

*Agreement*

**MINISTRY OF HEALTH OF UKRAINE**  
**ODESA NATIONAL MEDICAL UNIVERSITY**

Department of Neurology and Neurosurgery



**CONFIRMED by**

Acting vice-rector for scientific and pedagogical work

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Eduard BURIACHKIVSKYI

September 1<sup>st</sup>, 2024

**WORKING PROGRAM IN THE DISCIPLINE**  
**«NEUROLOGY»**

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

**Field of knowledge:** 22 «Health care»

**Specialty:** 221 «Dentistry»

**Educational and professional program:** Dentistry

The working program is compiled on the basis of the educational and professional program "Dentistry" for the training of specialists of the second (master's) level of higher education in the specialty 221 "Dentistry" of the field of knowledge 22 "Health care", approved by the Academic Council of ONMedU (Protocol No. 10 dated June, 27 2024).

Authors:

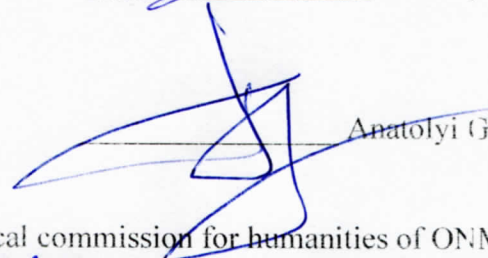
- Anatoliy SON, MD, PhD, DSci, Professor, Head of the department
- Vasyl DOBROVOLSKYI, MD, PhD, Associate Professor
- Olexander STOYANOV, MD, PhD, DSci, Professor
- Yuryi GORANSKYI, MD, PhD, Associate Professor
- Ganna PERKOVA, MD, PhD, Associate Professor
- Olena LEBID, MD, PhD, Associate Professor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

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

Head of the department

 \_\_\_\_\_ Anatoliy SON

Approved by the guarantor of  
the educational and professional program

 \_\_\_\_\_ Anatoliy GULYUK

Approved by the subject-cycle methodological commission for humanities of ONMedU  
Protocol № 1 dated 30 aug 2024

Head of the subject-cycle methodological commission 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: 1	Specialty 221 «Dentistry»	<i>Course: 3</i>
Hours: 30	Level of higher education second (master's degree)	<i>Semester: V - VI</i>
Content modules: 2		<i>Lectures (4 hours)</i>
		<i>Seminars (0 hours)</i>
		<i>Practical classes (14 hours)</i>
		<i>Laboratories (0 hours)</i>
		<i>Independent work (12 hours)</i>
		<i>including individual tasks (0 hours)</i>
		<i>Form of final control – Differentiated credit</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:**

IC. The ability to solve typical and complex specialized tasks and problems in the field of health care in the specialty «Dentistry», in professional activities or in the learning process, which involves conducting research and/or implementing innovations and is characterized by the complexity and uncertainty of conditions and requirements.

GC 2. Knowledge and understanding of the subject area and understanding of professional activity.

GC 3. Ability to apply knowledge in practical activities.

GC 7. Ability to search, process and analyze information from various sources.

GC 8. Ability to adapt and act in a new situation.

GC 9. Ability to identify, pose and solve problems.

GC 11. Ability to work in a team.

GC 13. The ability to act socially responsibly and consciously.

- **Special competencies are:**

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

SC2. The ability to interpret the results of laboratory and instrumental research.

SC3. Ability to diagnose: determine preliminary, clinical, final, accompanying diagnosis, emergency conditions.

SC6. The ability to determine a rational regimen of work, rest, and diet in patients in the treatment of diseases of the organs and tissues of the oral cavity and maxillofacial region.

SC7. The ability to determine the management tactics of patients with diseases of the organs and tissues of the oral cavity and maxillofacial region with accompanying somatic diseases.

SC8. Ability to perform medical and dental manipulations.

SC11. Ability to determine tactics, methods and provision of emergency medical assistance.

SC16. Ability to organize and carry out rehabilitation measures and care for patients with diseases of the oral cavity and maxillofacial region.

**Program learning outcomes (PLO):**

PLO2. Collect information about the general condition of the patient, evaluate the psychomotor and physical development of the patient, the condition of the maxillofacial organs, based on the results of laboratory and instrumental studies, evaluate information about the diagnosis (according to list 5).

