

MINISTRY OF HEALTH OF UKRAINE  
KHARKIV NATIONAL MEDICAL UNIVERSITY

Academic year 2021-2022

**D. ALPERN GENERAL AND CLINICAL  
PATHOPHYSIOLOGY DEPARTMENT**


SYLLABUS  
SYLLABUS OF THE EDUCATIONAL DISCIPLINE  
«CLINICAL PATHOPHYSIOLOGY»

Direction of training 22 "Health care"  
The form of education is full-time  
Specialty 222 "Medicine" - masters  
Course IV  
Faculty of Medicine

The syllabus of the discipline  
approved at the meeting of the department  
pathological physiology. D. Alperna

Protocol from  
"30" August 2021 № 15

Head of the department

 prof. Pavlova O.

Approved by the methodical commission of  
KhNMU  
on problems of professional training

Protocol from,  
"31" August 2021 № 1

Chairman

 prof. O.U. Vovk

**Drafters:** Nikolaeva Olga Viktorivna, Shutova Natalia Anatoliivna.

**Teachers:** Nikolaeva Olga, Shutova Natalia, Pavlova Olena, Kuzmina Iryna, Kucheryavchenko Marina, Kovaltsova Marina, Kolyada Oleg, Sulkhdst Inna Oleksandrivna,

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**Attendance-based consultations:** by prior arrangement;

**Online consultations:** on the platform according to the schedule;

**Location:** classes are held in the Department of Pathological Physiology named after D. Alpern in KhNMU, online - in Google Meet, Moodle, ZOOM.

**INFORMATION ABOUT THE DISCIPLINE «Clinical pathophysiology»**

<b>Indicator names</b>	<b>Field of knowledge, direction of training, educational and qualification level</b>	Characteristics of the academic discipline
		full-time education
Number of credits - 3	Educational program for training specialists of the second (master's) level of higher education training 22 "Health"	Selective
The total number of hours is 90	Specialty:  222 "Medicine"	<b>Year of preparation:</b>
		4th
		<b>Semester</b>
		7
		<b>Lectures</b>
		0 hrs.
		<b>Practical, seminar</b>
Hours per day (or evening) form of study: classroom – 20  independent student work - 70		20 hrs.
		<b>Lab work</b>
		0 hrs.
		<b>Independent work</b>
		70 hrs.
		<b>Individual tasks:</b>
		Type of control: test

Educational program of higher education in Ukraine, second (master's) level, educational qualification - master's degree, field of knowledge - 22 Healthcare, specialty 222 "Medicine" is based on the Law of Ukraine "On Higher Education" and the resolution of the Cabinet of Ministers Of Ukraine dated 01.02.2017 № 53 "An amendment to the resolution of the Cabinet of Ministers of Ukraine dated 29.04.2015 № 266", in accordance with the order of the Ministry of Education and Science of Ukraine dated 01.06.2016 № 600 "On approval and appliance of Methodical recommendations for the development of higher education standards. "

The course program determines the prerequisites for access to training, orientation and main focus of the program, the amount of ECTS credits required for a master's degree, a list of general and special (professional) qualifications, normative and variable content of training, formulated in terms of learning outcomes and quality control requirements for higher education.

The department accepts qualified students of any race, national or ethnic origin, gender, age, people with special needs, any religion, sexual orientation, gender, veteran status or marital status for all rights, privileges, programs and activities, provided to university students.

**Link to the discipline page in Moodle:** [31.128.79.157:8083/course/index.php?categoryid=19](http://31.128.79.157:8083/course/index.php?categoryid=19)

## 1. The description of academic disciplines

Clinical pathophysiology (elective course) is an integral part (third section) of the discipline "Pathological Physiology", which involves the application of knowledge received by students during studying general pathophysiology, while practicing in a hospital to deepen and systematize knowledge in the field of relevant issues of pathophysiology of human organs and systems.

Practical classes include the analysis of case histories of various patients with analysing the causes and pathogenesis of their disease according to the schedule of classes, as well as during individual work.

