MINISTRY OF HEALTH OF THE REPUBLIC OF BELARUS
EDUCATIONAL INSTITUTION
BELARUSIAN STATE MEDICAL UNIVERSITY

APPROVED
by First Vice-Rector, Professor
_____ I.N.Moroz
27.06.2023
Reg. #UD-01-31/2324 /edu.

PATHOLOGIC ANATOMY

Curriculum of educational institution
in the educational discipline for the specialty:

1-79 01 01 «General Medicine»

2023

Curriculum is based on the educational program «Pathologic Anatomy», approved 27.06.2023, registration № УД-01-31/2324/уч.; on the educational plan in the specialty 1-79 01 01 «General Medicine», approved 27.06.2023, registration # 7-07-0911-01/2324/mf.

COMPILERS:

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RECOMMENDED FOR APPROVAL:

by the Department of Pathological Anatomy of the educational institution «Belarusian State Medical University»
(protocol # 10 of 30.05.2023);

by the Scientific and Methodological Council of the educational institution «Belarusian State Medical University»
(protocol # 6 of 27.06.2023)

EXPLANATORY NOTE

«Pathologic Anatomy» – the academic discipline of the module «Biomedical Module # 2», which contains systematized scientific knowledge about etiology, pathogenesis, morphological features of general pathological processes and diseases at different stages of its development and morphogenesis.

The aim of the discipline «Pathologic Anatomy» is the formation of basic professional competencies by studying of structural bases of diseases, their etiology and pathogenesis for understanding of theoretical bases of medicine, studying of clinical manifestations of diseases and using of received knowledge in the practice.

The objectives of the discipline «Pathologic Anatomy» are to form students' scientific knowledge about:

pathology of the cell and general pathological processes, the totality of which determine the morphological manifestations of a disease;

etiology, pathogenesis and morphology of diseases at different stages of their development (morphogenesis), structural bases of recovery, complications, outcomes and long-term consequences of diseases;

morphology and mechanisms of organism adaptation and compensation processes in response to pathogenic factors and changing environmental conditions;

changes in the picture of a disease resulting from both changing conditions and treatments (pathomorphosis) and therapeutic and diagnostic manipulations (therapeutic pathology)

pathology service, its objectives in the health care system and the organisational and practical forms of solving these tasks.

The knowledge, skills, and abilities acquired during the study of the academic discipline «Pathologic Anatomy» are necessary for successful mastering of the following academic disciplines or modules: «Internal Medicine», «Therapeutic Module 2», «Therapeutic Module 3», «Surgical Module 2», «Surgical Module 3», «Obstetrics and Gynecology Module».

Studying the educational discipline «Pathologic Anatomy» should ensure the formation of students' basic professional competencies.

BPC. Use knowledges about etiology, pathogenesis, morphological features of general pathological processes and diseases at different stages of development (morphogenesis), apply morphological methods of research.

As a result of studying the discipline «Pathologic Anatomy» the student should know:

causes, mechanisms and morphological features of typical pathological processes;

etiology, pathogenesis and morphogenesis of diseases at different stages of their development; structural bases of recovery; complications, outcomes and long-term consequences of diseases; causes of death and thanatogenesis;

etiology, pathogenesis and morphological features of the most actual and socially significant diseases and changes of oral cavity associated with them;

morphology and mechanisms of organism adaptation and compensation processes in response to pathogenic factors and changing environmental

conditions;

pathomorphosis of socially significant diseases; etiology, pathogenesis and morphology of iatrogenic diseases.

be able to:

determine the essence of the pathological process on gross specimens, on autopsy;

identify the main common pathological processes and diseases on histological specimens under light microscopy;

diagnose pathological processes and diseases from the description of macro- and microscopic changes of organs and tissues of the body.

master:

basic techniques of work with the microscope;

skills of clinical and anatomical analysis;

basics of synthetic generalization morphological diagnostic signs of diseases and their correct interpretation in cause-effect relationships.

Total number of hours for the study of the discipline is 228 academic hours. Classroom hours according to the types of studies: lectures – 26 hours (including 9 hours of supervised student independent work), practical classes – 96 hours, student independent work (self-study) – 106 hours.

Intermediate assessment is carried out according to the syllabus of the specialty in the form of a credit (5 semester) and examination (6 semester).

Form of higher education – full-time.

ALLOCATION OF ACADEMIC TIME ACCORDING TO SEMESTERS OF STUDY

Code, name of the specialty	semester	Number of academic hours						Form of intermediate assessment
		total	in-class	including			out-of-class self-studies	
				lectures (including supervised independent work)	supervised student independent work	practical classes		
1-79 01 01 «General Medicine»	5	120	65	14	5	51	55	credit
	6	108	57	12	4	45	51	examination

THEMATIC PLAN

Name of section (topic)	Number of class hours	
	lectures	practical
1. General pathological anatomy	**14**	**51**
1.1. Introduction to the academic discipline «Pathologic Anatomy»	2	3
1.2. Reversible cell injury (dystrophies). Irreversible cell injury (necrosis)	2	12
1.3. Circulatory disorders	2	6
1.4. Inflammation	2	9
1.5. Immunopathological processes	-	6
1.6. Adaptive and compensatory processes	-	3
1.7. Tumors and blood diseases	6	12
2. Specific pathological anatomy	**12**	**45**
2.1. Diseases of the cardiovascular system	-	6
2.2. Rheumatic diseases	-	3
2.3. Diseases of the respiratory system	2	3
2.4. Diseases of the gastrointestinal tract	-	3
2.5. Liver diseases	2	3
2.6. Diseases of the endocrine glands	-	3
2.7. Kidney diseases	2	3
2.8. Infectious diseases	2	9
2.9. Genital and pregnancy pathology	2	3
2.10.Perinatal pathology and perinatal infections	2	3
2.11.Prenatal pathology (congenital malformations)	-	6
Total hours	**26**	**96**

CONTENT OF THE EDUCATIONAL MATERIAL

1. GENERAL PATHOLOGICAL ANATOMY

1.1. Introduction to the academic discipline «Pathologic Anatomy»

Pathological anatomy, its content, objectives, objects, methods and levels of investigation. Pathological anatomy service and its place in the health care system. Causes of death. Natural death, violent death and death because of disease. Clinical and biological death. Mechanisms of death and signs of death. Postmortem changes and their morphological characteristics.

