MINISTRY OF EDUCATION AND SCIENCE OF THE KYRGYZ REPUBLIC

Government-run Educational Institution of Higher Professional Education
Kyrgyz-Russian Slavic University named after B.N.Yeltcin

ENDORSED BY VICE RECTOR
Prof Anes Zarifyan
«__28__» «__02__» 2022 year

IMMUNOLOGY

Course Outline (Module)

Assigned to **Epidemiology and Immunology**
Academic Curriculum 560001_23_1LDi.pli.xml
560001 KR General Medicine (for foreign student)

Qualification specialist

Mode of Study **Intramural**
Total Credit Value **3 credit points**

Course Hours 108
including:
in-class learning 54
individual work 54

Scope of Testing Semesters:
exams
credits

Course Hours Scheduling (per semester)						
Semester Academic Year	1 (1.1)		2 (1.2)		Total	
Weeks	18,7		18			
Type of Traning	AC	CO	AC	CO	AC	CO
Lectures	18	18			18	18
Practical Session	36	36			36	36
Including Interactive Session	3	3			3	3
Total In-class Session	54	54			54	54
Face-to-face Learning	54	54			54	54
Individual Work	54	54			54	54
Total	108	108			108	108

The Course outline developed by:
PhD, MD, Associate Professor of the Department of Epidemiology and Immunology: Mainazarova E.S._____

Reviewers:
Doctor of Medical Sciences, Professor of the Department of Hygiene, Kyrgyz-Russian Slavic University named after B.N.Yeltcin, Kasymova R.O. _____

PhD, MD, Associate Professor of the Department of Microbiology, Virology and Immunology, Kyrgyz state medical academy named after I.K. Akhunbaev, Niyazalieva M.S._____

The Course Outline
EPIDEMIOLOGY AND IMMUNOLOGY

in accordance with Academic Curriculum:
Specialty 560001 – KR – General Medicine (for foreign students)
Confirmed by KRSU Board of Academics in 28.02.2023 y. record №7.

The Course Outline endorsed by Epidemiology and Immunology Department Meeting

Record of 20.02. 2023 г. №8
Valid for: 2023 – 27 academic years
The Head of Department of Epidemiology and immunology, professor Orozbekova B.T. _____

The course outline endorsed for the following academic year

Chairman of the Educational and Methodological Board
09 09 2021.
The course outline has been reserved, considered and endorsed for implementation
In 2021 – 2022 Academic Year at the Staff Meeting of **Epidemiology and Immunology** Department

Record of ____ 2021. № 2
The Head of Department Orozbekova B.T., professor, DMS

The course outline endorsed for the following academic year

Chairman of the Educational and Methodological Board
14 09 2022.
The course outline has been reserved, considered and endorsed for implementation
In 2022 – 2023 Academic Year at the Staff Meeting of **Epidemiology and Immunology** Department

Record of ____ 2022. № 2
The Head of Department Orozbekova B.T., professor, DMS

The course outline endorsed for the following academic year

Chairman of the Educational and Methodological Board
15 09 2023.
The course outline has been reserved, considered and endorsed for implementation
In 2023 – 2024 Academic Year at the Staff Meeting of **Epidemiology and Immunology** Department

Record of ____ 2023. № 2
The Head of Department Orozbekova B.T., professor, DMS

The course outline endorsed for the following academic year

Chairman of the Educational and Methodological Board
20 09 2024.
The course outline has been reserved, considered and endorsed for implementation
In 2024 – 2025 Academic Year at the Staff Meeting of **Epidemiology and Immunology** Department

Record of ____ 2024. № 2
The Head of Department Orozbekova B.T., professor, DMS

The course outline endorsed for the following academic year

Chairman of the Educational and Methodological Board
20 09 2025.
The course outline has been reserved, considered and endorsed for implementation
In 2025 – 2026 Academic Year at the Staff Meeting of **Epidemiology and Immunology** Department

Record of ____ 2025. № 2
The Head of Department Orozbekova B.T., professor, DMS

1. COURSE OUTLINE OBJECTIVES
Prepare students for independent work on the clinical diagnosis of syndromes based on immunopathological mechanisms.

2. PLACE OF THE COURSE IN THE EDUCATIONAL PROGRAM	
Educational Program Units:	
2.1	**Students' Preliminary Training Requirements:**
	2.1.1. General immunology 2.1.2. Clinical Immunology
2.2	**Course Units and Practical Sessions imposing the prior Proficiency**
	2.2.1. Biochemistry 2.2.2. Histology, embryology, cytology 2.2.3. Normal physiology 2.2.4. Microbiology, virology

3. STUDENTS' COMPETENCIES RESULTING FROM THE COURCE UNIT (MODULE)	
GPC-6: readiness for the introduction of medical documentation	
Knowledge:	
Level 1	Anatomical and physiological, age-sex and individual characteristics of the structure and development of a healthy and sick body
Level 2	Safety regulations and work in laboratories with reagents and instruments.
Level 3	Principles of organization of the service of allergology and immunology
Skills:	
Level 1	To justify the need for clinical and immunological examination of the patient
Level 2	Interpret the results of assessing the immune status of the tests of the I-th level
Level 3	Give the patient a preliminary diagnosis and indicate the number of additional studies to clarify the diagnosis.
Expertise:	
Level 1	Physical examination of the immune system organs (condition of the tonsils, skin, mucous membranes, lymph nodes, spleen)
Level 2	Selection of material for immunological studies at the organism, cellular and molecular levels using modern laboratory equipment
Level 3	Basic technologies of information transformation and technology work on the Internet for professional activities
GPC-9: the ability to assess morphofunctional, physiological states and pathological processes in the human body to solve professional problems	
Knowledge:	
Level 1	The structure and function of the human immune system, cellular and molecular mechanisms of development and functioning of the immune system
Level 2	Types of immune pathologies, their classification, diagnosis and differential diagnosis, etiology and pathogenesis
Level 3	Modern methods of treatment, prevention of immunopathologies and drugs used in immunological and allergic practice
Skills:	
Level 1	To characterize and assess the levels of organization of the human immune system
Level 2	To take the clinical record and prescribe a clinical examination of a patient with immune pathology
Level 3	To justify the need for immunocorrective therapy
Expertise:	
Level 1	Algorithm of statement of the preliminary immunological diagnosis with the subsequent referral to the doctor to the allergist-immunologist
Level 2	Fundamentals of medical diagnostic and therapeutic measures to provide first medical aid in emergency and life-threatening conditions with immune disorders
Level 3	Skills in the use of drugs in the treatment, rehabilitation and prevention of diseases based on disorders in the immune system

PC-15: readiness to educate patients and their relatives on basic hygienic measures of a health-improving nature, skills of self-monitoring of basic physiological indicators that contribute to the preservation and promotion of health, and the prevention of diseases.	
Knowledge:	
Level 1	The main methods of immunodiagnostics
Level 2	Basics of functioning of medical equipment, device and purpose of medical equipment for immunodiagnostics
Level 3	Basic concepts of immune status and clinical assessment of the immune system
Skills:	
Level 1	To conduct immunological and serological diagnostics
Level 2	To use computer technology in their work to interpret immunological methods
Level 3	To characterize the age features of the immune status and the principles of its assessment
Expertise:	
Level 1	Analyze the algorithm for making a preliminary immunological diagnosis
Level 2	Interpretation of the results of the laboratory, instrumental diagnostic methods in patients of different ages
Level 3	Simulate immune responses at the organism and cellular levels

Final Students' Competences

3.1	**Knowledge:**
	- principles of organization of the service of allergology and immunology; – structure and functions of the human immune system, its age characteristics, cellular and molecular mechanisms of development and functioning of the immune system, the main stages, types, genetic control of the immune response, methods of immunodiagnostics; - types of immune pathologies, their classification, diagnosis and differential diagnosis, etiology and pathogenesis; - modern methods of treatment and prevention of immunopathologies, drugs used in immunological and allergic practice; -safety regulations and work in laboratories with reagents, instruments; - basic concepts and problems of the biosphere and ecology; the phenomenon of parasitism and bioecological diseases; - classification, morphology and physiology of microorganisms and viruses, their impact on human health, methods of microbiological diagnosis; use of basic antibacterial, antiviral and biological products; - anatomical, physiological, age-sex and individual characteristics of the structure and development of a healthy and sick body.
3.2	**Skills:**
	- take anamnesis and prescribe a clinical examination of a patient with immune pathology; - conduct a physical examination of the immune system organs (condition of the tonsils, skin, mucous membranes, lymph nodes, spleen); - interpret the results of the main diagnostic allergological tests; - justify the need for clinical and immunological examination of the patient, to interpret the results of the assessment of the immune status of tests of the 1st level; -characterize and assess the levels of organization of the human immune system, evaluate the mediator role of cytokines; - analyze the effect of drugs on the basis of their pharmacological properties and the possibility of their use for therapeutic treatment, justify the need for the use of immunocorrective therapy; - keep medical records. - conduct immunological and serological diagnostics.
3.3	**Expertise:**
	-an algorithm for making a preliminary immunological diagnosis, followed by referral to a doctor, an allergist-immunologist; - basics of medical diagnostic and therapeutic measures for the provision of first medical aid in emergency and life-threatening conditions with immune disorders; - drug use skills in the treatment, rehabilitation and prevention of diseases based on disorders in the immune system.

4. COURSE (MODULE) STRUCTURE AND CONTENT							
Class Code	**Subject Name /Type of Class/**	**Semester / Academic Year**	**Hours**	**Competencies**	**Literature**	**Interactive Sessions**	**Notes**
	Section 1. Basics of Immunology						
1.1.	The organs of the immune system. Natural resistance. Cellular and humoral components of the human immune system. The formation and implementation of cellular and humoral immune response. Regulation of the immune response, the genetic basis of the immune response (Lecture).	3	2	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
1.2.	Innate immunity. Acquired immunity: active, passive. Innate and acquired immunity factors. Nonspecific resistance. Complement, phagocytosis and macrophages, natural killers. Cytokines: interferons, interleukins (Lecture).	3	2	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
1.3.	Antigens. Properties of antigens. Antigens of bacteria, viruses. Human antigens MHC I class, MHC II class. Antibodies. The structure and function of immunoglobulins (Lecture).	3	2	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
1.4.	Innate immunity. Acquired immunity: active, passive. Innate and acquired immunity factors. Nonspecific resistance. Complement, phagocytosis and macrophages, natural killers. Cytokines: interferons, interleukins (Pr. L.).	3	2	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
1.5	The organs of the immune system are central, peripheral. T-lymphocytes, B-lymphocytes. Immune response: humoral, cellular. Cell co-operation in the immune response (Pr. L.).	3	2	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
1.6.	Assessment of the functional state of phagocytes, the main methods for the detection of antibodies and antigens, the definition of complement. Reactions of CFR, RPGA and CIC (Pr. L.).	3	2	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
1.7.	Antigens. Properties of antigens. Antigens of bacteria, viruses, human antigens. MHC I class, MHC II class, their	3	2	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	

	role in the immune response (Pr. L.).						
1.8.	Antibodies, structure and function of immunoglobulins. Immunodiagnostic reactions and therapeutic and prophylactic and immunobiological preparations (Pr.L.).	3	2	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
1.9.	Innate immunity. Acquired immunity: active, passive. Innate and acquired immunity factors. Nonspecific resistance. Complement, phagocytosis and macrophages, natural killers. Cytokines: interferons, interleukins (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
1.10.	The organs of the immune system are central, peripheral. T-lymphocytes, B-lymphocytes. Immune response: humoral, cellular. Cell co-operation in the immune response (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
1.11.	Assessment of the functional state of phagocytes, the main methods for the detection of antibodies and antigens, the definition of complement. Reactions of CFR, RPGA and CIC (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
1.12.	Antigens. Properties of antigens. Antigens of bacteria, viruses, human antigens. MHC I and II classes, their role in the immune response (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
1.13.	Antibodies, structure and function of immunoglobulins. Immunodiagnostic reactions and therapeutic and prophylactic and immunobiological preparations (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
	Section 2. Assessing the Immune System Conditions						
2.1.	The collection of immunological history and characteristics of the main immunopathological syndromes (infectious, allergic, autoimmune, lymphoproliferative, primary and secondary immunodeficiency). Immune status and principles of its evaluation. Age features of the immune status. Methods for the study of lymphocytes, evaluation of the functional	3	2	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	

