MINISTRY OF HEALTH PROTECTION OF UKRAINE

ODESSA NATIONAL MEDICAL UNIVERSITY

Department of histology, cytology, embryology and pathological morphology with a course of forensic medicine

I APPROVE

Vice-rector for scientific and pedagogical work

Eduard BURYACHKIVSKY

September 1, 2024

WORKING PROGRAM OF EDUCATIONAL DISCIPLINE "PATHOMORPHOLOGY"

Level of higher education: second (master's)

Field of knowledge: 22 "Health care"

Specialty: 222 "Medicine"

Educational and professional program: Medicine

2024

Робоча програма складена на основі освітньо-професійної програми «Медицина» підготовки фахівців другого (магістерського) рівня вищої освіти зі спеціальності 222 «Медицина» галузі знань 22 «Охорона здоров'я», ухваленою Вченою Радою ОНМедУ (протокол № 10 від 27 червня 2024 року).

Розробники: к.мед.н., доц. Литвиненко М.В.

Робоча програма затверджена на засіданні кафедри гістології, цитології, ембріології та патологічної морфології з курсом судової медицини
Протокол № 1 від 26.08.2024 р.

Завідувач кафедри _____ Варвара СИТНІКОВА

Погоджено із гарантом ОПП _____ Валерія МАРІЧЕРЕДА

Схвалено предметною цикловою комісією з медико-біологічних дисциплін ОНМедУ
Протокол № 1 від 28.08.2024 р.

Голова предметної циклової методичної комісії
з медико-біологічних дисципліни ОНМедУ _____ Леонід ГОДЛЕВСЬКИЙ

Переглянуто та затверджено на засіданні кафедри _____
_____

Протокол № ___ від "___" _____ 20__ р.

Завідувач кафедри _____ (_____)
(підпис) *(Ім'я, ПРІЗВИЩЕ)*

Переглянуто та затверджено на засіданні кафедри _____
Протокол № ___ від "___" _____ 20__ р.

Завідувач кафедри _____ (_____)
(підпис) *(Ім'я, ПРІЗВИЩЕ)*

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: 7.0 Hours: 210 Content modules : 6	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
		Semesters V - VI
		Lectures (30 hours)
		Seminars (0 hours)
		Practical (96 hours)
		Laboratory (0 hours)
		Independent work (84 hours)
		including individual tasks (0 hours)
		Final control form - exam

2. The purpose and tasks of the educational discipline

2.1. Purpose: Acquisition of knowledge by the aplicants of higher education and formation of professional competencies elements in the field of pathomorphology, and improvement of skills and competencies acquired during the study of previous disciplines.

Task:

1. Formation of abilities and skills in the differential diagnosis of pathological processes, using the main methods of pathomorphological findings.
2. Mastering the ability to interpret etiology, to determine pathogenesis and pathological changes in diseases at various stages of their development (morphogenesis), structural foundations of complications and consequences of the disease.
3. Improvement of skills to interpret cell pathology and substantiate the clinical and morphological characteristics of general pathological processes that determine the manifestations of diseases.
4. Improving skills to determine the consequences arising from changes in human life conditions and during treatment and diagnostic manipulations.

The process of studying the discipline is aimed at forming elements of the following competencies:

- Integral (IC):

The ability to solve typical and complex problems, including those of a research and innovation nature in the field of medicine. Ability to continue learning with a high degree of autonomy.

- General (GC):

GC 1 Ability to abstract thinking, analysis and synthesis
GC 3 Ability to apply knowledge in practical situations
GC 4 Knowledge and understanding of the subject area and understanding of professional activity
GC 10 Ability to use information and communication technologies
GC 11 Ability to search, process and analyze information from various sources
GC 13. Awareness of equal opportunities and gender issues
GC 16 Ability to evaluate and ensure the quality of performed works

- **Special (SC)**

SC 3. The ability to establish a preliminary and clinical diagnosis of the disease.
SC 10 . Ability to perform medical manipulations.
SC 1 6 . Ability to maintain medical documentation , including electronic forms
SC 25. Observance of professional and academic integrity, bear responsibility for the reliability of the obtained scientific results.
SC 28. Ability to apply fundamental biomedical knowledge at a level sufficient to perform professional tasks in the field of health care.

Program learning outcomes (PLO):

PLO 1. Have thorough knowledge of the structure of professional activity. To be able to carry out professional activities that require updating and integration of knowledge. To be responsible for professional development, the ability for further professional training with a high level of autonomy.
PLO 2. Understanding and knowledge of fundamental and clinical biomedical sciences, at a level sufficient for solving professional tasks in the field of health care.
PLO 3. Specialized conceptual knowledge, which includes scientific achievements in the field of health care and is the basis for conducting research, critical understanding of problems in the field of medicine and related interdisciplinary problems.
PLO 21. Search for the necessary information in the professional literature and databases of other sources, analyze, evaluate and apply this information.

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

Know:

- Terms that are used in the course of pathomorphology and basic methods of pathological examination.
- Concept of etiology, pathogenesis, morphogenesis. pathomorphosis, doctrine of disease, nosology, principles of classification of diseases.
- The essence and main regularities of general pathological processes.
- Characteristic changes internal organs in the most important human diseases.
- To have specialized knowledge about the structural basis of diseases, to know standard methods of conducting an autopsy and intravital diagnosis of diseases.
- Know the pathogenesis and pathological changes in diseases at different stages of their development (morphogenesis), the structural basis of complications and consequences of the disease;

Be able to :

- Describe morphological (macroscopic, microscopic and ultrastructural) changes tissues and organs in typical pathological processes and diseases.
- Based on the description and pictures make a conclusion about the nature of the pathological process and its features of clinical manifestations
- To appreciate the results of the autopsy.
- Assess morphological changes in biopsy and section materials.
- Analyze the morphological manifestations of diseases.
- To analyze the structural basis of the development of diseases and their clinical manifestations, the structural basis of recovery, complications and consequences with further use of the acquired knowledge in the practical work of a doctor.
- Do differential diagnosis between pathological processes.

3. Content of the academic discipline

Content module 1.
Introduction. Morphology of damage and death of cells and tissues.

Topic 1. Subject and tasks of pathomorphology. Pathomorphological research methods. The main stages of the development of pathomorphology. Advanced level of knowledge. Morphology of reversible and irreversible damage to cells and tissues. Intracellular accumulation of proteins, carbohydrates and lipids (parenchymal dystrophy).

Pathological anatomy as a science, a field of practical medicine and an educational subject. Problems of pathological anatomy. Levels of research on the structural basis of diseases. Material (objects) and methods of pathomorphological research. The main stages of the development of pathological anatomy. Contribution of domestic scientists to the development of world pathomorphology. Definition of the term "dystrophy", causes of dystrophy. Pathogenesis and mechanisms of dystrophy. Classification of dystrophy. Morphogenesis and morphology of parenchymal (intracellular) protein, fat and carbohydrate dystrophies (lipidoses). Elements of ultrastructural cell pathology. Cell-matrix interactions. Cellular and extracellular mechanisms of trophic regulation. The concept of ultrastructural cell pathology. Damage to the cytoplasmic membrane, mitochondria, endoplasmic reticulum, Golgi apparatus, lysosomes. Reversible and irreversible nuclear damage. Damage to mitosis, causes, types.

Topic 2. Morphological changes of the extracellular matrix (stroma) as a response to damage (stromal-vascular dystrophies). Pathomorphology of extracellular accumulation of complex proteins (hyalinosis), fats and carbohydrates. Exhaustion of the body.

Stromal-vascular (extracellular) protein, carbohydrate and fatty dystrophies, varieties, morphology, mechanisms, causes, outcomes.

Topic 3. Disorders of metabolism and their metabolism. Morphology of pathological accumulation of endogenous and exogenous pigments. Morphology of mineral metabolism disorder.

Definition of mixed dystrophy, classification. Classification of hemoglobinogenic pigments. Types of violations of their exchange. Violation of the metabolism of lipidogenic pigments. Violation of nucleoprotein metabolism. Disorders of calcium metabolism, types of calcinosis, its causes and morphology.

Topic 4. Necrosis - definition, terms and phases of development, consequences. Clinical and morphological forms of necrosis. Pathological anatomy of multiple organ failure. Fundamentals of Thanatology. Death, mechanisms, signs. Biological, medical, social aspects due to a chronic incurable disease. The concept of thanatogenesis. Structural mechanisms of cessation of activity of vital organs during the natural course of the disease. Complications of stopping the work of the heart, lungs, brain, kidneys, and liver.

Definition of necrosis, its causes, types, depending on the mechanism of action of the pathogenic factor. Morphological signs of necrosis. Early morphological and histochemical changes. Morphological signs of necrosis in the nuclei. Morphological signs of necrosis in the cytoplasm and intercellular substance. Clinical and morphological forms of necrosis. Coagulation necrosis, causes of development, types, microscopic and macroscopic changes in areas of necrosis. Enzymatic and non-enzymatic fat necrosis, localization, causes. Gangrene, definition, classification. Dry and wet gangrene, localization, macroscopic changes in necrotic tissue. Bedsores, features of development, localization. Collective (wet) necrosis, location, macro-microscopic changes. Exits of necrosis. Apoptosis, definition, morphological manifestations of apoptosis. The influence of external factors on the regulation of apoptosis. Categories of autonomous apoptosis. Signs of general death, mechanisms and terms of their development.

Topic 5. Practical skills: section “Introduction. Morphology of damage and death of cells and tissues”.

Practicing of practical skills.

Content module 2.
Disorders of blood and lymph circulation. Violation of hemostasis. Inflammation.

Topic 6. Acute systemic circulatory disorders (acute coronary insufficiency, shock) and systemic circulatory disorders in chronic heart failure and their consequences. Regional blood circulation disorders (hyperemia, ischemia, plasmarrhagia, bleeding and hemorrhage). Violation of lymph formation and circulation.

Varieties of general arterial congestion. Local arterial congestion, types, causes, morphology. Pathomorphology , consequences of stasis. General venous congestion, types, causes of development, changes in the lungs and liver in chronic venous congestion. Blood thickening, causes, morphological changes in organs. Thinning of the blood, causes, meaning. Bleeding, definition, causes of development, classification. Hemorrhage, types, morphology. Shock, definition, classification. Stages of development of shock, morphological changes. Heart attack, definition, causes. Types of heart attacks. Mechanisms of development and morphological changes in the infarct zone. Disorders of lymphatic circulation, causes, classification. Acute and chronic local lymphedema. Morphology of acute and chronic general lymphedema.