Autopsy and pathohistological examination. The concept of thanatogenesis and resuscitation. Features of pathohistological examination of the oral cavity and dentomandibular system (DMS). Types and techniques of biopsies, indications for biopsy.

1.2. Reversible cell injury (dystrophies). Irreversible cell injury (necrosis)

Definition of dystrophy as disorders of tissue and (cellular) metabolism and form of damage (alteration). Causes of dystrophy development. Morphogenetic mechanisms, structural levels of manifestation and outcomes of dystrophies. Classification of dystrophies: depending on predominance of morphological changes (parenchymatous, mesenchymal and mixed); depending on predominance of one or another type of metabolism disorders (protein, fat, carbohydrate, mineral); depending on influence of genetic factors (acquired, hereditary) and process prevalence (general, local).

Parenchymatous protein dystrophies: hyaline-drop, hydropic, keratin accumulations. Morphological characteristics, causes, pathogenesis.

Parenchymatous fatty dystrophies. Fatty dystrophy of myocardium, liver, kidneys. Morphological characteristics, causes, pathogenesis.

Parenchymatous carbohydrate dystrophies. Dystrophies associated with disorders of glycogen metabolism. Morphology, causes, pathogenesis of glycogen metabolism disorders in diabetes mellitus.

Dystrophies associated with disorders of glycoprotein metabolism.

Mucosal (colloidal) dystrophy. Morphological characteristics, pathogenesis.

Cystic fibrosis.

Stromal-vascular (mesenchymal) dystrophies.

Stromal-vascular (mesenchymal) protein dystrophies: mucoid swelling, fibrinoid swelling, hyalinosis, amyloidosis. Morphological characteristics, causes, pathogenesis. Classification of amyloidosis, characteristic of its forms.

Stromal-vascular (mesenchymal) fatty dystrophies associated with metabolism of neutral fat or cholesterol disorders. General obesity: morphological characteristics, causes, pathogenesis, classification. Emaciation (cachexia): causes, pathogenesis, morphological manifestations. Local obesity (lipomatosis) and regional lipodystrophies.

Stromal-vascular (mesenchymal) carbohydrate dystrophies associated with impaired glycoprotein and mucopolysaccharide metabolism, tissue lysis: causes, pathogenesis, morphological characteristics.

Mucopolysaccharidoses.

Disorders of chromoprotein metabolism. Endogenous pigments: hemoglobinogenic, proteinogenic and lipidogenic. Causes of disorders of chromoprotein metabolism. Endogenous pigments: types, mechanism of development, morphological characteristics. Disorders of hemoglobinogenic pigments metabolism. Hemosiderosis, hemochromatosis, hemomelanosis, jaundice (prehepatic, hepatic, posthepatic), porphyria. Proteinogenic pigment metabolism disorders. Melanosis: widespread and local, acquired and congenital. Addison's disease. Impairment of pigmentation: widespread and local, acquired and congenital. Albinism. Disorder of lipidogenic pigment metabolism. Lipofuscinosis.

Nucleoprotein metabolism disorders. Gout, urolithiasis, urinary infarction.

Avitaminosis.

Rickets: etiology, pathogenesis, pathological anatomy of early and late forms of rickets, complications.

Scurvy. Etiology, pathogenesis, pathological anatomy, complications. Xerophthalmia. Etiology, pathogenesis, pathological anatomy.

Mineral metabolism disorders. Calcium metabolism disorders, calcinosis: types of calcinosis (metastatic, dystrophic and metabolic calcification), morphological characteristics, causes, pathogenesis.

Stone formation: causes and mechanisms of stone formation, types of stones. Cholelithiasis. Nephrolithiasis. Consequences of stone formation.

Necrosis.

Definition of necrosis. Causes, mechanism of development and morphological characteristics of necrosis.

Classification of necrosis depending on the cause (traumatic, toxic, trophoneurotic, allergic, vascular), and the mechanism of pathogenic factor influence (direct and indirect necrosis).

Clinical and morphological forms of necrosis and their characteristics. The significance of necrosis and its outcomes.

Concept of apoptosis. Its importance for the organism. Morphogenesis.

1.3 Circulatory disorders

The concept of general and local circulatory disorders, their relationship and classification.

Hyperemia. Active (arterial) hyperemia. Causes, types, morphology. Venous hyperemia (congestion): general and local, acute and chronic. Changes in organs in acute venous congestion, its outcomes. Changes in organs in chronic venous congestion (chronic cardiovascular insufficiency).

External and internal bleeding, haemorrhages. Causes, types, morphology, outcomes, significance. Haemorrhagic diathesis.

Plasmorrhagia. Causes, mechanisms of development, morphological characteristics.

Thrombosis. Causes, mechanisms of thrombus formation. Local and general factors of thrombosis. Thrombi, its types, morphological characteristics, outcomes. Disseminated intravascular coagulation syndrome (DIC). The significance of thrombosis.

