SYLLABUS OF THE EDUCATIONAL COMPONENT
«PATHOLOGICAL PHYSIOLOGY»

Specialty: **221 "Dentistry"**
Educational and professional program: "Dentistry"
Component code in the educational program:**OK 19**
Level of higher education: second (master's)
Form of education: full-time (full-time)
Year of study: 2
Semester(s): IV (spring)
Type of educational component: mandatory
Academic year: 2025-2026

Amount:**6 ECTS credits (180 hours)**
Training sessions: lectures, practical classes
Final control: exam
Prerequisites: knowledge of normal anatomy and physiology, pathological anatomy, medical biology, microbiology, medical informatics, fundamentals of biophysics, biochemistry, medical genetics, pharmacology, epidemiology and principles of evidence-based medicine, emergency and urgent medical care, history of medicine, philosophy.

Department/division:Department of General and Clinical Pathophysiology named after D.O. Alpern**,**Nauky Ave., 4, main building, 4th floor
Head of the educational component: Prof. Myroshnychenko Mykhailo Serhiyovych,
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Educational component page in the KhNMU Distance Learning System (Moodle): https://distance.knmu.edu.ua/course/view.php?id=6790

DESCRIPTION OF THE EDUCATIONAL COMPONENT

Pathophysiology is the science of the general patterns of the onset, development, and termination of disease. The main goal of pathophysiology as an educational component is to lay the theoretical foundations for students' understanding of the etiology, pathogenesis, and clinical manifestations of disease.

Pathophysiology consists of two sections: general nosology, typical pathological processes; pathophysiology of organs and systems. The first section contains the basic principles of the doctrine of disease, etiology and pathogenesis, reveals the essence of the pathogenic influence of external and internal environmental factors, typical pathological processes. The second section involves the study of the basic patterns of functional and structural disorders and changes that occur under the influence of pathogenic factors, and the general patterns of the development of diseases of individual organs and systems that occur in clinical practice.

Subject. The study of the educational component is general patterns, primarily of a functional nature, which study the course of the disease, mechanisms of resistance, recovery and termination of the disease.

GOAL OF THE COURSE: teaching students a complex of medical knowledge for a better understanding of the mechanisms of the emergence and development of pathological changes that occur in a sick organism.

LEARNING OUTCOMES:

- To identify and identify the leading clinical symptoms and syndromes; using standard methods, using preliminary data from the patient's history, patient examination data, knowledge about the person, his organs and systems, to establish a probable nosological or syndromic preliminary clinical diagnosis of a dental disease.
- Collect information about the patient's general condition, assess the patient's psychomotor and physical development, the condition of the maxillofacial organs, and evaluate information regarding the diagnosis based on the results of laboratory and instrumental studies.

- Diagnose emergencies in any circumstances (at home, on the street, in a medical facility), in conditions of emergency, martial law, lack of information, and limited time.
- Determine tactics for providing emergency medical care, using recommended algorithms, under any circumstances based on the diagnosis of an emergency condition in a time-limited setting.
- Analyze and evaluate government, social, and medical information using standard approaches and computer information technologies.
- Follow a healthy lifestyle, use self-regulation and self-control techniques.
- To comply with the requirements of ethics, bioethics and deontology in their professional activities.
- Organize the necessary level of individual safety (one's own and those in one's care) in the event of typical dangerous situations in one's individual field of activity.

CONTENT OF THE EDUCATIONAL COMPONENT

List of topics of lectures (30 hours):

1. General doctrine of disease, etiology and pathogenesis.
2. The role of reactivity in pathology.
3. Allergy.
4. Pathophysiology of the cell.
5. Inflammation.
6. Pathophysiology of tissue growth. Tumor growth.
7. Disturbances of carbohydrate metabolism.
8. Pathophysiology of water and electrolyte metabolism.
9. Acid-base disturbances.
10. Pathophysiology of the blood system. Disorders of total blood volume. Pathophysiology of blood loss. Disorders of the erythrocyte system
11. Pathophysiology of the blood system. Disorders of the leukocyte system.
12. Pathophysiology of the cardiovascular system. Heart failure.
13. Pathophysiology of external respiration.
14. Pathophysiology of the digestive system.
15. Pathophysiology of extreme conditions. Pathophysiology of modern combat trauma.

List of topics of practical classes (80 hours):

1. Subject and tasks of pathophysiology. Methods of pathophysiological research. Main stages of development of pathophysiology.
2. Pathogenic effect on the body of physical factors.
3. The effect of ionizing radiation on the human body. Radiation sickness.
4. Pathology of reactivity. Biological barriers. Phagocytosis disorders.
5. Impaired immunological reactivity.
6. Allergy.
7. Practical skills on the topic "General nosology. Pathogenic effect of environmental factors. The role of internal factors in pathology"
8. Typical disorders of peripheral circulation and microcirculation.
9. Typical disorders of peripheral circulation and microcirculation.
10. Inflammation.
11. Inflammation
12. Fever.
13. Tumors.
14. Hypoxia.