Topic 7. Violations of hemostasis: hemorrhagic syndrome, thrombosis, DIC-syndrome. Embolism. Thromboembolism of the pulmonary artery, thanatogenesis.

Thrombosis, definition, causes and mechanisms of thrombosis. Morphology and types of blood clots. Favorable and unfavorable outputs thrombosis Definition and stages of DIC-syndrome, causes. Definition of embolus, types of embolus. Ways of movement of emboli. Morphology of thromboembolism of the pulmonary artery and vessels of the great circle of blood circulation. Violation of ion-osmotic and water balance. A general idea of edema, composition of tissue fluid, classification, localization of fluid accumulation. Local edema, its regulation, mechanism of development, types. General edema, its varieties and mechanisms of occurrence. Dehydration of the body, mechanisms of development, degrees of dehydration.

Topic 8. Inflammation: causes, morphogenesis. Pathomorphology of exudative inflammation.

Definition of inflammation, etiology. Morphological signs of inflammation. Morphological changes during alteration, exudation and proliferation. Classification of inflammation by morphology, course and depending on the reactivity of the body. Forms of exudative inflammation.

Topic 9. Proliferative (productive) inflammation: with the formation of acute condylomas, around animal parasites, intermediate productive inflammation, granulomatous inflammation. Specific proliferative inflammation.

General characteristics of productive inflammation, classification , methods . Intermediate (interstitial) inflammation, morphology, outcome. Granulomatous inflammation, definition of granuloma, etiology, stages of granuloma. Productive inflammation with the formation of polyps and acute condylomas; localization, etiology, consequences.

Topic 10. Practical skills: section “Disorders of blood and lymph circulation. Inflammation”.

Practicing of practical skills.

Content module 3.
Pathology of the immune system. Regeneration. Compensatory and adaptive processes. Tumors

Topic 11. Molecular and pathomorphological bases of the immune response. The immune system in the prenatal and postnatal period. Pathology of immune processes: amyloidosis, hypersensitivity reactions, transplant rejection. Immune deficiency. Autoimmune diseases.

Primary and secondary organs of immunogenesis, their role in the development of immune reactions.

Types of immune reactions. Definition of immunopathological processes, classification. Violations of immunogenesis associated with pathology of the thymus and pathology of peripheral lymphoid tissue. Mechanisms of development of immediate and delayed hypersensitivity reactions. Classification of hypersensitivity reactions. Morphological characteristics of delayed-type hypersensitivity (HDT) and immediate-

type hypersensitivity (HIT) reactions. Morphological characteristics of the reaction of transplant rejection. Definition and classification of autoimmune diseases.

Classification of immunodeficiency states. Classification of primary immunodeficiency syndromes. Combined immunodeficiency syndromes, types, state of organs of immunogenesis, clinical manifestations. Syndromes of insufficient cellular and humoral immunity, state of organs of immunogenesis, clinical manifestations. Reasons for the development of secondary immunodeficiency states.

Topic 12. Regeneration. Structural basis of physiological adaptation of organs and cells. Morphology of cell accommodation processes. Compensatory and adaptive processes.

Definition of regeneration, classification. Regulation and phases of the regenerative process. Characteristics of physiological regeneration. Types of reparative regeneration. Characteristics of complete and incomplete regeneration. Pathological regeneration, conditions of occurrence, types. Types of wound healing. Wound healing by primary and secondary tension. The concept of compensation and adjustment. Stages of the compensatory process. Manifestations of adaptive processes. Hypertrophy and hyperplasia, definition, classification. Atrophy, definition, classification. Definition of organization, encapsulation, cirrhosis and sclerosis, morphology. Metaplasia and dysplasia, definition, morphological characteristics. Degrees of dysplasia.

Topic 13. Oncogenesis. Anatomical and microscopic features and types of growth of benign and malignant tumors. Morphological characteristics of the main stages of development of malignant tumors. Clinical and morphological nomenclature of tumors. Benign and malignant non-epithelial (mesenchymal) tumors. Sarcoma: features of development and metastasis. Tumors of fibroblastic, myofibroblastic and fibrohistiocytic origin. Tumors from adipose and muscle tissue, tumors from blood vessels.

Tumors, definitions, modern theories of carcinogenesis. Tumor morphogenesis, morphogenetic variants of tumor formation. Structure of the tumor. Types of tumor growth. Tumor atypism, definitions, types. Morphological characteristics of tissue and cellular atypism. Precancerous (precancerous) conditions and changes, morphology. Metastasis: types, regularities, mechanisms. Relapse, definition. Modern classification of tumors. Morphological features of benign tumors. Morphological features of malignant tumors. General characteristics and nomenclature of tumors from tissues originating from mesenchyme.

Topic 14. Epithelial tumors: benign organ-nonspecific epithelial tumors, cancer (features of development, metastasis, histological forms).

Nomenclature of epithelial tumors. Morphological features of epithelial tumors without specific localization. Benign and malignant tumors from the covering epithelium.

Topic 15. Morphological features of epithelial tumors of individual organs. Benign tumors of the stomach and intestines from Kulchytsky's enterochromaffin cells. Organ-specific tumors of the thyroid gland, kidneys, skin: benign and malignant. Benign and malignant uterine tumors, types, morphology. Tumors of the salivary glands and oral cavity.

Topic 16. Nomenclature and morphological features of tumors of nervous tissue. Features of tumors of the central nervous system.

Classification and morphological features of tumors of the central nervous system. Benign neuroectodermal tumors. Low-differentiated and embryonic neuroectodermal tumors. Benign and malignant tumors of the meninges. Mature and immature tumors of peripheral nerves. Benign and malignant tumors of sympathetic ganglia.

Topic 17. Nomenclature and morphological features of tumors originating from melanin-producing tissue. Tumors from cambial embryonic tissues. Tumors of children's age, which develop according to the type of tumors of adults.

Melanoma, classification. Nevus Peculiarities of childhood tumor growth.

Topic 18. Practical skills: section "Immunopathological processes. Regeneration, processes of adaptation and compensation. Tumors".

Practicing of practical skills.

Content module 4.

Diseases of the blood system and cardiovascular system. Diseases of the nervous system.

Topic 19. Anemia. Thrombocytopathies.

Definition, classification and morphological characteristics of anemias. Definition, classification, morphological characteristics thrombocytopenia and thrombocytopenia. Classification, morphological characteristics of coagulopathies.

Topic 20. Tumors of hematopoietic and lymphoproliferative tissue.

Definition, classification, general morphological characteristics of leukemias. Types, stages of the course, morphological characteristics of acute leukemia. Types, stages of the course, morphological characteristics of chronic leukemia. Pathohistological types, morphological characteristics of Hodgkin's disease, causes of death. General characteristics, classification, morphological manifestations and prognosis of non-Hodgkin's lymphomas.

Topic 21. Atherosclerosis and arteriosclerosis. Coronary heart disease.

Definition of atherosclerosis, risk factors, modern theories. Morphogenesis of macroscopic changes in atherosclerosis. Morphogenesis of microscopic changes in atherosclerosis. Clinical and morphological forms of atherosclerosis, organ lesions in atherosclerosis. Definition, risk factors, connection of coronary heart disease with atherosclerosis and hypertension. Morphology of acute, recurrent and repeated myocardial infarction. Consequences, complications, causes of death in myocardial infarction. Morphological characteristics, complications, causes of death in chronic ischemic heart disease.

Topic 22. Hypertension and arteriolosclerosis. Hypertensive disease and symptomatic arterial hypertension.

Hypertensive disease: definition, risk factors. Morphological changes in blood vessels, heart, changes in organs in hypertensive disease.

Topic 23. Cerebrovascular disease. Alzheimer's disease. Multiple sclerosis. Amyotrophic lateral sclerosis. Postresuscitation encephalopathy. Diseases of the peripheral nervous system.

General characteristics, classification, background diseases and risk factors of cerebrovascular disease. Infarct (ischemic stroke) of the brain: morphological characteristics. Morphological characteristics, consequences of hemorrhagic stroke. Morphological characteristics , complications of spontaneous intracranial hemorrhage. Morphological characteristics, complications of spontaneous subarachnoid hemorrhage. Morphological characteristics, complications of Alzheimer's disease. Morphological characteristics, complications of multiple sclerosis. Morphological characteristics, complications of ocular amyotrophic sclerosis. Morphological characteristics, complications of postrheanimation encephalopathy. Morphological characteristics, complications of diseases of the peripheral nervous system.

Topic 24. Systemic connective tissue diseases with autoimmunization: rheumatism, systemic lupus erythematosus, rheumatoid arthritis, systemic scleroderma, dermatomyositis, Bekhterev's disease. Endocardial and myocardial diseases.

General characteristics of systemic diseases of connective tissue: violation of immune homeostasis and systemic progressive disorganization of connective tissue in rheumatic diseases. Morphology of Bekhterev's disease. Morphogenesis, pathomorphology, complications and causes of death in systemic lupus erythematosus. Pathological anatomy, visceral manifestations, complications, causes of death in systemic scleroderma. Pathological anatomy of dermatomyositis. Complications, causes of death. Cardiomyopathies, Leffler's endocarditis, idiopathic myocarditis, acquired heart defects. Systemic vasculitis. Pathomorphology of systemic vasculitis: nonspecific aortoarteritis, nodular periarteritis, Wegener's granulomatosis, obliterating thromboangiitis. Pathological anatomy of acquired heart defects. Pathological anatomy of acquired (secondary) cardiomyopathies.

Topic 25. Practical skills: section “Diseases of the blood system and cardiovascular system. Diseases of the nervous system”.

Practicing of practical skills.

Content module 5.

Respiratory diseases. Diseases of digestive organs. Diseases of the endocrine system. Diseases of the genitourinary system. Diseases of the musculoskeletal system. Diseases of pregnancy and the postpartum period. Diseases of the pre- and perinatal period. Pathomorphology of hypo- and vitamin deficiency. Diseases caused by human activity and the influence of the external environment

Topic 26. Respiratory diseases.