PLO 3. Prescribe and analyze additional (mandatory and optional) examination methods (laboratory, X-ray, functional and/or instrumental) according to list 5, of patients with diseases of organs and tissues of the oral cavity and maxillofacial region for differential diagnosis of diseases (according to the list 2).

PLO 4. Determine the final clinical diagnosis in compliance with the relevant ethical and legal norms, by making a reasoned decision and logical analysis of the received subjective and objective data of clinical, additional examination, carrying out differential diagnosis under the control of the head physician in the conditions of a medical institution (according to list 2.1).

PLO 5. Diagnose emergencies under any circumstances (at home, on the street, in a medical facility), in emergencies, wartime, lack of information, and limited time (according to list 4).

PLO 10. Determine the tactics of managing a dental patient with somatic pathology (according to list 3) by making a reasoned decision according to existing algorithms and standard schemes.

PLO 21. Perform medical manipulations based on a preliminary and/or final clinical diagnosis (according to lists 2, 2.1) for different segments of the population and in different conditions (according to list 6).

**In 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 establish a probable nosological or syndromic preliminary clinical diagnosis.
- Establish a diagnosis of urgent conditions in the conditions of an emergency situation.

**3. The content of the educational discipline**

**Content module 1. «Neurology».**

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

The first researchers of diseases of the nervous system (Hippocrates, Galen, Avicenna) studied neurology in the universities of the Middle Ages and the Renaissance. Domestic and international neurological school. Modern directions of neuroscience: differentiation of neurological science (creation of separate departments and scientific centers for the study of

cerebrovascular, demyelinating diseases, epilepsy, neuromuscular pathology, etc.) and integration with other sciences (somatoneurology, vertebroneurology, neurosurgery).

**Theme 2. Voluntary movements and their disorders. Pyramidal system. Symptoms of central and peripheral paresis. Extrapyramidal system and syndromes of affection. Cerebellum, syndromes of its damage.**

The concept of reflex and reflex arc conditioned and unconditioned reflexes circuit levels of skin, tendon and periosteal reflexes. Anatomical features and neurophysiology of voluntary movements, extrapyramidal system and cerebellum. Research Methodology motor system. Implementation of voluntary movements. Pyramidal system. Central and peripheral motor neurons. Nuclear and cortical-cortical-spinal tract. Symptoms of central (spastic) and peripheral (flaccid) paralysis. The syndrome of motor disorders in lesions of the motor way at different levels.

Anatomical data: basal ganglia (lenticular, caudate nucleus, fencig, subthalamic), the formation of the brainstem (red nucleus, substantia nigra, reticular formation). Links subcortical ganglia from different parts of the brain and spinal cord. Physiology of the extrapyramidal system, its part in providing unconditional reflexes of automated stereotypical movements of the muscles ready for action. Modern concepts of exchange and the concentration of catecholamines in nihrostriarniy system. Of extrapyramidal syndromes. Akinec-rigid syndrome, Parkinson's disease or syndrome, its biochemical aspects. Key clinical features of Parkinson's disease: oligo-bradikineziya, muscular rigidity, parkinsonian tremor, postural instability. Hyperkinetic syndrome. Types of hyperkinesis: athetosis, choreic, hemibalizm, tics. Muscle dystonia (focal (blepharospasm, facial hemispasm, spastic torticollis, oromandybulyarna dystonia, dystonia hand, foot dystonia, torsion dystonia), segmental, generalized).

Anatomical and physiological features of the cerebellum. Connections of the cerebellum with different parts of the brain and spinal cord (homo- and heterolateral). Afferent and efferent ways. Worm and cerebellar hemispheres. Functions of the cerebellum: ensuring balance, coordination, synergism of movements, regulation of muscle tone. Syndromes of damage to the cerebellum. Concept of static and locomotor ataxia. Types of ataxias: (cerebellar, cortical, vestibular, sensitive, hysterical).

**Theme 3. Sensitive system and symptoms of injury. Kinds and types of sensory loss.**

The concept of reception. Types of receptors. Ekstrotseptyvna, propriotsep-ment, interoceptive sensitivity. Clinical classification sensitivity. Pathways sensitivity. Research Methodology. Types of sensory disorders: anesthesia, hypoesthesia, hyperesthesia, hyperpatiya, dysesthesia. Synesthesia, dissociated disorders poliesteziya, paresthesia. Pain and its classification. The concept of nociceptive and antinociceptive systems of the brain. Topical types of sensory disorders: mononeuropathy, polineuropathy, radicular, posterior horns, conductor (in the sensory tract lesion leading at the spinal cord, the medial loop, thalamus, internal capsule), cortical (syndromes irritation and loss).

