

MINISTRY OF HEALTH OF UKRAINE
ODESA NATIONAL MEDICAL UNIVERSITY

Faculty of medicine, international

Department of Neurology and Neurosurgery



CONFIRMED by

Acting vice rector for scientific and pedagogical work

Eduard BURIACHKIVSKYI

September 1st, 2024

WORKING PROGRAM IN THE DISCIPLINE
«NEUROLOGY»

Level of higher education: second (master's degree)

Field of knowledge: 22 «Health care»

Specialty: 222 «Medicine»

Educational and professional program: Medicine

The working program is compiled on the basis of the educational and professional program "Medicine" for the training of specialists of the second (master's) level of higher education in the specialty 222 "Medicine" of the field of knowledge 22 "Health care", approved by the Academic Council of ONMedU (Protocol No. 10 dated June, 27 2024).

Authors:

Anatoliy SON, MD, PhD, DSci, Professor, Head of the department
 Vasyly DOBROVOLSKYI, MD, PhD, Associate Professor
 Olexander STOYANOV, MD, PhD, DSci, Professor
 Yuryi GORANSKYI, MD, PhD, Associate Professor
 Gana PERKOVA, MD, PhD, Associate Professor
 Olena LEBID, MD, PhD, Associate Professor
 Yuliya SOLODOVNIKOVA, MD, PhD, Associate Professor

The working program is approved at the meeting of the department
 Protocol No 1 dated August, 26 2024

Head of the department

 Anatoliy SON

Approved by the guarantor of
 the educational and professional program

 Valeriia MARICHEREDA

Approved by the subject cycle methodical commission for therapeutic disciplines of ONMedU
 Protocol No 1 dated 30 aug 2024

Head of the subject-cycle methodological commission for therapeutic disciplines of ONMedU

 Olena VOLOSHYNA

Revised and approved at the meeting of the department of health care management
 Protocol № _____

Head of the department

 Anatoliy SON

Revised and approved at the meeting of the department of health care management
 Protocol № _____

Head of the department

 Anatoliy SON

1. Description of the discipline:

Name of indicators	Field of knowledge, specialty, specialization, level of higher education	Characteristics of the discipline
Total number:	Field of knowledge 22 «Health care»	<i>Full-time (day) education</i> <i>Compulsory discipline</i>
Credits of ECTS: 3,5	Specialty 222 «Medicine»	<i>Course: 4</i>
Hours: 105	Level of higher education second (master's degree)	<i>Semester: VII - VIII</i>
Content modules: 5		<i>Lectures (10 hours)</i>
		<i>Seminars (0 hours)</i>
		<i>Practical classes (60 hours)</i>
		<i>Laboratories (0 hours)</i>
		<i>Independent work (35 hours)</i>
		<i>including individual tasks (0 hours)</i>
		<i>Form of final control – exam</i>

2. The purpose and tasks of the educational discipline, competencies, program learning outcomes

Purpose: Acquisition by the student of higher education of knowledge and formation of elements of professional competences in the field of neurology and improvement of skills and competences acquired during the study of previous disciplines.

Task:

1. Formation of skills and abilities: differential diagnosis, the most common diseases of the nervous system.

2. Improving the skills of substantiating a clinical diagnosis, drawing up a plan for laboratory and instrumental research,

3. Mastering the ability to determine the tactics of emergency care, treatment and prevention of the most common diseases of the nervous system.

The process of studying the discipline is aimed at forming elements of following competencies:

- **General competencies (GC):**

IC. The ability to solve typical and complex problems, including those of a research and innovation nature in the field of medicine. Ability to continue learning with a high degree of autonomy.

GC1. Ability to abstract thinking, analysis and synthesis

GC 3. Ability to apply knowledge in practical situations

GC 4. Knowledge and understanding of the subject area and understanding of professional activity

GC 5. Ability to adapt and act in a new situation

GC 6. Ability to make reasonable decisions

GC 7. Ability to work in a team

GC 8. Ability to interpersonal interaction

GC 10. Ability to use information and communication technologies

GC 11. Ability to search, process and analyze information from various sources

GC 12. Determination and persistence in relation to assigned tasks and assumed responsibilities

- **Special competencies are:**

SC1. Ability to collect medical information about the patient and analyze clinical data

SC 2. Ability to determine the necessary list of laboratory and instrumental studies and evaluate their results

SC 3. Ability to establish a preliminary and clinical diagnosis of the disease

- SC 4. Ability to determine the necessary regime of work and rest in the treatment and prevention of diseases
- SC 5. Ability to determine the nature of nutrition in the treatment and prevention of diseases
- SC 6. Ability to determine the principles and nature of treatment and prevention of diseases
- SC 7. Ability to diagnose emergency conditions
- SC 8. Ability to determine tactics and provide emergency medical care
- SC 9. Ability to carry out medical evacuation measures
- SC 10. Ability to perform medical manipulations
- SC 16. Ability to fill medical documentation, including electronic forms
- SC 17. Ability to assess the impact of the environment, socio-economic and biological determinants on the state of health of an individual, family, population
- SC 24. Adherence to ethical principles when working with patients and laboratory animals
- SC 25. Adherence to professional and academic integrity, being responsible for the reliability of the obtained scientific results

- **Program learning outcomes** are:

- PLO 1. Having a thorough knowledge of the structure of professional activity. Being able to carry out professional activities that require updating and integration of knowledge. To be responsible for professional development, the ability for further professional training with a high level of autonomy.
- PLO 2. Understanding and knowledge of basic and clinical biomedical sciences, at a level sufficient for solving professional tasks in the field of health care.
- PLO 4. Identifying leading clinical symptoms and syndromes (according to list 1); according to standard methods, using preliminary data of the patient's history, data of the patient's examination, knowledge about the person, his organs and systems, establish a preliminary clinical diagnosis of the disease (according to list 2).
- PLO 5. Collecting complaints, history of life and diseases, assessing the psychomotor and physical development of the patient, the state of organs and systems of the body, based on the results of laboratory and instrumental studies, evaluation of the information regarding the diagnosis (according to list 4), taking into account the age of the patient.
- PLO 6. Establishing the final clinical diagnosis by making a reasoned decision and analyzing the received subjective and objective data of clinical, additional examination, carrying out differential diagnosis, observing the relevant ethical and legal norms, under the control of the managing physician in the conditions of the health care institution (according to the list 2).
- PLO 7. Assigning and analyzing additional (mandatory and optional) examination methods (laboratory, functional and/or instrumental) (according to list 4) of patients with diseases of organs and body systems for differential diagnosis of diseases (according to list 2).
- PLO 8. Determination of the main clinical syndrome or symptom that determines the severity of the victim's/victim's condition (according to list 3) by making a reasoned decision about the person's condition under any circumstances (in the conditions of a health care facility, outside its borders), including in conditions of emergency and hostilities, in field conditions, in conditions of lack of information and limited time.
- PLO 9. Determination of the nature and principles of treatment (conservative, operative) of patients with diseases (according to list 2), taking into account the patient's age, in the conditions of a health care institution, outside its borders and at the stages of medical evacuation, including in field conditions, based on a preliminary clinical diagnosis, observing the relevant ethical and legal norms, by making a reasoned decision according to existing algorithms and standard schemes, in case of the need to expand the standard scheme, be able to justify personalized recommendations under the control of the head physician in the conditions of a medical institution.
- PLO 10. Determination of the necessary mode of work, rest and nutrition based on the final clinical diagnosis, observing the relevant ethical and legal norms, by making a reasoned decision according to existing algorithms and standard schemes.

PLO 14. Determination of tactics and providing emergency medical care in emergencies (according to list 3) in limited time conditions according to existing clinical protocols and standards of treatment.

PLO 17. Performing medical manipulations (according to list 5) in the conditions of a medical institution, at home or work based on a previous clinical diagnosis and/or indicators of the patient's condition by making a reasoned decision, observing the relevant ethical and legal norms.

PLO 18. Determination of the state of functioning and limitations of a person's vital activities and the duration of incapacity for work with the preparation of relevant documents, in the conditions of a health care institution, based on data about the disease and its course, peculiarities of a person's professional activity, etc. Maintain medical documentation regarding the patient and the contingent of the population based on regulatory documents.

PLO 21. Searching for the necessary information in the professional literature and databases of other sources, analysing, evaluating and application of this information.

PLO 24. Organization of the necessary level of individual safety (own and the persons he cares for) in case of typical dangerous situations in the individual field of activity.