Teaching is based on the principles of evidence-based medicine and using current standards of world professional societies.

The course covers both practical and theoretical aspects of the future pediatrician, general practitioner and neonatologist.

Main subjects of the discipline are patterns (primarily of a functional nature), which determine the course of the disease, the mechanisms of resistance, recovery and curing the disease.

## 2. The purpose and objectives of the discipline

The purpose of the course is to provide students with the ability to apply the knowledge received during studying general and special pathological physiology, to understand the basic patterns of occurrence and features of the disease in a particular patient, the nature of compensatory mechanisms to preserve the function of an affected organ. Differentiated approach to the treatment of the patient during the practical work in the hospital or clinic.

### *The main objects of the course are:*

- deepening and systematizing knowledge in the field of clinical pathophysiology of human organs and systems;
- introducing students to the most modern and advanced achievements of pathophysiological science;
- obtaining skills to determine the connection between the pathogenesis of the disease and its clinical manifestations and laboratory and instrumental indicators;
- performing clinical and pathophysiological analysis of syndromes, true interpretation of the results of laboratory and instrumental research methods based on the understanding of what is happening in the patient's body;
- understanding the principles of therapy in accordance with modern ideas about the causes and mechanisms of the disease;
- formation of humane and deontologically correct attitude to patients.

In accordance with the requirements of the standard, the discipline helps students to obtain general and professional knowledge during the educational-professional program "Medicine" of the second level of higher education in the specialty 222 "Medicine".

*Integral qualifications:* the ability to solve typical and complex specialized tasks and practical problems in professional activities in the field of health care, or in the learning process, which involves research and / or innovation and is characterized by complexity and uncertainty of conditions and requirements.

*General qualifications:* the ability to apply knowledge of the mechanisms of occurrence and development of pathological changes that occur in the body of a patient in practical situations; ability to develop self-regulation, ability to adapt and act in a new situation; improving knowledge about information and communication technologies; ability to think abstract and analyse, ability to learn and be modernly trained; determination and persistence when completing tasks.

*Professional qualifications:* ability to evaluate the results of laboratory and instrumental research; ability to determine the pathogenetic principles of treatment of diseases; ability to identify emergency situations; ability to determine tactics for providing emergency medical care; ability to analyse the impact of the environment on the health of the population (individual, family, population).

### **Social skills that study of this discipline forms in students:**

- communication and teamwork (the method of group work and brainstorming during the analysis of clinical cases, the method of presenting the results of independent work and their argumentation in the group),
- conflict management (case games),
- time management (self-organization during classroom work in groups and independent work),
- leadership skills (presenting the results of independent work and their argumentation in the group).

**3. Discipline status:** selective; The format of the discipline is mixed - a discipline that has support in the Moodle system, teaching the discipline, combines traditional forms of classroom learning with elements of online learning, which uses accessible interactive information technology (Google Meet, Moodle, ZOOM), face-to-face and online counseling.

**4. Teaching methods.** Classes use clinical (analysis of the pathogenesis of the development of various pathologies of internal organs on the basis of case histories of various patients), electronic information (presentations, videos, guidelines), scientific (participation in scientific analysis in the discipline), control (tests, situational tasks, assessment of practical skills) teaching methods.

