

**MINISTRY OF HEALTH OF UKRAINE**

**ODESA NATIONAL MEDICAL UNIVERSITY**

Department of General and Clinical Pathophysiology



Vice-rector for scientific and pedagogical work  
Profesor \_\_\_\_\_ Svitlana KOTYUZHYNska

01 September 2022

**WORKING PROGRAM OF ELECTIVE EDUCATIONAL DISCIPLINE  
“CLINICAL PATHOPHYSIOLOGY”**

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

**Field of knowledge:** 22 “Health care”

**Speciality:** 222 “Medicine”

**Educational and professional program:** Medicine

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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Rooslan VASTYANOV

## 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 )	<i>Full-time education</i>
		<i>Mandatory discipline</i>
		<i>Year of training: 3.5</i>
		<i>Semester: V, IX - X</i>
		<i>Lectures (0 hours)</i>
		<i>Seminars (16 hours)</i>
		<i>Practical (0 hours)</i>
		<i>Laboratory (0 hours)</i>
		<i>Independent work (29 hours) including individual tasks (0 hours)</i>
	<i>Final control form - credit</i>	

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

**The purpose of the discipline:** formation of higher education students with systemic knowledge and understanding of the conceptual foundations of the general patterns of pathology development; the ability to interpret the main concepts of general nosology, to interpret the causes, mechanisms of development and manifestations of typical pathological processes and the most common diseases, to analyze and draw conclusions about the causes of the mechanisms of functional, metabolic, and structural disorders of organs and body systems in diseases; provides fundamental training and acquisition of practical skills for the next professional activity of a doctor.

### Tasks of the discipline:

1. Knowledge of the main etiological factors of human disease, their relationships with risk factors of human disease and the ability to interpret linear and spatial "false circles" of pathogenetic mechanisms in the development of inflammatory and dystrophic human diseases.
2. Basic knowledge of all issues related to the etiology, pathogenetic and sanogenetic mechanisms of typical pathological processes and understanding of the main ways of their pharmacocorrection, taking into account the pathogenetic component of each disease.
3. Basic knowledge of the pathogenetic mechanisms of comorbid diseases in the human body under conditions of immune dysfunction, understanding of primary and secondary breakdowns of the body's resistance of a sick person.
4. Formation of a certain amount of knowledge on the emergence and development of typical pathological processes and their modeling, understanding of the ways of pharmacocorrection of the main human diseases and creating a base that determines the professional competence and general erudition of the doctor.
5. To apply theoretical knowledge of nosology, cell pathophysiology, typical metabolic disorders, typical pathological processes in the research of issues of etiology and pathogenesis, manifestations and consequences of functional system (organ) disorders and the most common human diseases. Expected results:

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

### Know:

- causes and mechanisms of development of typical pathological processes;

- causes and mechanisms of development of typical metabolic disorders;
- quantitative and qualitative changes in cells of the blood system;
- main disorders of the cardiovascular system, respiratory system, digestion, functioning of the liver and kidneys;
- causes and mechanisms of violations of the functioning of regulatory systems (endocrine and nervous);

**Be able:**

- interpret the causes, mechanisms of development and manifestations of typical pathological processes and the most common diseases;
- analyze, draw conclusions about the causes and mechanisms of functional, metabolic, structural disorders of organs and ; - identify signs of typical pathological processes in the patient, assess the state of functions of various organs and systems.

### 3. Content of the academic discipline

#### Content module 1

Topic 1. **Inflammation.** The main components of the inflammatory process. Features of vascular reaction, exudation and emigration of leukocytes. Pathological principles of anti-inflammatory therapy.

Topic 2. **Allergy.** General characteristics of allergic reactions. The nature of allergens. Principles of allergy detection. The role of allergies in transplantology. Types and mechanisms of desensitization. Principles and treatment of allergic reactions.

Topic 3. **Typical metabolic disorders:** mechanisms of hyper- and dehydration. Principles of edema therapy. Characteristics of acidosis and alkalosis, main laboratory criteria and mechanisms of detected disorders in the patient's body.

Topic 4. **Clinical pathophysiology of extreme conditions:** shock, collapse, coma. Pathophysiological basis of shock prevention and therapy. The role of homeostasis disorders in the pathogenesis of coma. Principles of coma therapy.

Topic 5. **Clinical pathophysiology of red blood:** changes in total volume, anemia and erythrocytosis. Pathogenetic characteristics of anemia classifications for the analysis of their manifestations. Principles of prevention and treatment of anemia.

Topic 6. **Identify typical disorders in the white blood system:** leukocytosis, leukopenia, hemoblastosis, leukemia. Analysis of the mechanism of development and causes of changes in the cellular composition of "white blood" and their clinical consequences; pathogenetic principles of leukemia diagnosis, features of the results of therapy and bone marrow transplantation.

