SYLLABUS OF THE EDUCATIONAL COMPONENT

PATHOMORPHOLOGY

Specialty: **221 "Dentistry"**
Educational and professional program: **Dentistry**
Component code in the educational program: **OC18**
Level of higher education: **second (master's)**
Form of education: **full-time (day)**
Year of study: **2**
Semester(s): **IV (spring)**
Type of educational component: **obligatory**
Academic year: **2025-2026**

Volume: **3 ECTS credits (90 hours)**
Classes: **lectures, practical classes, consultations**
Final assessment: **credit**
Prerequisites: **knowledge of human anatomy and physiology, histology, cytology, embryology and genetics, microbiology, virology and immunology, biological chemistry, medical biology, and medical physics**

Department/division: **Department of Pathological Anatomy**, 4 Nauky Ave., main building, 3rd floor
Head of the educational component: Prof. **V.D. Markovsky**, email: vd.markovskyi@knmu.edu.ua

1. Page of the educational component in the Distance Learning System of Kharkiv National Medical University (Moodle): https://distance.knmu.edu.ua/course/view.php?id=235

DESCRIPTION OF THE EDUCATIONAL COMPONENT

Pathomorphology is an academic discipline that provides an understanding of the structural basis of human diseases for in-depth study of the fundamentals of medicine and the clinical picture of diseases, with subsequent application of the acquired knowledge in the practical work of a physician.

COURSE OBJECTIVE: to study the microscopic and ultramicroscopic structure of the human body, its development and changes under various conditions of life.

LEARNING OUTCOMES:
– evaluate information regarding diagnosis in a healthcare facility or its department, using knowledge of the structural basis of diseases, based on autopsy results and methods of lifetime diagnosis of diseases.

CONTENTS OF THE EDUCATIONAL COMPONENT

List of lecture topics (20 hours):

1. Subject and objectives of pathomorphology. Fundamentals of thanatology (birth and death of a human being, periods of thanatogenesis, signs of clinical death, causes and early signs of biological death, postmortem changes). Main stages of development of pathological anatomy. Methods of pathological diagnosis. Cellular dystrophies: hyaline-droplet, hydropic, horny, fatty. Pathomorphology of the accumulation of complex proteins (hyalinosis) and lipids.
2. Pathomorphology of the accumulation of products of disturbed metabolism. Disorders of iron metabolism and hemoglobin pigments, pathomorphological manifestations of impaired melanin formation, nucleoprotein and copper metabolism. Calcification (calcinosis) of tissues. Stone formation.
3. Acute systemic circulatory disorders (acute coronary insufficiency, shock) and systemic circulatory disorders in chronic heart failure and their consequences. Regional circulatory disorders (hyperemia, ischemia, plasmorragia, bleeding, and hemorrhage). Disorders of lymph formation and circulation. Thrombosis. Embolism.
4. Inflammation: causes, morphogenesis. Pathomorphology of exudative inflammation. Proliferative (productive) inflammation: with the formation of acute condylomas, around animal parasites, interstitial productive inflammation, granulomatous inflammation. Specific proliferative inflammation.

5. Molecular and pathomorphological basis of the immune response. The immune system in the prenatal and postnatal periods. Pathology of immune processes: amyloidosis, hypersensitivity reactions, transplant rejection. Immune deficiency. Autoimmune diseases.
6. Regeneration. Structural basis of physiological adaptation of organs and cells. Morphology of cell accommodation processes. Compensatory and adaptive processes.
7. Oncogenesis. Anatomical and microscopic features and types of growth of benign and malignant tumors. Morphological characteristics of the main stages of malignant tumor development. Benign and malignant non-epithelial (mesenchymal) tumors. Sarcoma: features of development and metastasis. Tumors of fibroblastic, myofibroblastic, and fibrohistiocytic origin. Tumors of adipose and muscle tissue, tumors of blood vessels. Clinical and morphological nomenclature of tumors. Tumors of the epithelium: benign epithelial tumors, cancer (features of development and metastasis, main histological forms). Melanocytic tumors.
8. Tumors of hematopoietic and lymphoproliferative tissue.
9. Atherosclerosis and arteriosclerosis. Ischemic heart disease. Hypertension and arteriolosclerosis. Hypertensive disease and symptomatic arterial hypertension.
10. Systemic connective tissue diseases with autoimmunity: rheumatism, systemic lupus erythematosus, rheumatoid arthritis, systemic scleroderma, dermatomyositis, ankylosing spondylitis. Endocardial and myocardial diseases: cardiomyopathies, endocarditis, myocarditis, acquired heart defects.

