

Summary of the working program of the academic discipline

«MICROBIOLOGY, VIROLOGY – MICROBIOLOGY OF THE ORAL CAVITY»

General Educational Program of higher education **31.05.03 DENTISTRY**

Department: **EPIDEMIOLOGY, MICROBIOLOGY AND EVIDENCE-BASED MEDICINE**

1. The purpose of mastering the discipline: *participation in forming the relevant competencies UC-1, UC-8, GPC-5, GPC-9, PC-3, PC-6 (mastering by students the theoretical foundations and patterns of interaction of micro- and macroorganism, practical skills in methods of prevention, microbiological, molecular biological and immunological diagnostics, the main directions of treatment of infectious and opportunistic human diseases manifested in the oral cavity).*

2. Position of the academic discipline in the structure of the General Educational Program (GEP).

2.1. The discipline "Microbiology, virology – microbiology of the oral cavity" refers to the core part of Block 1 of GEP HE (B1.O.18).

The discipline is taught in 3 and 4 semester II year of study.

3. Deliverables of mastering the academic discipline and metrics of competence acquisition

Mastering the discipline aims at acquiring the following universal (UC) or/and general professional (GPC) or/and professional (PC) competencies

№	Competence code	The content of the competence (or its part)	Code and name of the competence acquisition metric	As a result of mastering the discipline, the students should:		
				know	be able to	possess
1.	UC-1	Able to carry out a critical analysis of problem situations based on a systematic approach, develop an action strategy	1.1 Knows: methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis 1.2 Able to: gain new knowledge based on analysis, synthesis, etc.; collect data on complex scientific problems related to the professional field; search for information and solutions based on action, experiment and experience 1.3 Has practical experience: researching the problem of professional activity using analysis, synthesis	1.1 Knows: methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis	1.2 Able to: gain new knowledge based on analysis, synthesis, etc.; collect data on complex scientific problems related to the professional field; search for information and solutions based on action, experiment and experience	1.3 Has practical experience: researching the problem of professional activity using analysis, synthesis and other methods of intellectual activity; developing an action strategy to solve professional problems

			and other methods of intellectual activity; developing an action strategy to solve professional problems			
2.	UC-8	Able to: create and maintain safe living conditions in everyday and professional life for the preservation of the natural environment, ensuring sustainable development of society, including in the case of a threat and occurrence of emergency situations and military conflicts	8.1 Knows: factors of harmful influence on vital activity; algorithms of actions in case of emergencies and military conflicts 8.2 Able to: identify dangerous and harmful factors within the framework of its activities, create and maintain safe living conditions in everyday and professional life 8.3 Has practical experience in: participation in planned exercises to work out the rules of conduct in case of emergencies, first aid; complies with safety regulations at the workplace	8.1 Knows: factors of harmful influence on vital activity; algorithms of actions in case of emergencies and military conflicts	8.2 Able to: identify dangerous and harmful factors within the framework of its activities, create and maintain safe living conditions in everyday and professional life	8.3 Has practical experience in: participation in planned exercises to work out the rules of conduct in case of emergencies, first aid; complies with safety regulations at the workplace
3.	GP C-5	Able to conduct an examination of the patient in order to establish a diagnosis in solving professional problems	5.1 Knows the methodology for collecting anamnesis of life and diseases, complaints from children and adults (their legal representatives); 5.2 Is able to: collect complaints, anamnesis of life and disease in children and adults (their legal representatives), identify risk factors and causes of diseases; 5.3 Has practical experience in: collecting complaints,	method of examination and physical examination; clinical picture, diagnostic methods of the most common diseases; methods of laboratory and instrumental studies for assessing the state of health, medical indications for conducting studies, rules for interpreting their results; international statistical classification of diseases and related health problems (ICD); conditions requiring emergency medical attention - risk factors for the	apply methods of examination and physical examination of children and adults; interpret the results of the examination and physical examination of children and adults; diagnose the most common pathology in children and adults; refer children and adults to laboratory, instrumental and additional studies in accordance with the current procedures for the	examination and physical examination skills for children and adults; diagnosis of the most common diseases in children and adults; identification of risk factors for major cancers; formulating a preliminary diagnosis, drawing up a plan for instrumental, laboratory, additional

