion of 7,8,9,10,11,12 pairs of cranial nerves; the skill of examining the patient's neurological status; differentiation of central and peripheral lesions of 7,8,9,10,11,12 pairs of cranial nerves; topical diagnosis; practical tasks in the pathology of the cranial nerves.

**Lesson plan**

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| --- | --- |
| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**(written survey). |
| 3 | **The main part of the training session.**(stages are selected from those proposed in accordance with the type and purpose of the training session)Consolidation of theoretical material (forms of organization of educational activities, used questions and tasks).1. Where is the nucleus of the facial nerve located?2. Tell us about the course of the fibers of the facial nerve?3. Which branches extend from the facial nerve in the falopian canal and what do they innervate?4. Tell us about the peculiarities of clinical symptoms in case of damage to the facial nerve at different levels?5. Show on the diagram, table, bench-simulator of a patient with peripheral palsy of the facial nerve?6. What changes in electrical excitability are observed with peripheral paralysis of the facial nerve?7. What is the symptom of "crocodile tears"?8. What are the clinical differences between central and peripheral facial nerve palsy?9. What symptoms indicate damage to the sound-receiving and sound-conducting apparatus?10. Explain the structural features of the auditory and vestibular apparatus.11. How is vestibular ataxia different from other types of ataxia?12. What structures of the nervous system are affected by the presence of auditory and vestibular hallucinations?13. What are the symptoms of bulbar paralysis?14. How to distinguish bulbar palsy from pseudobulbar palsy?15. How to distinguish between central and peripheral lesions of the hypoglossal nerve? 16. Tell us about Jackson's Alternating Syndrome.17. What is the difference between dysarthria and aphasia?18. Explain the structure of the taste analyzer.19. What is the pathology in the lesion of the accessory nerve?20. What are the clinical symptoms of combined lesions of the glossopharyngeal and accessory nerves?21. What movement disorders are observed when the accessory nerve is damaged?22. What alternating syndromes do you know in lesions of the caudal parts of the brainstem?Practical skills training (questions for consideration, practical tasks, situational tasks, exercises, etc. are indicated):The student is faced with the task of studying the anatomy, pathology of the cranial nerves, learning how to make a topical and syndromological diagnosis depending on the level of the lesion.Practical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students.                  |

**Means of education:**

- didactic (tables, posters);

-logical (multimedia projector)

**Topic 6: Pathology of the extrapyramidal system and cerebellum.**

**Type of training session**(practical training).

**Purpose: To**present the clinical picture of the lesion of the striopallidal system and cerebellum, the skills of examining the neurological status of a patient with extrapyramidal disorders, differentiation of certain forms of hyperkinesis, topical diagnosis depending on the form of hyperkinesis, practical tasks on the pathology of the extrapyramidal system.

**Lesson plan**

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| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**( *written survey).* |
| 3 | **The main part of the training session.**Consolidation of theoretical material1. What structures of the brain belong to the extrapyramidal system?2. How does muscle tone change when the pallidum and substantia nigra are affected?3. What clinical signs are characterized by the amiostatic symptom complex?4. Describe the clinical features of hyperkinesis in parkinsonism?5. With the defeat of what formations in the brain choreiform hyperkinesis occurs?6. Describe the clinical features of choreiform hyperkinesis?7. Damage to what structures in the brain will manifest itself as athetosis?8. What are the clinical features of athetotid hyperkinesis?9. How is torsion dystonia clinically manifested?10. How is tics clinically manifested? 11. How is hemiballism manifested clinically?12. Under what conditions does the physical body maintain a stable position on the ground?13. At what position in the Romberg position is it difficult to maintain vertical balance?14. How is balance maintained when the body is thrown back in a standing position?15. What clinical signs are revealed cerebellar disorders.16. What functions, in addition to impaired coordination, does the cerebellum perform?Practical skills development: for successful mastering in the class of the following practical skills and abilities in diagnosing the pathology of the extrapyramidal system, the student must repeat the following questions: - the method of collecting anamnesis from the patient; - methods of research of neurological status: - a) motor sphere - determine the volume, pace, strength of voluntary movements; explore muscle tone and reflexes; parkinsonism symptoms; b) higher brain functions - speech, writing, memory, intellect, praxis; c) coordination - Romberg's test, coordination tests in the limbs; d) gait study; e) vegetative functions. - paraclinical research methods. - organization of care for neurological patients.Practical training on a clinical basis |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students *.*                  |

**Means of education:**

- didactic ( *tables, posters);*

-material and technical ( *multimedia projector).*

**Topic 7.**CSF, hydrocephalus , meningeal syndrome

**Type of training session**(practical training).

**Purpose: To**present the composition of the cerebrospinal fluid and cerebrospinal fluid dynamics in normal conditions and in various pathological conditions; etiology and pathogenesis of hydrocephalus; classification of hydrocephalus and features of liquorodynamic disorders in various types of hydrocephalus; clinic and methods for the diagnosis of hydrocephalus; the main methods of conservative and surgical treatment of hydrocephalus; syndromological and topical diagnosis in patients with hydrocephalus; studies of a patient with hydrocephalus.