As a result of studying the discipline, the student has to

Know:

- Etiology, pathogenesis, clinic, diagnosis, differential diagnosis, treatment, prevention of common diseases of the nervous system.

Be able:

- Communicate with the patient and his relatives, collect complaints, anamnesis of life and diseases.
- Conduct a clinical neurological examination according to standard methods.
- To analyze the results of laboratory, functional and instrumental studies in patients with diseases of the nervous system.
- Carry out differential diagnosis and substantiate the clinical diagnosis.
- Determine tactics and provide emergency medical care to patients with diseases of the nervous system in emergency situations.
- Determine the nature and principles of treatment of patients with diseases of the nervous system on the basis of a preliminary clinical diagnosis, observing the relevant ethical and legal norms, by making a reasoned decision according to existing algorithms and standard schemes.
- Perform medical manipulations (according to list 5) in patients with diseases of the nervous system.

3. The content of the educational discipline

Content module 1.

Introduction. Reflexes. Symptoms of the motor, coordinatory and sensory disorders.

Theme 1. The main stages of the development of neurological science.

The first studies of diseases of the nervous system (Hippocrates, Galen, Avicenna) The study of neurology in the universities of the Middle Ages and the Renaissance. Organization of the first departments of neurology at universities (Kharkiv, Kyiv, Lviv, etc.). Domestic and world neurological schools. Modern directions of the development of neurology: differentiation of neurological science (creation of separate centers and scientific divisions for the study of cerebrovascular, demyelinating diseases, epilepsy, neuromuscular pathology, etc.) and integration with other sciences (somatoneurology, vertebroneurology, neurosurgery).

Theme 2. Principles of structure and functioning of the nervous system. Functional unit of the nervous system - neuron. Motor system. Concept about the reflex and reflex arch.

Main stages of phylo- and ontogenesis of the nervous system. Structural and functional unit of the nervous system. Main anatomic-topographical divisions of the nervous system: the hemisphere of the brain, subcortical units, brain stem, spinal cord, radices, spinal ganglia, plexes,

peripheral nerves. Functional unit of the nervous system - neuron. Types of neurons, their functional significance. Neuroglia, its functional value.

Concept about the reflex and reflex arch, the conditional and unconditional reflexes, the levels of closing of the dermal, tendon and periosteal reflexes. Methodics of reflexes examination. Anatomic peculiarities and neurophysiology of the system of the voluntary motions, voluntary extrapyramidal system and cerebellum.

Theme 3. Voluntary motions and their impairment. The pyramidal system. Cortico-nuclear and cortico-spinal paths. Symptoms of central and peripheral pareses. Symptoms of central and peripheral pareses.

Realization of voluntary motions. The pyramidal system. Central and peripheral motor neurons. Cortico- nuclear and cortico-spinal paths.

Paralyses, pareses, monoplegia, paraplegia, hemiplegia, triplegia, tetraplegia. Procedure of the study of the motor system. Symptoms of central (spastic) paralysis. Pathophysiology of muscular hypertension, hyperreflex, pathologic reflexes, reduction of the abdominal reflexes.

Symptoms of peripheral (sluggish) paralysis. Pathophysiology of atony, areflexion, atrophy.

Syndromes of affection of the motor path at different levels. Clinical anatomy, physiology of the spinal cord. Syndrome of motor disorders with affection of the motor path at different levels: frontal central twist (syndromes of irritation and precipitation), radiate crown, internal capsule, the brain stem (alternating paralyses), different levels of the spinal cord (higher cervical thickening, at the level of cervical thickening, thoracic, lumbar thickening, cone), different levels of the peripheral motor neuron (anterior horn, anterior radix, nervous plexus, separate peripheral nerves). Pelvic reservoir dysfunction, symptoms of horsetail damage.

Theme 4. Automated involuntary movements. Movements coordination. The extrapyramidal system and syndromes of its affection

Anatomic data: basal ganglia (lentiform, caudate nucleus, claustrum, sub-thalamus), formation of the brain stem (red nucleus, substantia nigra, reticular formation). Connections of the subcortical ganglia with different sections of the brain and spinal cord. Physiology of the extrapyramidal system, its participation in providing unconditional reflexes, realization of the stereotype automated motions, readiness of muscles to the action.

Syndromes of affection of the extrapyramidal system. Akinetic-rigid syndrome, or the syndrome of parkinsonism, its biochemical aspects. Key clinical manifestations of parkinsonism: oligo- bradykinesia, rigidity of the muscles, parkinsonic tremor, postural instability.

Hyperkinetic syndrome. Forms of hyperkineses: athetosis, choreic, hemibalizm, ticks. Muscular dystonias (focal (blepharospasm, facial hemispasm, spastic torticollis, oromandibular dystonia, dystonia of the hand, dystonia of the foot, torsion dystonia), segmental, generalized).

Theme 5. The cerebellum, syndromes of affection of the cerebellum.

Anatomic-physiological peculiarities of the cerebellum. Connection of the cerebellum with different sections of the brain and spinal cord (homo- and heterolateral). Afferent and efferent paths. Vermis cerebelli and hemisphere of the cerebellum. Functions of the cerebellum: provision of equilibrium, coordination, synergism of motions, regulation of the muscular tone. Syndromes of affection of the cerebellum. Notion about static and locomotor ataxia, asinergia, atony of the muscles, intention tremor, adiadochokinesia, dysmetria, hypermetria, nystagmus, scanned language. Forms of ataxia: (cerebellar, cortical, vestibular, sensitive, hysterical).

Theme 6. The sensitive system and symptoms of its affection. Kinds and types of sensitive disorder

Notion about reception. Forms of receptors. Extroceptive, proprioceptive, interoceptive sensitivity. Clinical classification of sensitivity. The main paths of sensitivity. Techniques of investigation. Forms of the sensory disorders: anesthesia, hypesthesia, hyperesthesia, hyperpathia, disesthesia.

Synesthesia, dissociated disorder, polisthesia, paresthesia. Pain and its classification. Notion about nociseptive and antinociseptive systems of the brain.

Topical types of the sensor disorders: mononeuritic, polineuritic, radical, posterior horn, conductive (with affection of the amin sensitive paths at the level of the spinal cord, medial loop, thalamus, internal capsule); cortical type (syndromes of irritation and precipitation). Syndrome of half affection of the spinal cord (Brown-Sequard syndrome).

Content module 2.

Pathology of the cranial nerves. Disorder of the vegetative nervous system and higher cerebral functions. Meningeal liquororogic syndrome. Additional methods of investigations in neurology. Blood supply of brain and spinal cord.

Theme 7. The cranial nerves I, II, VII and syndromes of its affection.

CN I – the olfactory nerve (sensitive nerve): basic anatomic-physiological data.

The olfactory analyzer: the first neuron (ganglionic cells of the mucous membrane of the nose); the second neuron (olfactory bulbs, olfactory tract); the third neuron (primary subcortical olfactory centres - olfactory triangle, transparent septum, anterior perforated substance); cortical olfactory centre (medial surface of the temporal lobe of the brain). Investigations of the olfactory analyzer.

Syndromes of affection - hyposmia, anosmia, hyperosmia, olfactory hallucinations.

CN II - the optical nerve (sensitive nerve).

Anatomic-physiological peculiarities: sections- peripheral (rods and cones, bipolar cells, ganglionic cells, nerve itself, chiasmus, visual tract), central (lateral geniculate bodies, the upper tubers of quadrigeminal plate, cushion of the healthy tuber (subcortical centres), Gratiole fascicle, cancarine sulcus of the occipital lobe (cortical centre of the analyzer).

Symptoms of affection: amaurosis, amblyopia, homonymous and heteronymic hemianopsia (binasal, bitemporal), visual hallucinations. Changes of the optical nerve disk (change in the fundus).

CN VIII - parietal-cochlear nerve (sensitive).

Anatomic-physiological data, cochlear and vestibular nerves. Pathology of the cochlear-vestibular apparatus: affection of sound perception apparatus (disorder of hearing to high tones), affection of the sound perception apparatus (disorder of hearing to low tones); affection of the parietal part (vertigo, nystagmus, disequilibrium, motor coordination, vegetative disturbances, affection of the cortex of the temporal lobes (in case of irritation- hearing hallucinations).

Theme 8. The cranial nerves III, IV, VI and syndromes of its affection.