15. Practical skills on the topic "Typical pathological processes".
16. Disturbances of carbohydrate metabolism.
17. Violation of water and electrolyte metabolism.
18. Acid-base imbalance.
19. Practical skills on the topic "Typical metabolic disorders".
20. Changes in total blood volume. Qualitative changes in erythrocytes and leukocytes.
21. Anemia due to increased blood destruction (hemolytic anemia).
22. Leukocytosis. Leukopenia.
23. Leukemia.
24. Violation of the hemostasis system.
25. Practical skills on the topic "Blood Pathology".
26. Pathophysiology of the circulatory system. Circulatory insufficiency. Pathophysiology of the heart. Heart failure.
27. Cardiac arrhythmias.
28. Coronary myocardial damage. Coronary insufficiency. Ischemic heart disease. Myocardial infarction. Cardiogenic shock.
29. Pathophysiology of blood vessels. Arterial hypertension and hypotension.
30. Atherosclerosis.
31. Pathophysiology of external respiration. Respiratory failure.
32. Practical skills on the topic "Pathophysiology of systemic circulation and external respiration."
33. Pathophysiology of the digestive system. Digestive insufficiency.
34. Pathophysiology of the liver. Liver failure.
35. Pathophysiology of the kidneys. Renal failure.
36. Pathophysiology of the endocrine system.
37. Pathophysiology of the nervous system
38. Pathophysiology of extreme conditions. Etiology, pathogenesis of shock and collaptoid conditions. Pathophysiology of modern combat trauma.
39. Pathophysiology of extreme states. Etiology, pathogenesis of comatose states.
40. Practical skills on the topic "Pathophysiology of the digestive system, liver, kidneys." "Pathophysiology of regulatory systems (endocrine, nervous) and extreme conditions."

List of topics for student independent work (70 hours)

1. General doctrine of disease, etiology and pathogenesis.
2. Pathogenic effect of environmental factors: the effect of electric current.
3. Pathogenic effect of environmental factors: the effect of changes in atmospheric pressure.
4. Pathogenic effect of environmental factors: the effect of mechanical factors, noise, ultrasound, changing acceleration, space flight factors.
5. Pathogenic effect of environmental factors: the effect of radiant energy.
6. Pathogenic effect of environmental factors: the effect of chemical and biological factors.
7. The role of heredity, constitution, and age-related changes in pathology.
8. The role of the physiological connective tissue system in the body's resistance to the action of pathogenic agents.
9. Autoimmune reactions and diseases.
10. Allergy.
11. Pathophysiology of the cell. Cellular damage.

12. Violation of energy and basic metabolism. Starvation
13. Disturbance of fat metabolism.
14. Protein metabolism disorders. Purine and pyrimidine base metabolism disorders.
15. Violation of vitamin and mineral metabolism
16. Erythrocytosis.
17. Anemias caused by blood loss.
18. Leukocytosis, leukocyte formula. Leukopenia.
19. Hemoblastoses. Acute and chronic leukemia.
20. Violation of the hemostasis system.
21. Pathology of blood vessels. Atherosclerosis.
22. Pathophysiology of extreme conditions. Collapse. Shock
23. Pathophysiology of extreme states. Comatose states.
24. Pathophysiology of modern combat trauma.
25. Preparation for the annual computer certification Step-1
26. Individual work

The SIW is aimed at deepening and consolidating theoretical knowledge obtained during classroom training and contributes to the formation of professional competencies. The results of the SIW are subject to control and are included in the final knowledge control.

Consultations: face-to-face consultations: by prior arrangement; online consultations: platform according to schedule.

Teaching methods: lectures (problem-thematic with the use of multimedia presentation); practical classes (narration-explanation, video films, role-playing, case method, sparring-partnership (groups of 3-4 people), interdisciplinary training); independent work with literature, preparation of essays. Use of test tasks for self-control

EVALUATION

Current educational activities (CEA). Assessment of the success of education seekers is carried out in accordance with the Instructions for assessing the educational activities of higher education seekers at KhNMU (https://knmu.edu.ua/documents/normatyvni-dokumenty-navchalnogo-proczesu/). The grade for a practical or final lesson is from 2 to 5 points. Submitting assignments late for unwarranted reasons entails a reduction in the grade in accordance with the percentage of lateness in time from the time of completing the assignment. Assignments are checked within 24 hours. Grades are posted in the electronic journal. Unsatisfactory grades are worked out in accordance with the Regulations on the procedure for working out academic classes by students of KhNMU (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_vidprac_zaniat.pdf).

At the end of the semester, the semester average grade is converted into a multiple-point grade (70 – 120 points) in accordance with Table 1 of the Assessment Instructions (see above). The arithmetic average of the CEA for both semesters constitutes the total learning activity (TLA).