Morphological characteristics of acute bronchitis. Modern classification of pneumonia. Morphological characteristics and complications of acute focal pneumonia. Morphological characteristics and complications of lobar pneumonia. Morphological characteristics and complications of acute interstitial pneumonia. Morphological characteristics of acute destructive processes of the lungs. Definition and classification of chronic non-specific respiratory diseases. Morphological characteristics and complications of chronic bronchitis. Morphological characteristics of chronic obstructive emphysema. Morphological characteristics and complications of bronchiectasis. Morphological characteristics and complications of bronchial asthma. Morphological characteristics of idiopathic pulmonary fibrosis. Tumors of respiratory organs. Morphological characteristics of lung cancer.

Topic 27. Diseases of esophagus, stomach and intestines.

Diseases of the esophagus: morphological characteristics. Morphological characteristics of chronic gastritis. Pathomorphology of ulcer disease. Complications of ulcer disease. Pathomorphology of non-specific ulcerative colitis. Pathomorphology of Crohn's disease. Clinical and morphological forms of appendicitis. Complications of appendicitis . Tumors of the gastrointestinal tract. Stomach cancer. Macroscopic and histological forms. Peculiarities of metastasis. Intestinal tumors. Tumors of the pancreas, morphological characteristics. Liver tumors. Liver cancer, morphological characteristics. Peritonitis, adhesion disease. Definition. Classification, morphological features.

Topic 28. Diseases of the liver, biliary system and pancreas.

Morphological characteristics, prognosis of fatty hepatosis. Definition, morphological characteristics, prognosis of toxic liver dystrophy. Morphogenesis, forms, morphological characteristics of acute hepatitis. Morphological characteristics of chronic hepatitis, degree of activity and chronicity. Morphological characteristics of the most important types of cirrhosis. Pathomorphology of gallstone disease. Pathomorphology of acute and chronic cholecystitis. Morphological characteristics, complications of acute and chronic pancreatitis. Liver tumors.

Topic 29. Kidney diseases.

Modern clinical and morphological classification of kidney diseases. Chronic glomerulonephritis: morphological characteristics, consequences. Classification, morphological manifestations of idiopathic nephrotic syndrome. Morphological manifestations of membranous nephropathy. Morphological characteristics, prognosis of necrotic nephrosis, tubulointerstitial nephritis, acute and chronic pyelonephritis. Morphogenesis and morphological characteristics of nephrolithiasis, consequences Chronic renal failure. Nephrosclerosis.

Topic 30. Hypothalamic-pituitary disorders. Adrenal gland pathology. Pathology of the thyroid gland. Pathology of the endocrine apparatus of the pancreas.

Morphological characteristics, complications and causes of death in Itsenko-Cushing's disease. Morphological characteristics, complications of acromegaly. Morphological characteristics of diabetes insipidus. Morphological characteristics of diabetes. Complications of diabetes mellitus: morphological characteristics of diabetic macro- and microangiopathy. Multinodular goiter. Morphological characteristics, complications, consequences. Graves' disease: morphological features of the thyroid gland, visceral manifestations. Hypothyroidism. Cretinism. Myxedema. Morphological characteristics. Definition, pathomorphology of Hashimoto's thyroiditis. Primary chronic insufficiency of the cortical substance of the adrenal glands (Addison's disease): morphological manifestations. Waterhouse-Friederiksen syndrome: morphological manifestations.

Topic 31. Pathomorphological changes in diseases related to nutrition. Vitamins Occupational diseases. Radiation sickness. Parathyroid osteodystrophy, osteomyelitis, fibrous dysplasia, osteopetrosis, Paget's disease, muscular dystrophies, myasthenia.

Morphological characteristics of disturbed and insufficient nutrition. Pathological anatomy, consequences, causes of death in the case of injuries related to the influence of physical factors of the external environment: industrial noise, electromagnetic waves of radio frequencies, ionizing radiation, electric current, temperature effects. Morphological changes of bones in hyperparathyroid dystrophy. Morphological characteristics, complications of Paget's disease. Morphological characteristics, complications of fibrous dysplasia. Morphological characteristics, complications of osteomyelitis. Morphological characteristics, causes of death in Duchenne muscular dystrophy. Morphological characteristics, causes of death in myotonia.

Topic 32. Pathology of the female and male reproductive system. Breast disease.

Morphological manifestations of inflammatory diseases of the endometrium and myometrium. Morphological manifestations of precancerous processes and tumors of the endometrium and myometrium. Morphological characteristics, complications, consequences of inflammatory diseases of the mammary glands. Morphological characteristics of fibrocystic changes of mammary glands. Morphological characteristics, complications, consequences of benign nodular hyperplasia of the prostate gland. Morphological characteristics of inflammatory diseases of the testicles.

Topic 33. Pre- and perinatal pathology. Pathology of pregnancy, postpartum period and placenta.

Classification, morphological characteristics of ORH-gestoses. Classification, morphological characteristics and prognosis of trophoblastic disease. Morphological manifestations, impact on the fetus and the woman's body, consequences of infectious processes in the placenta. Morphological manifestations of blood circulation disorders in the placenta. Morphological characteristics, prediction of delay in intrauterine development of the fetus. Morphological characteristics of intrauterine infections of the fetus. Morphological characteristics of hemolytic disease of infants. Morphological characteristics of hemorrhagic disease of infants. Morphological characteristics, complications of pneumopathies. Morphological characteristics, consequences of non-infectious fetopathy: diabetic and alcoholic fetopathy. Classification and morphology of congenital malformations. Asphyxia of newborns. Birth trauma. Morphological characteristics, consequences of asphyxia. Birth injury: classification and morphology. Classification, morphological diagnosis, complications and consequences of ectopic pregnancy.

Topic 33. Practical skills: sections "Respiratory diseases. Diseases of digestive organs. Diseases of the endocrine system. Diseases of the genitourinary system. Diseases of the musculoskeletal system. Diseases of pregnancy and the postpartum period. Diseases of the pre- and perinatal period. Pathomorphology of hypo- and vitamin deficiency. Diseases caused by human activity and the influence of the external environment".

Practicing of practical skills.

Content module 6.

Pathomorphology of infectious diseases.

Topic 35. General concepts of human infectious pathology. Classification of infectious diseases. Intestinal infectious diseases. Quarantine infections.

Morphological characteristics, complications, consequences, causes of death in bacterial dysentery. Morphological characteristics, complications, consequences, causes of death in typhoid fever, salmonellosis. Quarantine infections. Cholera: clinical and morphological forms, complications, causes of death. Plague: clinical and morphological forms, complications, causes of death.

Topic 36. Viral airborne infections. Corona virus disease. HIV infection and AIDS. Rabies. COVID-19.

Morphological characteristics, complications, consequences, causes of death in respiratory viral infections, coronavirus disease, HIV infection, rabies. Rickettsioses. Prion infections. Morphological characteristics, complications, consequences, causes of death in typhoid fever. Morphological characteristics, complications of prion lesions of the central nervous system. Morphological characteristics, complications, causes of death in AIDS. COVID-19.

Topic 37. Childhood infections.

Morphological characteristics, complications, consequences, causes of death in scarlet fever. Morphological characteristics, complications, consequences, causes of death in diphtheria. Morphological characteristics, complications, consequences, causes of death in whooping cough.

Topic 38. Tuberculosis.

Tissue reactions in tuberculosis. Pathological anatomy of primary tuberculosis complex. Morphology of progression of primary tuberculosis. Pathological anatomy of the chronic course of primary tuberculosis. Morphological characteristics, complications, consequences, causes of death in hematogenous tuberculosis with predominant lung damage. Morphological characteristics, complications, consequences, causes of death in secondary tuberculosis. Modern pathomorphosis of tuberculosis.

Topic 39. Sepsis. Syphilis. Helminth infections. Mycoses.

Clinical and anatomical forms of sepsis: septicemia, septicopyemia, septic (infectious) endocarditis.

Pathomorphology of congenital syphilis. Pathomorphology of acquired syphilis. Diseases caused by protozoa, helminths. Mycoses. Morphological characteristics, complications, consequences, causes of death in diseases caused by protozoa: malaria, balantidiasis, amebiasis. Morphological characteristics, complications, consequences, causes of death in diseases caused by helminths: trichinellosis, echinococcosis, cysticercosis, opisthorcosis, schistosomiasis.

Topic 40 . Practical skills: section "Pathomorphology of infectious diseases".

Practicing of practical skills.

Topic 41. Test control of knowledge. Overview and description of micro and macro preparetions. Preparation for the exam.

4. Structure of the academic discipline:

Names of topics	**Number of hours**			
	Total	**including**		
		lectures	**practice**	**IWS**
Content module 1. Introduction. Morphology of damage and death of cells and tissues.				
Topic 1. Subject and tasks of pathomorphology. Pathomorphological research methods. The main stages of the development of pathomorphology. Morphology of reversible and irreversible damage to cells and tissues. Intracellular accumulation of proteins, carbohydrates and lipids (parenchymal dystrophy). Elements of ultrastructural cell pathology. Cell-matrix interactions. Cellular and extracellular mechanisms of trophic regulation.	8	2	2	4
Topic 2. Morphological changes of the extracellular matrix (stroma) as a response to damage (stromal-vascular dystrophies). Pathomorphology of extracellular accumulation of complex proteins (hyalinosis), fats and carbohydrates. Exhaustion of the body.	2		2	
Topic 3. Disorders of metabolism and their metabolism. Morphology of pathological accumulation of endogenous and exogenous pigments. Morphology of mineral metabolism disorder.	2		2	
Topic 4. Necrosis - definition, terms and phases of development, consequences. Clinical and morphological forms of necrosis. Pathological anatomy of multiple organ failure. Fundamentals of Thanatology. Death, mechanisms, signs. Biological, medical, social aspects due to a chronic incurable disease. The concept of thanatogenesis. Structural mechanisms of cessation of activity of vital organs during the natural course of the disease. Complications of stopping the work of the heart, lungs, brain, kidneys, and liver.	4	2	2	
Topic 5. Practical skills by section: Introduction. Morphology of damage and death of cells and tissues.	2		2	
Together according to content module 1	18	4	10	4
Content module 2. Disorders of blood and lymph circulation. Violation of hemostasis. Inflammation.				