	state of phagocytes. Tests of the first and second level, their clinical interpretation (Lecture).						
2.2.	Collect immunological history. Methods for studying the immune status and principles of its clinical evaluation. Evaluation of T-cell system immunity (cellular immunity). Evaluation of the B-cell system of immunity (humoral immunity). Assessment of the functional state of phagocytes, the main methods for measuring antibodies and antigens, the definition of complement, tests of the first and second levels, their clinical interpretation (Pr. L.).	3	2	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
2.3.	Differential diagnosis of major immunopathological syndromes (Pr. L.).	3	2	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
2.4.	Collect immunological history. Methods for studying the immune status and principles of its clinical evaluation. Evaluation of T-cell system immunity (cellular immunity). Evaluation of the B-cell system of immunity (humoral immunity). Assessment of the functional state of phagocytes, the main methods for measuring antibodies and antigens, the definition of complement, tests of the first and second levels, their clinical interpretation (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1.L1.2. L1.3.L2.2. L2.3.L3.1.	0	
2.5.	Differential diagnosis of major immunopathological syndromes (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L2.2. L2.3. L3.1.	0	
	Section 3. Allergology						
3.1.	Definition of allergies, stages of an allergic reaction, true and pseudo-allergic reactions, types of allergic reactions according to the classification of P. Gell and R. Coombs. Anaphylactic shock etiology, pathogenesis, clinic, diagnosis, treatment (Lecture).	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
3.2.	Atopic dermatitis - etiology, pathogenesis, clinic, diagnosis, treatment. Allergic rhinitis seasonal and year-round. Urticaria and angioedema - etiology, pathogenesis,	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	

	classification, diagnosis, treatment and prevention. Bronchial asthma. Drug allergies (etiology, clinical presentation, diagnosis, treatment and prevention). Food allergies. The most important food allergens, especially food allergies in children and adults, clinic, diagnosis, treatment and prevention (Lecture).						
3.3.	Allergy. Immediate and delayed hypersensitivity. Types of allergen-low olecular proteins or heptenes that cause allergies. Allergens: inhalation, food, medicinal, infectious, industrial. Classification according to Jelle and Coombs. Types and mechanisms of allergic reactions: anaphylactic, cytotoxic, immunocomplex, cell-mediated (Pr. L.).	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
3.4.	Drug and food allergies. Clinical options, diagnosis, treatment, prevention (Pr. L.).	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
3.5.	Atopic dermatitis. Allergic rhinitis. Bronchial asthma, urticaria, angioedema, etiology, pathogenesis, diagnosis, treatment, prevention (Pr. L.).	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
3.6.	Allergy. Immediate and delayed hypersensitivity. Types of allergen-low olecular proteins or heptenes that cause allergies. Allergens: inhalation, food, medicinal, infectious, industrial. Classification according to Jelle and Coombs. Types and mechanisms of allergic reactions: anaphylactic, cytotoxic, immunocomplex, cell-mediated (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
3.7.	Drug and food allergies. Clinical options, diagnosis, treatment, prevention (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
3.8.	Atopic dermatitis. Allergic rhinitis. Bronchial asthma, urticaria, angioedema, etiology, pathogenesis, diagnosis, treatment, prevention (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
	Section 4. Immunodeficiency						

4.1.	Genetics of immunodeficiency, features of inheritance. Congenital immunodeficiencies (classification, clinical options, diagnosis, treatment tactics). Congenital immunodeficiency in adults. Acquired immunodeficiency (AIDS) - classification, etiology, clinical variants, diagnosis and treatment. The role of AIDS in the pathogenesis of various human diseases (Lecture).	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
4.2.	Primary (congenital) immunodeficiency with B-lymphocyte defects. Classification, clinical options, diagnosis, treatment tactics (Pr. L.)	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
4.3.	Primary (congenital) immunodeficiencies with T-lymphocyte defects. Classification, clinical options, diagnosis, treatment tactics. Congenital immunodeficiency in adults (Pr. L.).	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
4.4.	Secondary (acquired) immunological deficiency (SID) - classification, etiology, clinical options, diagnosis and treatment. The role of SID in the pathogenesis of various human diseases. Acquired Immunodeficiency Syndrome.	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
4.5.	Primary (congenital) immunodeficiency with B-lymphocyte defects. Classification, clinical options, diagnosis, treatment tactics (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
4.6.	Primary (congenital) immunodeficiencies with T-lymphocyte defects. Classification, clinical options, diagnosis, treatment tactics. Congenital immunodeficiency in adults (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
4.7.	Secondary (acquired) immunological deficiency (SID) - classification, etiology, clinical options, diagnosis and treatment. The role of SID in the pathogenesis of various human diseases. Acquired Immunodeficiency Syndrome (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
	Section 5. Immunotropic Therapy						

5.1	Classification of immunotropic drugs. Immunosuppressants - classification and mechanisms of action, indications for use, contraindications, side effects. Glucocorticosteroid drugs - mechanisms of action, indications for use, complications, tactics of choice of treatment regimens. Immunostimulants - classification and mechanisms of action, indications for use, contraindications, side effects. Immunocorrectors - mechanisms of action, indications for use, tactics of choice of treatment regimens. Vaccines (Lecture).	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
5.2.	Principles of immunotherapy, classification of immunotropic drugs. Modern immunocorrective drugs. Applications, treatment regimens (Pr. L.).	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
5.3.	Principles of immunotherapy, classification of immunotropic drugs. Modern immunocorrective drugs. Applications, treatment regimens (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
	Section 6. Autoimmune Pathology						
6.1.	Classification of autoimmune diseases. Systemic lupus erythematosus, immunopathogenesis, main clinical manifestations, immunodiagnostics, treatment. Rheumatoid arthritis, immunopathogenesis, immunodiagnostics, main clinical manifestations, treatment. Systemic vasculitis, classification, pathogenesis, clinical forms, diagnosis, treatment. Autoimmune aspects of endocrine pathology(Lecture).	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
6.2.	Immunological tolerance and autoimmunity. Mechanisms for the development of auto-aggression. Classification of autoimmune diseases (Pr. L.).	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
6.3.	Systemic vasculitis. Immunopathogenesis and clinical options. Systemic lupus erythematosus. Immunopathogenesis and	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	

	clinical options (Pr. L.).						
6.4.	Rheumatoid arthritis, immunopathogenesis, main clinical manifestations, immunodiagnostics, treatment (Pr. L.).	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
6.5.	Autoimmune aspects of endocrine pathology. Antiphospholipid syndrome - clinic, diagnosis, treatment (Pr. L.).	3	2	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
6.6.	Immunological tolerance and autoimmunity. Mechanisms for the development of auto-aggression. Classification of autoimmune diseases (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
6.7.	Systemic vasculitis. Immunopathogenesis and clinical options. Systemic lupus erythematosus. Immunopathogenesis and clinical options (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
6.8.	Rheumatoid arthritis, immunopathogenesis, main clinical manifestations, immunodiagnostics, treatment (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	
6.9.	Autoimmune aspects of endocrine pathology. Antiphospholipid syndrome - clinic, diagnosis, treatment (Ind.w.).	3	3	GPC-6, GPC-9, PC-15	L1.1. L1.2. L1.3. L1.4. L2.1. L2.2. L2.3. L3.1.	0	

5. ASSESSMENT FUND

5.1. Advancement Questions and Assignments

Questions to test the level of KNOWLEDGE:

1. The subject and objectives of immunology. Sections of immunology (general and private).
2. The concept of immunity. Types of immunity (innate and acquired). Innate and acquired immunity factors.;
3. Nonspecific resistance. Types (humoral and cellular factors).
4. Complement. Ways of activation of a complement (Classical, alternative and lectin-dependent).
5. What is a membrane-attack complex and the complement system.
6. Phagocytosis. Chemotaxis. Chemoattractants. Opsonins.
7. Macrophage, types and functions of macrophages, TOLL and PATTERN receptors.
8. Natural killers - localization and functions.
9. APC cells. Types and functions. Dendritic cells - function and localization.
10. Cytokines: proinflammatory and anti-inflammatory.
11. Interferons and interleukins.
12. Organs of the immune system: central and peripheral.
13. Structure and function of the thymus and thymic hormones.
14. The structure and function of the bone marrow, the concept of polypotent stem cells.
15. Structure and function of the spleen as a peripheral organ of the immune system.
16. The structure and function of the lymph node, the localization of lymphatic follicles.
17. The structure and function of the tonsils, Peyer's patches and appendix.
18. Immune competent cells. Ways of migration and recycling of cells of the immune system.
19. Functions of T-lymphocytes. Receptors and subpopulations of T-lymphocytes.
20. Major differentiation antigens (CD antigens) on the surface: T-cytotoxic and T-helper cells.
21. B-lymphocytes, receptors and functions. Plasma cells.

22. Immune response: cellular and humoral.
23. Cell co-operation in the immune response.
24. Hormones and mediators of the immune system.
25. The main methods for the detection of antibodies and antigens.
26. Assessment of the functional state of phagocytes.
27. Methods for determining complement.
28. Principles of assignment of the reaction of CFR, RPGA and the CIC.
29. ELISA. The principle of ELISA.
30. Immunochromatography. The principle of the method.
31. Statement of the reaction of agglutination and precipitation.
32. Methods for the determination of immunoglobulins - the method of radial immunodiffusion (method Manchini) ;.
33. Antigen, the concept of antigens. Classification of antigens.
34. Structure and properties of antigens.
35. Antigens of bacteria and viruses.
36. Human antigens. MHC class I and II, their role in the immune response.
37. Haptens, their difference from antigens. Cross-reactive antigens. (examples).
38. The concept of adjuvants, antigenic mimicry and superantigens.
39. Autoantigens concept and classification.
40. Definition of the concept and principles of classification of antibodies.
41. The structure and function of immunoglobulins.
42. Class IgG and its subclasses, structure and function of IgG.
43. IgM structure, function and rate in serum.
44. IgE and IgD structure, functions. Difference from other classes of immunoglobulins.
45. IgA types, structure, function and norm in serum.
46. Methods for producing monoclonal antibodies and scope.
47. The role of the main classes of Ig in immunological reactions.
48. The structure and function of Fab and Fc fragments.
49. The definition of the concept of immune status. Collect immunological history.
50. Age features of the immune status and principles of its evaluation.
51. Tests of the first and second level, their clinical interpretation.
52. Evaluation of the T-cell system of immunity (cellular immunity).
53. Evaluation of the B-cell system of immunity (humoral immunity).
54. Assessment of the functional state of phagocytes.
55. The concept of immunopathological syndromes and classification.
56. Allergic syndrome.
57. Infectious syndrome.
58. Autoimmune syndrome.
59. Immunoproliferative syndrome.
60. Immunodeficiency syndrome (primary and secondary).
61. The definition of the concept of allergy and the principles of classification of allergens: (endo and exogenous allergens).
62. The concept of true and pseudo-allergies. The mechanism of development stages of allergic reactions.
63. Classification of allergic reactions according to Jelle and Coombs and Ado.
64. Hypersensitivity I type, cause, mechanism of development and manifestation.
65. Hypersensitivity type II, the cause, mechanism of development and manifestation.
66. Hypersensitivity type III, the cause, mechanism of development and manifestation.
67. Hypersensitivity type IV, the cause, mechanism of development and manifestation.
68. Types and methods of allergy tests for allergens.
69. Anaphylactic shock. Etiology, pathogenesis, diagnosis, treatment, prevention.
70. Drug allergies. Etiology, pathogenesis, diagnosis, treatment, prevention.
70. Drug allergies. Etiology, pathogenesis, diagnosis, treatment, prevention.
71. Food allergies. Etiology, pathogenesis, diagnosis, treatment, prevention.
72. Quincke edema. Etiology, pathogenesis, diagnosis, treatment, prevention.
73. Bronchial asthma. Etiology, pathogenesis, diagnosis, treatment, prevention.
74. Urticaria. Etiology, pathogenesis, diagnosis, treatment, prevention.
75. Atopic dermatitis. Etiology, pathogenesis, diagnosis, treatment and prevention.
76. Allergic rhinitis. Etiology, pathogenesis, diagnosis, treatment and prevention.
77. What is the immunodeficiency state.

78. Classification of immunodeficiencies.
79. Primary (congenital) immunodeficiencies with B-lymphocyte defects.
80. Causes of defects of the humoral link.
81. Classification, clinical options, diagnosis, treatment tactics of humoral defects.
82. Primary (congenital) immunodeficiencies with T-lymphocyte defects.
83. The causes of the defect cell link.
84. Classification of T-cell immunodeficiencies.
85. Congenital immunodeficiency in adults.
86. Clinical options, diagnosis, treatment tactics.
87. Secondary (acquired) immunological deficiency.
88. Classification of Secondary (acquired) immunodeficiency.
89. Etiology, clinical variants, diagnosis, treatment of Secondary immunodeficiency.
90. The role of the Secondary immunodeficiency in the pathogenesis of various human diseases.
91. The structure and structure of HIV.
92. Ways of HIV transmission.
93. AIDS, etiology, pathogenesis, clinic, diagnosis and treatment.
94. Principles of immunotherapy.
95. Classification of immunotropic drugs, modern immunocorrective drugs.
96. Immunomodulators of thymic and bone marrow origin, mechanism of action and indications for use.
97. Immunomodulators of microbial and plant origin, mechanism of action and indications for use.
98. Immunomodulators of synthetic origin, mechanism of action and indications for use.
99. Immunomodulators based on interferon (IFN) and interleukins (IL). Applications, treatment regimens.
100. Classification of immunosuppressants, mechanism of action and indications for use.
101. Immunological tolerance, types of immunological tolerance. Immunological memory.
102. Autoantigens and autoantibodies. Mechanisms for the development of auto-aggression.
103. Classification of autoimmune diseases. Target organs in autoimmune diseases.
104. Diabetes mellitus type I: etiology, pathogenesis, clinic, diagnosis and treatment.
105. Diseases of the thyroid gland: Graves disease, etiology, pathogenesis, clinic diagnosis and treatment.
106. Rheumatoid arthritis: etiology, pathogenesis, clinic, diagnosis and treatment.
107. Systemic lupus erythematosus. Etiology, pathogenesis, clinic, diagnosis and treatment.
108. Antiphospholipid syndrome. Etiology, pathogenesis, clinic, diagnosis and treatment.
109. Vasculitis, etiology, pathogenesis, clinic, diagnosis and treatment.
110. To which organs and tissues does not develop natural immunological tolerance.