### **5. Recommended literature**

1. Robbins Pathology basis of disease / V. Kumar, A.K. Abbas, N. Fausto, J.C. Aster. – 8th ed., 2010. – 1450 p.
2. Pathophysiology: The Biologic Basis of Disease in Adults and Children / Edited by K.L. McCance, S.E. Huether. – 4th ed., 2002. – 1423 p.
3. General and Clinical Pathophysiology / Edited by A.V. Kubyshkin. – Vinnitsia: Nova Knyha Pabli-shers, 2011. – 656 p.
4. Pathophysiology – Патофізіологія / Н.В. Сімеонова; за науковою редакцією В.А. Міхньова. – К.: ВСВ «Медицина», 2010. – 544 с.
5. Exercise book on pathophysiology / Authors: prof. O.V. Nikolaeva, prof. A.N. Shevchenko, prof. Ye.A. Pavlova.- Kharkov: KNMU, 2017.
6. Патофізіологія: Підручник / Ю.В. Биць, Г.М. Бутенко, А.І. Гоженко та ін.; За ред. М.Н. Зайка, Ю.В. Биця, М.В. Кришталя. –4-е вид.,перероб. І допов. - К.: ВСВ «Медицина», 2014.-752с.
7. Атаман О. В. Патофізіологія: підручник: в 2 т. / О. В. Атаман. – Вінниця: Нова Книга, 2012. – Т. 1. : Загальна патологія. – 2012. – 579 с.
8. Атаман О. В. Патофізіологія: підручник: в 2 т. Т. 2. / О. В. Атаман. – Вінниця: Нова Книга О. В. Атаман. — Вінниця: Нова Книга, 2016. —448 с.
9. Н.А. Клименко, А.Н. Шевченко Патологическая физиология. Часть 1. Общая патология. Учеб-ное пособие. Харьков:2010- 484 стр.
10. Н.А. Клименко, А.Н. Шевченко Патологическая физиология. Часть 2. Частная патология. Учебное пособие. Харьков:2010- 356 стр.

### **6. Information resources**

1. <http://repo.knmu.edu.ua/handle/123456789/15755>
2. <http://repo.knmu.edu.ua/handle/123456789/22731>
3. <http://repo.knmu.edu.ua/handle/123456789/8974>
4. <http://repo.knmu.edu.ua/handle/123456789/15>
5. <http://repo.knmu.edu.ua/handle/123456789/21865>
6. <http://repo.knmu.edu.ua/handle/123456789/13705>

## 7. Prerequisites and co-requisites of the discipline

**Prerequisites.** The program in clinical pathophysiology involves the use of knowledge, skills and abilities obtained while studying normal anatomy and physiology, pathological anatomy, medical biology, micro-biology, medical informatics, basics of biophysics, biochemistry, medical genetics, pharmacology, epidemiology and principles of evidence-based medicine, emergency medical care, history of medicine, philosophy. The knowledge of pathophysiology is professionally integrated into special clinical disciplines.

**Postrequisites.** The study of the discipline involves the use of skills and abilities to search, analyse and evaluate sources of information, discussion, dialogue, oral and written argumentation, public speeches in the study of related disciplines during 4 years of study; is the basis for preparation for the OSQE licensing exam, preparation for study in higher education institutions in the programs of the third educational and scientific level of higher education.

**8. Learning outcomes.** According to the training program in the discipline "Pathological Physiology", the applicant will obtain theoretical knowledge, methodological training, practical skills and abilities in the following areas:

*After studying the discipline, students should know:*

- ✓ the main provisions of the doctrine of disease, its etiology and pathogenesis;
- ✓ basic patterns of beginning, development and ending of the pathological process, disease or other pathological conditions;
- ✓ patterns of disease development in individual organs and systems;
- ✓ the role of the etiological factor in the development of a pathological condition.

*Students must be able to;*

- ✓ creatively use obtained knowledge of pathophysiology in solving problems;
- ✓ recognize individual nosological forms on the basis of a set of manifestations;
- ✓ to see connection between pathological processes and symptoms of diseases;
- ✓ identify complications of the underlying disease;
- ✓ distinguish between destructive phenomena and protective-adaptive reactions of the organism in the development of pathological processes;
- ✓ to determine the primary link in the development of the pathological process.

*Students should be informed about:*

- ✓ bases of the legislation on health protection of the population of Ukraine;
- ✓ new diagnostic methods, the role of environmental factors and internal factors in the occurrence of diseases.