			<p>anamnesis of life and diseases in children and adults (their legal representatives), identifying risk factors and causes of diseases;</p>	<p>occurrence of infectious diseases; a plan for conducting laboratory, instrumental and additional studies in children and adults in accordance with the procedures for providing medical care, clinical recommendations, taking into account the standards of medical care; - bases of carrying out differential diagnostics of diseases; recognition of conditions arising from sudden acute illnesses, exacerbation of chronic diseases without obvious signs of a threat to the patient's life and requiring emergency medical care - clinical signs of sudden acute diseases, conditions, exacerbations of chronic diseases without obvious signs of a threat to life, requiring emergency medical care</p>	<p>provision of dental care, clinical guidelines, taking into account the standards of medical care; refer children and adults for consultations to specialist doctors in accordance with the procedures for providing medical care, clinical recommendations, taking into account the standards of medical care; interpret and analyze the results of consultations by medical specialists for children and adults; interpret and analyze the results of basic (clinical) and additional (laboratory, instrumental) examination methods; conduct differential diagnosis of diseases in children and adults;</p>	<p>studies, consultations with specialist doctors; referral of patients for instrumental, laboratory, additional studies, consultations of medical specialists in accordance with the current procedures for the provision of medical care, clinical recommendations, taking into account the standards of medical care; interpretation of data from additional (laboratory and instrumental) examinations of patients; making a preliminary diagnosis in accordance with the international statistical classification of diseases and related health problems (ICD);</p>
4.	GP C-9	<p>GPC-5. Able to assess morphofunctional, physiological conditions and pathological processes in the human body to solve professional problems</p>	<p>5.1 Knows: anatomy, histology, embryology, topographic anatomy, physiology, pathological anatomy and physiology of human organs and systems 5.2 Able to: evaluate the basic morphological and functional data, physiological conditions and pathological</p>	<p>- safety regulations and work in physical, chemical, biological laboratories, with reagents, instruments, animals; - pathological anatomy and physiology of human organs and systems, possible pathological processes associated with the vital activity of microorganisms, the effect of enzymes and bacterial toxins on homeostasis - the main disciplines for assessing pathological</p>	<p>evaluate the main morphological and functional data, physiological conditions and pathological processes in the human body associated with contamination by pathogenic microorganisms, including viruses and fungi; use laboratory equipment; work with magnifying equipment; interpret the</p>	<p>assessment of basic morphofunctional data, physiological conditions and pathological processes in the human body when solving professional problems, diagnosis of infectious lesions of the skin and mucous membranes of a person in the process of examining a</p>

			<p>processes in the human body</p> <p>5.3 Has practical experience in: assessment of basic morphological and functional data, physiological conditions and pathological processes in the human body when solving professional problems</p>	<p>processes in the human body - the biosphere and ecology, the phenomenon of parasitism and bioecological diseases; classification, morphology and physiology of microorganisms and viruses, their impact on the health of children and adolescents; - the spread of microbes, their impact on human health. Ecology of microorganisms, their role in the cycle of substances. methods of microbiological diagnostics -use of basic antibacterial, antiviral and biological drugs - the nature of the pathological process and its clinical manifestations, the principles of pathogenetic therapy of the most common diseases, in particular dental;</p>	<p>results of the most common methods of laboratory and functional diagnostics, thermometry to identify pathological processes in the organs and systems of patients; evaluate the main pathological processes in the human body - carry out sampling, marking and formalizing the direction of biological material from the patient and objects of the environment for microbiological examination; - to interpret the results of the most common methods of laboratory and functional diagnostics;</p>	<p>patient - skills to assess the main pathological processes in the human body - information on the principles of sterilization, disinfection and antiseptic treatment of instruments and equipment in order to avoid infection of the doctor and patient; - the skills of making a preliminary diagnosis based on the results of laboratory and instrumental examinations.</p>
5.	PC-3	<p>ability and readiness to carry out anti-epidemic measures and provide medical assistance in foci of dangerous infections, in case of deterioration of the radiation situation, natural disasters and other emergencies, including participation in copper -qing evacuation.</p>	<p>3.1 Knows: The algorithm for carrying out anti-epidemic measures and providing medical care in foci of dangerous infections, in case of deterioration of the radiation situation, natural disasters and other emergencies, including the procedure for participating in medical evacuation. IPC</p> <p>3.2 Able to: comply with anti-epidemic measures and provide the necessary medical</p>	<p>rules of work and safety in physical, chemical, biological and clinical laboratories, with reagents, instruments, animals; the chemical and biological essence of the processes occurring in a living organism at the molecular and cellular levels; the biosphere and ecology, the phenomenon of parasitism and bioecological diseases; classification, morphology and physiology of microorganisms and viruses, their impact on human health; Rules for the use of</p>	<p>Use personal protective equipment. Comply with the requirements of labor protection, fire safety, emergency procedures. to comply with anti-epidemic measures and provide the necessary medical care in the foci of dangerous infections - to substantiate the choice of material for research from the microbiological point of view when diagnosing infectious diseases; - use</p>	<p>medical-functional conceptual apparatus; methods of sterilization, disinfection and antiseptic treatment; information on the principles of sterilization, disinfection and antiseptic treatment of instruments and equipment in order to avoid infection of the doctor and patient; the skills of making a preliminary diagnosis based on the results of laboratory and</p>