Tasks for testing the level of learning to SKILLS and EXPERTISE:

1. To characterize and assess the levels of organization of the human immune system.
2. To evaluate the mediator role of cytokines.
3. Jjustify the need for clinical and immunological examination of the patient.
4. To collect an immunological history and prescribe a clinical examination of a patient with immune pathology.
5. To interpret the results of the assessment of the immune status of the tests of the first level.
6. To interpret the results of the assessment of the immune status of the tests of the II level.
7. Interpret the results of the main diagnostic allergological tests.
8. To conduct immunological analysis.
9. Select materials for immunological studies at the organism, cellular and molecular levels using modern laboratory equipment.
10. To characterize the main methods for the detection of antibodies and antigens.
11. To evaluate immunological reactions.
12. Clinical interpretation of the evaluation of the T-cell system of immunity (cellular immunity).
13. Clinical interpretation of the assessment of the B-cell immune system (humoral immunity).
14. To assess the functional state of phagocytes.
15. To characterize methods for the determination of complement.
16. Describe the principles for the assignment of the response of the CFR, RPGA and the CIC.
17. Describe the principle of the ELISA method.
18. Describe the principle of the method of immunochromatography.
19. To carry out the formulation of the reaction of agglutination and precipitation and their clinical interpretation.
20. Describe the methods for the determination of immunoglobulins - the method of radial immunodiffusion (the Manchini method).
21. To use computer technology in their activities for the interpretation of immunological methods.
22. To assess the immune status.

23. Describe the methods for assessing the immune status.
24. Describe the age characteristics of the immune status and the principles of its evaluation.
25. Describe the main immunopathological syndromes.
26. Apply skills to study the functions of organs and immune systems in the clinic.
27. To develop skills in laboratory equipment.
28. To evaluate the in vivo allergic tests and their interpretation.
29. To conduct an evaluation of in vitro allergy tests and their interpretation.
30. To conduct methods of observing immunological reactions in the experiment.
31. Describe the main methods of experimental immunologists.
32. To characterize the main methods of experimental immunology.
33. Simulate immune responses at the organic and cellular levels.
34. Apply knowledge of the mechanisms of development of immune disorders in the clinic.
35. To characterize the diagnostic methods of immunopathologies.
36. Predict the development of immune-related diseases.
37. Aalyze the mechanism of action of immunocorrective agents.
38. Substantiate the need for the use of immunocorrective therapy.
39. Analyze the algorithm for making a preliminary immunological diagnosis.

5.2. Course Papers Themes

Discipline is not provided for the implementation of term papers (projects).

5.3. Assessment Fund

Presentation. Subject:

1. Age-related features of the development of the immune system.
2. Immunology of reproduction
3. Anti-infective immunity
4. Features of the immune response in fungal diseases.
5. Immune transplantation, the response during transplantation of various organs.
6. Ways to overcome immune rejection
7. Immunology of the tumor process. Causes of tumor escaping from immune surveillance.
8. Immunoecology. The influence of environmental factors on the immune system
9. Immunodeficiency diseases. Primary immunodeficiencies.
10. Secondary immunodeficiencies. HIV and AIDS.
1. Autoimmune diseases, autoaggression mechanism.
12. Modern problems of immunodiagnostics.
13. The phenomenon of immune memory. Formation mechanisms.
14. "Naive cells" and memory cells, their characteristics.
15. Phylogenesis of immunity
16. Ontogenesis of immunity.
17. Human isoantigens (system of antigens of erythrocytes, leukocytes, platelets and other cells).
18. Phylogenesis and ontogenesis of antibodies.
19. Scheme of immunopoesis. Lymphoid and myeloid progenitor cells, pathways of development.
20. Stem cell. The origin, characteristics, markers, circulation in the body.
21. Bone marrow peptides (myelopeptides). Classification, characterization, mechanisms of action on the cells of the immune system.
22. Immunity and stress.

Test:

Examination "Introduction to immunology. Types of immunity and non-specific factors of the immune reactivity of the body ":

1. Introduction to immunology.
2. The subject and objectives of immunology.
3. The history of the development of immunology.
4. Tasks and prospects of modern immunology.
5. The doctrine of immunity.
6. Definition and types of immunity.
7. Innate immunity.
8. Constitutional, species immunity.
9. Adaptive immunity. Specific mechanisms of immunity.
10. The concept of the immune and lymphoid system.
11. Immune homeostasis. Immunological supervision and maintenance of antigenic constancy of the internal

environment of the body.
12. Nonspecific factors of immune reactivity of an organism.
13. Cellular and humoral non-specific protective factors.
14. Cellular factors of resistance.
15. The MFS system of mononuclear phagocytes.
16. Monocytes, granulocytes, mast cells, large granular lymphocytes.
17. APC cells. Types and functions. Dendritic cells - function and localization.
18. Humoral factors of resistance.
19. Protein acute phase.
20. Mediators of inflammation.
34. The complement system.
35. Alternative and classical pathway of activation of the complement system.
36. Other nonspecific immunity factors. Lysozyme. Interferon.

Test:
Examination "The organization and function of the immune system. Evaluation of the states of the immune system ":
1. Ontogenesis and phylogenesis of the immune system.
2. Organs of the immune system: central and peripheral.
3. Structure and function of the lymphoid system. Bone marrow as an organ of lymphopoiesis.
4. Structure and function of the central organ of the immune system - the thymus.
5. The structure and function of the peripheral organs of the immune system - lymph nodes.
6. Spleen, structure and function.
7. Peyer's Patches, structure and function.
8. Immunobiological activity of primary, secondary and tertiary organs of the lymphoid system.
9. Leukocytes, their types.
10. Tissue and circulating macrophages.
11. T-cell immune system.
12. Cellular immunity, meaning and induction.
13. Effectors of cellular immunity (CCI).
14. T-cell receptor.
15. Mediators of cellular immunity.
16. Cell cytotoxicity.
17. The mechanisms of activation of T and B cells.
18. Cooperative mechanisms of intercellular interactions.
19. Lymphokines.
20. T-helpers and T-suppressors are regulatory cells of the immune system.
21. The system of human B-lymphocytes.
22. Humoral immunity, meaning and induction.
23. B-cell receptor.
24. Mediators of humoral immunity.
25. Immunocompetent cells. Ways of migration and recycling of cells of the immune system.
26. Hormones and mediators of the immune system.
27. Immunological memory. Definition Forms of manifestation.
28. The mechanism of immunological memory.
29. Methods of induction of immunological memory. T-and B-cell memory.
30. Features of the development of immunological memory in cellular and humoral immune response.
31. The role of immunological memory in protecting the body against infection.
32. The use of the phenomenon of immunological memory in the diagnosis and prevention of infectious diseases.
33. Antigen, the concept of antigens. Classification of antigens.
34. Structure and properties of antigens.
35. Types of antigens: full-fledged antigens, haptens, half-haptens.
36. Immunogenic activity of antigens.
37. Antigens of bacteria and viruses.
38. Human antigens. MHC class I and II, their role in the immune response.
39. Haptens, their difference from antigens.
40. Cross-reactive antigens.
41. The concept of adjuvants, antigenic mimicry and superantigens.

42. Autoantigens concept and classification.
43. Definition of the concept and principles of classification of antibodies.
44. The structure and function of immunoglobulins.
45. Molecular structure, classes of immunoglobulins, properties of immunoglobulins (IgG, IgM, IgA. IgD. IgE).
46. Avidity and affinity of antibodies.
47. The concept of the valence of antibodies.
48. Antigenic structure of immunoglobulins: isotypic, allotypic. idiotypical determinants.
49. Theories of synthesis and diversity of antibodies.
50. Genetics of antibody formation.
51. The mechanism of interaction of antibodies with antigen. Immune complex.
52. The study of cellular and humoral factors of the immune system and their clinical significance.
53. The clinical significance of the study of the content and functional activity of blood granulocytes, blood monocytes, natural killer cells.
54. The clinical significance of the study of the content and functional activity of non-specific humoral factors.
55. The clinical significance of the study of the content and functional activity of T-lymphocytes and their subpopulations.
56. The clinical significance of the study of the content and functional activity of B-lymphocytes and their subpopulations.
57. The clinical significance of the study of the content and functional activity of immunoglobulins of different classes and subclasses.
58. Immune system during infection.
59. Viral infections, bacterial infections, parasitic infections.
60. Principles of immunodiagnostics of infectious diseases.
61. Transplantation immunity. Types of transplants.
62. Genetic basis of donor and recipient compatibility.
63. Cellular and humoral factors of transplant immunity.
64. Clinical manifestations of tissue incompatibility.
65. The definition of the concept of immune status. Collect immunological history.
66. Methods for assessing the immune status.
67. Age features of immune status and principles of its evaluation.
68. Tests of the first and second level, their clinical interpretation.
69. The main methods for the detection of antibodies and antigens.
70. Methods for the determination of immune complexes.
71. Methods for the quantitative and qualitative determination of immunoglobulins.
72. Evaluation of the functional state of phagocytes.
73. Methods for the determination of complement.
74. Principles of assignment of the reaction of CFR, RPGA and CIC.
75. The principle of formulation of reactions using chemical and physical labels of antibodies and antigens (ELISA, immunofluorescence, radioimmunoassay, flow cytometry) and their variants and diagnostic value.
76. Modern immunochromatographic tests, the principle of the method.
77. Phenomena of specific agglutination and precipitation, staging options, use in medicine.
78. Reactions using labeled antigens and antibodies.
79. Immunoelectron microscopy (using antibodies labeled with ferritin, colloidal gold, isotopes).
80. Methods for producing monoclonal antibodies and scope.
81. The concept of immunopathological syndromes and their classification.
82. Differential diagnosis of major immunopathological syndromes.

Test:

Examination "Clinical Immunology":

1. Definition of the concept of allergy and principles of classification of allergens.
2. Characteristics of allergens.
3. The concept of true and pseudo-allergies.
4. The mechanism of development of allergic reactions.
5. Classification of allergic reactions according to Jelle and Coombs.
6. Hypersensitivity type I, the cause, the mechanism of development and manifestation.
7. Hypersensitivity type II, the cause, mechanism of development and manifestation.
8. Hypersensitivity type III, the cause, mechanism of development and manifestation.
9. Hypersensitivity IV type, the cause, mechanism of development and manifestation.
10. Immunological mechanisms of allergy. .

