MINISTRY OF HEALTH OF UKRAINE

ODESA NATIONAL MEDICAL UNIVERSITY

Department of General and Clinical Pathophysiology

CERTIFY

Vice-rector for scientific and pedagogical work
Profesor _____ Svitlana KOTYUZHYNSKA

01 September 2022

WORKING PROGRAM OF ELECTIVE EDUCATIONAL DISCIPLINE " CLINICAL NEUROPHYSIOLOGY AND ELECTROPHYSIOLOGICAL BACKGROUND OF DIAGNOSIS "

Level of higher education: second (master's)

Field of knowledge: 22 "Health care"

Speciality: 222 "Medicine"

Educational and professional program: Medicine

2022

The Working Program is compiled on the basis of the educational and professional program "Medicine" for specialists preparation of the second (master's) level of higher education in the speciality 222 "Medicine" in the field of knowledge 22 "Health Care" approved by the Scientific Council of Odesa National Medical University (June 23, 2022; Protocol N 9).

Developers:
Head of the Department General and Clinical Pathological Physiology, Honoured Worker of Science and Technology of Ukraine, D.Sci, Prof. Rooslan VASTYANOV;
Head of the educational part of the department, Asst. Ihor OSTAPENKO

The Working Program was approved at the meeting of the Department of General and Clinical Pathological Physiology (June 27, 2022; Protocol N 12).

Head of the Department General and Clinical Pathological Physiology, Honoured Worker of Science and Technology of Ukraine, D.Sci, Prof. Rooslan VASTYANOV

Agreed with the EPP guarantor Valeriya MARICHEREDA

The Working Program was approved at the meeting of the subject cycle commission on medical disciplines of Odesa National Medical University (30.06, 2022; Protocol N 6).

Chairman of the subject cycle methodical commission on medical disciplines of ONMedU, D.Sci, Prof. Olena APPELHANS

The Working Program was reviewed and approved at the meeting of the Department of General and Clinical Pathological Physiology (June 27, 2022; Protocol N __).

Head of the Department General and Clinical Pathological Physiology, Honoured Worker of Science and Technology of Ukraine, D.Sci, Prof. Rooslan VASTYANOV

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1. Description of the academic discipline :

Name of indicators	Field of knowledge, specialty, specialization, level of higher education	Characteristics of the academic discipline
The total number of: Credits: 1.5 Hours: 45 Content modules: 1	Branch of knowledge 22 "Health care" Specialty 222 "Medicine" Level of higher education second (master's **)**	*Full-time education* *Mandatory discipline*
		Year of training: 3.5
		Semester: V , lX - X
		Lectures (0 hours)
		Seminars (16 hours)
		Practical (0 hours)
		Laboratory (0 hours)
		Independent work (29 hours)
		including individual tasks (0 hours)
		Final control form - credit

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

Purpose : formation of students of higher education with thorough knowledge, which is a set of previously studied medical and biological disciplines regarding the main features of generation and conduction of electrical potentials in excitable tissues, on the basis of which it is possible to establish a final clinical diagnosis by making a reasoned decision based on the analysis of the received objective data of a neurophysiological examination of a sick person.

Task:

1. Basic knowledge of all issues related to the mechanisms of excitation and conduction of electrical potentials in cells, tissues and organs of the human body, their registration and the main components of electrical potentials.

2. Basic knowledge of pathogenetic mechanisms of dysfunction of excitable body tissues, features of their clinical manifestation and correlation of the clinical process with electrophysiological images (video and/or paper registration).

3. The formation of a certain amount of knowledge on the interdependence of etiopathogenetic mechanisms and electrophysiological parameters of the functioning of specific organs and organ systems that are subject to a pathological process.

4. The ability to apply the acquired knowledge with a diagnostic purpose in determining the prognosis of the disease, the terms of its clinical course and probable changes in pathogenetically justified pharmacocorrection schemes .

Expected results:

As a result of studying the academic discipline, the applicant must:

Know:

- mechanisms of pathogenic action of environmental factors and their influence on the dynamics of changes in the excitability of excitable tissues of the human body;
- correlations between electrophysiological disturbances and corresponding clinical processes

Be able:

- ability to establish a preliminary and clinical diagnosis based on electrophysiological studies and evaluation of their results;
- determine the principles and character of human disease treatment based on the assessment of

electroencephalogram, electrocorticogram , electroretinogram, electromyogram, electrocardiogram, etc.;
- solve medical problems in new or unfamiliar environments in the presence of incomplete or limited information, focusing exclusively on the results of electronic neurophysiological diagnostics.