List of topics for practical classes (40 hours):

1. Introduction to pathomorphology. Subject and objectives of pathomorphology. Main stages of development of pathomorphology. Methods of pathological diagnosis. Methods of pathomorphological research.
2. Morphological changes in cells in response to stress and toxic damage (parenchymal/cellular dystrophies). Cellular dystrophies: hyaline-droplet, hydropic, fatty.
3. Morphological changes in the extracellular matrix (stroma) in response to damage (stromal-vascular dystrophies). Pathomorphology of complex protein (hyalinosis) and lipid accumulation. Depletion of the body.
4. Pathomorphology of the accumulation of products of impaired metabolism. Disorders of iron metabolism and hemoglobinogenic pigment metabolism. Pathomorphological manifestations of impaired melanin formation, nucleoprotein and copper metabolism. Calcification (calcinosis) of tissues. Stone formation.
5. Fundamentals of thanatology. Necrosis. Clinical and morphological forms of necrosis. Selective death of specialized cells: pathogen-induced apoptosis, selective cell death induced by the immune system, and cell destruction by activated complement.
6. Acute systemic circulatory disorders (acute coronary insufficiency, shock) and systemic circulatory disorders in chronic heart failure and their consequences. Regional circulatory disorders (hyperemia, ischemia, plasmorragia, bleeding, and hemorrhage). Impaired lymph formation and circulation. Impaired ion-osmotic and water balance, acid-base status.
7. Hemostasis disorders: hemorrhagic syndrome, thrombosis, DIC syndrome. Embolism. Pulmonary artery thromboembolism, thanatogenesis.
8. Concluding class. Practical skills
9. Inflammation: causes, morphogenesis. Pathomorphology of exudative inflammation.
10. Proliferative (productive) inflammation: with the formation of acute condylomas, around animal parasites, intermediate productive inflammation, granulomatous inflammation. Specific proliferative inflammation.
11. Molecular-pathomorphological basis of the immune response. The immune system in the prenatal and postnatal periods. Pathology of immune processes: amyloidosis, hypersensitivity reactions, transplant rejection. Immune deficiency. Autoimmune diseases.
12. Regeneration. Structural basis of physiological adaptation of organs and cells. Morphology of cell accommodation processes. Compensatory and adaptive processes.

13. Autopsy
14. Oncogenesis. Anatomical and microscopic features and types of growth of benign and malignant tumors. Morphological characteristics of the main stages of malignant tumor development. Clinical and morphological nomenclature of tumors. Epithelial tumors: benign organ-nonspecific epithelial tumors, cancer (features of development, metastasis, histological forms).
15. Benign and malignant non-epithelial (mesenchymal) tumors. Sarcoma: features of development and metastasis. Tumors of fibroblastic, myofibroblastic, and fibrohistiocytic origin. Tumors of adipose and muscle tissue, tumors of blood vessels.
16. Melanocytic tumors. Features of childhood tumors. Embryonal tumors. Germ cell tumors. Teratomas and teratoblastomas. "Adult-type" tumors.
17. Autopsy.
18. Anemias. Thrombocytopathies.
19. Tumors of hematopoietic tissue. Tumors of lymphoid tissue.
20. Final class. Practical skills. Credit.

List of topics for independent work (30 hours)

1. Systemic vasculitis: nodular periarteritis, Takayasu arteritis, temporal (giant cell) arteritis, Wegener's granulomatosis, obliterative thromboangiitis, Kawasaki disease, Schönlein-Henoch purpura, Raynaud's disease and syndrome. Sjögren's syndrome.
2. Morphological features of the organs of the dentoalveolar system and oral cavity. Malformations of the face, neck, and organs of the oral cavity.
3. Diseases of the jaws, salivary glands, lips, tongue, and soft tissues of the oral cavity.