11. Immunological mechanisms of allergy. Immediate type of hypersensitivity.
12. The concept of sensitization.
13. Desensitization.
14. Signs of the difference between humoral and cellular allergic reactions.
15. Diagnostic tests for the detection of humoral type allergies.
16. Skin allergy tests, their diagnostic value.
17. Anaphylactic shock. Etiology, pathogenesis, clinic, diagnosis, treatment and prevention.
18. Drug allergies. Etiology, pathogenesis, clinic, diagnosis, treatment and prevention.
19. Food allergies. Etiology, pathogenesis, clinic, diagnosis, treatment and prevention.
20. Angioedema. Etiology, pathogenesis, clinic, diagnosis, treatment and prevention.
21. Bronchial asthma. Etiology, pathogenesis, clinic, diagnosis, treatment and prevention.
22. Urticaria. Etiology, pathogenesis, clinic, diagnosis, treatment and prevention.
23. Atopic dermatitis. Etiology, pathogenesis, clinic, diagnosis, treatment and prevention.
24. Allergic rhinitis. Etiology, pathogenesis, clinic, diagnosis, treatment and prevention.
25. Immunodeficiency states.
26. Classification of immunodeficiencies.
27. Immunogenetic mechanisms of congenital immunodeficiency formation.
28. Primary (congenital) immunodeficiencies with B-lymphocyte defects.
29. Causes of defects of the humoral link.
30. Classification, clinical options, diagnosis, treatment tactics.
31. Primary (congenital) immunodeficiencies with T-lymphocyte defects.
32. The causes of the defect cell link.
33. Classification, clinical options, diagnosis, treatment tactics of T-cell immunodeficiency.
34. Protein deficiency of the complement system and their clinical manifestations.
35. Deficiencies of the mononuclear phagocyte system and their clinical manifestations.
36. Secondary (acquired) immunological deficiency.
37. Classification of Secondary immunological deficiency (SID) .
38. Etiology, clinical variants, diagnosis, treatment of the SID.
39. The role of the (SID) in the pathogenesis of various human diseases.
40. The structure and texture of HIV.
41. Ways of HIV transmission.
42. AIDS, etiology, pathogenesis, clinic, diagnosis and treatment.
43. The basic principles of the appointment of immunotherapy.
44. Classification of immunotropic drugs.
45. Modern immunocorrective drugs.
46. Immunomodulators of thymic and bone marrow origin, mechanism of action and indications for use.
47. Immunomodulators of microbial and plant origin, mechanism of action and indications for use.
48. Immunomodulators of synthetic origin, mechanism of action and indications for use.
49. Immunomodulators based on interferon (IFN) and interleukins (IL). Applications, treatment regimens.
50. Classification of immunosuppressants, mechanism of action and indications for use.
51. Immunological tolerance, types of immunological tolerance.
52. Immunological memory. The mechanism of immunological memory.
53. Autoantigens and autoantibodies. Mechanisms for the development of auto-aggression.
54. Classification of autoimmune diseases. Target organs in autoimmune diseases.
55. Diabetes mellitus type I: etiology, pathogenesis, clinical manifestations, diagnosis and treatment.
56. Diseases of the thyroid gland: Graves disease, etiology, pathogenesis, clinic diagnosis and treatment.
57. Rheumatoid arthritis: etiology, pathogenesis, clinic diagnosis and treatment.
58. Systemic lupus erythematosus. Etiology, pathogenesis, clinic, diagnosis and treatment.
59. Antiphospholipid syndrome. Etiology, pathogenesis, clinic, diagnosis and treatment.
60. Vasculitis, etiology, pathogenesis, clinic, diagnosis and treatment.
61. To which organs and tissues does not develop natural immunological tolerance.

Topics of essays for Individual Work :

1. Works of eminent researchers, founders of modern immunology (E. Jenner, L. Pasteur, R. Koch, P. Erlich, II Mechnikov, and others).
2. The theory of immunity - features of ideas about the protective mechanisms of the body in different historical periods.
3. Modern ideas about the system of resistance of living organisms.
4. Leukocytes - features of the structure and functions.

5. Inflammation - flow mechanisms and biological role.
6. The most important antigens and haptens in the world around man.
7. Features of the population composition, structure and functions of lymphocytes.
8. Humoral immune response - the structure and diversity of antibodies. Mechanisms of functioning of immunoglobulins.
9. Cellular immune response - T-killers, structural features and mechanisms of functioning.
10. Immunological memory.
11. Cytokines - structure, classification, biological role.
12. Comparative characteristics of mechanisms of innate and adaptive immunity.
13. Evolutionary value of the immune system.
14. The evolution of cellular immunity.
15. The history of the formation of immunology as a science.
16. The definition of "immune system".
17. Primary and secondary lymphoid organs.
18. Cells of the immune system: structure, function, origin and maturation.
19. Lymphocyte circulation, mobility and leukocyte lifetime.
20. Innate immunity. Constitutional, species immunity.
21. Cellular and humoral non-specific protective factors.
22. Phagocytosis. Oxygen-dependent and oxygen-independent mechanisms for the destruction of foreign antigens.
23. Cellular factors of resistance. MFS- system of mononuclear phagocytes. Monocytes, granulocytes, mast cells, large granular lymphocytes.
24. Humoral factors of resistance. Acute phase proteins. Complement system. Mediators of inflammation. Anafilotoxins.
25. Alternative, classical and lectin-dependent pathways of activating the complement system.
26. Acquired immunity. Specific mechanisms of immunity. Population composition of lymphocytes.
27. Antigens. Basic concepts and concepts. Classification of antigens. Immunogenicity The specificity of the antigen. Examples of some antigens.
28. Antibodies. The structure of immunoglobulins.
29. Molecular structure, classes of immunoglobulins, properties of immunoglobulins (IgG, IgM, IgA. IgD. IgE).
30. Genetics of antibody formation.
31. Cellular immunity, meaning and induction. Effects of cellular immunity (CI).
32. Mediators of cellular immunity. Cell cytotoxicity.
33. The mechanisms of activation of T and B cells. Cooperative mechanisms of intercellular interactions. Lymphokines.
34. Natural and acquired tolerance.
35. Cytokines. Principles of functioning of the cytokine system.
36. Ontogenesis of the immune system.
37. Antigens of the cluster of differentiation.
38. Evolution and phylogenesis of the immune response.
39. Anti-infective immunity.
40. Immunodeficiency and its prevention.
41. Vaccination. Vaccination based on killed and attenuated microorganisms.
42. Classical and modern methods of attenuation.
43. Use of purified antigens.
44. Molecular cloning, synthetic peptides.
45. Idiotypical vaccines.
46. Primary immunodeficiencies.
47. Secondary immunodeficiencies.
48. AIDS.
49. Allergic reactions: Immediate type of hypersensitivity and Cellular type of hypersensitivity.
50. Hypersensitivity. Reactions of hypersensitivity I-IV types.
51. Etiology, manifestations and mechanisms of autoimmune diseases.
52. Transplant immunology.

5.4. List of Assessment Tools

Presentation
Test
Essays for Individual Work
Situational tasks

Frontal survey in the form of a test
Differentiated credit
(Grading scales for all types of evaluation tools in Appendix 3)

6. COURSE (MODULE) METHODOLOGICAL AND INFORMATIONAL SUPPORT

6.1 Recommended Reading

6.1.1 Required Reading List

	Authors, Compliers	Title	Book publisher, Year
L1.1.	Male D., Brostoff J., Roth D., Roitt I.	Immunology	ISBN: 978-0-702-04548-6 Elsevier, 2013 – 590p.
L1.2.			
L1.3.	Peter J. Delves [et al.].	Roitt's essential immunology	12th ed. – 2011 – 546 p.
L1.4.	Robert R. Rich, Thomas A. Fleisher, William T. Shearer, Harry W. Schroeder Jr., Anthony J. Frew, and Cornelia M.	Clinical Immunology: Principles and Practice	2010 – 1578 p.

6.1.2 Advanced Reading

	Authors, Compliers	Title	Book publisher, Year
L2.1.	Stephen T. Holgate, Martin K. Church, David H. Broide, and Fernando D. Martinez.	Allergy	4th ed. / – 4th ed. – 2012. – 399 p.
L2.2.	Lauren Sompayrac.	How the immune system works	4th ed. – 2012. – 141 p.
L2.3.	Raif Geha, Luigi Notarangelo.	Case studies in immunology: a clinical companion	6th ed. – 2011. – 363 p.

6.1.3 Guidance Papers

	Authors, Compliers	Title	Book publisher, Year
L3.1.	I Kenneth Murphy with acknowledgment to Paul Travers, Mark Walport; with contributions by Allan Mowat, Casey T. Weaver.	Janeway's immunobiology	8th ed. – 2012 – 868 p.

6.2 Online Resources

6.3.2.1 Allimmunologi.org - a site dedicated to immunology, immunity, immunization. [El. resource]. Access mode: http://allimmunology.org/ On this site you can freely find immunological journals, links to various websites on immunology
6.3.2.2 http://www.biblioclub.ru
6.3.2.3 Immunology in Russia On-Line »- [El. resource]. Access mode: http://www.rji.ru/ruimmr.htm - electronic journal
6.3.2.4 Scientific electronic library. [El. resource]. Access Mode: elibrary.ru.
6.3.2.5 http://www.nature.ru - site for all sections of biology, medicine, genetics, physiology
6.3.2.6 Russian National Library http://www.nlr.ru

6.3. List of Information and Education Technologies

6.3.1 Competence-based Educational Technologies

6.3.1.1 Traditional educational technologies - lectures, practical exercises, consultations focused on the communication of knowledge transferred to students in finished form.
6.3.1.2 Innovative educational technologies - classes in an interactive form, which form systems thinking and the ability to generate ideas in solving various problems. These include electronic texts of lectures with presentations.
6.3.1.3 Information educational technologies - independent use by a student of computer equipment and Internet resources for carrying out practical tasks and independent work.

6.3.2 List of Information Reference Systems and Software

6.3.2.1 Allimmunologi.org - a site dedicated to immunology, immunity, immunization. [El. resource]. Access mode: http://allimmunology.org/ On this site you can freely find immunological journals, links to various websites on immunology
6.3.2.2 http://www.biblioclub.ru
6.3.2.3 Immunology in Russia On-Line »- [El. resource]. Access mode: http://www.rji.ru/ruimmr.htm -

electronic journal
6.3.2.4 Scientific electronic library. [El. resource]. Access Mode: elibrary.ru.
6.3.2.5 http://www.nature.ru - site for all sections of biology, medicine, genetics, physiology
6.3.2.6 Russian National Library http://www.nlr.ru

7. COURSE (MODULE) LOGISTICS

7.1. The department is located on the territory of the Ilbirs LLC - at the address: Bishkek, Kiev st., 77
7.2. Classroom №1 for 24 seats, for practical training, individual work and watching multimedia, video, visual aids - stands, board, sets of tables and diagrams.
7.3. Classroom №.2 for 24 seats, for practical training, individual work and viewing multimedia, video materials, visual aids - stands, board, sets of tables and diagrams.
7.4. Classroom №3 (small lecture hall) for 50 seats, for conducting practical exercises, performing individual work and watching multimedia, video materials, visual aids - stands, board, sets of slides, tables, multimedia visual materials on various sections of the discipline.
7.5. Classroom №4 for 12 seats for practical training.
7.6. Classroom №5 for 12 seats, for practical training.
7.7. Information sources: - library - 80 copies;
7.8. Computer
7.9. Projector
7.10. Printer
7.11. Scanner
7.11. Netbook
7.12. Modern instrumental base for demonstration of immunological methods of research in the immunological laboratory of the Research Institute of Molecular Biology and Medicine.

8. COURSE (MODULE) PROFICIENCY METHODICAL GLUIDELINES (FOR STUDENT)

Starting to study the discipline, the student should carefully read the thematic lesson plan, a list of recommended literature. Should understand the sequence of individual learning tasks. Independent work of a student involves working with scientific and educational literature, the ability to create texts. The level and depth of mastering the discipline depends on the active and systematic work at the lectures, the study of the recommended literature, the performance of written control tasks.
When studying the discipline, students perform the following tasks:
- study the recommended scientific-practical and educational literature;
- perform the tasks provided for independent work;
The course program is based on the principles of consistency and continuity of the content of the topics studied. Learning technology is focused on the use of traditional forms.
The main types of classroom work of students are lectures and practical exercises.
During the lectures, the teacher sets out and explains the basic, most complex concepts of the topic, as well as the theoretical and practical problems associated with it, gives recommendations for the seminar lesson and instructions for individual work.
Practical classes complete the study of the most important topics of the academic discipline. They serve to consolidate the material studied, develop the skills and abilities to prepare reports, reports, gain experience of oral public speaking, lead discussions, argue and defend put forward positions, and also control the teacher's degree of students' readiness in the discipline.

Practical classes

Topic 1. Tasks and history of the development of immunology.

Plan: The emergence and formation of immunology as a science, the stages of formation of immunology. The role of domestic and foreign scientists in the development of immunology. The main directions of modern immunology: cellular, molecular, clinical, transplantation.
Questions for self-control:
1. Tell us about the emergence and formation of immunology as a science. 2. What is the role of domestic and foreign scientists in the development of immunology? 3. List the main directions of modern immunology.
Questions for self-study: environmental immunology; immunogenetics, immunopathology, allergology, immunomorphology, immunochemistry, immunohematology. immunology of reproduction, etc. The role of immunology in the development of medicine and biology, its relationship with other sciences.

Topic 2. The modern definition of the term "immunity".

Plan: Immunity as the main function of the immune system, aimed at maintaining the genetic constancy of the

internal environment of the body. Formation of human immunity. The role of the immune system in humans. The main directions of development of modern immunology.
Questions for self-control: 1. Describe the immune system as the main function of the immune system, aimed at maintaining the genetic constancy of the internal environment of the body. 2. How is the formation of human immunity? 3. List the main directions of development of modern immunology.
Questions for self-study: Types of immunity (innate, acquired, natural, artificial, active, passive, sterile, non-sterile, local, etc.). Immunity in ontogeny and phylogenesis. Immunity theory.