**Theme 4. Localization of functions in the cerebral cortex. Syndromes of affection. Cerebro-spinal fluid, its change. Meningeal syndrome.**

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. 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 5. Vascular diseases of the brain and spinal cord.**

Classification. Acute disorders of cerebral blood circulation: strokes and transient disorders of cerebral blood circulation (transient ischemic attacks and cerebral hypertensive crises). Chronic disorders of cerebral circulation: early and late forms. Vascular dementia. Etiological factors and pathogenesis of acute disorders of cerebral circulation. Hemorrhagic and ischemic (thrombotic and nonthrombotic) strokes, subarachnoid hemorrhages. Symptoms of damage to the anterior, middle, posterior cerebral arteries. Syndromes of occlusion and stenosis of the main vessels of the brain. Whole-brain and focal syndromes. Quantitative and qualitative types of disorders of consciousness (Productive and unproductive symptoms). Differential diagnosis of various types of acute cerebral circulation disorders.

Modern methods of undifferentiated and differentiated therapy of acute disorders of cerebral circulation. The "therapeutic window" period. Indications and contraindications for surgical treatment of cerebral circulation disorders.

### **Theme 6. Infectious diseases of the nervous system.**

Meningitis Classification of meningitis: primary and secondary, purulent and serous. Purulent meningitis. Primary meningococcal meningitis, clinic, diagnosis, features of the course, atypical forms. Secondary meningitis: pneumococcal, staphylococcal. Clinic, diagnostics, indicators of cerebrospinal fluid, treatment, prevention. Serous meningitis. Primary viral: lymphocytic choriomeningitis, enterovirus meningitis (ESNO, Coxsackie), mumps and others. Secondary: tuberculous meningitis and meningitis due to other infections. Clinic, diagnosis, significance of cerebrospinal fluid examination in differential diagnosis, treatment, prevention.

Encephalitis. Classification. Primary encephalitis: epidemic, tick-borne spring-summer, herpetic. Secondary encephalitis: rheumatic (small chorea), post-vaccinal, with chicken pox. come on, sweethearts. Clinic, course, forms of the disease, diagnosis.

Damage to the nervous system during influenza (influenza hemorrhagic encephalitis, encephalopathy).

Neurosyphilis. Early neurosyphilis (mesodermal): generalized syphilitic meningitis, meningovascular syphilis, gum of the brain and spinal cord, latent asymptomatic meningitis (liquor syphilis). Late neurosyphilis (parenchymal): spinal tuberculosis, progressive paralysis. Diagnosis, methods of treatment.

NeuroAIDS. Etiology, pathogenesis, key clinical manifestations: dementia, acute meningocephalitis and atypical aseptic meningitis, myelopathy, damage to the peripheral nervous system. Damage to the nervous system associated with infections that develop on the background of immunodeficiency, caused by toxoplasmosis, herpes simplex virus, cytomegalovirus infection, papovavirus, fungi (cryptococcus, candidiasis). Tumors of the central nervous system in AIDS: primary lymphoma, Kaposi's sarcoma. Disorders of cerebral circulation in patients with AIDS. Diagnosis of neurological manifestations of AIDS. Treatment. Forecast. Prevention.

Tuberculosis of the nervous system. Tuberculous meningitis (clinic, course, cerebrospinal fluid data). Tuberculous spondylitis, solitary tuberculomas of the brain. Diagnostics, modern methods of treatment, prevention.

### **Theme 7. Epilepsy and nonepileptic paroxysmal states.**

Epilepsy. The pathogenetic essence of the epileptic center in the development of the disease. The value of endogenous and exogenous factors involved in the formation of this focus. Classification of epileptic seizures: generalized, partial and partial-generalized. Principles of differentiated treatment of epilepsy. Epileptic status (diagnosis, emergency care). Non-epileptic paroxysmal conditions. Conditions with convulsions: spasmophilia, febrile convulsions, toxic convulsions, hysterical paroxysms. Conditions without convulsions: autonomic paroxysms, migraine, syncope. Differential diagnosis of epilepsy and non-epileptic paroxysmal conditions. Treatment of paroxysm and treatment in the inter-attack period.