			care in the centers of dangerous infections, including taking part in medical evacuation. IPC 3.3 Has practical experience: compliance with anti-epidemic measures and the provision of necessary medical care in the centers of dangerous infections.	personal protective equipment. Requirements for labor protection, fire safety, emergency procedures. scientific principles of sterilization, disinfection and antiseptic treatment to avoid infection when working in a dental practice;	physical, chemical and biological equipment; - work with magnifying equipment (microscopes, optical and simple magnifiers);	instrumental examination of patients. The use of personal protective equipment. Compliance with the requirements of labor protection, fire safety, emergency procedures.
6.	PC-6	readiness to collect, analyze complaints and other information from the patient (relatives/legal representatives), data from his anamnesis, interpretation of examination results, laboratory, instrumental, pathological-anatomical and other studies in order to recognize the state or establish the fact of the presence or absence of a dental disease, symptoms, syndromes of dental diseases, the establishment of nosological forms in accordance with the International statistical classification of diseases and health-related problems and other regulatory documents of the Ministry of Health of the Russian Federation	6.1 Knows: The methodology for collecting complaints and anamnesis from patients (their legal representatives). The procedure for providing medical care to children with dental diseases 6.2. Able to: interpret the results of the examination, laboratory, instrumental, pathoanatomical and other studies in order to recognize the condition or establish the presence or absence of a dental disease, symptoms, syndromes of dental diseases, the establishment of nosological forms in accordance with the International Statistical Classification of Diseases 6.3 Has practical experience: interpretation of the results of examination, laboratory, instrumental, pathoanatomical	Methods of physical examination of patients (examination, palpation, percussion, auscultation). The procedure for providing medical care to the adult population in case of dental diseases rules of work and safety precautions in physical, chemical, biological and clinical laboratories, with reagents, instruments, animals; the chemical and biological essence of the processes occurring in a living organism at the molecular and cellular levels; the biosphere and ecology, the phenomenon of parasitism and bioecological diseases; - classification, morphology and physiology of microorganisms and viruses, their impact on human health; - microbiology of the oral cavity; methods of microbiological diagnostics; the use of basic antibacterial, antiviral and biological drugs; scientific principles of sterilization, disinfection and	use laboratory equipment; work with magnifying equipment; interpret the results of the most common methods of laboratory and functional diagnostics, thermometry to identify pathological processes in the organs and systems of patients; to substantiate the nature of the pathological process and its clinical manifestations, the principles of pathogenetic therapy of the most common diseases, in particular dental ones; Develop a plan for the treatment of children and adults with dental diseases in accordance with the procedures for the provision of medical care, clinical guidelines, taking into account the standards of medical care.	medical-functional conceptual apparatus; methods of sterilization, disinfection and antiseptic treatment; information on the principles of sterilization, disinfection and antiseptic treatment of instruments and equipment in order to avoid infection of the doctor and patient; the skills of making a preliminary diagnosis based on the results of laboratory and instrumental examination of patients; development of a treatment plan for children and adults with dental diseases, taking into account the diagnosis, age and clinical picture in accordance with the current procedures for the provision of medical care, clinical guidelines, taking into account the standards of medical care

			and other studies in order to recognize the condition or establish the presence or absence of a dental disease.	antiseptic treatment to avoid infection when working in a dental practice; clinical guidelines on the provision of medical care to patients with dental diseases Standards of care (The procedure for providing medical care, the Standard of Medical Care, Clinical Guidelines on the provision of medical care, etc.)		determination of symptoms, syndromes of dental diseases, establishment of nosological forms in accordance with the International Statistical Classification of Diseases and Related Health Problems, and other regulatory documents of the Ministry of Health of the Russian Federation
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4. Volume of the academic discipline and types of academic work