Embolism. Causes, types, morphological characteristics, outcomes and significance of embolism. Classification of emboli by aggregate state. Orthograde, retrograde and paradoxical embolisms. Arterial and venous thromboembolism. Pulmonary embolism.

Shock. Causes, mechanism of development, morphological characteristics.

Lymphatic circulation disorders.

Lymph circulation insufficiency. Causes, types, morphological characteristics. Significance of lymph circulation disorders for the body.

1.4. Inflammation

Definition, essence and biological significance of inflammation.

The problem of local and general in the understanding of inflammation. Age-

specific features of inflammation.

Etiology and pathogenesis of inflammation. Inflammatory mediators. Kinetics of inflammatory reaction. Humoral and neural factors of inflammation regulation. Inflammation and immunity. Allergic or immune inflammation.

Morphology of inflammation: alteration, exudation and proliferation. Classification of inflammation. Alterative, exudative and productive (proliferative) inflammation. Acute and chronic inflammation.

Exudative inflammation. Its types: serous, fibrinous (serosal, parenchymal, mucosal – croupous type, diphtheria type), purulent and its special forms, putrid, hemorrhagic, catarrhal, mixed.

Productive inflammation, its types: interstitial, granulomatous, inflammation around foreign bodies and parasites, inflammation with the formation of polyps and poited condylomas. Causes, mechanism of development, morphological characteristics, outcomes of productive inflammation. Granulomatosis. The kinetics of granulomatosis.

The concept of specific inflammation. Morphology of inflammation in tuberculosis, syphilis, leprosy, scleroma, sarcoidosis.

1.5. Immunopathological processes

Thymus changes in disorders of immune system. Age and acidental involution (transformation), hypoplasia and hyperplasia of the thymus. Thymomegaly as an expression of congenital immune deficiency.

Changes of peripheral lymphoid tissue in disorders of immune system, morphological characteristics.

Hypersensitivity reactions, their types, transplant immunity reactions, morphogenesis, morphological and immunohistochemical characteristics, association with inflammation.

Autoimmunization and autoimmune diseases: etiology, mechanism of development, classification, morphological characteristics.

Immunodeficiency (primary and secondary), clinical and morphological characteristics. Acquired immunodeficiency syndrome (AIDS).

1.6. Adaptive and compensatory processes

The essence, biological and medical significance of adaptation and compensation.

The processes of adaptation and compensation

Adaptation. Definition, essence. Types of adaptive reactions: atrophy, hypertrophy, hyperplasia, organization, rearrangement of tissues, metaplasia, dysplasia.

Compensation. Definition, essence. Types of compensation. Working (compensatory) and vicarious (substitution) hypertrophy.

Regeneration: definition, essence and biological importance of regeneration, regulation mechanisms. Cellular and intracellular forms of regeneration. General and local conditions determining the course of regenerative process.

Morphogenesis of regenerating process, phases of proliferation and differentiation and their characteristics. Concept of cambial elements, precursor cells,

stem cells.

Types of regeneration: physiological, reparative, pathological. Their morphological characteristic. Complete and incomplete regeneration. Regenerative hypertrophy.

Regeneration of separate tissues and organs. Regeneration of blood, vessels, connective, fat, cartilaginous, bone, muscular tissue and epithelium. Wound healing.

Sclerosis and cirrhosis. Concept, causes, mechanism of development, morphological characteristics. Relation of sclerosis and cirrhosis to chronic inflammation.

1.7. Tumors and blood diseases

Definition of the nature of tumor growth, spreading of tumors.

Etiology of tumors. Current theories of tumor growth.

Morphogenesis and histogenesis of tumors. Pre-tumor (precancerous) conditions and changes, their essence, morphology. Dysplasia and cancer, their essence and morphology. Pre-tumorous processes of tissues of dentomandibular system. The concept of tumor progression (Fulds). Immune response to tumor. Importance of biopsy in oncology.

Tumor structure, features of tumor tissue and tumor cells.

Tumor growth - expansive, infiltrative and opposite; exophytic and endophytic.

Benign, malignant tumors and tumors with local destructive growth. Criteria for malignancy. Metastasis, types, patterns. Secondary changes in tumor.

Modern classification of tumors. Principles of its construction.

Epithelial tumors benign and malignant. Cancer and its types.

Benign and malignant mesenchymal tumors. Sarcoma, general characteristics. Mesenchymal tumors of the DMS.

Benign and malignant tumors of melanin-forming tissue. Nevus, melanoma.

Brain tumors. Classification. Tumors of the nervous system and meninges. Features of neuroepithelial tumors.

Tumors of the DMS, classification. Odontogenic tumors of epithelial origin, benign and malignant, types, morphology. Odontogenic tumors of mesenchymal origin, types, morphology. Odontogenic tumors of mixed origin, types, morphology. Non-odontogenic tumors, types, morphology.

Anemia. Causes, pathogenesis, types, classification. General morphological characteristic of acute and chronic anemia.

Hemoblastosis. Classification.

Leukemias –- systemic tumor diseases of hematopoietic tissue. Causes, pathogenesis, forms, morphological characteristics. Acute leukemia, its types. Chronic leukemia of myelocytic, lymphocytic and monocytic origin. Paraproteinemic leukemias (myeloma disease, primary Waldenstrom macroglobulinemia, Franklin heavy chain disease).

Lymphomas – regional tumor diseases of the hematopoietic system. Causes, pathogenesis, forms, morphological characteristics. Lymphogranulomatosis (Hodgkin's disease). Non-Hodgkin's lymphomas.

Thrombocytopenias and thrombocytopathies. Causes, mechanisms of

development, morphological manifestations.