## Content module 2. «Neurology, including neurostomatology».

### Theme 8. Cranial nerves I - XII and symptoms of their damage.

Cranial nerve I - olfactory nerve (sensitive nerve): basic anatomical and physiological data. Olfactory analyzer: the first neuron (ganglion cells of the mucous membrane of the nose); the second neuron (olfactory bulbs, olfactory pathway); third neuron (primary subcortical olfactory centers – olfactory triangle, transparent septum, anterior perforated substance); cortical olfactory center (medial surface of the temporal lobe of the brain). Research of the olfactory analyzer.

Damage syndromes - hyposmia, anosmia, hyperosmia, olfactory hallucinations.

Cranial nerve II - optic nerve (sensory nerve). Anatomical and physiological features: departments - peripheral (rods and cones, bipolar cells, ganglion cells, the nerve itself, chiasm, optic tract), central (lateral geniculate bodies, upper tubercles of the quadricolium, pillow of a healthy tubercle (subcortical centers), bundle of Graziolo, spur groove of the occipital lobe (cortical center of the analyzer). Symptoms of damage: amaurosis, amblyopia, homonymous and heteronymous hemianopsia (binasal, bitemporal), visual hallucinations. Changes in the optic disc (changes in the fundus).

Cranial nerves III, IV, VI - oculomotor (mixed), block, abductor (motor) nerves: localization of nuclei, exit of roots from the skull, zone of innervation on the periphery. Symptoms of damage: ptosis, strabismus, diplopia, violation of convergence and accommodation, ophthalmoplegia (partial and complete); pupillary reactions, reflex arc of the pupillary reflex, violation of pupillary reactions (Argyle-Robertson syndrome), miosis, mydriasis, anisocoria.

Cranial nerve V - trigeminal nerve (mixed): nerve cores, root exit at the base of the brain, skull, nerve branches and their innervation zones (optic nerve, maxillary, mandibular nerves).

Symptoms of damage to the trigeminal nerve system: damage to the branches of the trigeminal nerve (shooting pains, disturbances of all types of sensitivity in the innervation zone of the corresponding branches, loss of the corneal reflex, paresis of the masticatory muscles, loss of the mandibular reflex); damage to the trigeminal nerve node (herpetic rashes, pain, impaired sensitivity of all types on half of the face, decreased corneal and mandibular reflexes); damage to the sensitive nucleus of the trigeminal nerve - the nucleus of the spinal cord (segmental - dissociated type of pain and temperature sensitivity disorder on half of the face); damage to the thalamus (hemianesthesia of all types of sensitivity, thalamic pains on the opposite side of the focus; damage to the cortex of the postcentral gyrus).

Trigeminal neuralgia. Neuralgia of the nasopharyngeal nerve (Charlin's syndrome). Neuralgia of the ear-temporal nerve (Frey's syndrome).

Cranial nerve VII - facial nerve (mixed). Anatomical and physiological features; component branches of the nerve (large stony nerve, stapes nerve, tympanic cord, facial nerve itself). Symptoms of facial nerve damage: peripheral paresis of facial muscles (nerve damage in the canal, pons-cerebellar angle, brainstem (alternating bridge syndromes)) and central paresis of facial muscles (internal capsule; lower parts of the anterior central gyrus). Syndrome of damage to the knee joint (Hunt's syndrome). Neuralgia of the vedic nerve (Fayle's syndrome). Vegetative prosopalgia and other neurogenic diseases of the face. Ganglionitis of the ciliary node (Oppenheim's syndrome). Ganglionitis wing of the palatine node (Sluder's syndrome). Ganglionitis of the ear node. Ganglionitis under the mandibular and sublingual nodes. Ganglionitis of cervical sympathetic nodes. Cluster headache (cluster cephalgia). Angioneurotic edema (Angioedema). Rossolimo-Melkerson-Rosenthal syndrome. Sjogren's syndrome. Progressive facial hemiatrophy (Parry-Romberg syndrome).

Cranial nerve VIII - sphenoid nerve (sensitive). Anatomical and physiological data, cochlear and vestibular nerves. Pathology of the cochleo-vestibular apparatus: damage to the sound-receiving apparatus (hearing disorder for high tones), damage to the sound-conducting apparatus (hearing disorder for low tones); damage to the temporal lobe (dizziness, nystagmus, impaired balance, coordination of movements, autonomic disorders, damage to the cortex of the temporal lobe (in case of irritation - auditory hallucinations)).