CN III, IV, VI – perimotor (mixed), block, abducent (motor) nerves: localization of the nuclei, outlet of the radices from the skull, zone of innervation on the periphery.

Symptoms of affection: ptosis, squint, diplopia, disturbance of convergence and accommodation, ophthalmoplegia (partial and complete); pupil reactions, the reflex arch of the pupil reflex, disturbance of pupil reactions (Argile- Robertson syndrome), myosis, mydriasis, anisocoria.

Theme 9. The cranial nerves V, VII and syndromes of its affection.

CN V- the trigeminal nerve (mixed): the nuclei of the nerve, the outlet of radices on the basis of the brain, skull, branch of the nerve and zone of their innervation (optic nerve, upper maxillary, mandibular nerves).

Symptoms of affection of the system of the trigeminal nerve: affection of the branches of the trigeminal nerve (shooting pains, disturbance of all forms of sensitivity in the zone of innervation of the corresponding branches, loss of the corneal reflex, paresis of the masticatory muscles, loss of the mandibular reflex); affection of the node of the trigeminal nerve (herpetic rash, pain, disturbance of all forms of sensitivity on half of the face, reduction of the corneal, mandibular reflexes); affection of the sensitive nucleus of the trigeminal nerve - the nucleus of the cerebrospinal tract (segmental – dissociated type of disturbance of painful and temperature sensitivity on half of the face); affection of the thalamus (hemianesthesia of all forms of sensitivity, thalamic pain on the opposite side of the focus; affection of the cortex of postcentral gyrus).

CN VII- the facial nerve (mixed).

Anatomic-physiological peculiarities; the components of the branch of the nerve (large petrosal nerve, stapedius nerve, tympanichord, facial nerve itself).

Symptoms of affection of the facial nerve: peripheral paresis of the mimic muscles (affection of the nerve in the canal, cerebellopontine angle, brain stem (alternating syndromes of the pons) and central paresis of the mimic muscles (internal capsule; the lower sections of anterior central gyrus).

Theme 10. The cranial nerves IX, X, XI, XII and syndromes of its affection. Bulbar and pseudobulbar syndromes. Alternative syndromes.

CN IX - the glossopharyngeal nerve (mixed);

CN X - the vagus (mixed);

CN XI - the accessory nerve (motor);

CN XII - the hypoglossal nerve (motor).

Anatomic-physiological peculiarities. Localization of the nuclei in the medulla. Bulbar and pseudobulbar syndromes: common signs (dysphagia, disphonia, dysarthria) and differences (fibrillations and atrophy of the lingual muscles, reflexes of the oral automatism, forced laughter, weeping). Impairment of innervation of the lingual muscles - peripheral and central pareses. Alternation paralysis.

Theme 11. Vegetative nervous system. Methods of investigation of the vegetative nervous system. Pathology of the vegetative nervous system.

Anatomical-physiological peculiarities and function of the vegetative nervous system. Segmental section of the vegetative nervous system. Sympathetic nervous system: the lateral horns of the spinal cord, sympathetic stem, ganglia. Parasympathetic nervous system: Craniobulbar, sacral sections. Super-segmental section of the vegetative functions: hypothalamus, limbic system, the reticular formation of the brain stem. Ergotropic and trophotropic activity. Methods of investigation of the vegetative functions. Syndromes of affection of the super-segmental section of the vegetative nervous system. Syndrome of vegetative dystonia. Permanent and paroxysmal motion. Hypothalamic syndrome. Vegetative-vascular paroxysms: sympathoadrenal, Vagoinsular, mixed. Syndrome of affection of the segmental vegetative nervous system. Affections of the brain stem, lateral horns of the spinal cord, ganglia of the marginal stem, plexuses, nerves. Syndrome of Claude-Bernard-Horner. Visceral symptoms. Equal regulations of the pelvic functions and their disorder.

Theme 12. Localization of functions in the cerebral cortex. Syndromes of affection.

Structure of the large cerebral hemispheres. Cyto- and mieloarchitectonics of the cortex. Localization of functions in the cerebral cortex. Dynamic localization of functions. Motor and sensory representations in the cortex. Concept about the functional asymmetry of the hemispheres.

Functions of gnosticism. Kinds of dysfunctions of the gnosticism: visual, olfactory, gustatory, auditory agnosia, astereognosis, autotopagnosia, anozognosia. Praxis. Kinds of apraxiae: constructive, ideational, motor. Speech. Disorders of speech: motor, sensory, amnesic aphasia. Syndromes of affection of separate parts of the large hemispheres: frontal, temporal, parietal, occipital lobes, limbic cortex. Syndromes of irritation of the cortex of the large hemispheres. Syndromes of affection of the right and left hemispheres. Concept about interhemispheric asymmetry. Syndrome of chronic vegetative state. Syndrome of the "locked-in" patient. Syndrome of death of the brain.

Theme 13. Cerebro-spinal fluid, its change. Meningeal syndrome.

Cerebrospinal puncture. Membranes of the brain and spinal cord. Physiology of liquor-formation. Composition of the liquor in the norm, its modification in meningitis, tumours, hemorrhagic stroke, tuberculosis. Cellular- protein, protein- cellular dissociation. Pleocytosis.

Meningeal symptoms: headache, vomiting, general hyperesthesia, photophobia, rigidity of the occipital muscles, Kernig's symptom, signs of Brudzinsky (upper, median, lower), trismus, local reactive painful phenomena- Mendel's syndrome, Bekhterev's zygomatic syndrome, pain on

pressure of the exit points of the small and large occipital nerves. Meningeal pose of a patient.

Symptom of Lessage

Theme 14. Functional diagnosis of diseases of the nervous system.

Roentgenologic (cranio-, spondilography);

Contrasting roentgenologic examinations (mielography, angiography, ventriculography);

Ultrasound (echoencephalography, dopplerography);

Electro-physiological (electroencephalography, rheoencephalography, echoencephalography, electromyography and others);

Methods of neurovisualization (computer tomography, magnetic-resonance tomography, including in the vascular regimen).

Theme 15. Blood supply of brain and spinal cord.

Vertebrobasillar, carotid blood supply and the signs of its affection.

Content module 3.

Vascular diseases of the brain and spinal cord, paroxysmal states, cephalgias, sleep disorders, neurointoxications. Traumatic affections of the nervous system.

Theme 16. Vascular diseases of the brain and spinal cord. Chronic disturbances of the cerebral blood circulation.

Classification. Etiological factors and pathogenesis of disturbances of the cerebral blood circulation. Treatment. Vascular dementia.

Theme 17. Ischemic stroke. Hemorrhagic stroke.

Acute cerebrovascular accident, stroke and disturbances of the cerebral blood circulation (transitory ischemic attacks and cerebral hypertonic crises). Etiological factors and pathogenesis.

Classification types. Symptoms lesions of the anterior, middle, posterior cerebral arteries. Syndromes occlusion and stenosis of major vessels of the brain. General and focal neurological syndromes. Disorders of consciousness (Coma Glasgow scale).

The differential diagnosis of different types of acute cerebrovascular accidents.

Modern methods of undifferentiated (basic) and differentiated treatment of acute cerebrovascular events. The concept of the "therapeutic window".

Hemorrhagic stroke. Classification, types. Symptomatology. Diagnosis. Intensive therapy in the acute period. Indications and contraindications for surgical treatment of stroke.

Treatment in the period of residual effects after cerebral and spinal strokes. Rehabilitation and examination of capacity of patients.

Prevention of vascular diseases of the brain and spinal cord.

Theme 18. Epilepsy and nonepileptic paroxysmal states.

Epilepsy. Pathogenetic essence of epileptic medium in development of the disease. Significance of the endogenous and exogenous factors, which participate in the formation of this centre. Classification of the epileptic attacks: generalized, partial and partially –generalized. Principles of differentiated treatment of epilepsy. Epileptic status (diagnosis, emergency aid).

Nonepileptic paroxysmal states. States with convulsions: spasmophilia, febril convulsions, toxic convulsions, hysterical paroxysms. States without convulsions: vegetative paroxysms, migraine, syncopes. Differential diagnosis of epilepsy and nonepileptic paroxysmal states. Treatment of paroxysm and treatment in the period between attacks.

Theme 19. Headache. Sleep disorder and state of cheerfulness.

Etiology and mechanisms of the headache: vascular, liquorodynamic, neuralgic, muscular stress, psychalgia, mixed. Classification. Nosologic forms of the headache: migraine, pain of the muscular stress, cluster pain. Differential diagnosis, principles of treatment.

