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**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**  
**«CURRENT ISSUES OF NEUROSURGERY**  
**AND CEREBROVASCULAR PATHOLOGY»**

**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).

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The working program is approved at the meeting of the department

Protocol No 1 August, 26 2024

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Protocol No 1 dated 30 aug 2024

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Revised and approved at the meeting of the department of health care management

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Head of the department

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

### 1. Description of the academic discipline:

Name of indicators	Field of knowledge, specialty, specialization, level of higher education	Characteristics of the academic discipline
Total number:	Field of knowledge 22 «Health care»	<i>Full-time (day) education</i> <i>Elective discipline</i>
Credits of ECTS: 3,0	Specialty 222 «Medicine»	<i>Course: 5</i>
Hours: 90		<i>Semester: IX - X</i>
Content modules: 5	Level of higher education second (master's degree)	<i>Lectures (0 hours)</i>
		<i>Seminars (0 hours)</i>
		<i>Practical classes (30 hours)</i>
		<i>Laboratories (0 hours)</i>
		<i>Independent work (60 hours)</i> <i>including individual tasks (0 hours)</i>
		<i>Form of final control – test</i>

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

**Purpose:** Acquisition by the student of higher education of knowledge and formation of elements of professional competences in the field of neurosurgery 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 the following competencies:

• **General (GC):**

IR. 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

GC3. Ability to apply knowledge in practical situations

GC4. Knowledge and understanding of the subject area and understanding of professional activity

GC6. Ability to make informed decisions

GC7. Ability to work in a team

GC8. Ability to interpersonal interaction

GC10. Ability to use information and communication technologies

GC11. Ability to search process and analyze information from various sources

GC12. Determination and persistence in relation to assigned tasks and assumed responsibilities

• **Special (SC):**

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

SC2. Ability to determine the necessary list of laboratory and instrumental studies and evaluate their results

SC3. Ability to establish a preliminary and clinical diagnosis of the disease

SC4. The ability to determine the necessary regime of work and rest in the treatment and prevention of diseases

SC5. The ability to determine the nature of nutrition in the treatment and prevention of diseases

SC6. Ability to determine the principles and nature of treatment and prevention of diseases

SC7. Ability to diagnose emergency conditions

SC8. Ability to determine tactics and provide emergency medical care

SC10. Ability to perform medical manipulations

SC16. Ability to maintain medical documentation, including electronic forms

SC17. The ability to assess the impact of the environment, socio-economic and biological determinants on the state of health of an individual, family, population

SC24. Adherence to ethical principles when working with patients and laboratory animals

SC25. Adherence to professional and academic integrity, to be responsible for the reliability of the obtained scientific results.

SC26. The ability to determine the management tactics of persons subject to dispensary supervision.

**Program learning outcomes (PRL):**

PRL1. Have thorough knowledge of the structure of professional activity. To be 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.

PRL2. Understanding and knowledge of basic and clinical biomedical sciences, at a level sufficient for solving professional tasks in the field of health care.

PRL4. Identify and identify 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).

PRL5. Collect complaints, history of life and diseases, evaluate psychomotor and physical development of the patient, state of organs and systems of the body, based on the results of laboratory and instrumental studies, evaluate information regarding the diagnosis (according to list 4), taking into account the age of the patient.

PRL6. To establish a 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).

PRL7. Assign and analyze additional (mandatory and optional) examination methods (laboratory, functional and/or instrumental) (according to list 4), patients with diseases of organs and body systems for differential diagnosis of diseases (according to list 2).

PRL8. To determine the main clinical syndrome or symptom, which determines the severity of the condition of the victim/victim (according to list 3) by making a reasoned decision about the condition of a person under any circumstances (in the conditions of a health care institution, outside its borders), including in conditions of emergency and hostilities, in field conditions, in conditions of lack of information and limited time.

PRL9. Determine the nature and principles of treatment (conservative, operative) of patients with diseases (according to list 2), taking into account the age of the patient, in the conditions of the health care institution, outside its borders and at the stages of medical evacuation, including in field conditions, 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, 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.

PRL10. Determine the necessary mode of work, rest and nutrition on the basis of the final clinical diagnosis, observing the relevant ethical and legal norms, by making a reasoned decision according to existing algorithms and standard schemes.

PRL14. Determine tactics and provide emergency medical care in emergency situations (according to list 3) in limited time in accordance with existing clinical protocols and treatment standards.

PRL 15. To organize the provision of medical aid and medical evacuation measures to the population and military personnel in emergencies, including in field conditions.