Individual tasks (IT) are rated up to 10 points.

Final control. The condition for admission to the exam is to score 70 points on the TLA. The exam score ranges from 50 to 80 points.

Discipline assessment (DA). DA = TLA + IT + exam.

Appealing the results of the final control is carried out in accordance with the procedure established at KhNMU (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_apel_kontrol.pdf).

EDUCATION COMPONENT POLICIES

Recommendations for course work: actively participate in all forms of work in classes, devote 1-2 hours daily to independent work and preparation for classes, ask questions during classes, attend consultations, submit assignments on time, and complete all forms of control.

Attending classes. Attendance at lectures and practical classes is mandatory. The uniform for offline classes is a white medical gown. If you are more than 5 minutes late, you may not be allowed to attend the class. Missed classes are made up in accordance with the Regulations on the procedure for students of KhNMU to complete classes (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_vidprac_zaniat.pdf).
Academic integrity. KhNMU has a zero tolerance policy towards academic dishonesty. Any violation of the principles of academic integrity entails liability in accordance with the procedure established at KhNMU (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_ad-1.pdf).
Use of electronic gadgets and artificial intelligence tools is allowed only with the permission of the teacher.
Policy on individuals with special educational needs. Applicants with special educational needs should contact a teacher to develop an individual educational trajectory.
Teacher response time: 24 hours.

Technical requirements for working on the course:

- access to a computer, laptop, tablet or smartphone
- corporate Google account with your own photo
- skills in working with Google Workspace (Google Meet, Docs, Sheets, Slides, Forms) and Moodle

Technical support: **ASU (ev.shevtsov@knmu.edu.ua), Google (tehotdelknmu@gmail.com), Moodle (al.korol@knmu.edu.ua)**

RECOMMENDED SOURCES

Basic

1. Banasic, J. L. Pathophysiology :3 / J. L. Banasic, L-E. C. Copstead. - 6th ed. - St. Louis : Elsevier, 2019. - XXII, 1177 p.
2. Pathophysiology : textbook / N. V. Krishtal, V. A. Mikhnev, N. N. Zayko [et al.] ; ed.: N. V. Krishtal, V. A. Mikhnev. - 2nd ed., corrected. - Kyiv : AUS Medicine Publishing, 2018. - 656 p.
3. Roberts, Fiona. Pathology Illustrated : учбовий посібник / F. Roberts, E. MacDuff ; ed.: F. Roberts, E. MacDuff ; ill.: R. Callander, I. Ramsden. - 8th ed., international. - Edinburgh ; London : Elsevier, 2019. - XII, 714 p.
4. Simeonova, N. K. Pathophysiology / N. K. Simeonova = Патофізіологія / Н. К. Сімеонова; за наук. ред. В. А. Міхньова :підручник.1 - 3rd ed. - Kyiv : AUS Medicine Publishing, 2017. - 544 p.
5. General and Clinical Pathophysiology / A. V. Kubyshkin, A. I. Gozhenko, V. F. Sagach [et al.]; ed. A. V. Kubyshkin = Загальна та клінічна патофізіологія / ред. А. В. Кубишкін : [textbook]. - 3th ed. - Vinnytsya : Nova Knyha Publ., 2017. - 656 p.

Auxiliary

1. Gary D. Hammer, Stephen J. McPhee. Pathophysiology of Disease: An Introduction to Clinical Medicine. - 8th Edition. - McGraw-Hill Education, 2019.
2. https://accessmedicine.mhmedical.com/book.aspx?bookid=2468
3. Pathophysiology of Blood Disorders / ed.: J. C. Aster, H. F. Bunn. - 2nd Edition. - McGraw-Hill Education, 2020.
4. https://accessmedicine.mhmedical.com/book.aspx?bookid=1900
5. Reisner Howard M. Pathology: A Modern Case Study. - 2nd Edition. - McGraw-Hill Education, 2020.
6. https://accessmedicine.mhmedical.com/book.aspx?bookid=2748

7. Huppert's Notes: Pathophysiology and Clinical Pearls for Internal Medicine / ed.: L. A. Huppert, T. G. Dyster. - McGraw-Hill Education, 2021.
8. https://accessmedicine.mhmedical.com/Book.aspx?bookid=3072
9. Essentials of Pathology / Ya. Bodnar, A. Romanyuk, V. Voloshyn [та ін.]. - Kharkiv : Planeta-Print LTD, 2020. - 219 p.
10. Banasic, Jacquelyn L. Study Guide for Pathophysiology: учбовий посібник / J. L. Banasic. - 6th ed. - St. Louis : Elsevier, 2019. - XIII, 247 p.
11. First Aid For The USMLE Step 1 2019 : a student-to-student guide / T. Le, V. Bhushan, M. Sochat [et al.]. - 29th ed. - New York ; Chicago : McGraw Hill Education, 2019. - XXII, 792 p.

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