Migraine - etiology, modern mechanisms of pathogenesis. Clinical forms (simple migraine - without the aura, associated), diagnosis, a differentiated diagnosis, principles of treatment (during the attack and between attacks).

Headache with the syndrome of intracranial hypotension and syndrome of intracranial hypertension (etiopathogenetic factors, subjective data, clinical and instrument data).

Sleep and state of cheerfulness: the stages of sleep, disorders of falling asleep - presomnia, sleep disorder - insomnia, causal factors, treatment. Hypersomnia - pathologic sleepiness. Syndrome of sleepy apnoe. Treatment.

Theme 20. Professional and everyday neurointoxications. Affection of the nervous system under the effect of physical factors.

Poisoning by the industrial poisons of neurotropic effect (lead, mercury, manganese, tetraethyl lead, arsenic, carbon monoxide, methyl alcohol, carbon disulfide, organophosphorus compounds). Clinical course, neurologic syndromes, treatment, preventive measures.

Food intoxications, botulism.

Korsakov's syndrome and other neurologic manifestations of alcoholism. Clinical picture of acute poisonings with barbiturates. Emergency aid.

Vibration sickness, radiation injuries, electrotrauma of the nervous system, influence of constant and internating currents, affection of the nervous system by thermal and sunstroke. Clinical picture, neurologic syndromes, treatment, preventive measures.

Theme 21. Neurologic aspects of the craniocerebral injury. Spinal injury.

Modern aspects of classification of the craniocerebral injury. Concussion of the brain. Differential diagnosis of contusion and compression of the brain. Intracranial hemorrhage. Complication of the craniocerebral injury: post-traumatic encephalopathy, post-traumatic arachnoiditis, post-traumatic convulsive syndrome, post-traumatic asthenic syndrome. Chronic membraneous hematomas (epi- and subdural). Emergency aid in the craniocerebral injury.

Injury of the spinal cord. Clinical course, diagnosis, treatment. Injuries of the peripheral nerves.

Content module 4.

Infectious, infectious-allergic, demyelinating and parasitic diseases of the nervous system, prion infection, neuroborreliosis. Lateral amyotrophic sclerosis.

Theme 22. Meningitis. Arachnoiditis.

Meningites. Classification of meningites: primary and secondary, purulent and serous.

Purulent meningites. Primary meningococcal meningitis, clinical course, diagnosis, peculiarities of the course, atypical forms. Secondary meningites: pneumococcal, staphylococcal. Clinical course, diagnosis, indices of the liquor, treatment, preventive measures.

Serous meningites. Primary virus: lymphocytic choriomeningitis, enteroviral meningitis (ECHO, Coxsackie), parotid and others. Secondary: tubercular meningitis and meningites in other infections. Clinical course, diagnosis, significance of the liquor investigation in differential diagnosis, treatment, preventive measures.

Arachnoiditis. Etiology, pathogenesis. Pathomorphology: adhesive, cystic. Classification by localization: arachnoiditis of the posterior cranial fossa, basal, convex. Clinical course, diagnosis. Differential diagnosis. Treatment and preventive measures.

Theme 23. Encephalitis

Encephalites. Classification. Primary encephalitis: epidemic, tick-borne, spring-summer, herpetic. Secondary encephalitis: rheumatic (small chorea), postvaccinal, in chickenpox, measles, rubella. Clinical course, the form of the disease, diagnosis.

Affection of the nervous system in influenza (influenza hemorrhagic encephalitis, encephalopathy).

Infectious encephalopathy - discirculatory - dystrophic changes in the brain without marked focal affections with prevalence of asthenic manifestations in the clinical course, vegetative dystonia, intra-cranial hypertension.

The course, diagnosis, differential diagnosis, treatment, preventive measures.

Theme 24. Poliomyelitis. Acute myelitis. Lateral amyotrophic sclerosis.

Poliomyelitis. Etiology, pathogenesis, epidemiology, the ways of spread. Pathomorphology. Clinical classification: aparytic (abortive, subclinical) and paralytic forms (preparalytic and paralytic stages) and stem forms. Diagnosis, differential diagnosis. Significance of virological and serologic studies in diagnosis of the disease. Treatment in the acute and recovering period. Consequences. Preventive measures.

Poliomyelitis-like diseases in children, caused by viruses Coxsackie and ECHO, parotitis, herpes simplex, adenoviruses. Clinical forms, course, prognosis, diagnosis, treatment, preventive measures.

Acute myelitis. Etiology (in primary myelites- neuroviruses, tuberculosis, syphilis; in secondary - as a complication of the infectious diseases - measles, scarlet fever, typhus, pneumonia, influenza or in sepsis). Pathogenesis. Pathomorphology. Clinical course and clinical forms (symptom complex of affection of the spinal cord in the lumbar, thoracic part, at the level of cervical thickening, in the upper cervical part). Liquorodiagnosis. Differential diagnosis. Treatment.

Lateral amyotrophic sclerosis. Etiology (exitoxic affection of the of peripheral neurons and central motor neurons due to the increased function of glutamate receptors). Pathogenesis. Pathomorphology. Clinical course and clinical forms (bulbar, cervicothoracic, lumbar- sacral). Differential diagnosis. Treatment.

Theme 25. Neurosyphilis. Tuberculosis of the nervous system.

Neurosyphilis. Early neurosyphilis (mesodermal): generalized syphilitic meningitis, meningovascular syphilis, gums of the brain and spinal cord, latent asymptomatic meningitis (liquorosyphilis).

Late neurosyphilis (parenchymatous): tabes dorsalis, progressive paralysis. Diagnosis, methods of treatment.

Tuberculosis of the nervous system. Tubercular meningitis (clinical course, data of the liquor). Tubercular spondylitis, solitary tuberculomas of the brain. Diagnosis, modern methods of treatment, preventive measures.

Theme 26. Demyelinating diseases of the nervous system.

Acute multiple encephalomyelitis. Multiple sclerosis. Modern theory of pathogenesis (autoimmune disease, genetic tendency).

Pathomorphology (multiple foci of demyelination in the brain and spinal cord). Early symptoms. Basic clinical forms (cerebral: stem, cerebellar, optical, hyperkinetic, spinal, cerebrospinal). Charcot's triad. Marburg's pentad. Forms of the disease course. Differential diagnosis. Treatment (during exacerbation – metabolic plasmapheresis, pulse- therapy by corticosteroids, cytostatics, desensitizing therapy, antihistaminic drugs, antioxidants; during remission

- interferons - the preparations, which improve trophicity of the nervous system, vascular drugs. Subacute sclerosing panencephalitis. Leucodystrophies: metachromatic, globoid- cellular, sudanophilous, express methods of diagnosis.

Content module 5.

Diseases of the peripheral nervous system, the perinatal affections of the nervous system, somatoneurologic syndromes. Hereditary diseases of the nervous system, congenital defects of the spine and spinal cord. Medicines used in neurology.

Theme 27. Structure and function of the peripheral nervous system. Symptoms of nerve tension.

Roots, ganglions, spinal nerves, plexuses, peripheric nerves; nuclei, radices and cranial nerves. Symptoms of intention: Lasseg, Behterev, Broghard, Sokolyansky, "sitting", Nery, Dezherina, Wasserman, Matsckevich.

Theme 28. Disease of the peripheral nervous system. Paraneoplastic polyneuropathy, palliative therapy.

Clinical classification of diseases of the peripheral nervous system.

Vertebrogenic affection of the peripheral nervous system.

Cervical level: reflex syndromes (cervicago, cervicalgia; cervicocranioalgia or the syndrome of the posterior vertebral artery and cervicobrachyalgia with muscular-tonic, vegetative-vascular or neuro – dystrophic manifestations). The radicular syndromes (discogenic affections of the radices - radiculopathies). Radicular- vascular syndromes (radiculoishemia).

Thoracic level; reflex syndromes (thoracago, thoracalgia with muscular -tonic, vegetative –visceral or neurodystrophic manifestations).

Radicular syndromes (discogenic affections of the radices - radiculopathies).Radicular-vascular syndromes (radiculoishemia).

Lumbar- sacral level: reflex syndromes (lumbago, lumbalgia, lumboischalgia with musculo-tonic, vegetative- vascular or neurodystrophic manifestations).

Affection of the cranial nerves. Neuralgia of the trigeminal and other cranial nerves. Neuropathy of the facial nerve, neuropathy of other cranial nerves.