Topic 7. **Modern ideas about the mechanisms of damage to the gastrointestinal tract .** Principles of prevention and treatment of peptic ulcer disease. Pathogenetic mechanisms of development of acute pancreatitis. Local and systemic changes in the pathogenesis of pancreatic shock and their rationale.

Topic 8. **Modern concepts of pathogenetic mechanisms of nervous system disorders.** Motor and sensory disorders, their etiological-pathogenetic features, basic principles of pathogenetically determined pharmacological correction. The concept of the determinant of the pathological process in the nervous system, the generator of pathologically enhanced excitation and the systemic and anti-systemic mechanisms of regulation in the formation of the pathology of the nervous system.

### 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

Practical classes are not provided.

### 5.2. Seminar topics classes

No	Topic	hours
1	<b>Inflammation.</b> process Peculiarities of vascular reaction, exudation and emigration of leukocytes. Pathological principles of anti-inflammatory therapy.	2
2	<b>Allergy.</b> General characteristics of allergic reactions. The nature of allergens. Principles of allergy detection. The role of allergies in transplantology. Types and mechanisms of desensitization. Principles and treatment of allergic reactions.	2
3	<b>Typical metabolic disorders:</b> mechanisms of hyper- and dehydration. Principles of edema therapy. Characteristics of acidosis and alkalosis, main laboratory criteria and mechanisms of detected disorders in the patient's body.	2
4	<b>Clinical pathophysiology of extreme conditions:</b> shock, collapse, coma. Pathophysiological basis of shock prevention and therapy. The role of homeostasis disorders in the pathogenesis of coma. Principles of coma therapy.	2
5	<b>Clinical pathophysiology of red blood:</b> changes in total volume, anemia and erythrocytosis. Pathogenetic characteristics of anemia classifications for the analysis of their manifestations. Principles of prevention and treatment of anemia.	2
6	<b>Identify typical disorders in the white blood system:</b> leukocytosis, leukopenia, hemoblastosis, leukemia. Analysis of the mechanism of development and causes of changes in the cellular composition of "white blood" and their clinical consequences; pathogenetic principles of leukemia diagnosis, features of the results of therapy and bone marrow transplantation.	2
7	<b>Modern ideas about the mechanisms of damage to the gastrointestinal tract .</b> Principles of prevention and treatment of peptic ulcer disease. Pathogenetic mechanisms of development of acute pancreatitis. Local and systemic changes in the pathogenesis of pancreatic shock and their rationale.	2
8	<b>Topic 8. Modern concepts of pathogenetic mechanisms of nervous system disorders.</b> Motor and sensory disorders, their etiological-pathogenetic features, basic principles of pathogenetically determined pharmacological correction. The concept of the determinant of the pathological process in the nervous system, the generator of pathologically enhanced excitation and the systemic and anti-systemic mechanisms of regulation in the formation of the pathology of the nervous system.	2
	<b>In total</b>	<b>16</b>

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

No	Topics	hours
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1	V.V. Pidvysotskyi and O.O. Bogomolets are prominent pathophysiologicalists 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, paraesthesia.	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	The role of changes in the hematoencephalic 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, echoencephalography) - 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
	<b>In total</b>	<b>29</b>

## 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.

## INDEPENDENT WORK 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 the 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.; under the editorship M.N. Zayka, Yu.V. Bytsia, M.V. crystal — 6th ed., revised. and added - 2017. - 736 c.
2. Pathophysiology: textbook / Yu.V. Byts, H.M. Butenko, A.I. Gozhenko and others; under the editorship M.N. Zayka, Yu.V. Bytsia, M.V. crystal – 5th ed., corrected. - K.: VSV "Medicine" - 2015. - 752 p.
3. Pathophysiology: in 2 vols. T1. 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 / edited by M.N. Zaika, Y.V. Bytsia, M.V. Kryshtalya. - K.: Medicine - 2015. - 752 p.
2. Pathophysiology: textbook / NV Krishtal, VA Mikhnev, NN Zayko et al. — 3rd edition - K.: "Medicine" - 2019. - 656
3. Robbins Basic Pathology / V. Kumar, A. Abbas , J. Aster - 10th edition - Elsevier - 2017. - 952

### 13. Electronic information resources

1. [https://info.odmu.edu.ua/chair/pat\\_physiology/](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](http://www.who.int) - World Health Organization
4. [www.dec.gov.ua/mtd/home/](http://www.dec.gov.ua/mtd/home/) - State Expert Center of the Ministry of Health of Ukraine
5. <http://bma.org.uk> - British Medical Association