PRL17. Perform medical manipulations (according to list 5) in the conditions of a medical institution, at home or at 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.

PRL18. To determine 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 on the basis of regulatory documents.

PRL21. Search for the necessary information in the professional literature and databases of other sources, analyze, evaluate and apply this information.

PRL24. To organize 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 academic discipline, the student of higher education must:**

**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. Content of the academic discipline**

#### **Content module 1.**

#### **Traumatic lesions of the nervous system.**

##### **Theme 1. Stages of development of neurosurgery.**

The main stages of formation and development of neurosurgery. Scientific school in Ukraine. Development of neurosurgery in the south of Ukraine. Structure and organization of medical care for neurosurgical patients.

##### **Theme 2. Additional methods of examination in neurosurgery.**

##### **Theme 3. Traumatic lesions of the nervous system.**

### **Closed craniocerebral injury (TBI).**

Closed TBI. Classification. Clinic, diagnosis and treatment of Concussions, stroke and compressed brain. Obstetric TBI. Providing first aid to patients with TBI at the scene of the accident and at the pre-hospital stage. Modern diagnostic methods, assessment of their informativeness. Indications for surgical treatment of TBI in the acute and remote periods. Methods Opening of the skull cavity, principles of operations on the brain. Methods of stopping bleeding from soft tissues of the head, dura mater, vessels of brain tissue. Early and late complications of closed TBI. Conservative treatment of TBI in the remote period of the disease. Rehabilitation and readapt Open traumatic brain injury (TBI).

#### **Theme 4. Open TBI, clinic, diagnostics.**

Combined and combined TBI, clinical and diagnostic features. Principles of providing emergency care to patients with open, combined and combined TBI at the scene and at various stages of evacuation. Auxiliary methods of research in the diagnosis of TBI. Primary surgical treatment of open penetrating and non-penetrating wounds of the skull and brain. Early and late complications of open TBI, principles of surgical treatment. Plastic surgery of skull bone defects. Features of the course of TBI depending on the age and physical condition of patients. Obstetric TBI, emergency care, principles of treatment and prevention. Dispensary observation, rehabilitation of patients who have suffered an open TBI. Gunshot wounds of the skull and brain, their classification and clinic. First aid for skull injuries on the battlefield. Medical sorting and content of medical care at the stages of medical evacuation. Multiple injuries of the head, spine and other parts of a person (trunk, limbs). Medical assistance in field conditions and extreme situations. Features of preparation for evacuation. Provisions on non-transportability.

#### **Theme 5. Spinal cord injury.**

Etiopathogenesis of traumatic lesions of the spine and spinal cord. Classification. Clinic of various types of spinal cord and spine injuries, depending on the level of damage. Clinical and instrumental diagnostics. Evaluation of detected changes in the application of auxiliary methods of diagnosis of traumatic injuries of the spinal cord and spine. Emergency care for patients with traumatic lesions of the spine and spinal cord, basic methods and principles of transport immobilization of patients depending on the level of damage. Indications for surgical treatment in spinal cord injury. Modern methods of treatment of spinal cord and spine injuries. Prevention and treatment of complications in the acute and remote periods. Rehabilitation treatment of patients.

#### **Theme 6. Traumatic injuries of the peripheral nervous system.**

Classification of traumatic injuries of peripheral nerves. Clinic. Diagnostics. Emergency care for patients with traumatic damage to peripheral nerves. Compression-ischemic (tunnel) neuropathies. Algorithm for determining the tactics of treatment of open and closed injuries of peripheral nerves. Basic principles and methods of surgical interventions for peripheral nerve injury depending on the type, level and mechanism of damage. Principles of restorative treatment of patients in the postoperative period.

#### **Theme 7. Gunshot wounds of the skull and brain, their classification and clinic.**

First aid for skull injuries on the battlefield. Medical sorting and content of medical care at the stages of medical evacuation.

## **Content module 2.**

### **Brain tumors. Hydrocephalus.**

#### **Theme 8. Brain tumors.**

Classification. Clinic. Diagnostics. Pathophysiological mechanisms of hypertensive syndrome formation. Postbrain and focal symptoms. Pathogenesis of primary and secondary symptoms in brain tumors. The value of auxiliary examinations (ophthalmological examination,

craniography, ultrasound, echocardiography, EEG, pneumoencephalography, angiography, computer tomography, MRI, SPECT) in the diagnosis of brain tumors. Principles of surgical treatment of brain tumors depending on histostructure and localization. Radical and palliative operations, their principles. Combined and radiosurgical treatment of brain tumors. Emergency care for acute intracranial hypertension syndrome and dislocation syndromes. Rehabilitation and reintegration of patients after brain tumor surgery. The importance of bad habits in patients with pathology of the vessels of the brain and spinal cord.