Affection of separate cerebrospinal nerves.

Traumatic. On the upper extremities: radius, ulnar, elbow, medial –muscular and other nerves. On the lower extremities: femoral, gluteal, fibular, tibial, etc.

Plexopathies. Injuries of the plexes: cervical, upper humeral (paralysis of Erb-Dushen); lower humeral (Degerine-Klumpke paralysis); humeral (totally); lumbo-sacral (partially or totally).

Compression - ischemic mononeuropathies (most frequently tunnel syndromes). On the upper extremities: the syndrome of wrist canal (medial nerve); the syndrome of the canal of Guiyen (ulnar nerve). On the lower extremities: the syndrome of tarsal canal (fibular nerve); parestetic meralgia of Rott-Berngardt (jamming of the lateral skin nerve of the thigh under the inguinal ligament).

Multiple affections of the nerve radices.

Infectious polyneuropathies, infectious-allergic polyradiculoneuropathies (Landry, Guiyen-Barre).

Polyneuropathies. Toxic: in chronic everyday or production intoxications (alcoholic, lead, trichlorfon and others); in toxicoinfections (diphtheria, botulism); allergic (medicamental and others); dismetabolic: hypo- or avitaminosis, endocrine diseases - diabetes mellitus, diseases of the liver, kidneys, etc.; discirculatory: in nodular periarteriitis, rheumatic and other vasculites, idiopathic and hereditary forms. Paraneoplastic polyneuropathy (PNP). Paliative treatment of PNP.

Treatment of diseases of the peripheral nervous system: medicamental, orthopedic, surgical, sanitorium-health resort.

Treatment by gymnastics. Preventive measures and examination for fitness to work.

Theme 29. Somatoneurological syndromes.

Somatoneurologic syndromes, which develop as a result of metabolism disturbance of the nervous system, hypoxia, pathologic reflex impulses in somatical diseases of man.

Somatoneurologic syndromes, which are most often encountered: asthenic, vegetative dystonia, polyneuropathic, neuromuscular disturbances.

Somatoneurologic syndromes in diseases of the lungs, heart, blood system, digestive tract, liver, kidneys, endocrine system, collagenoses.

Paraneoplastic syndrome. Treatment. Preventive measures.

Theme 30. Hereditary-degenerative diseases of the nervous system.

Modern principles of classification. Neuromuscular diseases. Progressive muscular dystrophias. Myopathies: pseudo-hypertrophic of Duchen, juvenile Erb-Rot, Landussi - Degerine shoulder – scapula - facial; amyotrophies: spinal Verdnic-Goffmann, spinal Kugelberg-Velander, neural of Charcot-Marie.

Myotonias. Congenital myotonia of Thompson. Dystrophic myotonia of Rossolimo-Stejnert-Kurshmann.

Myasthenia. Myastenic syndromes. Extensive medical urgency of the problem, a feature of palliative care.

Paroxysmal myoplegia. Syndrome of paroxysmal myoplegia.

Extrapyramidal degeneration. Hepatocerebral degeneration – the disease of Konovalov-Wilson: pathogenesis, clinical syndromes, diagnosis, treatment. The disease of Huntington (pathogenesis, the leading clinical syndromes, diagnosis, treatment).

Modern biochemical aspects of the disease of Parkinson and its treatment.

Muscular dystonias (primary hereditary, secondary due to organic diseases of the brain), etiology, principles of treatment.

Spinocerebellar ataxias. Hereditary ataxia of Friedreich. Hereditary spinocerebellar ataxia.

Pyramidal degeneration. Hereditary spastic paraplegia (disease of Strumpel).

Principles of treatment. Goal of treatment not only improve the patient's condition, but also improve the quality of life (palliative neurology).

Theme 31. Practical skills.

General neurology.

Examination of the:

- scope of active and passive motions.
- tone and force of muscles.
- tendon, periosteal, skin reflexes (stylo-carpo- radial, of the biceps, based on the triceps, knee, achilles, abdominal).
- pathologic reflexes (Babinsky, Oppenheim, Gordon, Schaeffer, Rossolimo, Bekhterev, Zhukovskiy, etc) and synkinesias.
- motor coordination (finger-nose, knee-heel tests, diadochokinesis, test for dysmetria), development of static, dynamic ataxia.
- sensitivity (surface, deep and folded configurations).
- symptoms of tension for the ischiadic and femoral nerves..
- function of the cranial nerves.
- vegetative nervous system.
- speech, praxis, gnosis, writing, reading, calculation.

Special neurology

Examination of meningeal symptoms (rigidity of the occipital muscles, signs of Kernig, Brudzinski).

Treatment of the basic indices of the auxiliary methods of examination in the neurologic clinic (electro-physiological, ultrasonic, roentgenologic, computer-tomographic).

Determination of the leading neurologic syndrome in a present patient.

Substantiation of topical diagnosis in the patient, who is examined.

Making a differential diagnosis.

Determination of the treatment scheme and additional examinations that are prescribed for the existing patient.

Theme 32. Independent management of patients and making up the case history.

Theme 33. Tumours of the brain and spinal cord. Abscess of the brain.

Classification (topical and pathomorphological). Clinical course: general cerebral, focal and dislocation syndromes.

Differential diagnosis of tumours of the brain and spinal cord.

Extra- and intramedullar tumours. Diagnostic value of ophthalmoscopy, study of the liquor, EEG, echoscopy, craniography, angiography, ventriculography, MRT- CT, spondylography, myelography and other methods in tumours of the brain and spinal cord. Principles of surgical and conservative treatment of the tumours of the brain and spinal cord.

Abscess of the brain. Sources of abscess formation. Clinical course, diagnosis, differential diagnosis.

Theme 34. Parasitic diseases of the nervous system, prion infections, neuroborreliosis.

Cysticercosis, echinococcosis. Toxoplasmosis. Ways of infection. Clinical course. Diagnosis, treatment, preventive measures.

Prion infections. Disease of Kreitsfeld- Jakob (etiology, pathogenesis, clinical course, diagnosis, preventive measures).

Theme 35. Congenital defects of the spine and spinal cord. Syringomyelia.

Craniovertebral anomalies: the syndromes of Clippel-Weil, Arnold-Kiari. Underdevelopment of the spinal cord. Spinal hernias.

Syringomyelia - etiology, pathogenesis, pathomorphology, clinical forms, basic clinical syndromes (affection of the posterior horn, anterior and lateral horns, syndromes of affection of the conduction paths of the white substance of the lateral and posterior columns of the spinal cord, disrrhaphic status). Diagnostic criteria. Differential diagnosis. Principles of therapy.

Theme 36. Perinatal affections of the nervous system.

Etiological factors (intrauterine, ancestral injury, affection of the brain in the early postpartum period).

Hypoxic- ischemic encephalopathy (acute period, recovering period).

Children's cerebral paralysis, clinical forms - spastic, hemiplegic, atactic, quadriplegic, hyperkinetic. Diagnosis. Treatment (medicamental, nonmedicamental). Preventive measures.

Theme 37. Medicines which are used in neurology. Procedure for palliative care of incurable patients. Order № 41 from 01.21.2013.

The groups of medicines, which are used for treatment of the neurologic diseases: neuroprotectors; the drugs, which improve cerebral hemodynamics; antiparkinsonic; anticonvulsant; antimigraine, vegetotropic, anti-atherosclerotic, biogenic stimulators; neuroleptics; anti-stress preparations; interferons; the drugs, which are used in neuromuscular diseases, in autoimmune and demyelinating diseases, muscular dystonias and hyperkineses and others.

Theme 38. Affection of the nervous system in presence of HIV- infection.

NeuroAIDS. Etiology, pathogenesis, the key clinical manifestations: dementia, acute meningoencephalitis and atypical aseptic meningitis, myelopathy, affection of the peripheral nervous system.

Affection of the nervous system associated with infections, which developed against the background of immunodeficiency, caused by toxoplasmosis, virus of herpes simplex, cyomegaloviral infection, papovaviru, fungi (criptococci, candidiasis). Tumours of the central nervous system in AIDS: primary lymphoma, Kaposi's sarcoma. Disturbance of the cerebral blood circulation in patients with AIDS. Diagnosis of the neurologic manifestations of AIDS. Treatment. Prognosis. Preventive measures.