2. SPECIFIC PATHOLOGICAL ANATOMY

2.1. Diseases of the cardiovascular system

Atherosclerosis: etiology, pathogenesis, morphological characteristics. Stages of atherosclerosis, clinical and morphological forms, morphological characteristics, causes of death.

Arterial hypertension and symptomatic hypertension: etiology, pathogenesis, pathological anatomy. Benign and malignant arterial hypertension. Clinical and morphological forms of arterial hypertension, morphological characteristics, causes of death.

Coronary heart disease: definition, etiology, pathogenesis, risk factors. Myocardial infarction. Morphology of acute, recurrent, repeated myocardial infarction. Complications and causes of death. Chronic coronary heart disease. Morphological characteristics, complications, causes of death.

Primary and secondary cardiomyopathies: causes, pathogenesis, morphological characteristics. Alcoholic cardiomyopathy.

Vasculitis: causes, mechanism of development, morphological characteristics, outcomes. Non-specific aortoarteritis (Takayasu's disease), temporal arteritis (Horton's disease), polyarteritis nodosa, Wegener's granulomatosis, obliterative thrombangitis (Buerger's disease). Primary and secondary vasculitides

Cerebrovascular diseases: etiology, pathogenesis, morphological characteristics.

2.2. Rheumatic diseases

The concept of rheumatic diseases. Morphology of immune disorders and processes of systemic disorganization of connective tissue, general morphological characteristics of rheumatic diseases.

Acute rheumatic fever: etiology, pathogenesis, pathological anatomy. Immunomorphological characteristics; dynamics of changes; mucoid and fibrinoid swelling, granulomatosis, sclerosis. Clinical and anatomical forms. Changes of the heart (endocarditis, myocarditis, pericarditis) and vessels. Rheumatic heart defects. Changes of the lungs, nervous system, kidneys and other organs. Complications, causes of death.

Rheumatoid arthritis: etiology, pathogenesis, pathological anatomy, immunomorphological characteristics. Changes of synovial membrane, cartilage and periarticular connective tissue. Visceral manifestations: mechanism of development, morphology, outcomes. Complications, causes of death.

Systemic lupus erythematosus: etiology, pathogenesis, pathological anatomy, immunomorphological characteristics. Changes of vessels, kidneys, heart. Complications, causes of death.

Systemic scleroderma (systemic progressive sclerosis): etiology, pathogenesis, pathological anatomy, visceral manifestations, complications, causes of death.

Polyarteritis nodosa: etiology, pathogenesis, pathological anatomy.

Dermatomyositis: etiology, pathogenesis, pathological anatomy, complications and causes of death.

2.3. Diseases of the respiratory system

Acute inflammatory lung diseases (acute pneumonia), classification, its principles.

Lobar pneumonia: etiology, pathogenesis, pathological anatomy, pulmonary and extrapulmonary complications.

Focal pneumonia: etiology, pathogenesis, pathological anatomy. Features of focal pneumonia depending on etiology and pathogenesis - viral, bacterial, fungal (candidiasis). Complications of focal pneumonia.

Interstitial pneumonia: etiology, pathogenesis, general morphological characteristics, outcomes.

Chronic obstructive pulmonary diseases. Chronic bronchitis, bronchiectasis, pulmonary emphysema, bronchial asthma. Chronic abscess and chronic pneumonia. Interstitial lung diseases, pneumofibrosis. Etiology, pathogenesis, pathological anatomy of various nosological forms.

Lung cancer: distribution, etiology, pathogenesis, precancerous conditions, clinical and morphological characteristics. Morphological characteristics of root and peripheral lung cancer, the nature of growth, complications, roentgenoanatomical and histological forms. Regularities of metastasis.

Acute respiratory viral infections: etiology, common pathogenetic links of development.

Influenza: etiology, forms of course and their morphological characteristics, complications and causes of death.

Oral changes, associated with acute and chronic lung diseases.

2.4. Diseases of the gastrointestinal tract

Tonsillitis: causes, mechanism of development. Primary and secondary, acute and chronic tonsillitis, pathological anatomy, complications.

Esophageal diverticula: congenital and acquired, general characteristics.

Esophagitis: causes, types, morphological characteristics, complications.

Esophageal cancer: etiology, pathogenesis, classification, morphological characteristics, complications.

Gastritis: acute and chronic.

Acute gastritis: causes, mechanism of development, morphological forms and their characteristics, complications.

Chronic gastritis: causes, mechanism of development, morphological forms, their characteristics, complications. Chronic gastritis as a precancerous condition of the stomach.

Gastric and duodenal ulcers, acute and chronic ulcers. The concept of erosion of the mucous membrane of the stomach and duodenum. Symptomatic gastroduodenal ulcers: etiology, pathogenesis, types, pathohistological characteristics, complications.

Peptic ulcer of stomach and duodenum: etiology, pathogenesis, pathological anatomy during exacerbation and remission, complications, outcomes. Chronic

gastric ulcer as a precancerous condition.

Gastric cancer: distribution, etiology, pathogenesis, precancerous conditions and changes, clinical and morphological classification. Morphological characteristics of gastric cancer with predominantly exo- and endophytic growth pattern, histological forms, complications, patterns of metastasis.

Crohn's disease: causes, mechanism of development, pathological anatomy, complications.

Ulcerative colitis: causes, mechanism of development, pathological anatomy, complications.

Appendicitis: distribution, etiology, pathogenesis, classification. Pathological anatomy of acute and chronic appendicitis, complications, peculiarities in young children.

Tumours of the intestine. Colon cancer: distribution, etiology, pathogenesis, forms, morphological characteristics, patterns of metastasis, complications.

Peritonitis: clinical and morphological characteristics.

2.5. Liver diseases

Hepatosis: hereditary and acquired, acute and chronic.