Topic 3. Nonspecific factors of protection of the human body.
Plan: The concept of mechanical, physico-chemical biological barriers. Mechanical protective reactions of the skin, mucous membranes. Physical and chemical protection of the body: pH, pepsin enzymatic activity, etc. Biological factors are protected. Nonspecific protection factors (barrier structures of the skin and mucous membranes, liver, acute phase proteins, secretions and biological fluids of the body, enzymes, lysozyme, properdin, inflammatory reactions, the organism's microflora), their role in the body's resistance to infections, a fundamental difference from specific immune factors. The main stages and mechanisms of phagocytosis.
Questions for self-control: 1. Expand the concept of mechanical, physico-chemical biological barriers. 2. Name the mechanical protective reactions of the skin, mucous membranes. 3. List the main stages and mechanisms of phagocytosis.
Questions for self-study: The complement system and its role in protective and regulatory reactions. Classic and alternative pathways to activate complement. The system of natural cytotoxicity (natural killer, interferons). Natural killers, their role in protecting the body. Humoral non-specific protection factors. Complement system, lysines, interferons, leukins, antiviral serum inhibitors, lysozyme, plaquins, properdin, fibronecty, etc. Interferons. Interferon classification, inductors, mechanism of formation and action of interferons. Immunobiological value of interferons (antiviral, immunomodulatory, anti-proliferative), their production and practical use.

Topic 4. The immune system of the human body and its main functions. Organs and cells of the human immune system.
Plan: The immune system as a set of organs, tissues and cells that perform immunological functions. Central organs of the immune system: bone marrow, thymus. Peripheral organs of the immune system: spleen, lymph nodes and follicles. Age features of the immune system. Modern scheme of immunogenesis. Lymphocyte is a central figure in the immune system. Modern ideas about the development of lymphocytes. The concept of the stem (parental) hematopoietic cell. The origin of the stem cell, its characteristics. Stem cell circulation. The concept of the precursors of T-and B-lymphocytes, their characteristics, identification. Thymus-dependent pathway for the development of lymphocytes (T-cells).
Questions for self-control: 1. Describe the immune system as a set of organs, tissues and cells that perform immunological functions. 2. List the central organs of the immune system. 3. Tell us about the role of the spleen, lymph nodes, tonsils and other tissues of the peripheral part of the immune system in immunity.
Questions for self-study: Features of lymphoid accumulations associated with mucous membranes in the intestines, lungs, urogenital system, skin, etc. The role in the immunity of the spleen, lymph nodes, tonsils and other tissues of the peripheral part of the immune system, their morphological features. T-and B-lymphocytes, their characteristics, methods of identification. The concept of subpopulations of T-and B-lymphocytes.

Topic 5. Basics of immunodiagnostics.
Plan: The concept of serological reactions. Characterization of the reaction of antigen - antibody: specificity, biphasic nature, reversibility, the optimal ratio of ingredients, qualitative and quantitative, sensitivity, etc. The mechanism of reactions. Practical use of serological reactions: identification of the antigen, diagnostic detection of antibodies. The main components of serological reactions. Diagnostic immune sera, diagnosticum. Monoclonal antibodies, their use. Phenomena of manifestation and methods of registration of serological reactions. The main methods for the detection of antibodies and antigens. Assessment of the functional state of phagocytes. Methods for determining complement. Principles of assignment of the reaction of CFR, RPGA and CIC. The principle of formulation of reactions using chemical and physical labels of antibodies and antigens (ELISA, immunofluorescence, radioimmunoassay, flow cytometry), their variants and diagnostic value. Modern immunochromatographic tests, the principle of the method.
Questions for self-control: 1. List the main components of serological reactions. 2. What are monoclonal antibodies, what is their use? 3. List modern immunochromatographic tests and explain the principle of the method. 4. What is an ELISA? .5. Tell the phenomena of specific agglutination and precipitation, staging options, use in medicine.
Questions for self-study: Reactions based on the phenomenon of agglutination. Reactions based on precipitation

phenomenon. Reactions involving the complement. Reactions using labeled antigens and antibodies. Immunoelectron microscopy (using antibodies labeled with ferritin, colloidal gold, isotopes).

Topic 6. Antigens.
Plan: Definition. The concept of foreignness, antigenicity, immunogenicity, antigen specificity. Characteristics of molecules with antigenic properties (proteins, polysaccharides, lipopolysaccharides, etc.). Complete and incomplete antigens. Haptens The structure of the macromolecule antigen. Antigenic determinants (epitopes) and their role in the formation of the specificity of antigens.
Questions for self-control: 1. Give the definition of antigen. 2. Give the characteristic of molecules with antigenic properties. 3. Describe the diversity of antigens.
Questions for self-study: Immunochemical specificity of antigens, its manifestations: species, group, type, organ, heterospecific. Microbial antigens, localization, chemical composition, their role in the infectious process and the development of the immune response. Thymus-dependent and thymus-independent antigens. Variety of antigens.

Topic 7. Antibodies.
Plan: Antibodies. Definition. Physico-chemical, biological properties and functions. Immunoglobulins. The main classes, their structural and functional features. The mechanism of interaction of antibodies with antigen. Immune complex. Avidity and affinity of antibodies. The concept of valency antibodies. Antigenic structure of immunoglobulins: isotypic, allotypic. idiotypical determinants. Theory of synthesis and diversity of antibodies.
Questions for self-control: 1. Expand the concepts of antibodies and immunoglobulins 2. Tell us about the antigenic structure of immunoglobulins. 3. Name the properties of antibodies. 4. Tell the molecular structure, classes of immunoglobulins, properties of immunoglobulins (IgG, IgM, IgA. IgD. IgE).
Questions for self-study: Definition of the concept and principles of classification of antibodies. The structure and function of immunoglobulins. Molecular structure, classes of immunoglobulins, properties of immunoglobulins (IgG, IgM, IgA. IgD. IgE). Avidity and affinity of antibodies. The concept of valency antibodies. Antigenic structure of immunoglobulins: isotypic, allotypic. idiotypical determinants. Theory of synthesis and diversity of antibodies. Genetics of antibody formation. The mechanism of interaction of antibodies with antigen. Immune complex.

Topic 8. The human immune status.
Plan: Principles of formation. Age dynamics. Factors affecting the immune status: climatic, geographical, social, medical. Collect immunological history. Methods of investigation of the immune status and principles of its clinical evaluation. Evaluation of T-cell system immunity (cellular immunity). Evaluation of the B-cell system of immunity (humoral immunity). Assessment of the functional state of phagocytes. The main methods for the detection of antibodies and antigens. Definition of complement. Tests of the first and second level, their clinical interpretation.
Questions for self-control: 1. Name the factors affecting the immune status. 2. List the methods for assessing the immune status. 3. Expand the age features of the immune status and principles of its evaluation.
Questions for self-study: Methods for assessing the immune status. Detection of antibodies. Methods for the determination of immune complexes. Methods for the quantitative and qualitative determination of immunoglobulins. Determination of subpopulations of T-and B-lymphocytes: cluster analysis. E- and EAC-rosette; assessment of mitotic and killer lymphocyte activity, determination of NK-cell activity. Skin tests as a method of indicating cellular immunity. Tests of the first and second level, their clinical interpretation. Evaluation of T-cell system immunity (cellular immunity). Evaluation of the B-cell system of immunity (humoral immunity). Assessment of the functional state of phagocytes.

Topic 9. Differential diagnosis of major immunopathological syndromes.
Plan: The concept of immunopathological syndromes and their classification. Allergic syndrome. Infectious syndrome. Autoimmune syndrome. Immunoproliferative syndrome. Primary immunodeficiency. Secondary immunodeficiency. Differential diagnosis of major immunopathological syndromes.
Questions for self-control: 1. What are the factors influencing the development of immunopathological syndromes. 2. List the main immunopathological syndromes 3. Describe the differential diagnosis of the main immunopathological syndromes.
Questions for self-study: The concept of immunopathological syndromes and their classification. Allergic syndrome. Infectious syndrome. Autoimmune syndrome. Immunoproliferative syndrome. Primary immunodeficiency. Secondary immunodeficiency. Differential diagnosis of major immunopathological syndromes.

Topic 10. Allergic reactions.
Plan: The concept of allergies. The classification of allergic reactions according to Jelle and Coombs: type I - due to IgE anaphylactic (atopic) reactions; type II - cytotoxic reactions; type III - immunocomplex reactions; Type IV - T cell lymphocyte mediated reactions. History of discovery. The concept of sensitization. Characteristics of allergens. The mechanism of development of allergic reactions of the humoral type. Signs of difference between humoral and cellular allergic reactions. Manifestations (anaphylactic shock. Serum sickness, local anaphylaxis, etc.).
Questions for self-control: 1. Expand the concept of allergies. 2. List allergic reactions according to Gel and Coombs. 3. Name the signs of the difference between humoral and cellular allergic reactions.
Questions for self-study: Diagnostic tests to identify the humoral allergy type. Immunological basis of prevention and treatment. Desensitization. The concept of cell-mediated immunity. Mechanisms of development of reactions, the role of mediators. Forms of manifestation: infectious, contact, transplant. Antitumor, autoimmune allergy. Detection methods. Allergy skin tests, their diagnostic value.

Topic 11. Allergy pathology.
Plan: The concept of anaphylaxis. Anaphylactic shock. Etiology, pathogenesis, clinic, diagnosis, treatment, prevention. Drug allergies. Etiology, pathogenesis, diagnosis, treatment, prevention. Food allergies. Etiology, pathogenesis, clinic, diagnosis, treatment and prevention. Angioedema. Etiology, pathogenesis, clinic, diagnosis, treatment and prevention
Questions for self-control: 1. Expand the concept of anaphylaxis. 2. List the types of drug allergies 3. Name the signs of food allergic reactions.
Questions for self-study: Mechanisms of development of anaphylactic shock. Lyell syndrome - etiology, pathogenesis, clinic, diagnosis, treatment and prevention. Stevens-Johnson syndrome - etiology, pathogenesis, clinic, diagnosis, treatment and prevention. First aid for anaphylactic shock. Rehabilitation with swelling of the larynx. Food allergies - etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention. Angioedema-Quincke's edema - etiology, pathogenesis, clinic, diagnosis, treatment and prevention.

Topic 12. Allergic diseases.
Plan: Bronchial asthma. Etiology, pathogenesis, clinic, diagnosis, treatment and prevention. Urticaria. Etiology, pathogenesis, clinic, diagnosis, treatment and prevention. Atopic dermatitis. Etiology, pathogenesis, clinic, diagnosis, treatment and prevention. Allergic rhinitis. Etiology, pathogenesis, clinic, diagnosis, treatment and prevention.
Questions for self-control: 1. Expand the concept of atopic diseases. 2. List the types of asthma and allergic rhinitis. 3. What are the main symptoms of urticaria and atopic dermatitis? 4. What is ASIT therapy.
Questions for self-study: Mechanisms of development of bronchial asthma. Quincke edema, etiology, pathogenesis, clinic, diagnosis, treatment and prevention. Allergic rhinitis - etiology, pathogenesis, clinic, diagnosis, treatment and prevention. ASIT therapy for atopic dermatitis.

Topic 13. Immunopathology.
Plan: Primary and secondary immunodeficiencies. Lack of humoral, cellular immunity, combined disorders of immunity. The role of infection in the development of human immunodeficiency.
Questions for self-control: 1. What is the role of infection in the development of human immunodeficiency? 2. Tell about the etiology and pathogenesis of primary immunodeficiencies. 3. What is an immunodeficiency condition? 4. Classification of immunodeficiencies.
Questions for self-study: The role of environmental factors in the induction of primary and secondary immunodeficiencies. Primary (congenital) immunodeficiencies with B-lymphocyte defects. Causes of defects of the humoral link. Bruton disease, clinical options, diagnosis, treatment tactics. Selective IgG deficiency - clinic, diagnosis, treatment tactics. Hyper IgE - syndrome - etiology, pathogenesis, clinic, diagnosis, treatment tactics.

Topic 14. Primary T-cell immunodeficiencies. Congenital immunodeficiencies with defects in the macrophage system.
Plan: Primary (congenital) immunodeficiencies with T-lymphocyte defects. Classification of T-cell immunodeficiencies. Causes of cellular defects. Causes of macrophage defect
Questions for self-control: 1. What are the causes of cellular defects? 2. Tell us about the etiology and pathogenesis of primary immunodeficiency of the macrophage.
Questions for self-study: Primary (congenital) immunodeficiencies with T-lymphocyte defects. Di-Georgie syndrome, clinical signs, diagnosis, treatment tactics. Louis-Barr Clinic syndrome, diagnosis, treatment tactics. Chediak-Higashi syndrome - etiology, pathogenesis, clinic, diagnosis, treatment tactics. TKID clinical signs, diagnosis, treatment. Chronic granulomatous disease clinical signs, diagnosis, treatment tactics. Wiskott-Aldrich

syndrome, clinical signs, diagnosis and treatment.

Topic 15. Secondary (acquired) immunological deficiency.
Plan: Secondary (acquired) immunological deficiency. Classification VIEW. The role of species in the pathogenesis of various human diseases. The structure and structure of HIV. Ways of HIV transmission. AIDS, etiology, pathogenesis, diagnosis and treatment.
Questions for self-control: 1. What is the induced form of the VIEW? 2. Tell us about the spontaneous form of VIEW. 3. What is HIV? 4. How is HIV different from AIDS? 4. List ways to transmit AIDS.
Questions for self-study: Secondary (acquired) immunological failure. Classification SID . The role of species in the pathogenesis of various human diseases. The structure and structure of HIV. Ways of HIV transmission. AIDS, etiology, pathogenesis, diagnosis and treatment.