#### **Theme 9. Hydrocephalus**

Hydrocephalus. Pathogenesis. Clinic. Diagnostics. Classification. Modern methods and principles of surgical treatment of hydrocephalus. The main types of liquid shunt operations, indications for their performance and the method of carrying them out. Emergency care for shunt dysfunction. Rehabilitation and social reintegration of patients.

**Theme 10. Peculiarities of management of incurable patients and the use of palliative treatment methods in neurosurgical practice.**

#### **Theme 11. Abscesses of the brain, epiduritis.**

Etiology of brain and spinal cord abscesses. Clinic of brain abscesses of various localization. Diagnosis of brain abscesses. The value of auxiliary examination methods in the diagnosis of this pathology. Principles of surgical treatment of brain abscesses and epiduritis. Prevention of brain and spinal cord abscesses.

### **Content module 3.**

#### **Vascular diseases of the brain and spinal cord**

#### **Theme 12. Vascular pathology of the brain, accompanied by hemorrhagic stroke.**

Classification. Clinic. Etiopathogenesis. Methods of diagnosis of cerebral vascular pathology. Vascular diseases of the brain requiring surgical treatment. Clinic, diagnosis and treatment of aneurysms, arteriovenous malformations, carotid-cavernous junction in the acute and remote periods. Emergency care for patients with acute hemorrhagic cerebral circulation disorders. Modern methods of surgical treatment of patients with cerebral vascular pathology. Restorative treatment in the postoperative period. Prevention of vascular diseases of the brain. Rehabilitation and reintegration of patients with cerebral vascular pathology.

**Theme 13. Principles of treatment of vascular pathology of the brain, accompanied by hemorrhagic type of stroke.**

Treatment of aneurysms, arteriovenous malformations, carotid-cavernous shunts in the acute and remote periods. Emergency care for patients with acute hemorrhagic cerebral circulation disorders. Modern methods of surgical treatment of patients with cerebral vascular pathology. Restorative treatment in the postoperative period. Prevention of vascular diseases of the brain. Rehabilitation of patients with cerebral vascular pathology.

#### **Theme 14. Vascular pathology of the brain accompanied by ischemic stroke.**

Types of pathology of main vessels, manifested by acute and chronic ischemia of the brain. Classification. Etiopathogenesis. Atherosclerosis of blood vessels as the main risk factor for cerebral blood circulation disorders of the ischemic type. Clinic, diagnosis.

**Theme 15. Principles of treatment of vascular pathology of the brain, which is accompanied by ischemic stroke.**

Treatment of stenoses, thrombosis and thromboembolism of cerebral vessels. Emergency care for patients with acute cerebral circulation disorders of the ischemic type. Modern methods of surgical treatment of ischemic lesions of the brain. Restorative treatment in the postoperative period. Prevention of vascular diseases of the brain. Rehabilitation of patients with cerebral vascular pathology.

**Theme 16. Pathology of spinal cord vessels.**

The main clinical manifestations of vascular pathology of the spinal cord. Diagnostics.

**Content module 4.****Tumors of the spine and spinal cord. Osteochondrosis****Theme 17. Tumors of the spinal cord.**

Classification. Features of the clinic depending on the localization of the tumor and the nature of its growth. Modern methods of diagnosis of spinal cord tumors. The importance of auxiliary methods in the examination of patients with tumors of the spinal cord and differential diagnosis of this pathology. Methods of surgical treatment of spinal cord tumors. Prevention of complications in spinal cord tumors (urosepsis, sepsis, bedsores). Restorative treatment in the postoperative period. Rehabilitation of patients after removal of spinal cord tumors.

**Theme 18. Osteochondrosis.**

Classification. Pathogenesis. Clinic. Diagnostics. Emergency care for radicular pain syndrome. Indications for surgical treatment in osteochondrosis and its principles depending on the level and degree of damage. Restorative treatment in the postoperative period, rehabilitation of patients. Prevention of osteochondrosis. Rehabilitation and social reintegration of patients.

**Content module 5.****Functional and restorative neurosurgery. Pain surgery****Theme 19. Functional and restorative neurosurgery.**

Principles of stereotaxic operations. Indications for their use in brain diseases. Basic principles and indications for surgical treatment of epilepsy, parkinsonism, cerebral palsy, etc. Principles of reconstructive neurosurgery. The main types of surgical interventions used in restorative neurosurgery. Prospects for the development of functional and restorative neurosurgery.