Massive liver necrosis (toxic liver dystrophy) as a variant of acute hepatosis, etiology, pathogenesis, pathological anatomy, complications, outcomes.

Fatty hepatosis (liver steatosis): etiology, pathogenesis, pathological anatomy, complications, outcomes. The role of alcohol in the development of hepatic steatosis.

Hepatitis acute and chronic, primary and secondary. Congenital hepatitis. The importance of puncture liver biopsy in the creation of modern classification of hepatitis. Morphological characteristics of hepatitis.

Viral hepatitis: classification, etiology, epidemiology and pathogenesis, clinical and morphological forms, their morphological characteristics, complications, outcomes. Viral hepatitis and liver cirrhosis.

Alcoholic hepatitis (acute and chronic): mechanism of development, morphological characteristics, complications, outcomes. Alcoholic hepatitis and liver cirrhosis.

Drug-induced hepatitis: mechanism of development, morphological characteristics.

Autoimmune hepatitis: mechanism of development, morphological characteristics.

Liver cirrhosis: etiology, pathogenesis and morphogenesis, classification. Types of liver cirrhosis, their morphological characteristics, complications, causes of death.

Liver cancer: causes, significance of liver cirrhosis as a precancerous condition, forms (macro- and microscopic), complications, patterns of metastasis.

Diseases of the gallbladder (cholecystitis, gallbladder cancer, gallstone disease).

Diseases of the pancreas. Pancreatitis acute and chronic:

Causes, mechanism of development, pathological anatomy, complications. Alcoholic pancreatitis.

Pancreatic cancer: causes, mechanism of development, frequency of localisation in different parts of the gland, morphological characteristics.

2.6. Diseases of the endocrine glands

Diseases of the pituitary gland. Acromegaly and gigantism: etiology, pathogenesis, morphological characteristics.

Pituitary dwarfism: etiology, pathogenesis, morphological characteristics.

Icenko-Cushing's disease: etiology, pathogenesis, morphological characteristics, causes of death.

Adipose-genital dystrophy: etiology, pathogenesis, morphological characteristics.

Non-sugar diabetes: etiology, pathogenesis, morphological characteristic.

Simmonds' disease.

Diseases of adrenal glands. Addison's disease: etiology, pathogenesis, morphological characteristics, causes of death.

Adreno-genital syndrome: types, morphological characteristics, complications.

Diseases of the thyroid gland. Goiter (struma): classification, causes, mechanism of development. Diffuse and nodular, colloidal and parenchymatous goiter. Endemic, sporadic, Graves' disease, autoimmune thyroiditis (Hashimoto's thyroiditis), Riedel's goiter. Pathological anatomy, complications, causes of death. Hypothyroidism and hyperthyroidism: causes, morphological characteristics.

Thyroid tumors: morphology, complications.

Pancreas. Diabetes mellitus: etiology, pathogenesis, pathological anatomy. Macro- and microangiopathy as a manifestation of diabetes mellitus. Types of diabetic microangiopathy, morphology; diabetic glomerulosclerosis. Complications. Causes of death.

2.7 Kidney diseases

Modern clinical and morphological classification of renal diseases.

Glomerulonephritis: modern classification, etiology, pathogenesis. Immunomorphological characteristics of various forms of glomerulonephritis. Acute, rapidly progressive and chronic glomerulonephritis: pathological anatomy, complications, outcomes.

Minimal change disease: causes, pathogenesis, morphological characteristics, complications, outcomes.

Membranous nephropathy (membranous glomerulonephritis): causes, pathogenesis, morphological characteristics, complications, outcomes.

Focal segmental glomerular sclerosis-hyalinosis.

Renal amyloidosis: causes, pathogenesis, morphological characteristics of stages, complications, outcomes.

Acute renal failure (acute tubular injury) - necrotizing nephrosis: causes, pathogenesis, morphological characteristics of stages, complications, outcomes.

Tubulo-interstitial nephritis: etiology, pathogenesis, pathological anatomy, complications, outcomes.

Acute and chronic pyelonephritis: etiology, pathogenesis, pathological anatomy, complications, outcomes, peculiarities in children.

Renal stone disease (nephrolithiasis): etiology, pathogenesis, pathological anatomy, complications, outcomes. Connection with pyelonephritis.

Features of nephrolithiasis in children.

Polycystic kidney: morphological characteristics.

Nephrosclerosis: causes, patho- and morphogenesis, types, morphological characteristics.

Chronic renal failure: pathogenesis, morphological characteristics, pathomorphosis in connection with the use of renal replacement therapy (dialysis, kidney transplantation).

Renal tumours. Renal cell cancer: causes, morphological characteristics.

Cancer of the pelvis and bladder.

2.8. Infectious diseases

General characteristics of infectious diseases.

Biological and social factors in the development of infectious disease. Reactivity of the organism, age and infection. General morphological characteristics of the infectious process, local and general changes. Immunomorphological characteristic of infection. Classification of infectious diseases. The pathogen, entry gate, pathogenesis of infection. Cyclic and acyclic infections. Complications of infectious diseases, causes of death. Pathomorphosis of infectious diseases.

Viral diseases: features of infection, general morphological characteristics.

HIV infection: etiology, epidemiology, pathogenesis, stages, morphological characteristics of AIDS, complications, causes of death.

COVID-19: etiology, pathogenesis, morphological characterisation, complications, causes of death.

Measles: etiology, pathogenesis, morphological characteristics, complications, causes of death.

Chickenpox: etiology, pathogenesis, morphological characteristics, complications, causes of death.

Diseases caused by bacteria: general morphological characteristics, peculiarity of infection in connection with the peculiarities of the causative agent and the way of its transmission.