Total labor intensity of the discipline is 5 CU (180 AH)

Type of educational work	Labor intensity		Labor intensity (AH) in semesters	
	volume in credit units (CU)	volume in academic hours (AH)	3	4
Classroom work, including	2,4	86	44	42
Lectures (L)		18	10	8
Laboratory practicum (LP)*		68	34	34
Practicals (P)				
Seminars (S)				
Student's individual work (SIW)	1,6	58	28	30
Mid-term assessment				
exam	1	36		exam 36
TOTAL LABOR INTENSITY	5	180	72	108

5. Sections of the academic discipline and competencies that are formed

No	Competence code	Section name of the discipline	The content of the section in teaching units
1	UC-1, UC-8, GPC-5, GPC-9, PC-3, PC-6	Introduction to medical microbiology. General bacteriology.	Medical microbiology. Subject and tasks. The main stages of development, the contribution of domestic scientists. The importance of medical microbiology in the practice of a dentist. The main groups of microorganisms. Principles of classification and nomenclature of microorganisms: morphological, biochemical, molecular genetic. Structural and functional organization of the bacterial cell. Structure and functions of the cell wall (three types of cell wall), cytoplasmic membrane, cytoplasm, nuclear substance. Inclusions, flagella. Environmentally dependent elements of bacteria: capsule, spores. Metabolism and cultivation of bacteria. Types of metabolism: anabolism and catabolism. Classification of microorganisms by types of nutrition and energy production. Bacterial respiration as biological oxidation. Microbial cell enzymes. Basic principles of cultivation and identification of bacteria by cultural and enzymatic properties. Atypical bacteria. Morphological features of actinomycetes,

			<p>rickettsias, chlamydia, mycoplasmas, spirochaetes. Significance in biology and medicine.</p> <p>Sterilization and disinfection. Methods of disinfection and sterilization. Principles of decontamination in dentistry. Antiseptics and disinfectants in dentistry.</p> <p>Variability of microorganisms. Phenotypic and genotypic variability. Modifications. Mutations. Spontaneous and induced mutations. Genetic recombination. Transformation. Transduction (general and specific). Conjugation. Extra-chromosomal factors of heredity (plasmids), their properties. The concept of genetic engineering.</p>
2	UC-1, UC-8, GPC-5, GPC-9, PC-3, PC-6	Antibacterial drugs.	<p>Microbiological bases of chemotherapy of infectious diseases. Antibiotics, chemotherapy drugs. Classification, spectrum and mechanism of action. Determination of the sensitivity of microbial flora to antimicrobial drugs.</p> <p>The problem of drug resistance of microorganisms. Side effect of antibiotics on the body.</p>
3	UC-1, UC-8, GPC-5, GPC-9, PC-3, PC-6	General virology	<p>History of virology development. Hypotheses about the origin and nature of viruses. Modern principles of classification and nomenclature of viruses. Features of the structural organization of viruses. Ecology of viruses. The concept of a virus and a virion. Viroids and prions, their role in pathology, stages of virus-cell interaction. Molecular bases of virus reproduction. Features of reproduction of RNA viruses (plus-RNA viruses, minus-RNA viruses), DNA viruses, retroviruses. Outcomes of virus-cell interaction. Productive, abortive and integrative infections. The persistence of viruses. Mechanisms and types of persistence. Virogenia.</p> <p>Methods of virus cultivation. Methods of studying viruses. Bacteriophages. Classification, mechanisms of interaction of a bacteriophage with a cell. Lysogeny. Concepts of profage. Practical significance of phages in biology and medicine.</p>
4	UC-1, UC-8, GPC-5, GPC-9, PC-3, PC-6	The basics mycology	<p>Classification and ultrastructure of fungi (micromycetes). Yeast: cultural features, organization of cells in colonies. Molds: cultural features, organization of cells in colonies. Dimorphic mushrooms. Manifestation of dimorphism. Sexual and asexual reproduction of fungi. Perfect and imperfect fungi (deuteromycetes).</p> <p>Characteristics of human mycoses: superficial, cutaneous, subcutaneous, systemic (deep). Factors of pathogenicity of fungi. Principles of diagnosis of mycoses. Principles of antifungal therapy.</p>
5	UC-1, UC-8, GPC-5, GPC-9, PC-3, PC-6	Infectious process. Pathogenicity and virulence of microorganisms.	<p>Infectious process. Infectious disease. Types of infection in the population: sporadic diseases, epidemic, pandemic. Natural focal infections. Primary, secondary (opportunistic), superinfection, relapse. Exogenous and endogenous infections. The concept of intrahospital infections. Forms of infection: acute, chronic, latent. The concept of the persistence of the pathogen. Reservoir and source of infection. Sapronoses, anthroponoses, zoonoses. Bacteriocarriage. Mechanisms of pathogen transmission. Stages of the development of the infectious process. The entrance gate of infection. Periods of infection development. Mechanisms of generalization of the infectious process. Bacteremia, septicemia, toxinemia, viremia. The concept of the ecology of bacteria as the basis of the doctrine of the pathogenicity of microbes. Pathogenic, conditionally pathogenic and non-pathogenic bacteria. Pathogenicity as a sign of a species, virulence as a sign of a strain. Factors of bacterial pathogenicity. Adhesion and colonization factors. Factors of invasion. Antiphagocytic factors. Toxin formation. Classification of bacterial</p>