**Curriculum of the discipline**  
**CLINICAL PATHOPHYSIOLOGY COURSE (90 hours) 3 credits**

<b>Topics of practical classes (20 hours)</b>		
1.	Allergy. Pathogenetic features of different types of allergic reactions.	4
2.	Disorders of peripheral blood circulation and microcirculation.	4
3.	Disorders of carbohydrate metabolism. Diabetes.	4
4.	Disorders of electrolyte balance.	4
5.	Acute leukemia.	4
<b>Total</b>		<b>20</b>
<b>Topics of individual work (70 hours)</b>		
1.	Significance of negative influence of exogenous harmful factors of external environment in different periods of ontogenesis of the child concerning development of pathology of various organs and systems.	4
2.	The importance of reactivity in the development of pathology in people of different ages.	2
3.	Disorder of immunological reactivity. Immunodeficiency states	2
4.	Autoimmune reactions and diseases.	2
5.	The role of heredity and constitution in pathology. The role of the physiological system of connective tissue and the body's resistance to pathogenic agents.	2
6.	The role of inflammation in pathology.	4
7.	Fever.	2
8.	Tumors.	2
9.	Hypoxia.	2
10.	Disorders of total blood volume. Acute blood loss as the most common cause of hypovolemia.	4
11.	Anemia.	4
12.	Pathophysiology of the hemostasis system.	2
13.	Dissorders of physicochemical properties of blood.	2
14.	Causes and pathogenesis of cardiac arrhythmias.	4
15.	Pathophysiology of the heart. Heart failure.	4
16.	Vascular tone disorders. Hypertension.	4
17.	Coronary and non-coronary myocardial lesions.	4
18.	Disorders of the functional state of the external respiratory system. Respiratory failure.	4
19.	Pathophysiology of the liver.	2
20.	Jaundice syndrome.	2
21.	Pathophysiology of the kidneys and urinary system.	4
22.	Pathophysiology of the endocrine system.	2
23.	Pathophysiology of the nervous system.	2
24.	Emergency conditions (collapse, shock, coma).	4
<b>Total</b>		<b>70</b>

**POLICY AND VALUES OF THE DISCIPLINE**

In order to successfully complete the relevant course, it is necessary to regularly attend practical classes; to have theoretical preparation for practical classes according to the subject; not to be late and not to miss classes; perform all necessary tasks and work in each lesson; be able to work with a partner or in a group; contact the curators of the course on various issues on the subject of classes and receive help when you need it.

Students have the right to discuss various tasks, but their performance is strictly individual. It is not allowed to cheat, use various software tools, tips, use electronic gadgets during classes for

purposes other than the educational process. Students are not allowed to be late for practical classes.

Students are encouraged to participate in research and conferences on this topic.

Students with special questions can meet with the teacher or warn them before the start of classes. Group leader can also ask questions on the behalf of other students. If you have any questions, please contact the teacher.

KhNMU provides training and work that is free from discrimination, sexual harassment, intimidation or exploitation. All students of KhNMU are protected by the "*Regulations on the Prevention, Prevention and Settlement of Cases Related to Sexual Harassment and Discrimination at Kharkiv National Medical University*", which is designed to define as an effective mechanism for resolving conflict situations related to discrimination and sexual abuse.

The regulation is developed on the basis of the following normative legal acts of Ukraine: the Constitution of Ukraine; Law of Ukraine "On Education"; Law of Ukraine "On Higher Education"; Law of Ukraine "On Principles of Prevention and Counteraction of Discrimination in Ukraine"; Law of Ukraine "On Ensuring Equal Rights and Opportunities for Women and Men"; Convention for the Protection of Human Rights and Fundamental Freedoms; Convention for the Suppression of Discrimination in Education; Convention on the Elimination of All Forms of Discrimination against Women; General recommendation № 25 to paragraph 1 of Article 4 of the Convention on the Elimination of All Forms of Discrimination against Women; General Comment № 16 (2005) "Equal rights for men and women to enjoy economic, social and cultural rights" (Article 3 of the International Covenant on Economic, Social and Cultural Rights; UN Economic, Social and Cultural Rights Committee); Recommendations on education in the spirit of international understanding, cooperation and peace and education in the spirit of respect for human rights and fundamental freedoms (UNESCO); The concept of the State Social Program to ensure equal rights and opportunities for women and men for the period up to 2021.