Topic 6. Acute systemic circulatory disorders (acute coronary insufficiency, shock) and systemic circulatory disorders in chronic heart failure and their consequences. Regional blood circulation disorders (hyperemia, ischemia, plasmarrhagia, bleeding and hemorrhage). Violation of lymph formation and circulation.	6	2	2	2
Topic 7. Violations of hemostasis: hemorrhagic syndrome, thrombosis, DIC-syndrome. Embolism. Thromboembolism of the pulmonary artery, thanatogenesis. Violation of ion-osmotic and water balance.	6		2	4
Topic 8. Inflammation: causes, morphogenesis. Pathomorphology of exudative inflammation	4	2	2	
Topic 9. Proliferative (productive) inflammation: with the formation of acute condylomas, around animal parasites, intermediate productive inflammation, granulomatous inflammation. Specific proliferative inflammation.	2		2	
Topic 10. Practical skills by the section: Disorders of blood and lymph circulation. Inflammation.	2		2	
Together according to content module 2	20	4	10	6
Content module 3. Pathology of the immune system. Regeneration. Compensatory and adaptive processes. Tumors				
Topic 11. Molecular and pathomorphological bases of the immune response. The immune system in the prenatal and postnatal period. Pathology of immune processes: amyloidosis, hypersensitivity reactions, transplant rejection. Immune deficiency. Autoimmune diseases.	4	2	2	
Topic 12. Regeneration. Structural basis of physiological adaptation of organs and cells. Morphology of cell accommodation processes. Compensatory and adaptive processes.	4	2	2	
Topic 13. Oncogenesis. Anatomical and microscopic features and types of growth of benign and malignant tumors. Morphological characteristics of the main stages of development of malignant tumors. Clinical and morphological nomenclature of tumors. Benign and malignant non-epithelial (mesenchymal) tumors. Sarcoma: features of development and metastasis. Tumors of fibroblastic, myofibroblastic and fibrohistiocytic origin. Tumors from adipose and muscle tissue, tumors from blood vessels.	4	2	2	
Topic 14. Epithelial tumors: benign organ-nonspecific epithelial tumors, cancer (features of development, metastasis, histological forms). Morphological features of epithelial tumors of individual organs **.**	2		2	
Topic 15. Morphological features of epithelial tumors of individual organs **.**	2		2	

Topic 16. Nomenclature and morphological features of tumors of nervous tissue. Features of tumors of the central nervous system.	2		2	
Topic 17. Nomenclature and morphological features of tumors originating from melanin-producing tissue.	2		2	
Topic 18. Practical skills by the section: Immunopathological processes. Regeneration, processes of adaptation and compensation. Tumors	6		2	4
Together according to content module 3	26	6	16	4
Content module 4. Diseases of the blood system and cardiovascular system. Diseases of the nervous system.				
Topic 19. Anemia. Thrombocytopathies.	2		2	
Topic 20. Tumors of hematopoietic and lymphoproliferative tissue	2		2	
Topic 21. Atherosclerosis and arteriosclerosis. Coronary heart disease.	6	2	4	
Topic 22. Hypertension and arteriolosclerosis. Hypertensive disease and symptomatic arterial hypertension.	2		2	
Topic 23. Cerebrovascular disease. Alzheimer's disease. Multiple sclerosis. Amyotrophic lateral sclerosis. Postresuscitation encephalopathy. Diseases of the peripheral nervous system.	6	2	4	
Topic 24. Systemic diseases of connective tissue with autoimmunization: rheumatism, systemic lupus erythematosus, rheumatoid arthritis, systemic scleroderma, dermatomyositis, Bekhterev's disease.	6		2	4
Topic. 25. Practical skills by the section: Diseases of the blood system and cardiovascular system. Diseases of the nervous system.	2		2	
Together according to content module 4	2 6	4	18	4
Content module 5. Respiratory diseases. Diseases of digestive organs. Diseases of the endocrine system. Diseases of the genitourinary system. Diseases of the musculoskeletal system. Diseases of pregnancy and the postpartum period. Diseases of the pre- and perinatal period. Pathomorphology of hypo- and vitamin deficiency. Diseases caused by human activity and the influence of the external environment				
Topic 26. Respiratory diseases. Tumors of respiratory organs.	8	2	2	4
Topic 27. Diseases of the esophagus, stomach and intestines. Tumors of the gastrointestinal tract. Peritonitis, adhesion disease.	8	2	2	4
Topic 28. Diseases of the liver, biliary system and pancreas. Liver tumors.	6		2	4
Topic 29. Kidney diseases.	4	2	2	
Topic 30. Hypothalamic-pituitary disorders. Adrenal gland pathology. Pathology of the thyroid gland. Pathology of the endocrine apparatus of the pancreas.	4	2	2	
Topic 31. Pathomorphological changes in diseases related to nutrition. Vitamins Occupational diseases.	6		2	4

Topic 32. Pathology of the female and male reproductive system. Breast disease.	4		4	
Topic 33. Pre- and perinatal pathology. Pathology of pregnancy, postpartum period and placenta.	8		4	4
Topic 34. Practical skills by the section: Diseases of respiratory organs. Diseases of digestive organs. Diseases of the endocrine system. Diseases of the genitourinary system. Diseases of the musculoskeletal system. Diseases of pregnancy and the postpartum period. Diseases of the pre- and perinatal period. Pathomorphology of hypo- and vitamin deficiency. Diseases caused by human activity and the influence of the external environment.	2		2	
Together according to content module 5.	50	8	22	20
Content module 6. Pathomorphology of infectious diseases.				
Topic 35. General concepts of human infectious pathology. Classification of infectious diseases. Intestinal infectious diseases. Quarantine infections.	8	2	2	4
Topic 36. Viral airborne infections. Corona virus disease. Rickettsioses. Prion infections. HIV infection and AIDS. Rabies. COVID-19.	12	2	2	8
Topic 37. Childhood infections.	8		4	4
Topic 38. Tuberculosis.	2		2	
Topic 39. Sepsis. Syphilis.	2		2	
Topic 40. Practical skills by the section: Pathomorphology of infectious diseases.	2		2	
Topic 41. Test control of knowledge. Overview and description of micro and macro drugs . Preparation for the exam.	36		6	30
Together according to content module 6.	70	4	20	46
Only hours	210	30	96	84

5. Topics of lectures / seminars / practical / laboratory classes

5.1. Topics of lectures

No.	TOPIC	Number of hours
1.	The subject and tasks of pathomorphology. Pathomorphological research methods. The main stages of the development of pathomorphology. Morphology of reversible and irreversible damage to cells and tissues. Intracellular and extracellular accumulation of proteins, carbohydrates and lipids.	2.0
2.	Necrosis - definition, terms and phases of development, consequences. Clinical and morphological forms of necrosis. Pathological anatomy of multiple organ failure. The basics of thanatology. Death, mechanisms, signs. Biological, medical, social aspects due to a chronic incurable disease. The concept of thanatogenesis. Structural mechanisms of cessation of activity of vital organs during the natural course of the disease. Complications of stopping the work of the heart, lungs, brain, kidneys, and liver.	2.0
3.	Blood circulation disorders: hyperemia, ischemia, heart attack, bleeding, hemorrhage, stasis, plasmarrhagia. Shock. Violation of lymphatic circulation.	2.0

4.	The general doctrine of inflammation. Exudative inflammation. Morphology of exudative inflammation. Productive inflammation.	2.0
5.	Pathomorphology of the immune system. Reactions and mechanisms of hypersensitivity.	2.0
6	Adaptation and compensation processes. Regeneration and reparation. Sclerosis.	2.0
7.	General doctrine about tumors. Oncogenesis. Anatomical and microscopic features and types of growth of benign and malignant tumors. Clinical and morphological nomenclature of tumors. Mesenchymal tumors. Sarcoma: features of development and metastasis. Epithelial tumors: benign organ-nonspecific epithelial tumors, cancer (features of development, metastasis, histological forms). Nomenclature and morphological features of tumors of nervous tissue. Nomenclature and morphological features of tumors originating from melanin-producing tissue. Leukoses (leukemia) and lymphomas.	2.0
8.	Atherosclerosis and arteriosclerosis. Coronary heart disease. Systemic connective tissue diseases with autoimmunization: rheumatism, systemic lupus erythematosus, rheumatoid arthritis, systemic scleroderma, dermatomyositis, Bekhterev's disease.	2.0
9.	Diseases of the nervous system. Cerebrovascular disease.	2.0
10.	Respiratory diseases.	2.0
11.	Diseases of esophagus, stomach and intestines. Liver disease.	2.0
12.	Kidney diseases.	2.0
13.	Hypothalamic-pituitary disorders. Adrenal gland pathology. Pathology of the thyroid gland. Pathology of the endocrine apparatus of the pancreas.	2.0
14.	Infectious and parasitic diseases. Characteristics of the infectious process. Intestinal infectious diseases.	2.0
15.	Viral airborne infections. Corona virus disease. HIV infection. Rabies. Rickettsioses. Prion infections. Tuberculosis.	2.0
	TOGETHER	**30**

5.2. Topics of seminar classes

Seminar classes are not provided.

5.3. Topics of practical classes

No	**Topic**	**Number of hours**
	Discipline section 1. General pathomorphology.	
1	**Topic 1. Practical lesson 1.** Subject and tasks of pathomorphology. Pathomorphological research methods. The main stages of the development of pathomorphology. Morphology of reversible and irreversible damage to cells and tissues. Intracellular accumulation of proteins, carbohydrates and lipids (parenchymal dystrophy). Elements of ultrastructural cell pathology. Cell-matrix interactions. Cellular and extracellular mechanisms of trophic regulation.	2.0
2	**Topic 2. Practical lesson 2.** Morphological changes of the extracellular matrix (stroma) as a response to damage (stromal-vascular dystrophies). Pathomorphology of extracellular accumulation of complex proteins (hyalinosis), fats and lipids. Exhaustion of the body.	2.0
3	**Topic 3. Practical lesson 3.** Violations of metabolism and their metabolism. Morphology of pathological accumulation of endogenous and exogenous pigments. Morphology of mineral	2.0