**Lesson plan**

(compiled based on the type and structure of the lesson, its goals; therefore, the stages, content and time frames may vary).

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| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**(written survey). |
| 3 | **The main part of the training session.**(stages are selected from those proposed in accordance with the type and purpose of the training session)Consolidation of theoretical material (forms of organization of educational activities, used questions and tasks).1.the state and functions of the cerebrospinal fluid are normal;2. CSF in various pathological conditions (protein-cellular and cellular-protein dissociation, subarachnoid hemorrhage, meningitis);3. meningeal syndrome (Kernig's and Brudzinsky's symptoms);4. CSF dynamics in health and disease (CSF flow tests of Kvekenstedt, Stuckey, Pousssen, lumbar puncture and measurement of CSF pressure, suboccipital puncture, ventricular puncture);5.classification of hydrocephalus (by etiology; by distribution; by the nature of liquorodynamic disorders; by the stage of the disease);6. clinic of hydrocephalus (dynamics of changes in head circumference, condition of the fontanelles of the skull, changes in tendon and periosteal reflexes, motor activity, stem symptoms, symptoms of intracranial hypertension);7. diagnostics of hydrocephalus (measurement of the head circumference, assessment of the condition of the fontanelles of the skull, echoencephaloscopy, craniography, lumbar puncture, liquorodynamic tests, computed tomography and magnetic resonance imaging of the brain);8. conservative therapy and modern basic methods of surgical treatment of hydrocephalus (bypass surgery).Practical skills training (questions for consideration, practical tasks, situational tasks, exercises, etc. are indicated):The student is faced with the task of studying the anatomy, pathology of the cerebrospinal fluid pathways.Practical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −task for self-preparation of students                  |

**Means of education:**

- didactic (tables, posters,);

-logical (multimedia projector)

**Topic 8.**Research methods in the diagnosis of diseases of the nervous system

**Type of training session**(practical training).

**Objective: To**introduce students to non-invasive and invasive research methods in neurology and neurosurgery; principles of diagnostics of subarachnoid hemorrhage, brain and spinal cord tumors; teach to formulate indications for the use of certain additional methods in the diagnosis of diseases of the nervous system; teach the skills of interpreting objective diagnostic methods in neurology and neurosurgery.

**Lesson plan**

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| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**(written survey). |
| 3 | **The main part of the training session.**Consolidation of theoretical materialQuestions:1.A set of additional research methods in patients with craniocerebral and spinal cord injury;2. a set of additional research methods in patients with convulsive syndrome;3. a set of additional research methods in patients with vascular pathology of the brain and spinal cord;4. a set of additional research methods in patients with the consequence of past organic diseases of the nervous system, hydrocephalus;5. a set of additional research methods in patients with a volumetric process of the brain and spinal cord.Practical skills development:the whole list of practical skills is appliedPreparation of material for the presentation of data of additional research methods in a practical lesson.Practical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −task for independent training of students .                  |

**Means of education:**

- didactic (tables, posters );

-material and technical (multimedia projector) .

**Topic 9.**Pathology of the autonomic nervous system.

**Type of training session**(practical training).

**Purpose: To**present a methodology for the study of autonomic disorders; segmental and suprasegmental divisions of the autonomic nervous system; sympathetic and parasympathetic innervation; autonomic disorder syndromes at various levels; classification of vegetative disorders.

**Lesson plan**

(compiled based on the type and structure of the lesson, its goals; therefore, the stages, content and time frames may vary).