Intestinal bacterial infections (typhoid fever, salmonellosis, dysentery, yersiniosis, intestinal coli-infection, cholera): etiology, epidemiology, pathogenesis, pathological anatomy, complications, causes of death. Cholera as a quarantine (conventional) disease.

Airborne bacterial infections (meningococcal infection, diphtheria, scarlet fever, whooping cough): etiology, epidemiology, pathogenesis, pathological anatomy, complications, causes of death.

Syphilis: etiology, pathogenesis. Primary, secondary, tertiary syphilis. Congenital syphilis. Pathological anatomy, complications of syphilis, causes of death. Pathomorphosis of syphilis.

Tuberculosis: etiology, pathogenesis. Primary, secondary, haematogenous tuberculosis. Clinical and pathological anatomical classification, pathological anatomy, complications of tuberculosis, causes of death. Pathomorphosis of

tuberculosis.

Fungal diseases (mycoses). Dermatomycoses. Visceral mycoses. Classification, types, morphological characteristics of fungal diseases.

Diseases caused by protozoa and helminths: features of the causative agent, general morphological characteristics.

Echinococcosis, cysticercosis, opisthorchiasis and trichenelosis: etiology, epidemiology, pathogenesis, morphological characteristics, complications.

Sepsis. Third international consensus on sepsis and septic shock: definition of sepsis and septic shock, etiology of sepsis, place of sepsis in clinical and pathological diagnosis.

Morphological signs of generalised infectious process, complications of sepsis, causes of death.

Bacterial shock: definition, breakthrough factors, entrance gate, synonyms, pathological anatomy, pathogenesis, organ manifestations.

2.9. Genital and pregnancy pathology

Dyshomonal diseases. Benign prostatic hyperplasia (dyshormonal hypertrophic prostatopathy): forms, morphological characteristics, complications.

Glandular hyperplasia of the uterine mucosa: morphological characteristics, complications.

Benign dysplasias of the breast: classification, non-proliferative and proliferative forms, morphological characteristic, complications.

Gynaecomastia: morphological characteristics, complications.

Uterine cancer: frequency, causes, precancerous conditions, classification, morphological characteristics, peculiarities of the course of cervical and uterine body cancer, histological forms, pattern of metastasis, complications.

Ovarian cancer: incidence, cause, classification, morphological characteristics, complications.

Breast cancer: incidence, causes, precancerous conditions, classification, morphological characteristics, histological forms, pattern of metastasis, complications.

Testicular cancer: classification, morphological characteristics, complications.

Gestosis: etiology, pathogenesis, types, pathological anatomy, causes of death.

Ectopic pregnancy: causes, types, morphological characteristics, complications.

Spontaneous abortion, premature labour: causes, morphological diagnosis.

Hydatidiform mole: morphological characteristics, complications.

Chorionepithelioma: morphological characteristics, character of metastasis.

Placental polyp.

Uterine obstetrical infection: causes, pathogenesis, morphological characteristics, complications.

Inflammation of the afterbirth: types, nomenclature. Placental chorioamnionitis.

Placental insufficiency: primary, secondary, acute, chronic.

Violation of maturation of chorionic villi: accelerated, delayed, dissociated. Absolute placental insufficiency.

Pathological immaturity of the placenta: variant embryonic villi, variant intermediate villi, variant sclerosed chaotic villi, variant dissociated development, chorangiosis, obliterative angiopathy.

Pathology of the membranes: high water, low water, nodular amnion, amniotic strands, subamniotic haematoma.

Placenta in case of harmful habits of the mother: smoking, alcoholism, cocaine use.

2.10. Perinatal pathology and perinatal infections

Perinatal pathology: definition, periodisation, types of fetopathies, pathogenesis, general morphological characteristics of non-infectious fetopathies. Prematurity and prematurity: causes, morphological characteristics. Asphyxia (anoxia) of the fetus and newborn: pathogenesis, morphological characteristics.

Pneumopathies: classification, pathogenesis, morphological characteristics. Congenital pneumonias: etiology, pathogenesis, morphological characteristics. Birth trauma: classification, morphological characteristics. Perinatal disorders of cerebral circulation. Haemorrhagic and haemolytic diseases of newborns.

Perinatal infections. The peculiarity of perinatal infections, their pathological anatomy. Herpes simplex, cytomegaly, measles, toxoplasmosis, listeriosis, chlamydia: etiology, epidemiology, pathogenesis, pathological anatomy, complications, causes of death

2.11. Prenatal pathology (congenital malformations)

Prenatal pathology. The concept of periodisation and regularities of progenesis and cymatogenesis. Diseases of progenesis and cymatogenesis: causes, mechanism of development, morphological characteristics. Gametopathies, blastopathies, embryopathies.

Congenital malformations (CMD): definition, cellular and tissue mechanisms of teratogenesis, the concept of definition of teratogenic terminal period and critical periods, etiology, classification, basic principles. Terminology in teratology. Definition of syndromes of multiple congenital malformations, examples. Phenotypic characterisation of Down syndrome, Patau syndrome and alcohol syndrome. The main congenital malformations of individual organs and systems.

Hereditary disorders of connective tissue: monogenic (Marfan, Ehlers-Danlos, Louis-Dietz, etc.) and multifactorial syndromes.