Independent work by students is aimed at deepening and consolidating the theoretical knowledge acquired during classroom training and contributes to the formation of professional competencies. The results of independent work are subject to control and are included in the final assessment of knowledge.

Consultations: online, by prior registration on the course page in the Distance Learning System.

Teaching methods: lecture, exercises and practical tasks, solving situational tasks and case studies.

ASSESSMENT

Current educational activities (CEA). The assessment of the academic performance of students is carried out in accordance with the Instructions for assessing the educational activities of higher education students at KhNMU (https://knmu.edu.ua/documents/normatyvni-dokumenty-navchalnogo-proczesu/). The grade for a practical or final class ranges from 2 to 5 points. Submitting tasks late for insignificant reasons will result in a lower grade in accordance with the percentage of the delay in relation to the time of completion of the task. Tasks are checked within 24 hours. Grades are entered into an electronic journal. Unsatisfactory grades are retaken in accordance with the Regulations on the procedure for retaking 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 average grade for the semester is converted into a multi-point grade (70–120 points) in accordance with Table 1 of the Assessment Instructions (see above). **Individual assignments (IA)** are graded on a scale of up to 10 points.

Apellations of final assessment results are conducted in accordance with the procedure established by KhNMU (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_apel_kontrol.pdf).

EDUCATIONAL COMPONENT POLICIES

Recommendations for coursework: actively participate in all forms of classwork, 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 assessment.

Class attendance. Attendance at practical classes is obligatory. The dress code for offline classes is a white medical coat. If you are more than 5 minutes late, you may not be admitted to the class. Missed classes are made up in accordance with the Regulations on the procedure for making up classes by students of the Kharkiv National Medical University (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_vidprac_zaniat.pdf).

Academic integrity. KNMU has a zero-tolerance policy toward academic misconduct. Any violations of the principles of academic integrity will result in liability in accordance with the procedure established at KNMU (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_ad-1.pdf).

The use of electronic gadgets and artificial intelligence tools is permitted only with the permission of the instructor.

Policy regarding individuals with special educational needs. Applicants with special educational needs should contact the instructor to develop an individual educational trajectory.

Instructor response time: 24 hours.

Technical requirements for the course:

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

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

RECOMMENDED REFERENCES

1. Pathomorphology: national textbook / V.D. Markovsky, V.O. Tumansky, I.V. Sorokina, et al., edited by V.D. Markovsky, V.O. Tumansky. — Kyiv: VSV “Medicine.” 2015 — 936 p., color edition. ISBN 978-617-505-450-5
2. Kumar V. Robbins' Fundamentals of Pathology: 10th English edition: in 2 volumes / Viney Kumar, Abdul K. Abbas, John K. Aster; scientific editors: Prof. I. Sorokina, S. Gychka, I. Davydenko. – Kyiv: VSV “Medicine”, 2019. – XII, 420 p.
3. Pathomorphology : textbook / I.V. Sorokina, V.D. Markovskyi, D.I. Halata et al. ; edited by I.V. Sorokina, V.D. Markovskyi, D.I. Halata. – Kyiv : AUS Medicine publishing, 2019. – 320 p. + 2 colour inserts (8p. + 12 p.).
4. Kumar V. Robbins Basic Pathology. 9th Edition / Vinay Kumar, Abul Abbas, Jon Aster. – Elsevier. – 2015. – 952 p.
5. Basic dental diseases: textbook: in 2 parts. Part 1. Caries, pulpitis, periodontitis, periostitis, osteomyelitis / A. M. Romanyuk, E. V. Kuzenko, O. I. Kuzenko et al. – Sumy: Sumy State University, 2014. – 51 p.
6. Basic dental diseases: textbook: in 2 parts. Part 2. Periodontal diseases / A. M. Romanyuk, E. V. Kuzenko, O. I. Kuzenko et al. – Sumy: Sumy State University, 2014. – 52 p.
7. Regezi Regezi J. Oral Pathology: Clinical Pathologic Correlations. 7th Edition /Joseph Regezi, James Sciubba, Richard Jordan. – Elsevier. – 2015. – 496 p.
8. Sivapathasundharam B. Shafer's Textbook of Oral Pathology. 8th Edition / B Sivapathasundharam. –Elsevier India. – 2016. – 794 p.

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