	metabolism disorder.	
4	**Topic 4. Practical lesson 4.** Necrosis - definition, terms and phases of development, consequences. Clinical and morphological forms of necrosis. Pathological anatomy of multiple organ failure. Fundamentals of Thanatology. Death, mechanisms, signs. Biological, medical, social aspects due to a chronic incurable disease. The concept of thanatogenesis. Structural mechanisms of cessation of activity of vital organs during the natural course of the disease. Complications of stopping the work of the heart, lungs, brain, kidneys, and liver.	2.0
5	**Topic 5. Practical lesson 5.** Practical skills by the section: Introduction. Morphology of damage and death of cells and tissues.	2.0
6	**Topic 6. Practical lesson 6.** Acute systemic circulatory disorders (acute coronary insufficiency, shock) and systemic circulatory disorders in chronic heart failure and their consequences. Regional blood circulation disorders (hyperemia, ischemia, plasmarrhagia, bleeding and hemorrhage). Violation of lymph formation and circulation.	2.0 _
7	**Topic 7. Practical lesson 7.** Violations of hemostasis: hemorrhagic syndrome, thrombosis, DIC-syndrome. Embolism. Thromboembolism of the pulmonary artery, thanatogenesis.	2.0
8	**Topic 8. Practical lesson 8.** Inflammation: causes, morphogenesis. Pathomorphology of exudative inflammation	2.0
9	**Topic 9. Practical lesson 9.** Proliferative (productive) inflammation: with the formation of acute condylomas, around parasitic animals, intermediate productive inflammation, granulomatous inflammation. Specific proliferative inflammation.	2.0
10	**Topic 10. Practical lesson 10.** Practical skills by the section: Disorders of blood and lymph circulation. Inflammation.	2.0
11	**Topic 11. Practical lesson 11.** Molecular and pathomorphological bases of the immune response. The immune system in the prenatal and postnatal period. Pathology of immune processes: amyloidosis, hypersensitivity reactions, transplant rejection. Immune deficiency. Autoimmune diseases.	2.0
12	**Topic 12. Practical lesson 12.** Regeneration. Structural basis of physiological adaptation of organs and cells. Morphology of cell accommodation processes. Compensatory and adaptive processes.	2.0 _
13	**Topic 13. Practical lesson 13.** Oncogenesis. Anatomical and microscopic features and types of growth of benign and malignant tumors. Morphological characteristics of the main stages of development of malignant tumors. Clinical and morphological nomenclature of tumors. Benign and malignant non-epithelial (mesenchymal) tumors. Sarcoma: features of development and metastasis. Tumors of fibroblastic, myofibroblastic and fibrohistiocytic origin. Tumors from adipose and muscle tissue, tumors from blood vessels.	2.0
14	**Topic 14. Practical lesson 14.** Epithelial tumors: benign organ-nonspecific epithelial tumors, cancer (features of development, metastasis, histological forms).	2.0 _
15	**Topic 15. Practical lesson 15.** Morphological features of epithelial tumors of individual organs.	2.0
16	**Topic 16. Practical lesson 16.**	2.0

	Nomenclature and morphological features of tumors of nervous tissue. Features of tumors of the central nervous system.	
17	**Topic 17. Practical lesson 17.** Nomenclature and morphological features of tumors originating from melanin-producing tissue.	2.0
18	**Topic 18. Practical lesson 18.** Practical skills by the section: Immunopathological processes. Regeneration, processes of adaptation and compensation. Tumors	2.0
19	**Topic 19. Practical lesson 19.** Anemia. Thrombocytopathies.	2.0
20	**Topic 20. Practical lesson 20.** Tumors of hematopoietic and lymphoproliferative tissue	2.0
21	**Topic 21. Practical lesson 21-22.** Atherosclerosis and arteriosclerosis. Coronary heart disease.	4.0 _
22	**Topic 22. Practical lesson 23 .** Hypertension and arteriolosclerosis. Hypertensive disease and symptomatic arterial hypertension.	2.0
23	**Topic 23. Practical lesson 24 -25.** Cerebrovascular disease. Alzheimer's disease. Multiple sclerosis. Amyotrophic lateral sclerosis. Postresuscitation encephalopathy. Diseases of the peripheral nervous system.	4.0
24	**Topic 24. Practical lesson 26.** Systemic connective tissue diseases with autoimmunization: rheumatism, systemic lupus erythematosus, rheumatoid arthritis, systemic scleroderma, dermatomyositis, Bekhterev's disease.	2.0
25	**Topic 25. Practical lesson 27.** Practical skills by section: Diseases of the blood system and cardiovascular system. Diseases of the nervous system.	2.0
26	**Topic 26. Practical lesson 28.** Respiratory diseases.	2.0
27	**Topic 27. Practical lesson 29.** Diseases of esophagus, stomach and intestines.	2.0
28	**Topic 28. Practical lesson 30.** Diseases of the liver, biliary system and pancreas.	2.0
29	**Topic 29. Practical lesson 31.** Kidney diseases.	2.0
30	**Topic 30. Practical lesson 32.** Hypothalamic-pituitary disorders. Adrenal gland pathology. Pathology of the thyroid gland. Pathology of the endocrine apparatus of the pancreas.	2.0
31	**Topic 31. Practical lesson 33.** Manifestations of food-related diseases. Vitamins Occupational diseases.	2.0
32	**Topic 32. Practical lesson 34 -35 .** Pathology of the female and male reproductive system. Breast disease.	4.0
33	**Topic 33. Practical lesson 36 -37.** Pre- and perinatal pathology. Pathology of pregnancy, postpartum period and placenta.	4.0
34	**Topic 34. Practical lesson 38.** Practical skills by the section: Diseases of respiratory organs. Diseases of digestive organs. Diseases of the endocrine system. Diseases of the genitourinary system. Diseases of the musculoskeletal system. Diseases of pregnancy and the postpartum period. Diseases of the pre- and perinatal period. Pathomorphology of hypo- and vitamin deficiency. Diseases caused by human activity and the influence of the	2.0

	external environment.	
35	**Topic 35. Practical lesson 39.** General concepts of human infectious pathology. Classification of infectious diseases. Intestinal infectious diseases.	2.0
36	**Topic 36. Practical lesson 40 .** Viral airborne infections. Corona virus disease. HIV infection and AIDS. Rabies. COVID-19.	2.0
37	**Topic 37. Practical lesson 41 -42 .** Childhood infections.	4.0
38	**Topic 38. Practical lesson 43.** Tuberculosis.	2.0
39	**Topic 39. Practical lesson 44.** Sepsis. Syphilis.	2.0
40	**Topic 40. Practical lesson 45.** Practical skills by the section: Pathomorphology of infectious diseases.	2.0
41	**Topic 41. Practical lesson 46 -48.** Test control of knowledge. Overview and description of micro and macro drugs . Preparation for the exam.	6.0
	Together	96

6. Independent work

No.	TOPIC	Number of hours
1.	Topic 1. Elements of cell ultrastructural pathology. Cell-matrix interactions. Cellular and extracellular mechanisms of trophic regulation. Preparation for practical class 1.	4.0
2.	Topic 2. Shock. Preparation for practical class 6.	2.0
3.	Topic 3. Violation of ion-osmotic and water balance. Preparation for practical class 7.	4.0
5.	Topic 5. Tumors from cambial embryonic tissues. Tumors of children's age, which develop according to the type of tumors of adults. Preparation for practical class 18.	4.0
7.	Topic 7. Cardiomyopathies. Leffler's endocarditis, idiopathic myocarditis, acquired heart defects. Systemic vasculitis. Preparation for practical class 25.	4.0
8.	Topic 8. Tumors of respiratory organs. Preparation for practical class 27.	4.0
9.	Topic 9. Tumors of the gastrointestinal tract. Preparation for practical class 28.	2.0
10.	Topic 11. Peritonitis, adhesion disease. Preparation for practical class 28.	2.0
11.	Topic 11. Diseases of the biliary system, pancreas. Preparation for practical class 29.	2.0
12.	Topic 12. Liver tumors. Preparation for practical class 29.	2.0
13.	Topic 13. Parathyroid osteodystrophy, osteomyelitis, fibrous dysplasia, osteopetrosis, Paget's disease, muscular dystrophies, myasthenia. Preparation for practical class 31.	4.0

15.	Topic 15. Asphyxia of newborns. Birth trauma. Preparation for practical class 35-36.	4.0
17.	Topic 17. Quarantine infections. Preparation for practical class 39.	4.0
18.	Topic 18. Rickettsioses. Prion infections. Preparation for practical class 40.	4.0
20.	Topic 20. Diseases caused by protozoa, helminths. Mycoses. Preparation for practical lesson 46.	4.0
21.	Topic. 21. Corona virus disease. Preparation for practical class 40.	4.0
22.	Topic 22. Preparation for the exam. Preparation for practical lesson 46-48.	30
	TOGETHER	84

7. Teaching methods

Lectures: story, explanation, conversation.

Practical classes: conversation, solving of clinical situational problems, practicing the skills of microscopic and macroscopic diagnosis of pathological processes in organs and tissues, carrying out of differential diagnosis using the main methods of pathomorphological findings, in order to improve the skills of interpreting cell pathology and justifying the clinical and morphological characteristics of general pathological processes that cause manifestations of diseases, improvement of skills to determine the consequences of various pathological conditions.

Independent work: independent work with the recommended basic and additional literature, with electronic information resources, independent work with the bank of test tasks Step-1, independent work with the album, preparation for the exam. Students of higher education are recommended to keep albums in which they describe macroscopic and microscopic changes in organs, tissues and cells during certain pathological processes and sketch individual micropreparations, answer and record answers to tests from the KROC licensing exam database at each class.

8. Forms of control and assessment methods (including criteria for evaluating learning outcomes)

Current control: oral survey, testing, assessment of performance of practical skills, solution of situational pathomorphological tasks, assessment of activity in class. Means of diagnosing the level of training of higher education applicants: solving test tasks from the basis of the KROC licensing exam; procedurally structured control of practical skills and abilities (assessment of knowledge and ability to analyze and interpret macro- and microscopic changes in cells, tissues, organs and systems during certain pathological processes); interview.

Final control : exam.

The exam is a form of final control that takes place as a separate control measure. Exams are taken by examiners who are approved at the department meeting and submitted to the University's educational department.

Exams are taken by applicants: during the examination sessions at the end of the spring semester according to the schedule. The methodology of final control of the educational component in the form of an exam is unified and involves the use of standardized forms.

About the evaluation of the current educational activity in a practical session

When assessing the mastery of each topic, a student of higher education is given grades on a 4-point (traditional) scale ("2", "3", "4", "5").

1. **Evaluation of theoretical knowledge on the subject of the lesson:**
   - methods: survey, solving a situational clinical problem, tests
   - the maximum score is 5, the minimum score is 3, the unsatisfactory score IS 2 .