3 . Content of the academic discipline

Content module 1

Topic 1. **Mechanisms of pathogenic action of environmental factors: physical, chemical, biological.** Local and general changes in cells and organs in pathogenesis, manifestations of the action of these factors.

Topic 2. **Violation of the structure, function and metabolism of body cells during oxygen starvation.** Pathological changes in muscle cells (skeletal and smooth muscles of organs and systems).

Topic 3. **Causes and pathogenesis of stress.** General adaptive syndrome. Pathogenic effect on organs and systems.

Topic **4. Electrocardiography.** Its basics, graphic display. Methods of diagnosing disorders of automaticity and conduction of the heart.

Topic 5. **Clinical pathophysiology and ECG** diagnosis of heart failure arrhythmias.

Topic 6. **Analysis of ECG** recording in hypertrophy of different parts of the heart, myocardial infarction.

Topic 7. **Electromyography.** Pathogenesis and functional diagnosis of peripheral nervous systems and neuromuscular disorders .

Topic 8. **Pathogenesis and functional diagnosis of disorders of cerebral circulation: rheoencephalography .**

4. The structure of the academic discipline

Elective course of clinical pathophysiology and neurophysiology

5. Topics of lectures

Lectures are not provided.

5.1 . Topics of practical classes

5.2. Seminar topics classes

N	Topic	Hours
1	**Mechanisms of pathogenic action of environmental factors: physical, chemical, biological.** Local and general changes in cells and organs in pathogenesis, manifestations of the action of these factors.	2
2	**Violation of the structure, function and metabolism of body cells during oxygen starvation.** Pathological changes in muscle cells (skeletal and smooth muscles of organs and systems).	2
3	**Causes and pathogenesis of stress.** General adaptive syndrome. Pathogenic effect on organs and systems.	2
4	**E electrocardiography .** Its basics, graphic display. Methods of diagnosing disorders of automaticity and conduction of the heart.	2
5	**Clinical pathophysiology and ECG** diagnosis of heart failure arrhythmias.	2
6	**Analysis of ECG** recordings in hypertrophy of different parts of the heart, myocardial infarction.	2
7	**Electromyography.** Pathogenesis and functional diagnosis of peripheral	2

	nervous systems and neuromuscular disorders .	
8	**Pathogenesis and functional diagnosis of disorders of cerebral circulation: rheoencephalography .**	2
	Totally	**16**

6. Independent work of a student of higher education

N	Topics	Hours
1	V.V. Pidvysotskyi and O.O. Bogomolets are prominent pathophysiologists of the first half of the 20th century. Mechanisms of cell compensation and adaptation to damage. Necrosis and apoptosis, role in normality and pathology. Mechanisms. The role of heredity in pathology. The role of the constitution in pathology. Pathogenic effect of electric current. Electric injury. Pathogenic effect of ionizing radiation.	2
2	Etiology and pathogenesis of crash syndrome. Aging. Causes and mechanisms of aging. Ways of influencing aging. Starvation. Classification. Treatment of starvation. Hypoxia. Kinds Hypoxia as a treatment method. Interval hypoxic training in sports and medicine. Perespiratory function of the lungs. Pathophysiological foundations of dietetics. Pathogenesis of impaired function of gonads and intestinal glands.	2
3	Introduction. The concept of animal electricity. Resting potential and action potential. A neuron is a structural and functional unit of the nervous system. Types of neurons. Neuroglia , its functional significance. Reflex and reflex arcs, conditioned and unconditioned reflexes. Nerve center. Properties of excitation and inhibition of nerve centers. Disorders of the sinuses. Sinuses, classification . Impulse transmission through the sinuses.	2
4	Reception. Types of receptors. Sensitivity classification. Types of sensitive disorders: anesthesia, hypo- and hypertension, paresthesias .	2
5	Pain and their classification. Nociceptive and anticipatory brain systems.	2
6	Spinal cord and medulla oblongata. Syndromes of brain damage. Brown - Secard syndrome . Pathophysiological mechanisms of cerebellar damage syndromes. Research and diagnostic methods.	2
7	General characteristics of the pathophysiology of the nervous system, principles of classification of disorders of its activity. Features of the development of typical pathological processes in the nervous system.	2
8	of hematoencephalic changes barrier in the pathogenesis of disorders of the central nervous system.	2
9	Pathophysiology of the autonomic nervous system. Research methodology. Vegovascular dystonia syndromes .	2
10	Pathophysiological bases of functional diagnosis of diseases of the nervous system: - ultrasound (dopplerography , echoencephaloscopy) - electrophysiological (rheoencephalography , electromyography, electroencephalography , etc.) - neuroimaging methods (computed tomography, magnetic resonance imaging, etc.)	2
11	Features of the development of brain disorders in meningitis , encephalitis and poliomyelitis .	2
12	Pathophysiological basis of epilepsy.	2
13	Pathophysiological basis of sleep disturbance and alertness.	