Topic 16. Immunotropic therapy.
Plan: Principles of immunotherapy. Reportations to the use of immunotropic drugs. Classification of immunotropic drugs, modern immunocorrective drugs. Immunomodulators of thymic and bone marrow origin, mechanism of action and indications for use. Immunomodulators of microbial and plant origin, mechanism of action and indications for use. Immunomodulators of synthetic origin, mechanism of action and indications for use. Immunomodulators based on interferon (IFN) and interleukins (IL). Applications, treatment regimens. Classification of immunosuppressants, mechanism of action and indications for use.
Questions for self-control: 1. What groups of immunocorrective drugs know 2. Tell the basic principles of the appointment of immunotropic drugs. 3. Which immunomodulators have a membrane-protective action?
Questions for self-study: Immunomodulators of thymic and cerebral origin, mechanism of action and indications for use. Immunomodulators of microbial and plant origin, mechanism of action and indications for use. Immunomodulators of synthetic origin, mechanism of action and indications for use. Immunomodulators based on interferon (IFN) and interleukins (IL). Applications, treatment regimens. Classification of immunosuppressants, mechanism of action and indications for use.

Topic 17. Autoimmune pathology.
Plan: Immunological tolerance, types of immunological tolerance. Immunological memory. Autoantigens and autoantibodies. Mechanisms for the development of auto-aggression. Classification of autoimmune diseases. Target organs in autoimmune diseases.
Questions for self-control: 1. What are the causes of autoimmune pathology? 2. Tell the mechanism of immunological tolerance. 3. What are organ-specific and organ-specific diseases?
Questions for self-study: The concept of auto-aggression. Mechanisms for the development of auto-aggression. Immunological tolerance, types of immunological tolerance. Diabetes mellitus type I: etiology, pathogenesis, clinic, diagnosis and treatment. Autoimmune diseases of the thyroid gland: Graves disease, etiology, pathogenesis, clinic diagnosis and treatment. Hashimoto disease, etiology, pathogenesis, clinic diagnosis and treatment.

Topic 18. Autoimmune diseases.
Plan: What organs and tissues do not develop natural immunological tolerance. Rheumatoid arthritis: etiology, pathogenesis, clinic diagnosis and treatment. Systemic lupus erythematosus. Etiology, pathogenesis, clinic, diagnosis and treatment. Antiphospholipid syndrome. Etiology, pathogenesis, clinic, diagnosis and treatment. Vasculitis, etiology, pathogenesis, clinic, diagnosis and treatment.
Questions for self-control: 1. To which organs and tissues does not develop natural immunological tolerance? 2. Tell us about the etiology and pathogenesis of rheumatoid arthritis. 3. What is rheumatoid factor? 4. What is the Lupus test?
Questions for self-study: Rheumatoid arthritis: etiology, pathogenesis, clinic diagnosis and treatment. Systemic lupus erythematosus. Etiology, pathogenesis, clinic, diagnosis and treatment. Antiphospholipid syndrome. Etiology, pathogenesis, clinic, diagnosis and treatment. Vasculitis, etiology, pathogenesis, clinic, diagnosis and treatment.

APPENDIX 1

SITUATIONAL TASKS

Task 1. Organ has capsule, marginal sinuses, follicles, which consist of small lymphocytes on the periphery and blast forms of the center (reactive centers), zone of T-lymphocytes, in the center the sinus alternate with the accumulation of lymphocytes, plasma cells. What organ does have this structure?
1-Thymus
2- Brain
3-Lymphatic nodes

Task 2. With the microscopic examination of the blood, it is established that in man in the blood it does circulate many immunoglobulin's M and G what cells of the blood are critical for the formation of immunoglobulin?
1-T- lymphocytes
2. B- lymphocytes
3- Neutrophils
4-Erythrocytes

Task 3. With the microscopic examination of the cells of the blood are revealed the cells, which ripen in the thymus. With what cells does deal the discussion?
1- Erythrocytes
2-B- lymphocytes
3- Neutrophils
4. T- lymphocytes
5-Basophils

Task 4. With a macroscopic study of the thymus of child it is established that it is located on the neck, decreases in the size, in it the separation into the crust and the cerebral substance is disrupted. By coca another organ does relate to the central organs of immunogenesis?
1-Lymphatic nodes
2. Lymphatic follicles in the walls of gut.
3-Mindalin of brain.

Task 5. Name the cellular system, specific function of which is the immune protection:
1-Neutrophil granulocytes
2. Erythrocytes
3- Lymphoid cells a
4-.Reticulocytes

Task 6. The woman of 35 years entered hospital in the urgent of order with the assault of bronchial asthma and at the height of assault began death. On the dissection are found the expressed spasm of bronchi, the infiltration of the walls of bronchi with neutrophils, by lymphocytes, by fat cells, and also the obscuration of the opening of small bronchi by mucus. What mechanism of hypersensitivity does

be the basis of the described changes?
1. Immunological tolerance.
2. Immediate mechanism
3. Immunocomplex mechanism.
4. Cellular- defined by example mechanism
5. Atopy, anaphylaxis.

Task 7. The child of 2, 5 years, who prolonged was ill, lagged in the physical development, it died of the generalized fungus infection (candidiosis). The significant decrease of the thymus is found on the dissection. With the microscopic examination of the thymus among the fatty and connective tissue is determined an insignificant quantity of reticulocytes and lymphocytes. In the lymph nodes - expressed bright centers of the multiplication of follicles, the devastation of paracortical zones. About what process do testify these changes?
1. about immediate type hypersensitivity.
2. about retarded type hypersensitivity.
3. About the acquired of humeral immunity.
4. about the innate of humeral immunity.
5. about the innate of cellular immunity.

Task 8. With histological a study of the increased neck lymph node the anatomical pathologist found the plural granulomas, which consisted of epithelioid, lymphoid cells, giant polynuclear cells of Pirogov -Langans and foci of caseous necrosis. What mechanism of hypersensitivity does occur in this case?
1. Anaphylactic.
2. Immediate.
3. Immunocomprimesed
4. Cellular- indirected.
5. Cellular immunodeficiency.

Task 9. In woman with the rhesus- negative factor rh-positive child was born. Jaundice appeared toward the end of the first day in child, increased the liver and spleen. With a study of the placenta is determined its increase, pale painting, edema of naps. What immunopathologic mechanism does be the basis of changes in newborn?
1. Autoimmune disease
2. Humoral mechanism.
3. Immunocomplex mechanism.
4. Cellular mechanism
5. Atopy, anaphylaxis.

Task 10. Patient turned herself to the doctor with the complaints of an increase in the thyroid gland, the difficulty with the ingestion, apathy, and bradycardia. In palpation of gland is found the substitution of the tissue of gland by lymphoid infiltrations with the formation of lymphoid follicles and the proliferation of B-lymphocytes. For what illness the characteristic described histological picture?
1. Autoimmune thyroiditis of Hashimoto
2. Main goiter
3. Toxic goiter
4. Diffuse colloidal goiter

5. Diffuse parenchymatous goiter

Task 11. After transferred streptococcus angina in 2 weeks in the man of 23 years appeared general weakness, pains in the lumbar region, change in the urine - hematuria, proteinuria to 1 g/l. At the study of nephritic biostatic by immunohistochemical method are found the deposits in mezangiume, in the glomerate basal lamina Ig, M Ig.G, the fractions of complement, while with the electron-microscopic examination - electron-dense epithelial deposits. What immunological process did cause changes in the kidneys?
1. Anaphylactic mechanism of hypersensitivity.
2. Immediate mechanism of hypersensitivity.
3. Cellular mechanism of hypersensitivity.
4. Immunocomplex mechanism of hypersensitivity.
5. Cellular immunodeficiency.

Task 12. The boy of 8 months died of the staphylococcal sepsis. With a study of lymphatic it is main found the absence of reactive follicles and plasma cells. The thymus is developed normally. About what process do testify these changes in child?
1. Cellular immunity.
2. Immunological tolerance.
3. acquired humeral immunity.
4. Innate humeral immunity.
5. acquired cellular immunity.

Task 13. To patient with malignant lymphoma was carried out is somewhat it was course the radiation therapy. What changes in immunological status patient it does follow to expect?
1. Innate cellular immunodeficiency.
2. Immunological tolerance.
3. Acquired (second) immunodeficiency.
4. Innate humeral immunodeficiency.
5. Innate humeral and cellular immunodeficiency.

Task 14. A 22-year-old woman came to see a doctor complaining of the stuffy nose, attacks of sneezing, watery discharge from the nose, bothering her during last 3 years from August to September. The patient was made skin scarification tests with pollen allergens (ambrosia, wormwood, and goose-foot). The result of the tests is negative.
Which diagnostic measures are necessary to specify the causes of the diseases in this patient?

Task 15. A 20-year-old man is complaining of attacks of heavy breathing, itching of the eyelids, lachrymation, tickling in the throat, which develop during tidying-up, shaking out carpets and bedding. History: in the childhood suffered from atopic dermatitis.
Which etiological factors are the most probable in this case?
Which methods of investigation may prove them?
Which elimination measures must be taken for the patient?

Task 16. A 19-year-old woman is followed in the antenatal clinic because of pregnancy (10-12 weeks).
History: she is known to have been ill with pollinosis for 5 years; sensitization to ambrosia and goose-foot allergens was revealed.
Which preparations should be preferred in case of exacerbation of allergic rhinitis?
What recommendations may be given to prevent atopic diseases in the future child?

Task 17. In a 52-year-old man, after the contact with synthetic detergents, multiple eruptions have developed on the skin of the arms and abdomen, accompanied with pronounced itching. History: the patient is known to have been ill with ischemic heart disease: post-infarction cardiosclerosis, blockade of the right leg of the His' band.
Which antihistamine preparations should be administered in such a situation?

APPENDIX 2

Tests for basic and clinical Immunology

1. A secondary lymphoid organ is
   - a. TLR
   - b. bacterial flagellin
   - c. tonsils
   - d. C-reactive protein
2. One of the pathogen-associated molecular pattern is
   - a. TLR
   - b. bacterial flagellin
   - c. tonsil
   - d. C-reactive protein
3. Antimicrobial peptides is(are)
   - a. defensins and cathelicidins
   - b. unmethylated DNA, ss RNA
   - c. SALT
   - d. C-reactive protein
4. The cell of the following cell types that is called a Kupfer cell when in the liver is
   - a. neutrophil
   - b. T or B lymphocyte
   - c. macrophage
   - d. NK cell
5. A pathogen associated molecular pattern is(are)
   - a. defensins and cathelicidins
   - b. Unmethylated DNA, ss RNA
   - c. SALT
   - d. C-reactive protein
6. Which of the following is involved in a humoral immune response?
   - a. neutrophil
   - b. B lymphocyte
   - c. macrophage
   - d. NK cell
   - e. T cells
7. An acute phase reactant involved in cardiac risk measurements is(are)
   - a. defensins and cathelicidins
   - b. unmethylated DNA, ss RNA
   - c. SALT
   - d. C-reactive protein
8. CD19, 20, 21 are on these cells
   - a. macrophage
   - b. B cells
   - c. T cells
   - d. dendritic cells
9. Which one of these does not belong?
   - a. Kupfer cells
   - b. histiocytes
   - c. alveolar macrophages

- d. dendritic cells

10. CD11c+ cells are
- a. macrophage
- b. B cells
- c. T cells
- d. dendritic cells

11. A pattern recognition receptor is(are)
- a. defensins and cathelicidins
- b. unmethylated DNA, ss RNA
- c. SALT
- d. toll-like receptor

12. Apoptosis, also known as programmed cell death occurs when
- a. the cell receives certain signals and then sends perforins to kill neighboring cells
- b. the cell receives certain signals and digests its own DNA
- c. the cell receives certain signals and digests its own membrane
- d. none of the above

13. Which of the following cells kills tumor cells and virally infected cells, not antigen specific, uses perforins
- a. neutrophil
- b. B lymphocyte
- c. macrophage
- d. NK cell

14. The innate immune system uses
- a. PRR to recognize PAMP
- b. PAMP to recognize PRR
- c. PAMP to recognize surface mannose
- d. surface mannose to recognize lectins on the bacteria

15. Which of the following has a polymorphic nucleus
- a. neutrophil
- b. B lymphocyte
- c. macrophage
- d. NK cell
- e. T cells

16. The process by which macrophage and neutrophils squeeze through the intact blood vessel is
- a. opsonization
- b. diapedesis
- c. chemotaxis
- d. phagocytosis

17. An acute phase reactant is
- a. TLR
- b. bacterial flagellin
- c. tonsil
- d. C-reactive protein

18. An antigen-specific cell is a
- a. neutrophil
- b. T or B lymphocyte
- c. macrophage
- d. NK cell

19. The first cell at the site of an infection is a(n)
- a. neutrophil
- b. T or B lymphocyte
- c. macrophage

- d. NK cell

20. When treated with IL-2, this cell becomes an LAK cell.
- a. neutrophil
- b. T or B lymphocyte
- c. macrophage
- d. NK cell

21. A secondary lymphoid organ is(are)
- a. defensins and cathelicidins
- b. unmethylated DNA, ss RNA
- c. SALT
- d. C-reactive protein

22. A lectin is a
- a. molecule that binds to neutrophils
- b. molecule that binds lipids
- c. molecule that binds carbohydrates
- d. a molecule that causes apoptosis

23. Each of the 12 types of these binds a different PAMP.
- a. TLR
- b. bacterial flagellin
- c. tonsil
- d. C-reactive protein

24. The phagocytic cell that does not arrive first at the site of a chronic infection is the
- a. neutrophil
- b. B lymphocyte
- c. macrophage
- d. NK cell
- e. T cell

25. A phagocytic cell is a(n)
- a. platelet
- b. T or B lymphocyte
- c. macrophage
- d. NK cell

26. The cell of the following cells that has a specific regulatory subset is a
- a. neutrophil
- b. B lymphocyte
- c. macrophage
- d. T cell

27. Which cell is very active in antigen presentation?
- a. dendritic cells
- b. T cells
- c. epithelial cells
- d. LAK cells

28. Which statement is correct?
- a. Serum is formed after blood is allow to clot.
- b. Serum is formed in blood after anticoagulants have been added.
- c. Plasma is formed after blood is allowed to clot.
- d. Clotting factors are no longer in plasma.