Cranial nerve IX – glossopharyngeal nerve (mixed);

Cranial nerve X - vagus nerve (mixed);

Cranial nerve XI – additional nerve (motor);

Cranial nerve XII - hypoglossal nerve (motor).

Anatomical and physiological features. Localization of nuclei in the medulla oblongata. Neuralgia of the glossopharyngeal nerve. Neuralgia of the tympanic nerve (Reichert's syndrome). Neuralgia of the ear nerve. Neuralgia of the superior laryngeal nerve. Neuralgia of the hypoglossal nerve. Bulbar and pseudobulbar syndromes: common signs (dysphagia, dysphonia, dysarthria) and differences (fibrillation and atrophy of tongue muscles, reflexes of oral automatism, forced laughter, crying). Disorders of innervation of the tongue muscles - peripheral and central paresis.

**Theme 9. Neuropathy of the trigeminal nerve and its separate branches. Iatrogenic neuropathies of the trigeminal nerve.**

Neuropathy of the lower alveolar nerve. Neuropathy of the buccal nerve. Neuropathy of the lingual nerve (glossalgia). Neuropathy of the upper alveolar nerve. Iatrogenic neuropathies of the trigeminal nerve. Etiology, pathogenesis, clinic, diagnosis, treatment.

**Theme 10. Pathology of the autonomic nervous system.**

Syndromes of damage to the suprasegmental department of the autonomic nervous system. Vegetative dystonia syndrome. Permanent and paroxysmal course. Hypothalamic syndrome. Vegetative-vascular paroxysms: sympatho-adrenal, vago-insular, mixed. Syndrome of damage to the segmental autonomic nervous system. Damage to the brain stem, lateral horns of the spinal cord, ganglia of the border stem, plexuses, nerves. Claude-Bernard-Horner syndrome. Visceral symptoms. Levels of regulation of pelvic functions and their disorders.

**Theme 11. Functional diagnosis of diseases of the nervous system.**

X-ray (cranio-, spondylography); Contrast x-ray examinations (myelography, angiography, ventriculography); Ultrasound (echoencephalography, dopplerography); Electrophysiological (electroencephalography, rheoencephalography, echo-encephalography, electromyography, etc.); Methods of neuroimaging (computed tomography, magnetic resonance imaging).

**Theme 12. Disease of the peripheral nervous system.**

Clinical classification of diseases of the peripheral nervous system. Vertebrogenic lesions of the peripheral nervous system.

Traumatic nerve damage. Polyneuropathies (toxic: with chronic domestic or industrial intoxications (alcohol, lead, chlorophos and others); with toxic infections (diphtheria, botulism); allergic (medicated and others); dysmetabolic: hypo- or vitamin deficiency; with endocrine diseases – diabetes, diseases liver, kidney, etc.; dyscirculatory: with nodular periarteritis, rheumatic and other vasculitis, idiopathic and hereditary forms; paraneoplastic).

Treatment of diseases of the peripheral nervous system: medicinal, orthopedic, surgical, sanatorium-resort, palliative.

**Theme 13. Headache.**

Etiology and mechanisms of headache: vascular, liquor-dynamic, neuralgic, muscle tension, psychoalgalic, mixed. Classification. Nosological forms of headache: migraine, muscle tension pain, cluster pain. Differential diagnosis, principles of treatment. Migraine: etiology, modern mechanisms of pathogenesis. Clinical forms (simple migraine - without aura, associated), diagnosis, differential diagnosis, principles of treatment (during the attack and in the inter-attack period). Headache in intracranial hypotension syndrome and intracranial hypertension syndrome (etiopathogenetic factors, subjective data, clinical and instrumental data).