	Pathophysiological basis of memory impairment.	2
14	Pathophysiological basis of sleep disturbance and alertness. Pathophysiological basis of memory impairment.	2
15	Acute and chronic disorders of cerebral circulation. Stroke, edema. Intracranial hypertension.	1
	Totally	**29**

7. Teaching methods

Forms and methods of current control: oral survey, testing, solution of situational clinical tasks, assessment of activity in class

Current evaluation criteria in practical training

Rating	Evaluation criteria
Perfectly "5"	It is presented in the case when the applicant knows the program in its entirety, illustrating the answers with various examples; gives exhaustively accurate and clear answers without any leading questions; teaches the material without errors and inaccuracies ; performs practical tasks of varying degrees of complexity;
Fine "4"	It is issued on the condition that the applicant knows the entire program and understands it well, answers the questions correctly, consistently and systematically, but they are not exhaustive, although the applicant answers additional questions without errors; performs practical tasks, experiencing difficulties only in the most difficult cases;
Satisfactorily "3"	It is given to the applicant on the basis of his knowledge of the entire scope of the program on the subject and a satisfactory level of understanding of it. The applicant is able to solve simplified tasks with the help of leading questions; performs practical skills, experiencing difficulties in simple cases; is not able to give a systematic answer on his own, but answers directly to directly asked questions correctly
Unsatisfactorily "2"	It is issued in cases where the applicant's knowledge and skills do not meet the requirements of a "satisfactory" assessment (does not know any of the above questions, or knows less than 50% of the questions).

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

SELF-EDUCATION OF HIGHER EDUCATION ACQUIRES

Independent work with recommended basic and additional literature, with electronic information resources, preparation for seminar classes, preparation of reports. The independent work of applicants consists in processing the material, as well as in preparing for the execution and defense of practical works, preparation for current and final control, performance of training tests, searching for information from literary sources and the Internet .

10. Methodological support

- Working program of the academic discipline
- Syllabus of the academic discipline
- Methodical developments for practical classes

11. Questions for preparing for the final inspection

Not provided.

12. Recommended literature

Main:

1. Pathophysiology: a textbook (University III-IV years) /M.N. Zayko, Yu.V. Byts, M.V. Crystal, etc.; Ed by M.N. Zayko, Yu.V. Byts, M.V. Crystal — 6th ed., revised. and added - 2017. - 736 p.
2. Pathophysiology: textbook / Yu.V. Byts, H.M. Butenko, A.I. Gozhenko and others; Ed. by M.N. Zayko, Yu.V. Byts, M.V. Crystal – 5th ed., corrected. - K.: VSV "Medicine" - 2015. - 752 p.
3. Pathophysiology: in 2 vol. Vol. 1. General pathology: textbook for students. higher education closing / O.V. Ataman - Vinnytsia: Nova kniga, 2012. - 592 p.
4. Pathophysiology: in 2 vols. T2. Pathophysiology of organs and systems /O.V. Ataman - Vinnytsia: Nova kniga, 2016. - 448 p.

Additional:

1. Pathophysiology: a textbook /Ed. by M.N. Zaiko, Y.V. Byts, M.V. Kryshtal. - K.: Medicine - 2015. - 752 p.
2. Pathophysiology: textbook /M.V. Krishtal, V.A. Mikhnev, M.N Zayko et al. — 3rd edition - K.: "Medicine" - 2019. – 656 p.
3. Robbins Basic Pathology /V. Kumar, A. Abbas , J. Aster - 10th edition - Elsevier - 2017. – 952 p.**13.**

13. Electronic information resources

1. https://info.odmu.edu.ua/chair/pat_physiology/ - information resource of the department of general and clinical pathological physiology
2. http://moz.gov.ua – Ministry of Health of Ukraine
3. www.who.int - World Health Organization
4. www.dec.gov.ua/mtd/home/ - State Expert Center of the Ministry of Health of Ukraine
5. http://bma.org.uk - British Medical Association