The University recognizes the importance of confidentiality. All persons responsible for the implementation of this policy (employees of deans' offices, faculties, institutes and the Center for Gender Education, members of the student government and ethics committee, vice-rector for scientific and pedagogical work) are confidential about persons who reported or accused of discrimination or sexual harassment (except when the law requires disclosure and / or when disclosure by the University is necessary to protect the safety of others).

KhNMU creates a space of equal opportunities, free from discrimination of any national, racial or ethnic origin, sex, age, disability, religion, sexual orientation, gender, or marital status. All rights, privileges, programs and activities granted to students or staff of the University apply to all without exception, provided they are properly qualified. The anti-discrimination policy and the policy of counteracting sexual harassment of KhNMU are confirmed by the Code of Corporate Ethics and the Charter of KhNMU.

It is important for students to follow the rules of good behavior at the university. These rules are common to all, they also apply to all faculties and staff, and do not differ from generally accepted norms.

During classes:

• allowed:

- to leave the audience for a short time if necessary and with the permission of the teacher;
- to drink soft drinks;
- to take photos of presentation slides;
- to take an active part in the discussion.

• prohibited:

- to eat (except for students whose special medical condition requires other and they have a medical certificate);
- smoking, drinking alcohol or using drugs;
- to use obscene language or use words that offend the honor and dignity of colleagues and the faculty;
- gambling;



- to damage the property and technical base of the university (to break inventory, equipment; furniture, walls, floors, litter the premises and territories);
- shouting, making loud sounds or listening to loud music in classrooms and even in corridors during classes.

Department of Pathological Physiology named after D.Alpern maintains **zero tolerance for plagiarism**. Students are expected to constantly raise their awareness of academic writing. The first lessons will provide information on what to consider plagiarism and how to properly make a scientific research.

The first lesson of the course will explain the basic principles **of labor protection** by doing an appropriate training. It is expected that every higher education seeker should know where the evacuation exit closest to the audience is, where the fire extinguisher is, how to use it, etc.

**The procedure for informing about any changes in the syllabus:** the necessary changes in the syllabus are approved by the methodical commission of KhNMU on problems of general and pre-professional training and published on the site of KhNMU, the site of the Department of Pathological Physiology named after D. Alpern (KhNMU).

## EVALUATION POLICY

**Organization of current control.** Teachers make sure that each student receives the necessary competence included in the topics of practical classes. Understanding of the topic (current control) is controlled in a practical lesson according to specific goals. The following tools are used to assess the level of preparation of students: tests, solving situational problems, interpretation and evaluation of laboratory results, methods of prescribing therapy, monitoring the obtention of practical skills. Assessment of current learning activities (PND) in each practical lesson is based on a traditional 4-point scale: "excellent", "good", "satisfactory" and "unsatisfactory".

**Grading system.** The final lesson (FL) is conducted in accordance with the program of the academic discipline during the semester according to the schedule. The grade for the discipline is given to the student during the last (final) lesson. The final score for PND and final lesson (FL) is defined as the arithmetic sum of traditional grades for each lesson and FL, rounded to 2 decimal places (to the nearest hundredth), which are converted into points in accordance with the "Instructions for assessment of educational student activities... » using table 2 or the average grade (to the nearest hundredth) for PND and its conversion into ECTS points the teacher automatically receives using the electronic journal A. The minimum number of points that a student must score for the current activity during the study of the discipline is 120 points, the maximum number of points - 200 points.

**Assessment of students' independent work.** Students' independent work, which is provided by the topic of the lesson along with the classroom work, is assessed during the current control of the topic in the relevant lesson.