**Theme 20. Functional and restorative neurosurgery. Surgical treatment of pain syndromes.**

The concept of intractable pain syndromes. Mechanisms of formation of the main pain syndromes. Classification. Clinic. Diagnostics. Differential diagnosis. Emergency care for trigeminal neuralgia, causalgia, phantom and amputation pain syndromes. Indications for surgical treatment of pain syndromes and its principles. Rehabilitation and social reintegration of patients with intractable pain syndromes.

**Theme 21. Malformations of the brain and spinal cord.**

Classification. Clinic. Diagnostics. Auxiliary methods of diagnosis of malformations of the brain and spinal cord. Prenatal diagnosis. Indications for surgical treatment and its principles. Restorative treatment of patients in the postoperative period. Rehabilitation and reintegration of patients with developmental disabilities of the brain and spinal cord. Prevention of malformations of the brain and spinal cord.



#### 4. The structure of the academic discipline

Names of Themes	Number of hours					
	That's all	includes				
		Lec-tures	Semi-nars	Prac-tical	Labora-tory	ISW
<b>Content module 1.</b>						
<b>Traumatic lesions of the nervous system.</b>						
Theme 1. Stages of development of neurosurgery.	6	0	0	0	0	6
Theme 2. Additional methods of examination in neurosurgery.	6	0	0	0	0	6
Theme 3. Traumatic lesions of the nervous system. Closed craniocerebral injury (TBI). Open TBI, clinic, diagnostics.	4	0	0	2	0	2
Theme 4. Open TBI, clinic, diagnostics.	4	0	0	2	0	2
Theme 5. Spinal cord injury.	4	0	0	2	0	2
Theme 6. Traumatic injuries of the peripheral nervous system.	4	0	0	2	0	2
Theme 7. Gunshot wounds of the skull and brain.	6	0	0	0	0	6
<i>Total in content module 1</i>	<i>34</i>	<i>0</i>	<i>0</i>	<i>8</i>	<i>0</i>	<i>26</i>
<b>Content module 2.</b>						
<b>Brain tumors. Hydrocephalus.</b>						
Theme 8. Brain tumors.	4	0	0	2	0	2
Theme 9. Hydrocephalus.	4	0	0	2	0	2
Theme 10. Peculiarities of management of incurable patients and the use of palliative treatment methods in neurosurgical practice.	4	0	0	0	0	4
Theme 11. Abscesses of the brain, epiduritis.	4	0	0	0	0	4
<i>Total in content module 2</i>	<i>16</i>	<i>0</i>	<i>0</i>	<i>4</i>	<i>0</i>	<i>12</i>
<b>Content module 3.</b>						
<b>Vascular diseases of the brain and spinal cord</b>						
Theme 12. Vascular pathology of the brain, accompanied by hemorrhagic stroke.	4	0	0	2	0	2
Theme 13. Principles of treatment of vascular pathology of the brain, accompanied by hemorrhagic stroke.	4	0	0	2	0	2
Theme 14. Vascular pathology of the brain accompanied by ischemic stroke.	4	0	0	2	0	2
Theme 15. Principles of treatment of vascular pathology of the brain, accompanied by ischemic stroke.	4	0	0	2	0	2
Theme 16. Pathology of spinal cord vessels.	4	0	0	2	0	2
<i>Total in content module 3</i>	<i>20</i>	<i>0</i>	<i>0</i>	<i>10</i>	<i>0</i>	<i>10</i>

<b>Content module 4.</b>						
<b>Tumors of the spine and spinal cord. Osteochondrosis</b>						
Theme 17. Tumors of the spinal cord.	4	0	0	2	0	2
Theme 18. Osteochondrosis.	4	0	0	2	0	2
<i>Total in content module 4</i>	<i>8</i>	<i>0</i>	<i>0</i>	<i>4</i>	<i>0</i>	<i>4</i>
<b>Content module 5.</b>						
<b>Functional and restorative neurosurgery. Pain surgery</b>						
Theme 19. Functional and restorative neurosurgery.	4	0	0	2	0	2
Theme 20. Surgical treatment of pain syndromes.	4	0	0	2	0	2
Theme 21. Malformations of the brain and spinal cord.	4	0	0	0	0	4
<i>Total in content module 5</i>	<i>12</i>	<i>0</i>	<i>0</i>	<i>4</i>	<i>0</i>	<i>8</i>
Individual tasks	0	0	0	0	0	0
<b><i>Only hours</i></b>	<b><i>90</i></b>	<b><i>0</i></b>	<b><i>0</i></b>	<b><i>30</i></b>	<b><i>0</i></b>	<b><i>60</i></b>

## **5. Themes of lectures / seminars / practical / laboratory classes**

### **5.1. Themes of lectures**

Lectures are not provided.