ACADEMIC DISCIPLINE CURRICULAR CHART

Section, topic #	Section (topic) name	number of hours			Self-studies	Form of control
		lectures	supervised student independent work	practical		
	5 semester					
1.	**General pathological anatomy**	**14**	**5**	**51**	**55**	
1.1	**Introduction to the academic discipline «Pathologic Anatomy»**	**2**	-	**3**	-	Interviews
1.2	**Reversible cell injury (dystrophies). Irreversible cell injury (necrosis)**	**2**	**1**	**12**	**12**	
	Reversible cell injury. Parenchymatous dystrophies	2	1	3	3	Interviews, tests, electronic tests
	Reversible cell injury. Stromal-vascular dystrophies	-	-	3	3	Interviews, tests, electronic tests
	Reversible cell injury. Mixed dystrophies	-	-	3	3	Interviews, tests, electronic tests
	Necrosis, apoptosis	-	-	3	3	Interviews, tests, electronic tests
1.3	**Circulatory disorders**	**2**	**1**	**6**	**8**	
	Circulatory disorders: arterial and venous haemorrhage, stasis.	2	1	3	4	Interviews, situational tasks, tests, electronic tests
	Circulatory disorders: thrombosis, embolism.	-	-	3	4	Interviews, situational tasks, tests, electronic tests
1.4	**Inflammation**	**2**	**1**	**9**	**9**	
	Biological significance of inflammation. Exudative inflammation	2	1	3	3	Interviews, tests, electronic tests
	Productive inflammation.	-	-	3	3	Interviews, tests, situational tasks electronic tests
	Specific inflammation	-	-	3	3	Interviews, tests, seminar reports, situational tasks

1.5	**Immunopathological processes**	-	-	**6**	**8**	
	Immunopathological processes	-	-	3	2	Interviews, tests, seminar reports, electronic tests
	Final class «Inflammation. Immunopathological processes»	-	-	3	4	Situational tasks, tests, electronic tests, colloquium
1.6	**Adaptive and compensatory processes**	-	-	**3**	2	Interviews, tests, electronic tests
1.7	**Tumors and blood diseases**	**6**	**2**	**12**	**18**	
	Nature of tumor growth. Epithelial tumors	2	0,5	3	4	Interviews, tests, electronic tests
	Mesenchymal and melanin-forming tissue tumors. Tumors of the nervous system	2	0,5	3	4	Interviews, tests, electronic tests
	Diseases of the blood system	2	1	3	4	Interviews, tests, seminar reports, electronic tests
	Final class «Tumors. Diseases of the blood system»	-	-	3	6	Situational tasks, tests, electronic tests, colloquium
	6 semester					
2.	**Specific pathological anatomy**	**12**	**4**	**45**	**51**	
2.1	**Diseases of the cardiovascular system**	-	-	**6**	**3**	
	Autopsy. Macrospeciments and slides	-	-	3	3	Interviews
	Diseases of the cardiovascular system	-	-	3	3	Interviews, tests, seminar reports, electronic tests
2.2	Rheumatic diseases	-	-	3	3	Interviews, tests, electronic tests
2.3	Diseases of the respiratory system	2	0,5	3	3	Interviews, tests, seminar reports, electronic tests
2.4	Diseases of the gastrointestinal tract	-	-	3	3	Interviews, tests, electronic tests
2.5	Liver diseases	2	0,5	3	3	Interviews, tests, seminar reports, electronic tests
2.6	Diseases of the endocrine glands.	-	-	3	3	Interviews, tests, seminar reports
2.7	Kidney diseases	2	-	3	3	Interviews, tests, seminar reports, electronic tests
2.8	**Infectious diseases**	**2**	**1**	**9**	**11**	
	Intestinal infections	-	-	3	4	Interviews, tests, electronic tests
	Pediatric infections	2	1	3	4	Interviews, tests, seminar reports,

						electronic tests
	Tuberculosis and mycosis	-	-	3	3	Interviews, tests, electronic tests
2.9	Genital and pregnancy pathology	2	0,5	3	4	Interviews, tests, electronic tests
2.10	Perinatal pathology and perinatal infections	2	0,5	3	4	Interviews, tests, electronic tests
2.11	**Prenatal pathology (congenital malformations)**	-	-	**6**	**8**	
	Prenatal pathology	-	-	3	3	Interviews, tests, seminar reports, electronic tests
	Congenital malformations	-	-	3	5	Interviews, situational tasks, tests, seminar reports, electronic tests, oral examination
		26	**9**	**96**	**105**	

INFORMATION AND INSTRUCTIONAL UNIT

LITERATURE

Basic (relevant):

1. Robbins Basic Pathology / V. Kumar [et al.]. – 10th ed. – Elsevier, 2018. – 937 p.

Additional:

2. Harsh, M. Textbook of Pathology – 8th ed. – USA : Jaypee Brothers Medical Publishers (P) Ltd, 2019. – 933 p.

3. Klatt, E. C. Robbins and Cotran Atlas of Pathology / Klatt, Edward C. – 2nd ed. – Elsevier, 2014. – 600 p.

METHODOLOGICAL RECOMMENDATIONS FOR THE ORGANIZATION AND PERFORMANCE OF STUDENT INDEPENDENT WORK IN THE ACADEMIC DISCIPLINE

The time provided for self-activity, can be used by students for:

preparation for lectures and practical classes;

preparation for control classes, credit and examination in the discipline;

studying the topics (questions) submitted for self-research; solving situational tasks;

research and creative assignments;

preparation of thematic reports, essays, presentations;

taking notes on academic literature;

preparation of a review of scientific literature on a certain topic;

design of information and demonstration materials (stands, posters, graphs, tables, newspapers, etc.);

making models, laboratory and teaching aids;

compiling a thematic selection of literary sources, Internet sources;

compilation of tests by students to organize self-control.

METHODOLOGICAL RECOMMENDATIONS FOR THE ORGANIZATION AND PERFORMANCE OF SUPERVISED STUDENT INDEPENDENT WORK IN THE ACADEMIC DISCIPLINE

Main forms of supervised student independent work:

preparation and presentation of abstracts;

presentation of reports;

studying topics and problems that have not been discussed at the lectures;

taking notes of original sources (sections of anthologies, collections of documents, monographs, textbooks);

computer testing.