			<p>toxins. Exo- and endotoxins. Mechanisms of action of toxins. Superantigens. Secondary intoxication. Genetic basis of bacterial pathogenicity. Persistence. Direct and immunologically-mediated pathogenicity.</p> <p>Pathogenicity of viruses. The persistence of viruses. Mechanisms of virus variability.</p>
6	<p>UC-1, UC-8, GPC-5, GPC-9, PC-3, PC-6</p>	<p>The normal microflora of the oral cavity</p>	<p>Normal microflora of the human body. Normal (resident) human microflora. Permanent (obligate) and non-permanent (optional) microflora of the human body. Physiological significance of microflora and its role in pathology.</p> <p>Microflora of the oral cavity. Characteristics of obligate (anaerobic and aerobic) microflora of the oral cavity: taxonomy, ecology, role in pathology of the maxillofacial region. Gram-negative (undisputed) anaerobic bacteria (vaillonella, bacteroids, prevotella, porphyromonads, fusobacteria, leptotrichia, etc., convoluted forms of gram-negative anaerobic bacteria - treponema, etc.). Gram-positive indisputable anaerobic bacteria (peptococci, peptostreptococci, actinomycetes, Corynebacteria, lactobacilli). Gram-positive anaerobic spore bacteria (clostridia).</p> <p>Characteristics of facultative-anaerobic and aerobic microflora of the oral cavity: taxonomy, ecology, role in pathology of the maxillofacial region. Gram-positive bacteria (microaerophilic streptococci, enterococci, staphylococci, actinobacilli, etc.). Gram-negative bacteria (neisseria, hemophilic bacteria, Pseudomonas, enterobacteria).</p> <p>Characteristics of eukaryotic microbes of the oral cavity: taxonomy, ecology (fungi, protozoa), role in the pathology of the maxillofacial region.</p> <p>Microecology of the oral cavity. Formation of the microbial flora of the oral cavity during life. Factors contributing to and preventing microbial colonization of the oral cavity.</p> <p>Microbiocenosis and the doctrine of biofilms. The main biotopes of the oral cavity (biofilm of the oral mucosa, biofilm of the tongue, salivary gland ducts and saliva, gingival groove and gingival fluid, oral fluid – mixed saliva, dental biofilm - plaque, plaque) and methods of their study.</p> <p>The concept of dysbiosis (dysbiosis).</p> <p>Normal microflora in the pathology of the oral cavity. Etiology and pathogenesis of dental caries. Characteristics of the cariesogenic microflora. Formation of dental plaque. Features of dental plaque in pathology (dental caries, gingivitis, periodontitis, ulcerative necrotic gingivostomatitis). Mechanisms of quorum sensing between microbes in the biofilm of the oral cavity. Tooth biofilm and the pathogenesis of dental caries. Etiology and mechanisms of tartar formation.</p> <p>Microbial flora and immune processes in periodontal diseases. Characteristics of periodontopathogenic flora. Pathogens and pathogenesis of periodontitis. Pathogenesis and immune processes in odontogenic infection. Characteristics of pathogens of odontogenic infection and actinomycosis.</p> <p>Microbial flora and immune processes in diseases of the oral mucosa. Characteristics of pathogens of impetigo, stomatitis, syphilis, spirochetosis and other bacterial infections accompanied by manifestations in the oral cavity. Diseases of fungal etiology with lesions of the oral mucosa. Characteristics of pathogens of candidiasis and other mycoses accompanied by manifestations in the oral cavity. Diseases of viral etiology with lesions of the oral mucosa.</p> <p>Characteristics of herpes viruses, enteroviruses, human</p>