### **5.2. Themes of seminar classes**

Seminar classes are not provided.

### **5.3. Themes of practical classes**

<b>№</b>	<b>Theme name</b>	<b>Hours</b>
<b>1.</b>	Theme 3. Traumatic lesions of the nervous system. Closed craniocerebral injury (TBI).	2
<b>2.</b>	Theme 4. Open TBI, clinic, diagnostics.	2
<b>3.</b>	Theme 5. Spinal cord injury (SCI). Traumatic injuries of the peripheral nervous system.	2
<b>4.</b>	Theme 6. Traumatic injuries of the peripheral nervous system.	2
<b>5.</b>	Theme 8. Brain tumors.	2
<b>6.</b>	Theme 9. Hydrocephalus.	2
<b>7.</b>	Theme 12. Vascular pathology of the brain, accompanied by hemorrhagic stroke.	2
<b>8.</b>	Theme 13. Principles of treatment of vascular pathology of the brain, accompanied by hemorrhagic stroke.	2
<b>9.</b>	Theme 14. Vascular pathology of the brain accompanied by ischemic stroke.	2
<b>10.</b>	Theme 15. Principles of treatment of vascular pathology of the brain, accompanied by ischemic stroke.	
<b>11.</b>	Theme 16. Pathology of spinal cord vessels.	2
<b>12.</b>	Theme 17. Tumors of the spinal cord.	2
<b>13.</b>	Theme 18. Osteochondrosis.	2
<b>14.</b>	Theme 19. Functional and restorative neurosurgery.	2
<b>15.</b>	Theme 20. Surgical treatment of pain syndromes.	
	<b><i>The total number of hours in the discipline</i></b>	<b><i>30</i></b>

#### 5.4. Themes of laboratory classes

Laboratory classes are not provided.

#### 6. Independent work of a student of higher education

<b>№</b>	<b>Title of the Theme / types of tasks</b>	<b>Hours</b>
1	<i>Independent study of Themes that are not part of the classroom lesson plan:</i>	
1.1	Theme 3. Traumatic lesions of the nervous system. Closed craniocerebral injury (TBI).	2
1.2	Theme 4. Open TBI, clinic, diagnostics.	2
1.3	Theme 5. Spinal cord injury (SCI). Traumatic injuries of the peripheral nervous system.	2
1.4	Theme 6. Traumatic injuries of the peripheral nervous system.	2
1.5	Theme 8. Brain tumors.	2
1.6	Theme 9. Hydrocephalus.	2
1.7	Theme 12. Vascular pathology of the brain, accompanied by hemorrhagic stroke.	2
1.8	Theme 13. Principles of treatment of vascular pathology of the brain, accompanied by hemorrhagic stroke.	2
1.9	Theme 14. Vascular pathology of the brain accompanied by ischemic stroke.	2
1.10	Theme 15. Principles of treatment of vascular pathology of the brain, accompanied by ischemic stroke.	2
1.11	Theme 16. Pathology of spinal cord vessels.	2
1.12	Theme 17. Tumors of the spinal cord.	2
1.13	Theme 18. Osteochondrosis.	2
1.14	Theme 19. Functional and restorative neurosurgery.	2
1.15	Theme 20. Surgical treatment of pain syndromes.	2
	<i>Total</i>	<i>30</i>
2	<i>Independent study of topics that are not part of the classroom lesson plan:</i>	
2.1	Theme 1. Stages of development of neurosurgery.	6
2.2	Theme 2. Additional methods of examination in neurosurgery.	6
2.3	Theme 7. Gunshot wounds of the skull and brain.	6
2.4	Theme 10. Peculiarities of management of incurable patients and the use of palliative treatment methods in neurosurgical practice.	4
2.5	Theme 11. Abscesses of the brain, epiduritis.	4
2.6	Theme 21. Malformations of the brain and spinal cord.	4
	<i>Total</i>	<i>30</i>
	<b><i>The total number of hours in the discipline</i></b>	<b><i>60</i></b>

#### 7. Teaching methods

**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:** test.

### 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.

Credit is awarded to a student who has completed all tasks of the work program of the academic discipline, actively participated in practical classes, has an average current grade of at least 3.0 and has no academic debt.