2. **Assessment of practical skills on the topic of the lesson:**
   - methods: assessment of the correctness of the performance of practical skills
   - the maximum score is 5, the minimum score is 3, the unsatisfactory score IS 2.

   The grade for one practical session is the arithmetic average of all components and can only have a whole value (5, 4, 3, 2), which is rounded according to the statistical method.

Current assessment criteria for practical training:

Rating	Evaluation criteria
"5"	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 (solves situational clinical problems, tests, knows how to diagnose pathological processes in organs and tissues according to the algorithm).
"4"	The student knows the entire program and understands it well, answers the questions correctly, consistently and systematically, but they are not exhaustive, although the student answers additional questions without mistakes; performs practical tasks, feels difficulties only in the most difficult cases (orients himself within the limits of the above-mentioned issues and knows how to diagnose pathological processes in organs and tissues according to the algorithm);
"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; he is not able to systematically answer on his own, but he answers correctly to directly asked questions (he has a superficial idea of pathological conditions and does not know how to diagnose pathological processes in organs and tissues according to an algorithm).
"2"	The acquirer does not have the material, does not know any of the above questions, or knows less than 50% of the questions and does not know how to diagnose pathological processes in organs and tissues according to the algorithm.

Only those applicants who have fulfilled the requirements of the training program in the discipline, have no academic debt, their average score for the current educational activity in the discipline is at least 3.00, and they have passed the test control according to the tests "STEP - 1" are admitted to the final control in the form of an exam. » at least 90% (50 tasks). The test control of the "STEP-1" tests is conducted in the Educational and Production Complex of Innovative Technologies of Learning, Informatization and Internal Monitoring of the Quality of Education of the University in the last class before the exam.

Evaluation of the independent work of a student of higher education. The independent work of a student of higher education, which is provided by the topic of the lesson along with the classroom work, is evaluated during the current control of the topic in the corresponding lesson. The mastery of topics that are assigned only to independent work is checked during the final control.

Evaluation of learning results during the final control (exam)

The content of the evaluated activity	Scores
The answer to a theoretical question.	1
The answer to a theoretical question.	1
The answer to a theoretical question.	1
Practical task: diagnosis of pathology in a micropreparation	1
Practical task: description and diagnosis of pathology in macropreparation	1

The method of final control in the form of an exam is unified and involves the use of standardized forms. The number of questions (130) that are submitted to the exam corresponds to the amount of credits (7) assigned to the study of the academic discipline.

The form of the examinational card is standardized and consists of structural elements (components): theoretical questions (3) and practical tasks (2) (diagnosis of pathology in a micropreparation and description and diagnosis of pathology in a macropreparation). Theoretical questions are short, simple, understandable, clear and transparent, a complete answer to one theoretical question lasts no more than 5 minutes. Practical tasks are clearly and clearly formulated, a complete answer to one practical question lasts no more than 5 minutes. The timing of the exam is standard - no more than 30 minutes.

For each card, a check list (answer standard) is drawn up, which provides full correlation with the card, contains a similar number of structural elements (components), has answer standards, which are mandatory for providing complete answers to the questions.

During the exam, the applicant receives a card, and the examiners use a checklist for the corresponding ticket with standard answers and determine which mandatory components of the answer were named or not named by the applicant.

The overall grade for the exam is calculated as the arithmetic average of all grades obtained for answers to theoretical questions and practical tasks on a traditional four-point scale, rounded to two decimal places .

The exam is held in the educational and production complex of innovative technologies of learning, informatization and internal monitoring of the quality of education of the University during the examination sessions at the end of the semester (autumn and spring) according to the schedule.

9. Distribution of points received by students of higher education

The obtained average score for the academic discipline for applicants who have successfully mastered the work program of the academic discipline is converted from a traditional four-point scale to points on a 200-point scale, as shown in the table:

Conversion table of a traditional assessment into a multi-point scale

National assessment for discipline	The sum of points for the discipline
Excellent ("5")	185 - 200
Good ("4")	151 - 184
Satisfactory ("3")	120-150
Unsatisfactory ("2")	Below 120

Multi-point scale (200-point scale) characterizes the actual success of each applicant in mastering the educational component. The conversion of the traditional grade (average score for the academic discipline) into a 200-point grade is performed by the information and technical department of the University.

According to the obtained points on a 200-point scale, the achievements of the applicants are evaluated according to the ECTS rating scale. Further ranking according to the ECTS rating scale allows you to evaluate the achievements of students from the educational component who are studying in the same course of the same specialty, according to the points they received.

The ECTS scale is a relative-comparative rating, which establishes the applicant's belonging to the group of better or worse among the reference group of fellow students (faculty, specialty). An "A" grade on the ECTS scale cannot be equal to an "excellent" grade, a "B" grade to a "good" grade, etc. When converting from a multi-point scale, the limits of grades "A", "B", "C", "D", "E" according to the ECTS scale do not coincide with the limits of grades "5", "4", "3" according to the traditional scale. Acquirers who have received grades of "FX" and "F" ("2") are not included in the list of ranked acquirers. The grade "FX" is awarded to students who have obtained the minimum number of points for the current learning activity, but who have not passed the final examination. A grade of "F" is given to students who have attended all classes in the discipline, but have not achieved a grade point average (3.00) for the current academic activity and are not admitted to the final examination.

Applicants who study in one course (one specialty), based on the number of points scored in the discipline, are ranked on the ECTS scale as follows:

Conversion of the traditional grade from the discipline and the sum of points on the ECTS scale

Evaluation on the ECTS scale	Statistical indicator
A	Top 10% achievers
B	The next 25% of earners
C	The next 30% of earners
D	The next 25% of earners
E	The next 10% of earners

10. Methodological support

- Working program of the academic discipline
- Thematic plans of lectures, practical classes, IWS;
- Syllabus of the academic discipline
- Textbooks:
  1. Essentials of pathology: textbook / Ya. Bondar, A.Romanyuk, V.Voloshyn, V. Gargin – Kharkiv, "Planeta-Print" Ltd, 2020, 219p.
  2. Pathology: textbook / S.V. Sorokina,V.D. Markovskyi, D.I. Halata et al.; edited by S.V. Sorokina,V.D. Markovskyi, D.I. Halata.- 2-nd edition.- Kyiv : AUS Medicine Publishing, 2020. – 328p.+2 colour inserts (8p. + 12p.)
- Multimedia presentations
- Video presentations of lectures.
- Situational pathomorphological tasks
- Methodical elaborations of practical classes, IWS and lectures
- An electronic bank of test tasks by discipline subdivisions (pathomorphology test database for preparation for the KROC-1 licensing exam, theoretical questions);
- Study tables (1200), stands;
- A museum with a collection of micro- and macropreparations (1000 and 500 pieces, respectively).
- Student microscopes.
- Professional microscopes with video cameras.
- Laptop.
- Multimedia projector.

11. Questions for preparing for the final exam

1. Pathological anatomy as a science, a field of practical medicine and an educational subject. Problems of pathological anatomy.
2. Levels of research on the structural basis of diseases. Material (objects) and methods of pathomorphological research.
3. The main stages of the development of pathological anatomy. Contribution of domestic scientists to the development of world pathomorphology.
4. The concept of ultrastructural cell pathology. Damage to the cytoplasmic membrane, mitochondria, endoplasmic reticulum, Golgi apparatus, lysosomes. Reversible and irreversible nuclear damage. Damage to mitosis, causes, types.
5. Definition of the term "dystrophy", causes of dystrophy. Pathogenesis and mechanisms of dystrophy.
6. Classification of dystrophy. Morphogenesis of parenchymal (intracellular) protein dystrophies.

Morphogenesis and morphology of parenchymal fatty dystrophies (lipidoses). Morphogenesis and morphology of parenchymal carbohydrate dystrophies.

7. Stromal-vascular (extracellular) protein dystrophies, types, morphology, mechanisms, causes, outcomes.
8. Stromal-vascular lipidoses and carbohydrate dystrophies, varieties, morphology.
9. Definition of mixed dystrophy, classification. Classification of hemoglobinogenic pigments. Types of violations of their exchange.
10. Violation of the metabolism of lipidogenic pigments.
11. Violation of nucleoprotein metabolism.
12. Disorders of calcium metabolism, types of calcinosis, its causes and morphology.
13. Definition of necrosis, its causes, types, depending on the mechanism of action of the pathogenic factor. Morphological signs of necrosis. Early morphological and histochemical changes. Morphological signs of necrosis in the nuclei. Morphological signs of necrosis in the cytoplasm and intercellular substance.
14. Clinical and morphological forms of necrosis. Coagulation necrosis, causes of development, types, microscopic and macroscopic changes in areas of necrosis. Enzymatic and non-enzymatic fat necrosis, localization, causes.
15. Gangrene, definition, classification. Dry gangrene, localization, macroscopic changes in necrotic tissue. Wet gangrene, localization, causes, morphological changes. Bedsores, features of development, localization.
16. Collective (wet) necrosis, location, macro-microscopic changes. Outcomes of necrosis.
17. Apoptosis, definition, morphological manifestations of apoptosis. The influence of external factors on the regulation of apoptosis. Categories of autonomous apoptosis.
18. Signs of general death, mechanisms and terms of their development.
19. A general idea of edema, composition of tissue fluid, classification, localization of fluid accumulation. Local edema, its regulation, mechanism of development, types. General edema, its varieties and mechanisms of occurrence.
20. Dehydration of the body, mechanisms of development, degrees of dehydration.
21. Varieties of general arterial congestion. Local arterial congestion, types, causes, morphology. Pathomorphology , consequences of stasis.
22. General venous congestion , types, causes of development, changes in the lungs and liver in chronic venous congestion.
23. Blood thickening, causes, morphological changes in organs. Thinning of the blood, causes, meaning.
24. Bleeding, definition, causes of development, classification. Hemorrhage, types, morphology.
25. Shock, definition, classification. Stages of development of shock, morphological changes. Morphological changes of kidneys, lungs, liver, myocardium, stomach and intestines during shock.
26. Infarction, definition, causes. Types of infarctions. Mechanisms of development and morphological changes in the infarct zone. Myocardial infarction, localization, morphology, outcome. The result of an infarction.
27. Disorders of lymphatic circulation, causes, classification. Acute and chronic local lymphedema . Morphology of acute and chronic general lymphedema.
28. Thrombosis, definition, causes and mechanisms of thrombosis. Morphology and types of blood clots. Favorable and unfavorable outputs thrombosis
29. Definition of DIC- syndrome, causes. Stages of DIC -syndrome, morphological signs.
30. Definition of embolus, types of embolus. Ways of movement of emboli. Morphology of thromboembolism of the pulmonary artery and vessels of the great circle of blood circulation.
31. Definition of inflammation, etiology. Morphological signs of inflammation. Morphological changes during alteration, exudation and proliferation.
32. Classification of inflammation by morphology, course depending on the reactivity of the body. Forms of exudative inflammation. Serous inflammation, etiology, localization, morphology, outcome.
33. Fibrinous inflammation: etiology, types, localization, morphology, outcomes.
34. Purulent inflammation: etiology, forms, localization, morphology, outcomes.
35. Non-independent forms of inflammation. Catarrhal inflammation; etiology, localization, types, morphology, exits. Hemorrhagic and purulent inflammation: etiology, morphology, outcomes.