### Assessment of individual student tasks is carried out by the teacher:

- oral report on a practical lesson 0-2 points;
- a report with a presentation in a practical lesson 0-3 points,
- a report at scientific and practical conference department or university level, writing articles 0-5 points;
- participation in the All-Ukrainian Olympiad - 5-10 points

Scores for individual student tasks (a total of not more than 10 points) can be added extra to the final score for current learning activities, calculated using Table 2 and are part of the assessment of the discipline.

During the assessment of mastering each academic topic of the discipline (current educational activity - PND) and the final lesson (FL) the student is graded according to the traditional 4-point system: "excellent", "good", "satisfactory" and "unsatisfactory".

The maximum number of points that a student can score when studying the discipline is 200, the minimum is 120 points.

After graduating from the discipline "Clinical Pathophysiology" the student must pass a test.

### **Recalculation of the average score for current activities in a multi-point scale**

1. Evaluation of current educational activities (PND). The conversion of the average grade for current activities into a multi-point scale is made in accordance with the "Instructions for assessing the educational activities of students".

2. Assessment of the discipline. The final score for PND and final lesson (FL) is defined as the arithmetic sum of traditional grades for each lesson and FL, rounded to 2 decimal places, which are listed in points using Table 1.

Assessment of individual tasks of the student is carried out for performance of tasks of the teacher: oral report at a practical lesson 0-2 points; report with a presentation at a practical lesson 0-3 points, report at scientific and practical conference on the department or university level, writing articles 0-5 points; participation in the All-Ukrainian Olympiad - for each type of activity 5-10 points (not more than 10 points in total), which can be added extra to the final score for current educational activities, calculated using Table 1, and are part of grades in the discipline.

Table 1

### **Recalculation of the average score for current activities in a multi-point scale (for disciplines ending with a credit)**

4-point scale	200-point scale	4-point scale	120-point scale	4-point scale	120-point scale
5	200	4.22-4,23	169	3.45-3,46	138
4.97-4,99	199	4.19-4,21	168	3.42-3,44	137
4.95-4,96	198	4.17-4,18	167	3.4-3,41	136
4.92-4,94	197	4.14-4,16	166	3.37-3,39	135
4.9-4,91	196	4.12-4,13	165	3.35-3,36	134
4.87-4,89	195	4.09-4,11	164	3.32-3,34	133
4.85-4,86	194	4.07-4,08	163	3.3-3,31	132
4.82-4,84	193	4.04-4,06	162	3.27-3,29	131
4.8-4,81	192	4.02-4,03	161	3.25-3,26	130
4.77-4,79	191	3.99-4,01	160	3.22-3,24	129
4.75-4,76	190	3.97-3,98	159	3.2-3,21	128
4.72-4,74	189	3.94-3,96	158	3.17-3,19	127
4.7-4,71	188	3.92-3,93	157	3.15-3,16	126
4.67-4,69	187	3.89-3,91	156	3.12-3,14	125
4.65-4,66	186	3.87-3,88	155	3.1-3,11	124
4.62-4,64	185	3.84-3,86	154	3.07-3,09	123
4.6-4,61	184	3.82-3,83	153	3.05-3,06	122
4.57-4,59	183	3.79-3,81	152	3.02-3,04	121

4.54-4,56	182	3.77-3,78	151	3-3,01	120
4.52-4,53	181	3.74-3,76	150	<b>Less than 3</b>	<b>Not enough</b>
4.5-4,51	180	3.72-3,73	149		
4.47-4,49	179	3.7-3,71	148		
4.45-4,46	178	3.67-3,69	147		
4.42-4,44	177	3.65-3,66	146		
4.4-4,41	176	3.62-3,64	145		
4.37-4,39	175	3.6-3,61	144		
4.35-4,36	174	3.57-3,59	143		
4.32-4,34	173	3.55-3,56	142		
4.3-4,31	172	3.52-3,54	141		
4,27-4,29	171	3.5-3,51	140		
4.24-4,26	170	3.47-3,49	139		

Head of D. Alpern Pathological  
Physiology department, prof., MD

Nikolaeva O.