Assessment is carried out at the last lesson. The credit score is the arithmetic mean of all components according to the traditional four-point scale and has a value that is rounded according to the statistics method with two decimal places after the decimal point.

### 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
- Methodological recommendations for the individual work of students
- Multimedia presentations
- Tests on the theme

### 11. Questions for the final control

1. Closed craniocerebral injury. Classification. Clinic, diagnosis, treatment.
2. Providing medical care to a patient with a closed and open craniocerebral injury at the pre-hospital stage.
3. Intracerebral hematomas. Classification. Clinic, diagnosis, treatment.
4. Fractures of the bones of the skull in case of a closed craniocerebral injury. Classification. Indications for surgery for skull fractures. Basic principles of operations.

5. Open craniocerebral injury. Classification, diagnosis, emergency care.
6. Primary surgical treatment and its terms for open TBI. Methods of removing foreign bodies from brain matter.
7. Early and late complications of open TBI. Indications for surgical treatment, prevention of complications.
8. Gunshot wounds to the skull and brain. Classification, clinic, emergency care.
9. Post-traumatic epilepsy and methods of removing patients from epistatus.
10. Brain tumors. Hypertensive syndrome. Clinic, diagnostics, emergency care.
11. Auxiliary methods of diagnosing brain tumors in a neurosurgical clinic.
12. Pathology of cerebral vessels. Classification, clinic, diagnosis, emergency care.
13. Ischemic strokes. Clinic, diagnostics, emergency care. Indications for surgical treatment, its principles.
14. Hemorrhagic strokes. Classification, clinic, diagnosis, emergency therapy. Indications for surgical treatment.
15. Tumors of the spinal cord. Classification, clinic, diagnosis.
16. Liquordynamic and liquorological studies in the diagnosis of spinal cord tumors.
17. Neurosurgical treatment of patients with spinal cord tumors.
18. Osteochondrosis. Classification. Clinic, diagnosis, indications for surgical treatment.
19. Traumatic damage to the spine and spinal cord. Classification, clinic, diagnosis.
20. First aid and transportation of patients with traumatic injuries of the spine and spinal cord.
21. Neurosurgical operations for closed and open injuries of the spine and spinal cord.
22. Functional neurosurgery, pain syndromes, clinic, treatment. Research methods.
23. Epilepsy. Diagnostics. Removal of the patient from epistatus. Indications for surgical treatment, its principles.
24. Traumatic damage to peripheral nerves. Peculiarities of primary treatment of wounds with open injuries of peripheral nerves.
25. Pain syndromes (causalgia, amputation pain, phantom pain). Clinic, diagnostics, emergency care. Trigeminal neuralgia.
26. Defects in the development of the brain and spinal cord. Classification, clinic, diagnosis. Indications for surgical treatment.
27. Development stages of domestic and foreign neurosurgery.
28. Value of additional research methods in neurosurgery.
29. Hydrocephalus. Classification. Etiopathogenesis. Clinic, diagnosis. Indications for surgical treatment and its principles.
30. Brain abscesses. Classification, clinic, diagnosis, emergency care. Indications for surgical treatment and its principles.

#### **List of practical skills**

1. Carry out a clinical examination of a neurosurgical patient and assess his general condition, determine the examination plan.
2. Evaluate the data of additional research methods (radiography of the skull, spine, examination by an ophthalmologist, echocardiography, EEG, ultrasound, computer tomography, MRI, angiography, etc.).
3. Provide emergency care to patients with acute TBI.
4. Provide emergency care to patients with spine and spinal cord injuries.
5. Provide emergency care to patients with peripheral nerve injuries.
6. Provide emergency care to patients with acute manifestations of cerebral vascular diseases.
7. Provide emergency care for intracranial hypertension syndrome.
8. Bring the patient out of epileptic status.
9. Prove the procedure for performing a lumbar puncture, indications, contraindications.
10. Prove the procedure for performing fluid dynamic tests, evaluate the obtained data.
11. Carry out immobilization in case of damage to the spine

12. Prove the procedure for primary surgical treatment of wounds of soft tissues of the head.

## 12. Recommended literature

### Basic:

- 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
- 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, 2020. – 640 p.

### Additional:

- 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
- Themeal 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

## 13. Electronic information resources

1. Medical Books On-line Library (Neurology) – free download  
<http://medbookshelf.info/category/neurology/>