**4. The structure of the educational discipline**

	Hours
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Themes	Total	include				
		lectures	seminars	practical classes	Laboratories	ISW
<i>Content module 1. «Neurology».</i>						
Theme 1. The main stages of the development of neurological science.	2	0	0	0	0	2
Theme 2. Voluntary motions and their impairment. The pyramidal system. Symptoms of central and peripheral pareses. The extrapyramidal system. The cerebellum, syndromes of affection of the cerebellum.	2	0	0	2	0	0
Theme 3. The sensitive system and symptoms of its affection. Kinds and types of sensitive disorder	2	0	0	2	0	0
Theme 4. Localization of functions in the cerebral cortex. Syndromes of affection. Cerebro-spinal fluid, its change. Meningeal syndrome.	2	0	0	2	0	0
Theme 5. Vascular diseases of the brain	4	2	0	2	0	0
Theme 6. Infections diseases of the nervous system.	2	0	0	2	0	0
Theme 7. Epilepsy and nonepileptic paroxysmal states.	2	0	0	0	0	2
<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>
<i>Content module 2. «Neurology, including neurostomatology».</i>						
Theme 8. Cranial nerves I-XII and syndromes of affection.	2	0	0	2	0	0
Theme 9. Neuropathy of the trigeminal nerve and its individual branches. Iatrogenic neuropathies of the trigeminal nerve. Final control.	4	2	0	2	0	0
Theme 10. Pathology of the autonomic nervous system.	2	0	0	0	0	2
Theme 11. Functional diagnosis of diseases of the nervous system.	2	0	0	0	0	2
Theme 12. Disease of the peripheral nervous system. Paraneoplastic polyneuropathy, palliative therapy.	2	0	0	0	0	2
Theme 13. Headache.	2	0	0	0	0	2
<i>Total in content module 2</i>	<i>14</i>	<i>2</i>	<i>0</i>	<i>4</i>	<i>0</i>	<i>8</i>
Individual tasks	0	0	0	0	0	0
<b>Differentiated credit</b>	on the last class					
<b>Total</b>	<b>30</b>	<b>4</b>	<b>0</b>	<b>14</b>	<b>0</b>	<b>12</b>

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

### 5.1. Themes of lectures

№	Themes	Hours
1.	Lecture 1. Vascular diseases of the brain and spinal cord.	2
2.	Lecture 2. Basic neurostomatological diseases and syndromes. Neuropathy of the trigeminal nerve and its individual branches. Iatrogenic neuropathies of the trigeminal nerve.	2
	<b>Total</b>	<b>4</b>

### 5.2. Themes of seminars

Seminars are not provided.

### 5.3. Themes of practical classes

№	Themes	Hours
	<i>Content module 1. «Neurology».</i>	
1.	Theme 2. Voluntary motions and their impairment. The pyramidal system. Symptoms of central and peripheral pareses. Automated involuntary movements. The extrapyramidal system and syndromes of its affection. The cerebellum, syndromes of affection of the cerebellum.	2
2.	Theme 3. The sensitive system and symptoms of its affection. Kinds and types of sensitive disorder	2
3.	Theme 4. Localization of functions in the cerebral cortex. Syndromes of affection. Cerebro-spinal fluid, its change. Meningeal syndrome.	2
4.	Theme 5. Vascular diseases of the brain	2
5.	Theme 6. Infections diseases of the nervous system.	2
	<i>Total in content module 1</i>	<i>10</i>
	<i>Content module 2. «Neurology, including neurostomatology».</i>	
6.	Theme 8. The cranial nerves I-XII and syndromes of its affection.	2
7.	Theme 9. Neuropathy of the trigeminal nerve and its individual branches. Iatrogenic neuropathies of the trigeminal nerve. Final control.	2
	<i>Total in content module 2</i>	<i>6</i>
	<b>Total</b>	<b>14</b>

### 5.4. Themes of laboratories

Laboratories are not provided.

### 6. Independent work of the student

№	Themes / types of tasks	Hours
	Independent study of topics that are not part of the classroom classes plan:	
	<i>Content module 1. «Neurology».</i>	
1	Theme 1. The main stages of the development of neurological science. Principles of the structure and functioning of the nervous system.	2
2	Theme 7. Epilepsy and non-epileptic paroxysmal conditions	2
	<i>Total in content module 1</i>	<i>4</i>
	<i>Content module 2. «Neurostomatology».</i>	
3	Theme 10. Pathology of the autonomic nervous system.	2

4	Theme 11. Functional diagnosis of diseases of the nervous system.	2
5	Theme 12. Diseases of the peripheral nervous system.	2
6	Theme 13. Headache.	
	<i>Total in content module 2</i>	8
	<b>Total in discipline</b>	<b>12</b>

## 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:** Differentiated credit

### Assessment of the ongoing learning activity at the practical class:

- 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.
- 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.
- Evaluation of work with the patient on the subject of the lesson:
  - methods: assessment of:
    - communication skills of communication with the patient,
    - correctness of appointment and assessment of laboratory and instrumental studies,
    - adherence to the differential diagnosis algorithm,
    - substantiation of clinical diagnosis,
    - 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 in the form of a differentiated credit.