4. The structure of the educational discipline

Themes	Hours					
	Total	include				
		lectures	seminars	practical classes	laboratories	ISW
Content module 1.						
Introduction. Reflexes. Symptoms of movement, coordination and sensory disorders						
Theme 1. The main stages of the development of neurological science.	4	0	0	0	0	4
Theme 2. Principles of structure and functioning of the nervous system. Functional unit of the nervous system - neuron. Motor	3	1	0	2	0	0

system. Concept about the reflex and reflex arch.						
Theme 3. Voluntary motions and their impairment. The pyramidal system. Cortico-nuclear and cortico-spinal paths. Symptoms of central and peripheral pareses. Syndromes of damage to the motor path at different levels.	3	1	0	2	0	0
Theme 4. Automated involuntary movements. Movements coordination. The extrapyramidal system and syndromes of its affection	2	0	0	2	0	0
Theme 5. The cerebellum, syndromes of affection of the cerebellum.	2	0	0	2	0	0
Theme 6. The sensitive system and symptoms of its affection. Kinds and types of sensitive disorder	2	0	0	2	0	0
<i>Total in content module 1</i>	<i>16</i>	<i>2</i>	<i>0</i>	<i>10</i>	<i>0</i>	<i>4</i>
Content module 2.						
Pathology of cranial nerves. Symptoms of a violation of the autonomic nervous system and higher brain functions. Meningeal syndrome. Additional methods of research in neurology						
Blood supply of the brain and spinal cord.						
Theme 7. The cranial nerves I, II, VII and syndromes of its affection.	2	0	0	2	0	0
Theme 8. The cranial nerves III, IV, VI and syndromes of its affection.	2	0	0	2	0	0
Theme 9. The cranial nerves V, VII and syndromes of its affection.	2	0	0	2	0	0
Theme 10. The cranial nerves IX, X, XI, XII and syndromes of its affection. Bulbar and pseudobulbar syndromes. Alternative syndromes.	2	0	0	2	0	0
Theme 11. Pathology of the vegetative nervous system.	2	0	0	2	0	0
Theme 12. Localization of functions in the cerebral cortex. Syndromes of affection.	4	2	0	2	0	0
Theme 13. Cerebro-spinal fluid, its change. Meningeal syndrome.	2	0	0	2	0	0
Theme 14. Functional diagnosis of diseases of the nervous system.	2	0	0	2	0	0

Theme 15. Blood supply of brain and spinal cord.	2	0	0	2	0	0
<i>Total in content module 2</i>	20	2	0	18	0	0
Content module 3.						
Vascular diseases of the brain and spinal cord, paroxysmal conditions, cephalgia, sleep disorders, neurointoxication. Traumatic lesions of the nervous system.						
Theme 16. Vascular diseases of the brain and spinal cord. Chronic disturbances of the cerebral blood circulation.	4	1	0	2	0	0
Theme 17. Ischemic stroke. Hemorrhagic stroke.	2	1	0	2	0	0
Theme 18. Epilepsy and nonepileptic paroxysmal states.	2	1	0	2	0	0
Theme 19. Headache. Sleep disorder and state of cheerfulness.	2	0	0	2	0	0
Theme 20. Professional and everyday neurointoxications. Affection of the nervous system under the effect of physical factors.	2	0	0	2	0	0
Theme 21. Neurologic aspects of the craniocerebral injury. Spinal injury.	4	1	0	2	0	0
<i>Total in content module 3</i>	16	4	0	12	0	0
Content module 4.						
Infectious, infectious-allergic, demyelinating and parasitic diseases of the nervous system, prion infections. Amyotrophic lateral sclerosis.						
Theme 22. Meningitis. Arachnoiditis.	2	0	0	2	0	0
Theme 23. Encephalitis	2	0	0	2	0	0
Theme 24. Poliomyelitis. Acute myelitis. Lateral amyotrophic sclerosis.	2	0	0	2	0	0
Theme 25. Neurosyphilis. Tuberculosis of the nervous system.	2	0	0	2	0	0
Theme 26. Demyelinating diseases of the nervous system.	4	2	0	2	0	0
<i>Total in content module 4</i>	12	2	0	10	0	0
Content module 5.						
Diseases of the peripheral nervous system, perinatal damage to the nervous system, somatoneurological syndromes. Hereditary diseases of the nervous system, congenital defects of the spine and spinal cord. Medicines used in neurology.						
Theme 27. Structure and function of the peripheral nervous system. Symptoms of nerve tension.	2	0	0	2	0	0
Theme 28. Disease of the peripheral nervous system.	2	0	0	2	0	0

Paraneoplastic polyneuropathy, palliative therapy.						
Theme 29. Somatoneurological syndromes	2	0	0	2	0	0
Theme 30. Hereditary-degenerative diseases of the nervous system.	2	0	0	2	0	0
Theme 31. Practical skills.	5	0	0	2	0	3
Theme 32. Independent curation of patients with compilation of medical history.	6	0	0	0	0	4
Theme 33. Brain and spinal cord tumors. Brain abscess.	4	0	0	0	0	4
Theme 34. Parasitic diseases of the nervous system, prion infections.	4	0	0	0	0	4
Theme 35. Congenital defects of the spine and spinal cord. Syringomyelia.	4	0	0	0	0	4
Theme 36. Perinatal lesions of the nervous system.	4	0	0	0	0	4
Theme 37. Medicines used in neurology. The procedure for providing palliative care to incurable patients. Order of the Ministry of Health Ukraine № 41 от 21.01.2013.	4	0	0	0	0	4
Theme 38. Affection of the nervous system in presence of HIV- infection.	4	0	0	0	0	4
<i>Total in content module 5</i>	<i>41</i>	<i>0</i>	<i>0</i>	<i>10</i>	<i>0</i>	<i>31</i>
Individual tasks	0	0	0	0	0	0
Total in discipline	105	10	0	60	0	35

5. Themes of lectures / seminars / practical classes / laboratories

5.1. Themes of lectures

№	Themes	Hours
1.	Lecture 1. Introduction to neurology. Principles of the structure and functions of the nervous system. Symptoms of central and peripheral paresis. Syndromes of damage to the motor path at different levels. Automated involuntary movements. Coordination of movements. Extrapyramidal system and syndromes of its damage.	2
2.	Lecture 2. Higher brain functions and their disorders. Localization of functions in the cerebral cortex and lesion syndromes.	2
3.	Lecture 3. Vascular diseases of the brain and spinal cord.	2
4.	Lecture 4. Epilepsy and non-epileptic paroxysmal conditions. Neurological aspects of brain injury.	2
5.	Lecture 5. Demyelinating diseases of the nervous system.	2
	Total	10

5.2. Themes of seminars

Seminars are not provided.

5.3. Themes of practical classes

№	Themes	Hours
1.	Theme 2. Principles of structure and functioning of the nervous system. Functional unit of the nervous system - neuron. Motor system. Concept about the reflex and reflex arch.	2
2.	Theme 3. Voluntary motions and their impairment. The pyramidal system. Cortico-nuclear and cortico-spinal paths. Symptoms of central and peripheral pareses. Symptoms of central and peripheral pareses	2
3.	Theme 4. Automated involuntary movements. Movements coordination. The extrapyramidal system and syndromes of its affection	2
4.	Theme 5. The cerebellum, syndromes of affection of the cerebellum.	2
5.	Theme 6. The sensitive system and symptoms of its affection. Kinds and types of sensitive disorder	2
6.	Theme 7. The cranial nerves I, II, VII and syndromes of its affection.	2
7.	Theme 8. The cranial nerves III, IV, VI and syndromes of its affection.	2
8.	Theme 9. The cranial nerves V, VII and syndromes of its affection.	2
9.	Theme 10. The cranial nerves IX, X, XI, XII and syndromes of its affection. Bulbar and pseudobulbar syndromes. Alternative syndromes.	2
10.	Theme 11. Pathology of the vegetative nervous system.	2
11.	Theme 12. Localization of functions in the cerebral cortex. Syndromes of affection.	2
12.	Theme 13. Cerebro-spinal fluid, its change. Meningeal syndrome.	2
13.	Theme 14. Functional diagnosis of diseases of the nervous system.	2
14.	Theme 15. Blood supply of brain and spinal cord.	2
15.	Theme 16. Vascular diseases of the brain and spinal cord. Chronic disturbances of the cerebral blood circulation.	2
16.	Theme 17. Ischemic stroke. Hemorrhagic stroke.	2
17.	Theme 18. Epilepsy and nonepileptic paroxysmal states.	2
18.	Theme 19. Headache. Sleep disorder and state of cheerfulness.	2
19.	Theme 20. Professional and everyday neurointoxications. Affection of the nervous system under the effect of physical factors.	2
20.	Theme 21. Neurologic aspects of the craniocerebral injury. Spinal injury.	2
21.	Theme 22. Meningitis. Arachnoiditis.	2
22.	Theme 23. Encephalitis	2
23.	Theme 24. Poliomyelitis. Acute myelitis. Lateral amyotrophic sclerosis.	2
24.	Theme 25. Neurosyphilis. Tuberculosis of the nervous system.	2
25.	Theme 26. Demyelinating diseases of the nervous system.	2
26.	Theme 27. Structure and function of the peripheral nervous system. Symptoms of nerve tension.	2
27.	Theme 28. Disease of the peripheral nervous system.	2
28.	Theme 29. Somatoneurological syndromes	2
29.	Theme 30. Hereditary- degenerative diseases of the nervous system.	2
30.	Theme 31. Practical skills.	2
	Total	60

5.4. Themes of laboratories

Laboratories are not provided.