36. General characteristics of productive inflammation, classification, outputs. Intermediate (interstitial) inflammation, morphology, outcome. Granulomatous inflammation, definition of granuloma, etiology, stages of granuloma. Productive inflammation with the formation of polyps and acute condylomas; localization, etiology, consequences.
37. Primary organs of immunogenesis, their role in the development of immune reactions. Secondary organs of immunogenesis, their role in the development of immune reactions. Types of lymphocytes, their localization in organs of immunogenesis, functional features. Types of immune reactions.
38. Definition of immunopathological processes, classification. Violations of immunogenesis associated with pathology of the thymus and pathology of peripheral lymphoid tissue.
39. Mechanisms of development of immediate and delayed hypersensitivity reactions. Classification of hypersensitivity reactions. Morphological characteristics of delayed-type hypersensitivity (HDT) and immediate-type hypersensitivity (HIT) reactions. Morphological characteristics of the reaction of transplant rejection.
40. Definition and classification of autoimmune diseases. Characteristics of organ-specific autoimmune diseases. Diseases with autoimmune disorders, mechanisms of appearance of autoantigens.
41. Amyloidosis, chemical composition and physical properties of amyloid. Classification of amyloidosis. Characteristics of primary, hereditary (genetic), secondary, localized and senile amyloidosis. Types of amyloidosis depending on the specificity of the fibril protein. Methods of micro- and macroscopic detection of amyloid. Appearance of organs in amyloidosis, result.
42. Classification of immunodeficiency states. Classification of primary immunodeficiency syndromes. Combined immunodeficiency syndromes, types, state of organs of immunogenesis, clinical manifestations. Syndromes of insufficient cellular immunity, state of organs of immunogenesis, clinical manifestations. Humoral immunity deficiency syndromes, state of organs of immunogenesis, clinical manifestations.
43. Reasons for the development of secondary immunodeficiency states.
44. Definition of regeneration, classification. Regulation and phases of the regenerative process. Characteristics of physiological regeneration. Types of reparative regeneration. Characteristics of complete regeneration. Characteristics of incomplete regeneration. Pathological regeneration, conditions of occurrence, types.
45. Blood regeneration.
46. Regeneration of blood and lymphatic vessels.
47. Regeneration of connective and adipose tissue. Pathological regeneration of connective tissue. Regeneration of smooth and skeletal muscles.
48. Regeneration of bone tissue, regeneration conditions, characteristics of an uncomplicated bone fracture. Morphological characteristics of secondary bone fusion.
49. Cartilage tissue regeneration. Regeneration of the epithelium. Regeneration of the brain and spinal cord. Regeneration of peripheral nerves. Types of wound healing. Wound healing by primary and secondary tension.
50. The concept of compensation and adjustment. Stages of the compensatory process. Manifestations of adaptive processes. Hypertrophy and hyperplasia, definition, classification.
51. Working (compensatory) hypertrophy, causes of development. Characteristics of cardiac hypertrophy, causes, macro- and microscopic changes. Vicarious hypertrophy, conditions of development. Neurohumoral hypertrophy and hyperplasia. True and false hypertrophy, morphological changes in organs.
52. Atrophy, definition, classification. Types of general pathological atrophy, morphological changes in organs, appearance of patients. Types of local pathological atrophy, causes, morphology.
53. Definition of organization, encapsulation, cirrhosis and sclerosis, morphology. Metaplasia and dysplasia, definition, morphological characteristics. Degrees of dysplasia.
54. Tumors, definitions, modern theories of carcinogenesis. Mechanisms of blastomatous action of pathogenic agents. Tumor morphogenesis, morphogenetic variants of tumor formation. Structure of the tumor. Types of tumor growth.
55. Tumor atypism, definitions, types. Morphological characteristics of tissue and cellular atypism. Precancerous (precancerous) conditions and changes, morphology. Metastasis: types, regularities, mechanisms. Relapse, definition.

56. Modern classification of tumors. Morphological features of benign tumors. Morphological features of malignant tumors.
57. General characteristics and nomenclature of tumors from tissues originating from mesenchyme. Benign and malignant tumors from connective tissue, muscle tissue, blood and lymphatic vessels. Benign bone-forming and cartilage-forming tumors. Benign and malignant tumors from adipose tissue.
58. Classification and morphological features of tumors of the central nervous system. Benign neuroectodermal tumors. Low-differentiated and embryonic neuroectodermal tumors. Benign and malignant tumors of the meninges.
59. Mature and immature tumors of peripheral nerves. Benign and malignant tumors of sympathetic ganglia.
60. Nomenclature of tumors that develop from melanin-producing tissue. Nevi - definition, classification, morphology. Melanoma, stages of development. Different types of melanoma morphology.
61. Nomenclature of epithelial tumors. Morphological features of epithelial tumors without specific localization. Benign and malignant tumors from the covering epithelium.
62. Benign and malignant tumors of the liver. Benign tumors of the stomach and intestines from Kulchytsky's enterochromaffin cells.
63. Organ-specific tumors of the thyroid gland, kidneys, skin: benign and malignant
64. Benign and malignant uterine tumors, types, morphology
65. Tumors of the salivary glands and oral cavity.
66. Features of tumor growth in children compared to adults. Classification of childhood tumors. Dysontogenetic tumors in children. Theories of teratoma development, histological variants of teratoma. Morphological structure of mature and immature teratomas. Morphological features of hamartoma and hamartoblastoma.
67. Tumors in children arising from embryonic cambial tissues in the CNS, sympathetic ganglia, and adrenal glands.
68. Hamartomas and hamartoblastomas of vascular origin. Hamartomas and hamartoblastomas of muscle tissue. Hamartoblastomas of internal organs: nephroblastoma (Willms tumor), hepatoblastoma. Definition of teratoma, typical localization. Sacrococcygeal teratoma and teratoblastoma. Peculiarities of the morphological structure. Ovarian and testicular teratomas.
69. Benign and malignant tumors in children, which develop according to the type of tumors in adults.
70. Organ-specific hormonally active tumors of the adrenal glands: classification, morphological features.
71. Benign and malignant breast tumors.
72. Definition, classification and morphological characteristics of anemias. Definition, classification, morphological characteristics thrombocytopenia and thrombocytopenia. Classification, morphological characteristics of coagulopathies.
73. Definition, classification, general morphological characteristics of leukemias.
74. Types, stages of the course, morphological characteristics of acute leukemia. Types, stages of the course, morphological characteristics of chronic leukemia.
75. Pathohistological types, morphological characteristics of Hodgkin's disease, causes of death. General characteristics, classification, morphological manifestations and prognosis of non-Hodgkin's lymphomas.
76. Definition of atherosclerosis, risk factors, modern theories. Morphogenesis of macroscopic changes in atherosclerosis. Morphogenesis of microscopic changes in atherosclerosis. Clinical and morphological forms of atherosclerosis, organ lesions in atherosclerosis.
77. Definition, risk factors, connection of coronary heart disease with atherosclerosis and hypertension. Morphology of acute, recurrent and repeated myocardial infarction. Consequences, complications, causes of death in myocardial infarction.
78. Morphological characteristics, complications, causes of death in chronic ischemic heart disease.
79. Hypertensive disease: definition, risk factors. Morphological changes in blood vessels, heart, changes in organs in hypertensive disease.
80. General characteristics of systemic diseases of connective tissue: violation of immune homeostasis and systemic progressive disorganization of connective tissue in rheumatic diseases.
81. Classification, morphogenesis, morphological characteristics of rheumatism. Endocarditis, myocarditis, pericarditis and pancarditis: classification, morphological characteristics, complications.

82. Morphology of Bekhterev's disease. Morphogenesis, pathomorphology, complications and causes of death in systemic lupus erythematosus. Pathological anatomy, visceral manifestations, complications, causes of death in systemic scleroderma. Pathological anatomy of dermatomyositis. Complications, causes of death.
83. Pathomorphology of systemic vasculitis: nonspecific aortoarteritis, nodular periarteritis, Wegener's granulomatosis, obliterating thromboangiitis.
84. Pathological anatomy of acquired heart defects. Pathological anatomy of acquired (secondary) cardiomyopathies.
85. General characteristics, classification, background diseases and risk factors of cerebrovascular disease. Infarct (ischemic stroke) of the brain: morphological characteristics. Morphological characteristics, consequences of hemorrhagic stroke.
86. Morphological characteristics , complications of spontaneous intracranial hemorrhage. Morphological characteristics , complications of spontaneous subarachnoid hemorrhage.
87. Morphological characteristics , complications of Alzheimer's disease. Morphological characteristics , complications of multiple sclerosis. Morphological characteristics , complications of ocular amyotrophic sclerosis.
88. Morphological characteristics , complications of post -animation encephalopathy. Morphological characteristics , complications of diseases of the peripheral nervous system.
89. Morphological characteristics of acute bronchitis. Modern classification of pneumonia. Morphological characteristics and complications of acute focal pneumonia.
90. Morphological characteristics and complications of lobar pneumonia.
91. Morphological characteristics and complications of acute interstitial pneumonia. Morphological characteristics of acute destructive processes of the lungs.
92. Definition and classification of chronic non-specific respiratory diseases. Morphological characteristics and complications of chronic bronchitis.
93. Morphological characteristics of chronic obstructive emphysema. Morphological characteristics and complications of bronchiectasis.
94. Morphological characteristics and complications of bronchial asthma. Morphological characteristics of idiopathic pulmonary fibrosis. Morphological characteristics of lung cancer.
95. Diseases of the esophagus: morphological characteristics. Morphological characteristics of chronic gastritis. Pathomorphology of ulcer disease. Complications of ulcer disease.
96. Stomach cancer. Macroscopic and histological forms. Peculiarities of metastasis.
97. Pathomorphology of non-specific ulcerative colitis. Pathomorphology of Crohn's disease. Intestinal tumors. Clinical and morphological forms of appendicitis. Complication of appendicitis.
98. Morphological characteristics, prognosis of fatty hepatosis. Definition, morphological characteristics, prognosis of toxic liver dystrophy.
99. Morphogenesis, forms, morphological characteristics of acute hepatitis. Morphological characteristics of chronic hepatitis, degree of activity and chronicity.
100. Morphological characteristics of the most important types of cirrhosis. Liver cancer, morphological characteristics.
101. Pathomorphology of gallstone disease. Pathomorphology of acute and chronic cholecystitis.
102. Morphological characteristics, complications of acute and chronic pancreatitis. Tumors of the pancreas, morphological characteristics.
103. Morphological characteristics, complications and causes of death in Itsenko-Cushing's disease.
104. Morphological characteristics, complications of acromegaly. Morphological characteristics of diabetes insipidus.
105. Morphological characteristics of diabetes. Complications of diabetes mellitus: morphological characteristics of diabetic macro- and microangiopathy.
106. Multinodular goiter. Morphological characteristics, complications, consequences. Graves' disease (diffuse toxic goiter, Based's disease): morphological features of the thyroid gland, visceral manifestations.
107. Hypothyroidism. Cretinism. Myxedema. Morphological characteristic. Definition, pathomorphology of Hashimoto's thyroiditis.