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| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**(written survey). |
| 3 | **The main part of the training session.**(stages are selected from those proposed in accordance with the type and purpose of the training session)Consolidation of theoretical material (forms of organization of educational activities, used questions and tasks).1. The concept of the autonomic nervous system. What is the physiological role of the autonomic nervous system?2. What is the anatomical organization of the segmental division of the autonomic nervous system? What are segmental autonomic disorders?3. The suprasegmental division of the autonomic nervous system - anatomical organization. What are the suprasegmental lesion syndromes?4. Classification of vegetative disorders (according to AM Wayne).5. What is the sympathetic part of the autonomic nervous system represented by?6. What is the parasympathetic part of the autonomic nervous system represented by?7. How is the transmission of nerve impulses carried out in the sympathetic and parasympathetic nervous systems?8. What is the study of vegetative tone based on? What tests are used to determine autonomic reactivity? What is the technique and significance of the clinoorthostatic test?9. What are the methods of sweating research? How do adrenaline, pilocarpine, atropine act on the autonomic nervous system? Skin tests, research technique.10. What are the syndromes of damage to the motor area of ​​the cerebral cortex? What are the syndromes of damage to the medial surface of the temporal, base of the temporal and frontal cortex?11. What are the syndromes of hypothalamic lesion?12. What are the syndromes of brain stem damage?13. Autonomic syndromes of spinal cord injury depending on the level of injury?14. What are the symptoms of lesions of the sympathetic trunk, celiac plexus, nerve trunks?15. Anatomical and functional characteristics of the limbic system, its role in the regulation of autonomic function.16. What is the significance of the reticular formation for the activity of the autonomic nervous system?17. How is urination regulated? What are the clinical variants of urinary disorders?18. How is the sympathetic innervation of the eye carried out? What symptoms occur when the sympathetic innervation of the eye is turned off, and what is this syndrome called?Practical skills training (questions for consideration, practical tasks, situational tasks, exercises, etc. are indicated):Practical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −task for independent training of students .                  |

**Means of education:**

- didactic (tables, posters,);

-material and technical (multimedia projector) .

**Topic 10.**Pathology of the peripheral nervous system.

**Type of training session**(practical training).

**Purpose:**Formation at students of clinical neurological thinking, the ability to self-diagnose the most frequently Br e aspirants lesions of the peripheral nervous system, assisting in polyneuropathies.

**Lesson plan**

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| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**( *written survey).* |
| 3 | The main part of the training session. (stages are selected from those proposed in accordance with the type and purpose of the training session)Consolidation of theoretical material (forms of organization of educational activities, used questions and tasks).1. What is polyneuropathy (polyneuritis)?2. [Classification of dibetic polyneuropathy](https://translate.google.com/translate?hl=ru&prev=_t&sl=ru&tl=en&u=http://www.happydoctor.ru/diabetes/neuropathy-classification) according to ICD10.3. Variants of polyneuropathies.4. Pathogenetic mechanisms of development of polyneuropathies.5. The clinical picture.6. Progression of diabetic polyneuropathy.7. Diagnostics.8. Scale of symptoms - NSS (Neuropathy Symptom Score) and a scale of signs - NDS (Neuropathy Dysability Score).8. Neurological examination of sensorimotor disorders.9. Stages of distal diabetic neuropathy (International guidelines for the outpatient management of diabetic neuropathy, 1995).Practical skills developmentLearn methods of clinical diagnosis of neurological pat on nology, medical tactics required GP.To study the basics of the clinical course of the most common neurological diseases of the peripheral nervous system, modern methods of diagnosis and treatmentPractical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students *.*                  |

**Means of education:**

- didactic ( *tables, posters,);*

-material and technical ( *multimedia projector) .*

**Topic 11.**Primary headache.

**Type of training session**(practical training).

**Purpose:**Formation of a student's clinical neurological thinking, the ability to independently diagnose the most common primary headaches, and help with them.

**Lesson plan**

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| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**( *written survey).* |
| 3 | **The main part of the training session.**Consolidation of theoretical material, *questions:*1. Classification of migraine according to ICGB-3 beta (2013)2. What is chronic migraine?3. What complications of migraine do you know?4. What are the episodic syndromes that can be combined with migraine?5. What is new daily persistent GB?6.What is **GB**associated with **?**7. Diagnostics8. Indications for additional studies in patients with a complaint of hypertension.9. Suspicion of symptomatic (secondary) nature of cephalalgia .Practical skills developmentTo learn the methods of clinical diagnosis for primary headache, medical tactics required by a general practitioner.To study the basics of the clinical course of the most common primary headaches, modern methods of diagnosis and treatment.Practical training on a clinical basis *(practicing practical skills).* |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students *.*                  |

**Means of education:**

- didactic ( *tables, posters);*

-material and technical ( *multimedia projector).*

**Module 2**.

Private neurology

**Topic 1.**Acute disorders of cerebral circulation. Ischemic stroke.

**Type of training session**(practical training).

**Purpose: To**present to students the classification of vascular lesions of the brain and spinal cord, focal neurological symptoms, cerebral symptoms, meningeal symptoms, the severity of ischemic stroke, subtypes of ischemic stroke, acute hypertensive encephalopathy, subarachnoid hemorrhage, differential diagnosis of ischemic and other disorders complex of therapeutic measures at the prehospital stage, maintenance of the body's energy balance, therapy of cerebral edema and intracranial hypertension, metabolic protection of the brain, principles of intensive care, complications of stroke, differential therapy, therapy of transient disorders of cerebral circulation, surgical treatment.