### **Evaluation of the results of study of the applicants during the final control - differentiated credit**

<b>The content of the evaluated activity</b>	<b>Scores</b>
Answers to theoretical questions from the list of questions for final control (3 questions, 1 point for each).	3
Practical task according to OSKI type (performance of a task from the list of practical skills).	1
Practical task according to the OSKI type (interpretation of neurological examination data and demonstration of clinical thinking).	1

### **Criteria for evaluating the learning outcomes of education seekers on the final control - differentiated credit**

<b>Score</b>	<b>Evaluation criteria</b>
Excellent «5»	The student correctly, clearly and logically answered the questions posed by the examiners. Thoroughly and comprehensively knows the content of theoretical issues, fluent in professional and scientific terminology. Thinks logically and constructs an answer, freely uses acquired theoretical knowledge when analyzing practical tasks.
Good «4»	The student answered the questions posed by the examiners sufficiently fully, clearly and logically. He knows the content of theoretical issues deeply and comprehensively, and has professional and scientific terminology. Thinks logically and constructs an answer, uses acquired theoretical knowledge when analyzing practical tasks. But when teaching some questions, there is not enough depth and argumentation, it makes insignificant mistakes, which are eliminated by the applicant himself when the examiner points them out.
Satisfactory «3»	The student answered the examiner's questions incompletely, the answers to additional and leading questions are vague and vague. Possesses a basic amount of theoretical knowledge, uses professional and scientific terminology inaccurately. Experiences significant difficulties in constructing an independent logical answer, in applying theoretical knowledge in the analysis of practical tasks. There are significant errors in the answers.
Unsatisfactory «2»	The student did not answer the examiner's questions, in most cases he did not answer additional and leading questions. He did not master the basic amount

	of theoretical knowledge, he showed a low level of mastery of professional and scientific terminology. Answers to questions are fragmentary, inconsistent, illogical, cannot apply theoretical knowledge when analyzing practical tasks. There are a significant number of gross errors in the answers.
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### 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 assigned 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
- Tests on the theme

### **11. Questions for the final control**

1. The main stages of the development of neurological science. Principles of the structure and functioning of the nervous system. The first studies of diseases of the nervous system (Hippocrates, Galen, Avicenna). Domestic and foreign neurological schools
2. Voluntary movements and their disorders. Pyramid system. Symptoms of central and peripheral paresis.
3. Extrapyramidal system and syndromes of its damage.
4. Cerebellum, cerebellar damage syndromes. Types of ataxia.
5. Sensitive system and symptoms of its damage. Conductive pathways of sensitivity. Types of sensitive disorders: mononeuritic, polyneuritic, root, posterior horn, conductor, medial loop, optic hump, internal capsule, cortical type.
6. Localization of functions in the cerebral cortex. Injury syndromes.
7. Cerebrospinal fluid, its changes. Meningeal syndrome.
8. Epilepsy and non-epileptic paroxysmal conditions. Epileptic status (diagnosis, emergency care). Non-epileptic paroxysmal conditions.
9. Vascular diseases of the brain and spinal cord.
10. Infectious diseases of the nervous system. Meningitis. Encephalitis. Arachnoiditis Neurosyphilis. NeuroAIDS. Tuberculosis of the nervous system.
11. Cranial nerves I-XII and symptoms of their damage.
12. Headache.
13. Functional diagnosis of diseases of the nervous system.
14. Pathology of the autonomic nervous system. Hypothalamic syndrome. Vegetative-vascular paroxysms. Claude-Bernard-Horner syndrome.
15. Diseases of the peripheral nervous system at different levels. Root syndromes. Damage to individual nerves. Plexopathy. Compression-ischemic mononeuropathies. Polyneuropathies.

### **Enumeration of practical work and tasks.**

1. Examination of the volume of active and passive movements. Examination of muscle tone and strength. Examination of tendon, periosteal, skin reflexes.
2. Examination of pathological reflexes (Babinsky, Oppenheim, Gordon, Schaeffer, Rossolimo, Bekhterev, Zhukovsky and others) and synkinesis.
3. Examination of coordination of movements (tests for dysmetria), detection of static and dynamic ataxia.
4. Examination of sensitivity (surface, deep and complex types).
5. Examination of the functions of the cranial nerves (I - XII).
6. Examination of meningeal symptoms (rigidity of the occipital muscles, symptoms of Kernig, Brudzinsky), reactive pain phenomena: Mendel's disease, places of exit of the small and large occipital nerves.

## **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/>