Control of supervised student independent work is carried out in the form of:

test paper;

final class, colloquium in the form of an oral interview, written work, testing;

discussion of abstracts;

defense of educational assignments;
assessment of an oral reply to a question, presentation, report or problem solving;
checking up abstracts, written reports, accounts, prescriptions;
checking up notes of original sources, monographs and articles;
individual interview;
other tools.

LIST OF AVAILABLE DIAGNOSTIC TOOLS

The following forms are used for competences assessment:
1. Oral form:
interviews;
colloquiums;
seminar reports;
situational tasks.
2. Written form:
tests.
3. Oral-written form:
credits;
examinations.
4. Technical form:
electronic tests.

LIST OF AVAILABLE TEACHING METHODS

Traditional method (lecture, laboratory practicals);
Active (interactive) methods:
Problem-Based Learning (PBL);
Case-Based Learning (CBL);
Research-Based Learning (RBL).

LIST OF PRACTICAL SKILLS

1. Diagnosis of pathological processes and diseases by macroscopic changes in organs and tissues.
2. Diagnosis of pathological processes and diseases by microscopic changes.
3. Clinical and morphological analysis of clinical cases.

LIST OF EQUIPMENT USED

1. Light microscopes.
2. Histological slides (samples of pathological processes).
3. Museum of pathological processes.
4. Pathological atlases, tables.

LIST OF LECTURES

Semester 5

1. Introduction to the academic discipline «Pathologic Anatomy».
2. Reversible cellular damage. Parenchymatous dystrophies.

3. Circulatory disorders: arterial and venous congestion, stasis.
4. Biological significance of inflammation. Exudative inflammation.
5. Nature of tumor growth. Epithelial tumors.
6. Mesenchymal and melanocytic tumors. Tumors of the nervous system.
7. Diseases of the blood system.

Semester 6

1. Diseases of the respiratory system.
2. Liver diseases.
3. Kidney disease.
4. Pediatric infections.
5. Genital and pregnancy pathology.
6. Perinatal pathology and perinatal infections.

LIST OF LABORATORY (PRACTICAL) STUDIES

Semester 5

1. Introduction to Pathology.
2. Reversible cellular damage. Parenchymatous dystrophies.
3. Reversible cellular damage. Stromal-vascular dystrophies.
4. Reversible cellular damage. Mixed dystrophies.
5. Necrosis, apoptosis.
6. Circulatory disorders: arterial and venous haemorrhage, stasis.
7. Circulatory disorders: thrombosis, embolism.
8. General doctrine of inflammation. Exudative inflammation.
9. Productive inflammation.
10. Specific inflammation.
11. Immunopathological processes.
12. Final class «Inflammation. Immunopathological processes».
13. Adaptation and compensation (adaptation).
14. Nature of tumor growth. Epithelial tumors.
15. Mesenchymal and melanocytic tumours. Tumours of the nervous system.
16. Diseases of the blood system.
17. Final class «Tumors. Diseases of the blood system».

Semester 6

1. Autopsy. Macrospeciments and slides.
2. Diseases of the cardiovascular system.
3. Rheumatic diseases.
4. Diseases of the respiratory system.
5. Diseases of gastrointestinal tract.
6. Liver diseases.
7. Diseases of the endocrine glands.
8. Kidney diseases.
9. Intestinal infections.
10. Pediatric infections.
11. Tuberculosis and mycoses.
12. Genital and pregnancy pathology.
13. Perinatal pathology and perinatal infections.
14. Prenatal pathology.
15. Congenital malformations.

PROTOCOL OF THE CURRICULUM APPROVAL BY OTHER DEPARTMENTS

Title of the discipline requiring approval	Department	Amendments to the curriculum in the academic discipline	Decision of the department, which designed the curriculum (date, protocol #)
1.Internal Medicine	Department of Internal Diseases	No	14.10.2022, protocol #2
2. Paediatrics	Department of Childhood Diseases	No	14.10.2022, protocol #2
3. Infectious diseases	Department of Infectious Diseases	No	14.10.2022, protocol #2
4. Dermatovenerology	Department of Skin and Venereal Diseases	No	14.10.2022, protocol #2
5. Obstetrics and gynaecology	Department of Obstetrics and Gynaecology	No	14.10.2022, protocol #2
6. Neurology and neurosurgery	Department of Nervous and Neurosurgical Diseases	No	14.10.2022, protocol #2
7. Forensic medicine	Department of Forensic medicine	No	14.10.2022, protocol #2
8. Surgical diseases	Department of Surgical diseases	No	14.10.2022, protocol #2
9. Phthisiopulmonology	Department of Phthisiopulmonology	No	14.10.2022, protocol #2
10. Ophthalmology	Department of Eye Diseases	No	14.10.2022, protocol #2
11. Otolaryngology	Department of Ear, Nose and Throat Diseases	No	14.10.2022, protocol #2
12. Oncology	Department of Oncology	No	14.10.2022, protocol #2

COMPILERS/AUTHORS:

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Associate Professor of the Department of Pathological Anatomy of the Educational Institution «Belarusian State Medical University», PhD, Associate Professor _____ M.V.Dmitrieva

Curriculum content, composition and the accompanying documents comply with the established requirements.

Dean of the Medical Faculty for International Students of the educational institution «Belarusian State Medical University» _____ O.S.Ishutin
25.06.23

Methodologist of the educational institution «Belarusian State Medical University» _____ S.V.Zaturanova
25.06.23