**Lesson plan**

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| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.** |
| 3 | The main part of the training session.Consolidation of theoretical materialQuestions:1. Classification of acute disorders.
2. Risk factors for stroke.
3. What are focal neurological symptoms? What are cerebral symptoms? What symptomatology is called meningeal?
4. The severity of ischemic stroke.
5. Criteria for acute hypertensive encephalopathy.
6. Subtypes of ischemic stroke
7. Pseudo-stroke. What is it? Differential diagnosis.
8. Pathogenetic mechanisms of development of ischemic stroke subtypes.
9. Clinic of minor stroke in the carotid system, in the vertebrobasilar system.
10. Differentiated therapy for ischemic stroke.

Practicing practical skills and abilities, solving situational problems.Practical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students *.*                  |

**Means of education:**

- didactic ( *tables, posters);*

-material and technical ( *multimedia projector).*

**Topic 2.**Acute disorders of cerebral circulation. Hemorrhagic stroke.

**Type of training session**(practical training).

**Purpose: To**present to students meningeal symptoms, the severity of hemorrhagic stroke, subarachnoid hemorrhage, differential diagnosis of hemorrhagic stroke with other conditions, therapy of cerebral edema and intracranial hypertension in hemorrhagic stroke, principles of intensive care, differential therapy, surgical treatment.

**Lesson plan**

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| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**( *written survey).* |
| 3 | The main part of the training session.Consolidation of theoretical materialQuestions:1. Classification of hemorrhagic circulatory disorders of the brain.
2. Risk factors for stroke.
3. Severity according to Hunt-Hess.
4. Cerebral edema and dislocation syndrome, clinical picture and CT diagnostics.
5. Indications for surgical treatment for different localization of hemorrhagic stroke.
6. Rehabilitation for strokes.

Practicing practical skills and abilities, solving situational problems.Practical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students *.*                  |

**Means of education:**

- didactic ( *tables, posters);*

-material and technical ( *multimedia projector).*

**Topic 3.**Chronic cerebral ischemia / discirculatory encephalopathy.

**Type of training session**(practical training).

**Purpose: To**present to students the classification of discirculatory encephalopathy, focal neurological symptoms, a set of therapeutic measures, metabolic protection of the brain, differential therapy, therapy.

**Lesson plan**

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| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**( *written survey).* |
| 3 | The main part of the training session.Consolidation of theoretical materialQuestions:1. Questions of terminology, definitions of discirculatory encephalopathy according to ICD-10: "cerebral atherosclerosis" (I 67.2), "progressive vascular leukoencephalopathy" (I 67.3), "hypertensive encephalopathy" (I 67.4), "other specified lesions of cerebral vessels" (I 67.8) , "Cerebrovascular disease, unspecified" (I 67.9).
2. Etiology of discirculatory encephalopathy (hypertensive, atherosclerotic).
3. Pathogenesis of discirculatory encephalopathy: changes in the arteries of the brain along their entire length by the type of destructive processes: plasma and hemorrhages, necrosis with thinning of the wall of intracerebral vessels, reparative and adaptive processes, "hypertensive stenosis" and subsequent obliteration of the lumen, structural and functional properties of erythrocytes, platelets microcirculation, cerebral venous systems, perfusion pressure, irreversible morphological damage.
4. Clinic of discirculatory encephalopathy.
5. Clinical, neuropsychological and MRI diagnostics of discirculatory encephalopathy.
6. Differential diagnosis of discirculatory encephalopathy.
7. The main approaches to the treatment of discirculatory encephalopathy, depending on the etiological factor.

 Practicing practical skills and abilities, solving situational problems.Practical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students *.*                  |

**Means of education:**

- didactic ( *tables, posters);*

-material and technical ( *multimedia projector).*

**Topic 4.**Inflammatory diseases of the nervous system (meningitis, encephalitis, meningoencephalitis) .

**Type of training session**(practical training).

**Purpose: To**present students about the etiology, pathogenesis, clinical picture of inflammatory diseases of the nervous system (meningitis, encephalitis, meningoencephalitis), methods of clinical and additional diagnostics .