6. Independent work of the student

№	Themes / types of tasks	Hours
1	<i>Independent study of topics that are included in the classroom lesson plan:</i>	
1.1	Theme 31. Practical skills (theoretical training and development of practical skills).	3
2	<i>Independent study of topics that are not part of the classroom classes plan:</i>	
2.1	Theme 1. The main stages of the development of neurological science.	4
2.2	Theme 32. Independent curation of patients with compilation of medical history.	4
2.3	Theme 33. Brain and spinal cord tumors. Brain abscess.	4
2.4	Theme 34. Parasitic diseases of the nervous system, prion infections.	4
2.5	Theme 35. Congenital defects of the spine and spinal cord. Syringomyelia.	4
2.6	Theme 36. Perinatal lesions of the nervous system.	4
2.7	Theme 37. Medicines used in neurology. The procedure for providing palliative care to incurable patients. Order of the Ministry of Health Ukraine № 41 от 21.01.2013.	4
2.8	Theme 38. Affection of the nervous system in presence of HIV- infection	4
	Total	35

7. Teaching methods

Lectures.

Practical classes: conversation, solution of clinical situational problems, practice of patient examination skills, demonstration and practice of neurological examination skills, training exercise on differential diagnosis of the most advanced diseases of the nervous system.

Independent work: independent work with recommended basic and additional literature, with electronic information resources, independent work with the bank of test tasks Step-2, independent solution of clinical tasks and mastering of clinical protocols.

8. Forms of control and evaluation methods (including criteria for evaluating learning outcomes)

Ongoing control: oral survey, testing, assessment of performance of practical skills, solution of situational clinical tasks, assessment of activity in class.

Final control: Exam.

Assessment of the ongoing learning activity at the practical class:

1. Evaluation of theoretical knowledge on the subject of the lesson:
 - methods: survey, solving a situational clinical problem
 - maximum score – 5, minimum score – 3, unsatisfactory score – 2.
2. Evaluation of practical skills and manipulations on the subject of the lesson:
 - methods: assessment of the correctness of the performance of practical skills
 - maximum score – 5, minimum score – 3, unsatisfactory score – 2.
3. Evaluation of work with the patient on the subject of the lesson:
 - methods: assessment of:
 - a) communication skills of communication with the patient,
 - b) correctness of appointment and assessment of laboratory and instrumental studies,
 - c) adherence to the differential diagnosis algorithm,
 - d) substantiation of clinical diagnosis,
 - e) drawing up a treatment plan;

- maximum score – 5, minimum score – 3, unsatisfactory score – 2.

The grade for one practical session is the arithmetic average of all components and can only have a whole value (5, 4, 3, 2), which is rounded according to the statistical method.

Criteria of ongoing assessment at the practical class

Score	Assessment criterion
Excellent «5»	The student is fluent in the material, takes an active part in discussing and solving a situational clinical problem, confidently demonstrates practical skills during patient examination and interpretation of clinical, laboratory and instrumental research data, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
Good «4»	The student has a good command of the material, participates in the discussion and solution of a situational clinical problem, demonstrates practical skills during a patient examination, interpretation of clinical, laboratory and instrumental research data with some errors, expresses his opinion on the subject of the class, demonstrates clinical thinking.
Satisfactory «3»	The student does not have sufficient knowledge of the material, is unsure of participating in the discussion and solution of the situational clinical problem, demonstrates practical skills during the examination of the patient and the interpretation of clinical, laboratory and instrumental research data with significant errors.
Unsatisfactory «2»	The student does not possess the material, does not participate in the discussion and solution of the situational clinical problem, does not demonstrate practical skills during the examination of the patient and the interpretation of clinical, laboratory and instrumental research data.

Only those applicants who have fulfilled the requirements of the training program in the discipline, have no academic debt, and their average score for the current educational activity in the discipline is at least 3.00 are admitted to the final control.

Evaluation of the results of the students' training during the final control - an oral standardized exam.

The method of conducting the oral standardized exam is unified, transparent and involves the use of standardized forms. The number of questions on the oral standardized exam corresponds to the amount of credits assigned to the study of the academic discipline

The form of the examination ticket is standardized and consists of structural elements (components). The examination ticket can consist only of theoretical questions or with the addition of a situational problem. Each ticket can have from 3 to 5 questions. The questions are short, simple, clear, clear and transparent, designed in such a way that a complete answer to it takes no more than 5 minutes. The timing of the oral structured exam is standard - no more than 30 minutes.

A checklist (answer standard) is drawn up for each question, which provides for the key points required to provide a complete answer to the question. A literary source with pages is indicated for each standard answer.

During the oral structured exam, the candidate sees the questions, the teacher sees a checklist with standard answers and determines which components were named or not named by the candidate.

The overall grade for the oral structured exam is calculated as the arithmetic mean of all the grades received for the answers to the questions (including situational problems).

The prepared package of documents for the oral structured exam: the list of questions, standards of answers (check sheets), is reviewed by the subject cyclic methodical commission.

9. Distribution of points, obtained by the student

The obtained average score for the academic discipline for applicants who have successfully mastered the work program of the academic discipline is converted from a traditional four-point scale to points on a 200-point scale, as shown in the table:

Conversion table of traditional to multi-point

National score for the discipline	The sum of scores for the discipline
Excellent («5»)	185 – 200
Good («4»)	151 – 184
Satisfactory («3»)	120 – 150
Unsatisfactory («2»)	Less than 120

A multi-point scale (200-point scale) characterizes the actual success of each applicant in learning the educational component. The conversion of the traditional grade (average score for the academic discipline) into a 200-point grade is performed by the information and technical department of the University.

According to the obtained points on a 200-point scale, the achievements of the applicants are evaluated according to the ECTS rating scale. Further ranking according to the ECTS rating scale allows you to evaluate the achievements of students from the educational component who are studying in the same course of the same specialty, according to the points they received.

The ECTS scale is a relative-comparative rating, which establishes the applicant's belonging to the group of better or worse among the reference group of fellow students (faculty, specialty). An "A" grade on the ECTS scale cannot be equal to an "excellent" grade, a "B" grade to a "good" grade, etc. When converting from a multi-point scale, the limits of grades "A", "B", "C", "D", "E" according to the ECTS scale do not coincide with the limits of grades "5", "4", "3" according to the traditional scale. Acquirers who have received grades of "FX" and "F" ("2") are not included in the list of ranked acquirers. The grade "FX" is awarded to students who have obtained the minimum number of points for the current learning activity, but who have not passed the final examination. A grade of "F" is given to students who have attended all classes in the discipline, but have not achieved a grade point average (3.00) for the current academic activity and are not admitted to the final examination.

Applicants who study in one course (one specialty), based on the number of points scored in the discipline, are ranked on the ECTS scale as follows:

Conversion of the traditional evaluation and and ECTS scores

Score on the ECTS scale	Statistical indicator
A	The best 10% students
B	Next 25% students
C	Next 30% students
D	Next 25% students
E	Next 10% students

10. Methodological support

- Working program in the discipline
- Syllabus
- Methodological recommendations for the practical classes in the discipline
- Methodological recommendations for the individual work of students
- Multimedia presentations
- Situational tasks (including calculation)
- Tests on the theme

Educational and methodical literature:

- Neurology: textbook / I.A. Hryhorova, L.I. Sokolova, R.D. Herasymchuk et al.; edited by I.A. Hryhorova, L.I. Sokolova. – Kyiv : AUS Medicine Publishing, 2017. – 624 p.