			<p>immunodeficiency viruses, foot-and-mouth disease.</p> <p>Microbial flora of the oral cavity as an etiological factor in systemic diseases of the body. The importance of chronic foci of infection in the oral cavity in the development of general somatic pathology. The role of the microbial flora of the oral cavity in the development of infectious endocarditis.</p>
8	<p>UC-1, UC-8, GPC-5, GPC-9, PC-3, PC-6</p>	<p>Special medical Bacteriology</p>	<p>Methods of laboratory diagnostics of infectious diseases of microbiological research used in dentistry (express diagnostics, microbiological and immunological).</p> <p>Pyogenic cocci. Staphylococci. Streptococci. Meningococci. Gonococci. Classification. Characteristic. Role in pathology. Immunity. Laboratory diagnostics. Treatment and prevention.</p> <p>Family <i>Enterobacteriaceae</i>. <i>Escherichia</i>. <i>Shigella</i>. Taxonomy and classification. Morphology and other biological properties.</p> <p>Pathogenesis and clinic of the diseases caused. Immunity. Laboratory diagnostics. Prevention. Nosocomial infections caused by enterobacteria.</p> <p>Causative agents of diphtheria, whooping cough, paracoccussis. Biological properties. Pathogenesis and clinic of the diseases caused. Immunity. Laboratory diagnostics. Specific prevention.</p> <p><i>Mycobacterium tuberculosis</i>. Characteristic. Pathogenesis and clinic of tuberculosis. Immunity. Laboratory diagnostics. Specific prevention.</p> <p>Pathogenic clostridia and clostridiosis. Pathogens of tetanus, anaerobic wound infection, botulism. Ecology of pathogens. Pathogenesis and clinic of the diseases caused. Laboratory diagnostics. Specific therapy and prevention of clostridiosis.</p> <p>Pathogenic spirochetes and spirochetoses. The causative agent of syphilis. Biological properties. Pathogenesis and clinic of syphilis. Immunity. Prevention. Characteristic. Pathogenesis and clinic of the disease. Laboratory diagnostics. Prevention. Ulcerative necrotic angina of Vincent. Pathogens, pathogenesis. The clinic of the disease. Prevention, principles of treatment.</p> <p>Chlamydia. <i>Mycoplasma</i>. Features of morphology, physiology. Pathogenesis and clinic of the diseases caused. Diagnostics.</p> <p><i>Pseudomonas aeruginosa</i>. Taxonomy and classification. Morphology and other biological properties. Pathogenesis and clinic of the diseases caused. Immunity. Laboratory diagnostics. Prevention. Nosocomial infections caused by pseudomonads.</p>
9	<p>UC-1, UC-8, GPC-5, GPC-9, PC-3, PC-6</p>	<p>Special medical virology</p>	<p>Orthomyxoviruses. The flu virus. Structure and other biological properties. The pathogenesis of influenza. Immunity. Diagnostics. Specific prevention.</p> <p>Paramyxoviruses. Classification. General characteristics. Pathogenesis and clinic of measles and mumps. Prevention.</p> <p>Picornaviruses. Polio virus. Pathogenesis and clinic of polio. Specific prevention. Coxsackie viruses, ESNO – pathogens of polio-like diseases.</p> <p>Hepatitis A, B,C,D, E viruses. General characteristics. Pathogenesis and clinic of viral hepatitis A. B and C. Laboratory diagnostics. And mmunit. Prevention.</p> <p>Human immunodeficiency virus (HIV). Pathogenesis and clinic of the disease. Laboratory diagnostics.</p> <p>Human herpesviruses. Herpes simplex viruses. Primary and recurrent herpes. Varicella zoster and herpes zoster virus. Cytomegalovirus. Pathogenesis and clinic of the diseases caused. Diagnostics.</p>