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**Lesson plan**

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| No.p / p | Stages and content of the lesson |
| one   | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**( *written survey).* |
| 3 | The main part of the training session.Consolidation of theoretical material.Questions:1. The concept of encephalitis. Division of encephalitis into primary and secondary. Isolation of acute, subacute and chronic encephalitis. Polyencephalitis and leukoencephalitis.
2. General characteristic signs of the encephalitic process are cerebral, focal symptoms.
3. Characteristics of cerebrospinal fluid in encephalitis. Use for the diagnosis of encephalitis epidemiological, clinical, laboratory / serological, virological / data.
4. Etiology and pathogenesis of encephalitis. Group of viral encephalitis / tick-borne, mosquito-borne, epidemic, enterovirus, multi-seasonal /, infectious-allergic and allergic encephalitis / with bark, chickenpox, rubella, scarlet fever /, vaccinated / smallpox, anti-rabies, with CDS, DPT /, rheumatic encephalitis.
5. Epidemic encephalitis. The first descriptions of epidemic outbreaks. Opportunities for epidemic spread at the present time. Ways of spreading the infection. Features of pathological data. The initial manifestations of the acute manifestation of the disease. Features of the clinical picture of epidemic encephalitis at the present time / vestibular, hyperkinetic forms /.
6. The concept of leptomeningitis, arachnoiditis, pachymeningitis. Meningitis, primary and secondary, purulent and serous, is the main characteristic of meningeal syndrome. Changes in cerebrospinal fluid in various meningitis. The phenomenon of meningism.
7. Meningococcal meningitis. Etiology and pathogenesis. The predominant disease of childhood. Pathological anatomy, clinic of typical manifestations of meningococcal meningitis, complications and consequences. Atypical forms - meningococcemia, fulminant form, abortive, chronic. Principles of treatment for meningococcal meningitis.
8. Features of the clinic and course of purulent meningitis of other etiology. Principles of treatment of purulent meningitis.
9. Serous meningitis - various forms of meningitis etiology - Comrade, united serous nature of meningeal inflammation. The main types of serous meningitis are enteroviral, lymphocytic, with mumps. The most common forms of serous meningitis. Features of treatment. Outcomes, principles of differential - Noah serous meningitis diagnosis of tuberculous meningitis. Treatment of tuberculous meningitis.
10. Secondary infectious allergic encephalitis. Brain lesions that develop with general infections and after vaccination.
11. The predominance of lesions of the white matter of the brain, spinal cord / encephalomyelitis /, peripheral nervous system / encephalomyelopolyradiculoneuritis /.

Practical skills developmentPractical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students *.*                  |

**Means of education:**

- didactic ( *tables, posters);*

-logical ( *multimedia projector)*

**Topic 5.**Epilepsy, status epilepticus .

**Type of training session**(practical training).

**Purpose:**To provide students with knowledge about the clinical features of seizure conditions and the type of seizures, ways of providing emergency care in case of status epilepticus.

**Lesson plan**

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| No.p / p | Stages and content of the lesson |
| one | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**( *written survey).* |
| 3 | The main part of the training session.Consolidation of theoretical material.Questions.1. Epilepsy. Morbidity. Prevalence.
2. Modern concepts of etiology, pathogenesis, pathmorphology in convulsive conditions and epilepsy.
3. Classification of convulsive conditions in children and adults.
4. Differential diagnosis of convulsive conditions with epilepsy as an organic disease of the central nervous system.
5. Epilepsy research methods. Electroencephalography, computed tomography, magnetic resonance imaging, etc. in the diagnosis and differential diagnosis of convulsive conditions.
6. Etiology, pathogenesis, clinic of epilepsy, treatment of convulsive conditions depending on the type of seizure and the course of the disease. Clinical picture and treatment of status epilepticus.
7. Forecast and rehabilitation of patients with convulsive conditions.

 Practical skills developmentPractical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students *.*                  |

**Means of education:**

- didactic ( *tables, posters);*

-material and technical ( *multimedia projector).*

**Topic 6.**Demyelinating diseases of the nervous system. Multiple sclerosis.

**Type of training session**(practical training).

**Purpose:**To provide students with knowledge about the etiology, pathogenesis, clinical features of multiple sclerosis, differential diagnosis and treatment.