11. Questions for the final control

1. Neurology as a science, a branch of practical medicine and a subject of study.
2. The main stages of the development of the nervous system. Anatomical and topographic divisions of the nervous system.
3. Reflex apparatus of the spinal cord. Reflex, reflex arc. Tendon and periosteal reflexes, arcs of their closure. Examination of tendon, periosteal, skin reflexes (stilo-carpo-radial, biceps, triceps, knee, Achilles, abdominal).
4. Cortico-spinal and cortico-nuclear pathways. Central and peripheral paralysis. Examination of the volume of active and passive movements, muscle tone and strength.
5. Topical diagnosis of the pathology of voluntary movements at different levels of damage.
6. Examination of pathological reflexes (Babinsky, Oppenheim, Gordon, Schaefer, Rossolimo, Bekhterev, Zhukovsky and others) and synkinesis.
7. Extrapyramidal system, anatomical features, functions. Damage syndromes.
8. Cerebellum, damage syndromes. Types of ataxia. Examination of coordination of movements (toe-nose, knee-heel tests, diadochokinesis, tests for dysmetria).
9. Sensitivity. Types of sensitivity, types and types of sensitive disorders. Braun-Secard syndrome. Examination of sensitivity (surface, deep and complex types).
10. Anatomical and physiological data, research methodology, syndromes of lesions of I-XII pairs of cranial nerves.
11. Central and peripheral paresis of the facial nerve.
12. Bulbar and pseudobulbar syndromes.
13. Alternating paralysis. Syndromes of damage to the pedicles of the brain, bridge-cerebellar angle, varolius bridge.
14. Autonomic nervous system, functions, damage syndromes. Bernard-Horner syndrome.
15. Cortex of large hemispheres, cyto-architectonic fields, lesion syndromes. Examination of language, praxis, gnosis, writing, reading, arithmetic
16. Cerebrospinal fluid formation, normal composition of cerebrospinal fluid, its changes in meningitis, tumors, hemorrhagic stroke, tuberculosis. Meningeal syndrome clinic.
17. Functional research methods in neurology (electrophysiological, ultrasound, neuroimaging).
18. Blood supply of the brain and spinal cord.
19. Transient disorders of cerebral circulation. Transient ischemic attack.
20. Hemorrhagic stroke.
21. Ischemic stroke. Principles of undifferentiated and differentiated treatment of strokes.
22. Modern classification of paroxysmal conditions in the clinic of nervous diseases.
23. Pathogenetic essence of epilepsy, classification of epileptic attacks, principles of differentiated treatment. Epileptic status, clinic, diagnosis, treatment.
24. Non-epileptic paroxysmal states - convulsive and non-convulsive.
25. Cephalgia, pathogenetic mechanisms of occurrence, clinic, diagnosis, treatment.
26. Migraine: pathogenesis, clinic, treatment.
27. Insomnia, hypersomnia.
28. Basic clinical syndromes and principles of treatment in case of exogenous intoxications.
29. Stages of damage to the nervous system in the case of acute and chronic radiation sickness.
30. Vibration disease.
31. Closed craniocerebral injury. Spinal injury. Emergency aid.
32. Syndromes of manifestation of brain and spinal cord tumors. Changes in cerebrospinal fluid.
33. Brain abscesses, clinical syndromes, differential diagnosis.
34. Meningitis. Study of meningeal symptoms (rigidity of the occipital muscles, symptoms of Kernig, Brudzinsky).
35. Arachnoidites.

36. Encephalitis.
37. Damage to the nervous system during flu, rheumatism, herpes virus infection.
38. Poliomyelitis.
39. Acute myelitis.
40. Amyotrophic lateral sclerosis. Principles of palliative therapy.
41. Neurosyphilis. Clinical forms.
42. Damage to the nervous system in the presence of HIV infection.
43. Tuberculosis of the nervous system.
44. Multiple sclerosis (etiopathogenesis, variants of the course, clinic, modern methods of treatment).
45. Parasitic diseases of the nervous system (cysticercosis, echinococcosis, toxoplasmosis).
46. Reflex vertebrogenic syndromes. Root syndromes. Symptoms of tension of the femoral and sciatic nerves.
47. Neuralgia of the trigeminal nerve.
48. Neuropathy of the facial nerve.
49. Variants of shoulder plexopathies.
50. Neuropathies of the ulnar, radial, median, tibial, and fibular nerves.
51. Compression-ischemic (tunnel) syndromes.
52. Polyneuropathies (infectious, toxic, paraneoplastic), modern methods of treatment.
53. Children's cerebral palsy, clinical options, treatment.
54. Somatoneurological syndromes in diseases of the digestive tract, lungs, cardiovascular system, blood, endocrine diseases. Paraneoplastic syndrome.
55. Progressive muscular dystrophies - primary (myopathies) and secondary (amyotrophies).
56. Myotonia.
57. Myasthenia. Myasthenic syndromes. Paroxysmal myoplegia.
58. Hepatocerebral degeneration (Konovalov-Wilson disease).
59. Huntington's disease, clinical manifestations and treatment.
60. Parkinson's disease, clinical manifestations and treatment.
61. Muscular dystonias.
62. Spinocerebellar ataxias. Friedreich's hereditary ataxia.
63. Hereditary spastic paraplegia. Strümpel's disease.
64. Cranio-vertebral anomalies.
65. Syringomyelia (etiopathogenesis, clinic, diagnosis, treatment).
66. Groups of drugs used in neurology.
67. Peculiarities of management of incurable patients and the use of palliative methods in neurological practice. The procedure for providing palliative care. Order of the Ministry of Health No. 41.
68. Interpretation of the main indicators of auxiliary methods of examination in a neurological clinic (electrophysiological, ultrasound, x-ray, computed tomography).
69. Determination of the leading neurological syndrome in a specific patient.
70. Justification of a topical diagnosis in a patient being examined.

12. Recommended literature

Basic:

- Neurology: textbook / I.A. Hryhorova, L.I. Sokolova, R.D. Herasymchuk et al.; edited by I.A. Hryhorova, L.I. Sokolova. – Kyiv : AUS Medicine Publishing, 2017. – 624 p.
- Netter Atlas of Human Anatomy: Classic Regional Approach: Professional Edition with NetterReference Downloadable Image Bank (Netter Basic Science) 8th Edition By Frank H. Netter MD / Publisher : Elsevier; 8th edition (April 25, 2022). - 712 p. ISBN-10 : 0323793738 ISBN-13 : 978-0323793735

- Neuroanatomy through Clinical Cases 3rd Edition By Hal Blumenfeld / Publisher : Sinauer Associates is an imprint of Oxford University Press; 3rd edition (February 28, 2021).- 1056 p. ISBN-10 16053596299: ISBN-13 : 978-1605359625
- Pocket Neurology (Pocket Notebook Series) Third Edition By M. Brandon Westover MD PhD Publisher : LWW; Third edition (October 16, 2021). - 390 p. ISBN-10 : 1975169034 ISBN-13 : 978-1975169039

Additional:

- Topical Diagnosis in Neurology. Anatomy, Physiology, Signs, Symptoms / Mathias Baehr, Michael Frotscher (6 edition) – Thieme, 2019 - 332 p.
- Adams and Victor's Principles of Neurology / Allan Ropper, Martin Samuels, Joshua Klein, Sashank Prasad (11th edition). - McGraw-Hill, 2019. - 1664 p.
- Clinical Neuroanatomy Made Ridiculously Simple: Color Edition 6th Edition by Stephen Goldberg M.D. / Publisher: MedMaster; 6th edition (September 14, 2022).- 112 p. ISBN-10 : 1935660519 ISBN-13 : 978-1935660514
- Clinical Neurology and Neuroanatomy: A Localization-Based Approach, Second Edition 2nd Edition by Aaron Berkowitz / Publisher : McGraw Hill / Medical; 2nd edition (July 21, 2022).- 384 p. ISBN-10 : 1260453367 ISBN-13 : 978-1260453362
- Handbook of Neurosurgery 9th Edition by Mark S. Greenberg / Publisher : Thieme; 9th edition (October 23, 2019).- 1784 p. ISBN-10 : 1684201373 ISBN-13 : 978-1684201372

13. Electronic information resources

1. Medical Books On-line Library (Neurology) – free download

<http://medbookshelf.info/category/neurology/>