29. CD 56+, CD 16+, and CD3- are markers used to characterize–
- a. a macrophage
- b. an NK cell
- c. a dendritic cell
- d. an eosinophil

30. All the cells are effectors except:

A. T-cytotoxic.

B. NK-cell.

C. Plasma cell.

D. T-helper.

E. None of above

31. How many types of the immune globulines do you know?

A. 6.

B. 3.

C. 4.

D. 5.

E. 2.

32. All the markers are of T-cells except:

A. CD4.

B. CD8.

C. CD3.

D. CD19.

E. None of above

33. What type of immunoglobulins has the most important role in case of acute respiratory infection?

A. IgA.

B. IgM.

C. IgG.

D. IgD.

E. IgE

34. What is the function of plasma cells?

A. participation in immune cooperation.

B. immunoglobulin production.

C. IFN production.

D. participation in neoplasia control.

E. immunosuppression.

35. What is the function of NK-cells?

A. participation in immune cooperation.

B. immunoglobulin production.

C. IFN production.

D. participation in neoplasia control

E. immunosuppression.

36. What class of immunoglobulin increases in case of helmint invasion?

A. IgA.

B. IgM.

C. IgG.

D. IgD

E. IgE.

37. What class of immunoglobulin can go through placenta?

A. IgA.

B. IgM.

C. IgG.
D. IgD.
E. IgE.
38. All the medicines could be useful in case of anaphylactic reactions except:
A. epinephrine
B. diphenhydramine
C. zaditen
D. dobutamine
E. betametason
39. AIDS is caused by a human retrovirus that kills
A. B lymphocytes
B. lymphocyte stem cells
C. CD4-positive T lymphocytes
D. CD8-positive T lymphocytes
E. None of above
40.The least likely recurrent infection caused by primary immune deficiency is:
a. Recurrent otitis media
b. Recurrent bacterial skin infection
c. Recurrent bacterial pneumonia
d. Recurrent osteomyelitis
e. Recurrent urinary tract infection
41. Which one is considered as a characteristic of transient hypogammaglobulinemia of infancy (THI)?
a. Normal IgG
b. Normal IgM
c. Normal IgA
d. Normal IgD
42. Which one is the most likely diagnosis of an 18 year old female who presents with a history of recurrent sinopulmonary infection, low IgG and IgA and ITP?
a. X-linked agammaglobulinemia
b. Severe combined immunodeficiency
c. Common variable immunodeficiency
d. Ataxia-telangiectasia
e. Cystic fibrosis
43. A 7 month old infant with a history of failure to thrive, recurrent oral candidiasis, and Pneumocystis carinii pneumonia is being evaluated. Which of the following is the least useful diagnostic test?
a. Immunoglobulin levels and functional antibody
b. Enumeration of T cells and lymphocyte proliferation assay
c. Anti-HIV antibody
d. Delayed type hypersensitivity skin test
e. Nitroblue tetrazolium test and phagocytic tests
44. A mother brings her son, a 6 year old boy with severe eczema, recurrent bacteria skin infections and history of staphylococcal pneumonia for evaluation of immunodeficiency. Initial tests reveal normal CBC and platelets, 50,000 IU of IgE, normal IgG, IgM and IgA levels. Which one is the most likely diagnosis?
a. Atopic dermatitis
b. Wiskott-Aldrich Syndrome

c. Hyper-IgE syndrome

d. Chronic granulomatous disease

e. Leukocyte adhesion defect

45. Which one is a true association of a primary immune deficiency and an abnormal hematologic finding?

a. Leukocyte adhesion defect and thrombocytopenia.

b. Hyper-IgM syndrome and neutropenia.

c. Wiskott-Aldrich syndrome and gigantic platelets.

d. Chronic granulomatous disease and large cytoplasmic granules in PMNs.

e. Hyper-IgE syndrome and mastocytosis.

46. Which one is the characteristic infection in patients with terminal complement (C5-C9) deficiency?

a. MRSA

b. Pneumocystis carinii

c. Meningococcus

d. Catalase-positive organisms

e. Herpes viruses

47. A contraindicated vaccine in an isolated IgA deficiency patient is:

a. OPV

b. Varicella

c. Influenza

d. MMR

e. None of the above

48. IVIG replacement is indicated in all of the following, except:

a. X-linked agammaglobulinemia (XLA)

b. X-linked hyper-IgM syndrome

c. Chronic granulomatous disease (CGD)

d. Wiskott-Aldrich syndrome (WAS)

e. Common variable immunodeficiency

49. PCP prophylaxis with trimethoprim-sulfamethoxazole is recommended in:

a. X-linked agammaglobulinemia (XLA)

b. X-linked hyper-IgM syndrome

c. Chronic granulomatous disease (CGD)

d. Wiskott-Aldrich syndrome (WAS)

e. Hyper-IgE syndrome

50. Development of Lyel's Syndrome is caused by:

A. anaphylactic type of allergic reaction
B. hyperresponsiveness of delayed type
C. cyto-toxic type of allergic reaction
D. immuno-complex type of allergic reaction

51. In the base of pathogenesis of serum disease is:

A. anaphylactic type of allergic reaction
B. hyperresponsiveness of delayed type
C. cyto-toxic type of allergic reaction
D. immuno-complex type of allergic reaction

52. Risk factors of medication side effect:

A. intolerance of medications in anamnesis
B. simultaneous assignment of two or more medications from the one group
C.simultaneous assignment of two or more medications from different groups excluding their interaction
D. all of the above

53. What nosology is accompanied by necrosis of epidermis surface?
    A. Lyel's Syndrome
    B. Syndrome of Stivens-Jonson
    C. toxico-allergic dermatitis
    D. varicella
54. What condition is always accompanied by toxic damage of CNS:
    A. serum disease
    B. Syndrome of Stivens-Jonson
    C. Lyel's Syndrome
    D. eczema
55. For treatment of allergy it is used everything except:
    A. adrenaline
    B. eufilin
    C. diphenhydramine
    D. paracetamol
56. The most effective drug for anaphylactic shock is:
    A. adrenaline, dopamine
    B. calcium chloride
    C. penicillin
57. Allergic reaction of immediate type:
    A. anaphylactic shock
    B. nettle rash
    C. Lyel's Syndrome
    D. Syndrome of Stivens-Jonson
58. Allergic reaction of delayed type:
    A. serum disease
    B. nettle rash
    C. acute vascular purpura
    D. anaphylactic shock
59. Bullous damage of skin and mucosa is typical for:
    A. Lyel's Syndrome
    B. Syndrome of Stivens-Jonson
    C. multiform exudative erythema
    D. candidiasis
60. Lyel's Syndrome appears after:
    A. taking antibiotics of penicillin group
    B. taking non-narcotic analgetics, more often pyrazolone group
    C. taking sulfanilamide, more often of prolonged forms
    D. all of the above
61. Catarrhal or mattery keratoconjunctivitis is typical for:
    A. Lyel's Syndrome
    B. Syndrome of Stivens-Jonson
    C.syndrome of Guillian - Barre
    D.Lime's syndrome
62. There are infective-allergic syndromes:
    A. syndrome of Landry
    B. Syndrome of Stivens-Jonson
    C. syndrome of Lyel
    D. syndrome of Guillian - Barre
63. Clinics of hyperresponsiveness of delayed type is caused by action of:
    A. hystamine
    B. kinins
    C. prostaglandins
    D. catheholamine
64. There are hyperresponsiveness reactions of immediate type except:
    A. nettle rash
    B. asthma
    C. anaphylaxia
    D. serum disease

65. In the base of pathogenesis of anaphylactic shock there is:
    A. immune-complex type of allergic reaction
    B. cyto-toxic type of immune reaction
    C. hyperresponsiveness of delayed type
    D. anaphylactic type of allergic reaction
66. Syndrome of Lyel is caused by:
    A. anaphylactic type of allergic reaction
    B. hyperresponsiveness of delayed type
    C. cyto-toxic type of allergic reaction
    D. immune-complex type of allergic reaction
67. It is typical for **S**yndrome of Stivens-Jonson
    A. acute start, febrile fever
    B. catarrhal or mattery keratoconjunctivitis
    C. development of dehydration shock
    D. erosive damage of mucous
68. Emergency in anaphylactic shock:
    A. to stop introduction of medication which cause anaphylactic reaction
    B. to cut away at the injection site by 1 ml 0,1% adrenalin
    C. glucocorticosteroids - intravenously by stream infusion, then by drop infusion
    D. all of the above
69. Clinic features of serum disease:
    A. it appears after taking medication suddenly
    B. it's developed in 1-3 weeks after taking medications
    C. nettle rash or macular –popular rash
    D. bullous polymorphous exudative erythema
70. Complications of anaphylactic shock:
    A. vasogenic shock
    B. DIS
    C. cerebral and pulmonary edema,
    D. all of the above
71. After the test for penicillin patient felt pain in chest, labored breathing, loss of consciousness. What is your diagnosis?
    A. anaphylactic shock
    B. Arthus phenomenon
    C.thrombembolia of pulmonary artery
    D. infectious-toxic shock
71. It is assigned in anaphylactic shock to enter medicine:
    A. Dopamine, adrenalin, glucocorticosteroids
    B. Glucose
    C. antihistamines
    D. antibiotics
72. Development of pain and toxic-allergic shock is typical for:
    A. serum disease
    B. eczema
    C. Syndrome of Lyel
    D. Syndrome of Guillian - Barre
73. Allergic reaction of immediate type is:
    A. anaphylactic shock
    B. serum disease
    C. Syndrome of Lyel
    D**.** Syndrome of Stivens-Jonson
74. Disease accompanied by toxic damage of CNS:
    A. serum disease
    B. Syndrome of Stivens-Jonson
    C. Syndrome of Lyel
    D. eczema
75. Hyperresponsiveness reaction of delayed type is:
    A. acute vascular purpura
    B. nettle rash

C. anaphylactic shock
D. serum disease

76. Syndrome of Lyel appears after taking medications:
A. antibiotics of penicillin group
B. analgetics
C. sulfanilamides
D. all of the above

77. What nosology is accompanied by necrosis of epidermis surfaces:
A. Syndrome of Lyel
B. Syndrome of Stivens-Jonson
C. toxic-allergic dermatitis
D. varicella

78. Erosive-helcoid damages of mucous of different organs are typical for:
A. Syndrome of Guillian - Barre
B. Syndrome of Lime
C. Syndrome of Lyel
D. Syndrome of Stivens-Jonson

79. It is typical for serum disease:
A. beginning in 1-3 weeks after taking medication
B. nettle-rash or macular –popular rash, Quincke's disease
C. arthralgia and myalgia
D. all of the above

80. In the base of pathogenesis of Stivens-Jonson Syndrome:
A. allergic reaction of delayed type
B. allergic reaction of immediate type
C. cyto-toxic type of allergic reaction
D. immune-complex type of allergic reaction

81. Risk factors of side effects of medications are the following:
A. heavy allergological anamnesis
B. simultaneous assignment of two or more medications from the one group
C. simultaneous assignment of two or more medications from different groups excluding their interaction
D. all of the above

82. For treatment of allergy is used everything excluding:
A. adrenalin
B. diphenhydramine
C. hydrocortisone
D. paracetamol