**Lesson plan**

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| No.p / p | Stages and content of the lesson |
| one | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**( *written survey).* |
| 3 | The main part of the training session.Consolidation of theoretical material.Questions.1. Give a definition of multiple sclerosis.2. Prevalence and incidence of multiple sclerosis in different geographic areas.3. Influence of measles, rubella, infectious mononucleosis (Epstein – Barr virus), herpes virus, various bacteria on the development of MS.4. *Mr.*eneticheskie factors for MS *.*5. Mielin-synthesizing cells.6. Morphologically pathological process in MS.7. clinical manifestations.8. Diagnostic criteria.9. Treatment during the attack and outside the exacerbation.Practical skills developmentPractical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students *.*                  |

**Means of education:**

- didactic ( *tables, posters,);*

-material and technical ( *multimedia projector).*

**Topic 7.**Degenerative diseases of the nervous system. Amyotrophic lateral sclerosis.

**Type of training session**(practical training).

**Purpose:**To provide students with knowledge about the etiology, pathogenesis, clinical features of amyotrophic lateral sclerosis, differential diagnosis and treatment.

**Lesson plan**

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| No.p / p | Stages and content of the lesson |
| one | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**( *written survey).* |
| 3 | The main part of the training session.Consolidation of theoretical material.Questions.1. Give the definition of amyotrophic lateral sclerosis (ALS).2. Its prevalence and incidence.3. Risk factors for ALS.4. Pathogenetic mechanisms of ALS: theory of glutamate excitotoxicity; autoimmune theory; the theory of neurotrophic factor deficiency in the motor areas of the spinal cord and brain; mitochondrial dysfunction hypothesis.5. Classification of F. Norris, domestic authors (Hondkarian OA et al., 1978).6. Diagnostics: electromyography (ENMG), MRI of the brain, muscle biopsy.7. Modified El Escorian diagnostic criteria for ALS, (adopted by the World Federation of Neurology , 2003).8. Riluzole - prolonging the life of ALS patients (according to the recommendations of the European Federation of Neurological Society ).Practical skills developmentPractical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −assignment for self-preparation of students *.*                  |

**Means of education:**

- didactic ( *tables, posters);*

-logical ( *multimedia projector)*

**Topic 8.**Neuromuscular diseases. Myasthenia gravis and mysthenic syndromes.

**Type of training session**(practical training).

**Purpose:**To provide students with knowledge about the etiology, pathogenesis, clinical features of asthenia gravis , differential diagnosis and treatment.

**Lesson plan**

|  |  |
| --- | --- |
| No.p / p | Stages and content of the lesson |
| one | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**( *written survey).* |
| 3 | The main part of the training session.Consolidation of theoretical material.Questions.1. Give a definition of neuromuscular diseases.2. Prevalence and incidence of myasthenia gravis.3. Multifactorial development of myasthenia gravis.4. Pathogenesis of the development of myasthenia gravis.6. The leading clinical symptom of myasthenia gravis is pathological muscle fatigue.8. Generalized form of myasthenia gravis.9. Walker-reception, proserin test, stimulation electromyography.9. Treatment.Practical skills training.Practical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −task for independent training of students *.*                  |

**Means of education:**

- didactic ( *tables, posters,);*

-logical ( *multimedia projector)*

**Topic 9.**Tumors of the brain.

**Type of training session**(practical training).

**Purpose:**To provide students with knowledge about the etiology, pathogenesis, clinical features of the development of a brain tumor, early differential diagnosis and treatment.

**Lesson plan**

|  |  |
| --- | --- |
| No.p / p | Stages and content of the lesson |
| one | **Organizing time.**Announcement of the topic, the purpose of the lesson.Motivational moment (relevance of studying the topic of the lesson) |
| 2 | **Input control, updating of basic knowledge, abilities, skills.**( *written survey).* |
| 3 | The main part of the training session.Consolidation of theoretical material.Questions.1. Clinical classification of tumors of the central nervous system.
2. Topographic classification.
3. Histological classification.
4. Phases of tumor development.
5. Clinical subcompensation phase
6. Moderate clinical decompensation phase.
7. Phase of gross clinical decompensation.
8. Terminal phase.
9. Types of surgical interventions.

Practical skills training.Practical training on a clinical basis (practicing practical skills). |
| four | **The final part of the lesson:**−summing up the results of the lesson;                 −setting current grades in the educational journal;                 −task for independent training of students *.*                  |

**Means of education:**

- didactic ( *tables, posters,);*

-logical ( *multimedia projector)*