108. Primary chronic insufficiency of the cortical substance of the adrenal glands (Addison's disease): morphological manifestations. Waterhouse-Friederiksen syndrome: morphological manifestations.
109. Morphological manifestations of inflammatory diseases of the endometrium and myometrium. Morphological manifestations of precancerous processes and tumors of the endometrium and myometrium. Morphological characteristics, complications, consequences of inflammatory diseases of the mammary glands. Morphological characteristics of fibrocystic changes of mammary glands.
110. Morphological characteristics, complications, consequences of benign nodular hyperplasia of the prostate gland. Morphological characteristics of inflammatory diseases of the testicles.
111. Modern clinical and morphological classification of kidney diseases. Postinfectious glomerulonephritis: morphological characteristics, consequences. Rapidly progressive: morphological characteristics, consequences.
112. Chronic glomerulonephritis: morphological characteristics, consequences. Classification, morphological manifestations of idiopathic nephrotic syndrome. Morphological manifestations of membranous nephropathy.
113. Morphological characteristics, prognosis of necrotic nephrosis. Morphological characteristics, prognosis of tubulointerstitial nephritis. Morphological characteristics, prognosis of acute and chronic pyelonephritis.
114. Morphogenesis and morphological characteristics of nephrolithiasis, consequences Chronic renal failure. Nephrosclerosis. Pathological anatomy.
115. Morphological changes of bones in hyperparathyroid dystrophy. Morphological characteristics, complications of Paget's disease. Morphological characteristics, complications of fibrous dysplasia.
116. Morphological characteristics, complications of osteomyelitis. Morphological characteristics, causes of death in Duchenne muscular dystrophy. Morphological characteristics, causes of death in myotonia.
117. Classification, morphological diagnosis, complications and consequences of ectopic pregnancy. Classification, morphological characteristics of ORH-gestoses.
118. Classification, morphological characteristics and prognosis of trophoblastic disease. Morphological manifestations, impact on the fetus and the woman's body, consequences of infectious processes in the placenta. Morphological manifestations of blood circulation disorders in the placenta.
119. Morphological characteristics, prediction of delay in intrauterine development of the fetus. Morphological characteristics of intrauterine infections of the fetus.
120. Birth injury: classification and morphology. Morphological characteristics of hemolytic disease of infants. Morphological characteristics of hemorrhagic disease of infants.
121. Morphological characteristics, complications of pneumopathies. Morphological characteristics, consequences of asphyxia.
122. Morphological characteristics, consequences of non-infectious fetopathy: diabetic and alcoholic fetopathy. Classification and morphology of congenital malformations.
123. Morphological characteristics of disturbed and insufficient nutrition. Pathological anatomy, consequences, causes of death in the case of injuries related to the influence of physical factors of the external environment: industrial noise, electromagnetic waves of radio frequencies, ionizing radiation, electric current, temperature effects.
124. Morphological characteristics, complications, consequences, causes of death in scarlet fever.
125. Morphological characteristics, complications, consequences, causes of death in bacterial dysentery. Morphological characteristics, complications, consequences, causes of death in typhoid fever, salmonellosis.
126. Morphological characteristics, complications, consequences, causes of death in respiratory viral infections, coronavirus disease.
127. Morphological characteristics, complications, consequences, causes of death in typhoid fever. Morphological characteristics, complications of prion lesions of the central nervous system.
128. Morphological characteristics, complications, causes of death in AIDS. Morphological characteristics, complications, consequences, causes of death in childhood viral infections: measles, infectious mononucleosis, epidemic parotitis, poliomyelitis
129. Morphological characteristics, complications, consequences, causes of death in diphtheria. Morphological characteristics, complications, consequences, causes of death in whooping cough.

130. Tissue reactions in tuberculosis. Pathological anatomy of primary tuberculosis complex. Morphology of progression of primary tuberculosis. Pathological anatomy of the chronic course of primary tuberculosis. Morphological characteristics, complications, consequences, causes of death in hematogenous tuberculosis with predominant lung damage. Morphological characteristics, complications, consequences, causes of death in secondary tuberculosis. Modern pathomorphosis of tuberculosis.
131. Clinical and anatomical forms of sepsis: septicemia, septicopyemia, septic (infectious) endocarditis.
132. Plague: clinical and morphological forms, complications, causes of death. Tularemia: clinical and morphological forms, causes of death. Anthrax: clinical and morphological forms, causes of death.
133. Cholera: clinical and morphological forms, complications, causes of death.
134. Pathomorphology of congenital syphilis. Pathomorphology of acquired syphilis.
135. Morphological characteristics, complications, consequences, causes of death in diseases caused by protozoa: malaria, balantidiasis, amebiasis. Morphological characteristics, complications, consequences, causes of death in diseases caused by helminths: trichinellosis, echinococcosis, cysticercosis, opisthorcosis, schistosomiasis.

List of micropreparations, the diagnosis of which pathological processes are practical skills before passing the exam

1. Hyalinosis of vessels
2. Skin with Addison's disease
3. Hemosiderosis of the lungs
4. Ischemic infarction of the spleen
5. Nutmeg liver
6. Swelling of the lungs
7. Fibrinous epicarditis
8. Phlegmon of muscles, adipose tissue
9. Epithelioid cell granuloma
10. Actinomycosis
11. Brown atrophy of the liver
12. Granulation tissue
13. Skin
14. Cavernous hemangioma of the liver
15. Melanoma
16. Fatty dystrophy of the liver
17. Lymphogranulomatosis
18. Myocardial infarction with organization
19. Atherosclerosis of coronary arteries
20. Thrombosis of blood vessels
21. Croupous pneumonia
22. Emphysema of the lungs
23. Phlegmonous-ulcerative appendicitis
24. Liver cirrhosis
25. Fibroadenoma of the mammary gland
26. Extracapillary productive glomerulonephritis
27. Necrotic nephrosis
28. Chronic stomach ulcer
29. Purulent meningitis
30. Miliary tuberculosis of the lungs

The list of macropreparations, the diagnosis of which pathological processes are practical skills before passing the exam

1. Fatty liver dystrophy

2. Melanoma metastases in the liver
3. Kidney stones
4. Gangrene of the extremities
5. Infarction of the spleen
6. Myocardial infarction
7. Brain cyst
8. Fibrinous epicarditis
9. Kidney amyloidosis
10. Hypertrophy of the heart
11. Hydronephrosis
12. Uterine fibromyoma
13. Bladder papilloma
14. Cavernous hemangioma of the liver
15. Ovarian dermoid cyst
16. Spleen in lymphogranulomatosis
17. Atherosclerosis of the aorta
18. Postinfarction cardiosclerosis.
19. Hemorrhage in the brain
20. Rheumatic warty endocarditis
21. Primary shrunken kidney
22. Croupous pneumonia (gray hepatization)
23. Chronic stomach ulcer
24. Fibrinous colitis with dysentery
25. Colloidal goiter
26. Prostate hypertrophy
27. Purulent leptomeningoencephalitis.
28. Diphtheria of the trachea and bronchi.
29. Cavernous tuberculosis.
30. Syphilitic liver

12. Recommended literature

Main:

1. Essentials of pathology: textbook / Ya. Bondar, A.Romanyuk, V.Voloshyn, V. Gargin – Kharkiv, “Planeta-Print” Ltd, 2020, 219p.
2. Pathology: textbook / S.V. Sorokina,V.D. Markovskyi, D.I. Halata et al.; edited by S.V. Sorokina,V.D. Markovskyi, D.I. Halata.- 2-nd edition.- Kyiv : AUS Medicine Publishing, 2020. – 328p.+2 colour inserts (8p. + 12p.)
3. Pathology: textbook / S.V. Sorokina,V.D. Markovskyi, D.I. Halata et al.; edited by S.V. Sorokina,V.D. Markovskyi, D.I. Halata. – Kyiv : AUS Medicine Publishing, 2019. – 328p.+2 colour inserts (8p. + 12p.)
4. Atlas of micropreparations in pathomorphology / I.I. Starchenko, B.M. Filenko, N.V. Royko, etc.; VDZU "UMSA". - Poltava, 2018. - 190 p

Additional:

Kumar V. Robbins Basic Pathology. 9th Edition /Vinay Kumar, Abul Abbas, Jon Aster. – Elsevier. – 2015. – 952 p.

13. Electronic information resources

1. http://moz.gov.ua – Ministry of Health of Ukraine
2. www.ama-assn.org - American Medical Association / American Medical Association
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
6. www.gmc-uk.org - *General Medical Council* (*GMC*)
7. www.bundesaerztekammer.de – German Medical Association
8. http :// library . Med . utah _ edu / WebPath / webpath . html - Pathological laboratory
9. http :// www . webpathology . com / - Web Pathology