83. The first treatment in anaphylactic shock:
A. dopamine
B. adrenalin
C. hydrocortisone
D. antibiotics

84. Treatment of Lyel's Syndrome:
A. glucocorticosteroids
B. detoxication therapy
C. antihistaminic
D. sulfanilamides

85.Hyperresponsiveness of delayed type is typical for:
A. anaphylactic shock
B. serum disease
C. acute vascular purpura
D. nettle rash

86. Hyperresponsiveness of immediate type is typical for:
A. anaphylactic shock
B. Syndrome of Lime
C. Syndrome of Stiven-Jonson
D. nettle-rash

87. What doesn't refer to infectious-allergic syndrome^
    A. Syndrome of Guillian-Barre
    B. Syndrome of Lime
    C. Syndrome of Lyel
    D. Syndrome of Stivens-Jons
88. Risk factors of side effects of medications are the following:
    A. allergological anamnesis record
    B. simultaneous assignment of two or more medications from the one group
    C. simultaneous assignment of two or more medications from different groups excluding their interaction
    D. all of the above
89. Clinics of hyperresponsiveness of immediate type is caused by the following factors:
    A. histamine
    B. kinin
    C. prostaglandin
    D. catecholamine
90. Clinics of hyperresponsiveness of delayed type is caused by the following factors:
    A. histamine
    B. kinin
    C. prostaglandin
    D. catecholamine
91. In anaphylactic shock it is injected intravenously:
    A. dopamine
    B. adrenalin
    C. glucocorticosteroids
    D. antibiotics
92. It is typical for Syndrome of Lyel:
    A. bullous damage of skin
    B. erosive-helcoid damage of mucous
    C. dehydrative shock
    D. addition of the secondary infection
93. It is typical for Syndrome of Stivens-Jonson:
    A. acute beginning
    B. febrile fever
    C. catarrhal keratoconcjunctivitis
    D. all of the above
94. For treatment of allergy is used everything except:
    A. adrenalin
    B. diphenylhydramine
    C. aminophylline
    D. paracetamol
95. Emergency in anaphylactic shock is:
    A. to stop introduction of medications
    B. to inject adrenalin solution
    C. to inject dopamine, adrenalin, prednisolone intravenously
    D. all of the above
96. What nosology is accompanied by necrosis of epidermis surfaces:
    A. Syndrome of Lyel
    B. Syndrome of Stivens-Jonson
    C. toxic-allergic dermatitis
    D. varicella
97. In the base of serum disease pathogenesis is:
    A. anaphylactic type of allergic reaction
    B. hyperresponsiveness of delayed type
    C. cyto-toxic type of allergic reaction
    D. immune-complex type of allergic reaction
98. Development of Lyel's Syndrome is caused by:
    A. anaphylactic type of allergic reaction
    B. hyperresponsiveness of delayed type

C. cyto-toxic type of allergic reaction
D. immune-complex type of allergic reaction

99. Risk factors of side effects of medications are the following:
A. allergological anamnesis record
B. simultaneous assignment of two or more medications from the one group
C simultaneous assignment of two or more medications from different groups excluding their interaction
D. all of the above
100. What nosology is accompanied by necrosis of epidermis surfaces:
A. Syndrome of Lyel
B. Syndrome of Stivens-Jonson
C. toxic-allergic dermatitis
D. varicella
101. It is everything used for treatment of allergy except:
A. adrenalin
B. diphenylhydramine
C. hydrocortisone
D. paracetamol
102. The most effective medication for the treatment of anaphylactic shock is:
A. adrenalin, dopamine
B. penicillin
C. antihistaminic
D. calcium chloride
103. Everything refers to the reaction of responsiveness of delayed type except:
A. nettle-rash
B. asthma
C. anaphylaxia
D. serum disease
104. Clinics of hyperresponsiveness of immediate type is caused by many factors except:
A. catecholamine
B. histamine
C. kinin
D. prostaglandin
105. Complications of anaphylactic shock:
A. cardiovascular insufficiency
B. cerebral edema
C. DIC
D. all of the above
106. It is typical for Lyel's Syndrome:
A. epidermal necrolysis
B. erosive-helcoid damage of mucous
C. bacterial complications
D. dehydration shock
107. Infection-allergic syndromes are:
A. Syndrome of Guilline - Barre
B. Syndrome of Lyel
C. Syndrome of Stivens-Jonson
D. Syndrome of Lime
108. After the test for penicillin patient felt pain in chest, labored breathing, loss of consciousness. What is your diagnosis?
A. anaphylactic shock
B. Arthus phenomenon
C.thrombembolia of pulmonary artery
D. infectious-toxic

APPENDIX 3

Scale of evaluation

Examination (theoretical questions) (midterm)
«85-100%» • deep and durable learning themes of the module;
• complete, consistent, competent and logically presented answers to questions;
• reproduction of educational material on the themes of the module with the desired high degree of accuracy.
«75-84%»
• the presence of minor errors in the presentation of the material of the module;
• demonstration of the students knowledge of the completed the program;
• clear presentation of training material.
«60-74%»
• the presence of significant errors in the responses on module;
• demonstration to students is not enough knowledge on the program;
• not a clear presentation of educational material in the answer.

«less than 60%»
• no knowledge of materials topics;
• a serious mistakes in answers.

Control work of «Introduction to immunology. Types of immunity and nonspecific factors of immune reactivity»
0-59% - 0-4 points rating of "poor»
60-74% - 5-6 points rating of "satisfactory»
75-84% - 7-8 points rating of "good»
85-100% - 9-10 points rating of "excellent»

Control work of «Organization and function of the immune system. Evaluation of the immune system »
0-59% - 0-4 points rating of "poor»
60-74% - 5-6 points rating of "satisfactory»
75-84% - 7-8 points rating of "good»
85-100% - 9-10 points rating of "excellent»

Control work of «Clinical immunology »
0-59% - 0-4 points rating of "poor»
60-74% - 5-6 points rating of "satisfactory»
75-84% - 7-8 points rating of "good»
85-100% - 9-10 points rating of "excellent»

SCALE of EVALUATION of the PRESENTATION (the current control)

№ p/p	Name of the indicator	Mark (in %)
PRESENTATION		70
1	Cover sheet with title	0-4
2	Design of slides and use of additional effects (slide transitions, sound, drawings)	0-10
3	The text of the presentation write a short, well-formed and ideas are clear and structured 0-40	0-40
4	Slides presented in a logical sequence	0-10

5	Slides printed	0-06
REPORT		30
1	The correctness and accuracy of speech while protecting	0-12
2	Breadth of vision (answers to questions)	0-10
3	The implementation of the rules	0-8

During the presentation
0-59% - 0-7 points, a rating of "poor»
60-74% - 8-9 points, a rating of "satisfactory»
75-84% - 10-11 points, a rating of "good»
85-100% - 12-13 points, a rating of "excellent»

SCALE OF ASSESSMENT OF FRONTAL SURVEY TEST (current control)

1. In one test task 20 questions.
2. The questions are given ready-made answers to choose from, one correct and the others wrong.
3. For each correct answer – 5%.
4. Overall rating is defined as the amount of accumulated interest.
5. Scoring % is translated into points.

At testing: 0-59% - (0-11 correct answers), it is 0-7 points, a rating of "poor»
60-74% - (12 to 14 correct answers), it is 8-9 a rating of "satisfactory»
75-84% - (15-17 correct answers), it is 10-11 a rating of "good»
85-100% - (18-20 correct answers), it is 12-13 a rating of "excellent»

SCALE OF ASSESSMENT OF ORAL TEST
(intermediate control – "KNOW»)
(offset in the VII semester) When assessing oral answers to the test level of training to KNOW used the following criteria:

1. Knowledge of the basic processes of the studied subject area, depth and completeness of disclosure of the issue.
2. Ability to solve situational problems, making inferences and generalizations, to give reasoned answers.
3. Possession of a monological speech, the consistency of the answer, ability to answer questions, to express their opinion on the problem.

SCALE OF ASSESSMENT AN ORAL TEST "TO KNOW»
(credit in VII semester)

In assessing the oral responses to the test of the level of learning to KNOW taken into account following criterion:

1. Knowledge of the main processes of the studied subject area, depth and completeness of disclosure question's.
2. Ability to solve situational problems, to draw conclusions and generalizations, to give reasoned answers.
3. Possession of monologic speech, logic and sequence of the answer, ability to answer on the questions posed, to Express their opinion on the problem under discussion.

85-100% (16-20 points) estimated answer that shows solid knowledge the content of the subject of epidemiology; patterns of spread of infectious diseases among the population; the basic laws of the epidemic process; anti-epidemic and preventive measures for prevention and localization of infectious foci diseases; epidemiological features of infections of the respiratory tract, gastrointestinal tract, blood and external covers, as well as anthroponoses, zoonoses, and sapronoses; methods epidemiological analysis of infectious diseases.

75-84% (10-15 points) estimated response, revealing a strong knowledge of the content the subject of epidemiology; the legal framework of public health; biomedical statistics; regularities of the spread of infectious diseases among population; the basic laws of the epidemic process; anti-epidemic and

preventive measures for prevention and localization of infectious foci diseases; epidemiological features of infections of the respiratory tract, gastrointestinal tract, blood and external covers, as well as anthroponoses, zoonoses, and sapronoses; methods epidemiological analysis of infectious diseases; consistency and consistency answer's. However, one or two inaccuracies in the answer are allowed.

60-74% (5-10 points) evaluates the response, indicating mainly about the basic knowledge of the subject of epidemiology; patterns of the spread of infectious diseases among population; the basic laws of the epidemic process; anti-epidemic and preventive measures for prevention and localization of infectious foci diseases; epidemiological features of infections of the respiratory tract, gastrointestinal tract, blood and external covers, as well as anthroponoses, zoonoses, and sapronoses; methods epidemiological analysis of infectious diseases. Several errors are allowed in the content of the answer.

0-59% (1-4 points) estimated response, detecting ignorance of the subject of epidemiology; regularities of the spread of infectious diseases among the population; basic laws development of the epidemic process; anti-epidemic and preventive measures prevention and localization of foci of infectious diseases; epidemiological features anthroponoses, zoonoses and sapronoses; inability to give reasoned answers, weak possession of monologue speech, lack of logic and consistency. Allow serious errors in the content of the answer.

SCALE of ASSESSMENT of PRACTICAL TASKS "to be ABLE to OWN»
(credit in VII semester)

When assessing the answers to the test of the level of training to be ABLE and OWN are taken into account following criterion:

85-100% (8-10 points) estimated response in which the student is able to plan and carry out anti-epidemic measures in the foci of infectious diseases; sanitary and educational work among the population; analyze infectious diseases to establish the "territory, time and risk contingent" and to identify the "risk factors";
methods of epidemiological analysis of infectious diseases; ability to work with the population on the prevention of diseases and instilling sanitary and hygienic skills. Demonstrates full understanding of the problem. All requirements for the task done.

75-84% (4-7 points) estimated response in which the student is able to plan and conduct student anti-epidemic measures in the foci of infectious diseases; to carry out sanitary and educational work among the population; to analyze infectious diseases. morbidity to establish "territory, time and risk profile" and to identify " factors risk"; has the technique of epidemiological analysis of infectious diseases; ability
work with the population on the prevention of diseases and instilling sanitary and hygienic skills'.
Demonstrates a significant understanding of the problem. Most of the requirements, presented to the task completed.

60-74% (1-3 points) estimated response in which the student is not able to plan and the student is able to plan and carry out anti-epidemic actions in the centers infectious diseases; carry out sanitary and educational work among the population; to analyze the incidence of infectious disease to establish "territory, time and contingent risk" and identifying "risk factors"; not sufficiently good command of the technique epidemiological analysis of infectious diseases; not well-versed work with the population on the prevention of diseases and instilling sanitary and hygienic skills proficient in. Demonstrates partial or small understanding of the problem. Many of the requirements, the requirements for assignment are not met.

0-59% (0 points) is estimated the answer at which the student demonstrates misunderstanding problems or no answer and there was not even an attempt to solve the problem

APPENDIX 4

The planning sheet of discipline

Discipline Immunology
Field of study/specialization Diff. credits
Course/semester 2 / 3
Credit units (CU) 3

Title of module according to WPD	Type of control	Forms of control	Minimal credit points	Maximal credit points	Week of control
Module 1					
Introduction to immunology. Types of immunity and nonspecific factors of immune reactivity	Formative assessment	Activity, attendance, lecture notes, performance and presentation of lab works, individual work with tables, discussion of situational tasks	8	13	4 weeks
	Midterm examination	Evaluation test	5	10	
Module 2					
Organization and function of the immune system. Evaluation of the immune system	Formative assessment	Activity, attendance, lecture notes, performance and presentation of lab works, individual work with tables, discussion of situational tasks, writing of reports	8	13	9 weeks
	Midterm examination	Evaluation test	5	10	
Module 3					
Clinical immunology	Formative assessment	Activity, attendance, lecture notes, performance and presentation of lab works, individual work with tables, discussion of situational tasks, reports	9	14	15 weeks
	Midterm examination	Tests	5	10	
Total			40	70	**18 weeks**
Midpoint assessment			20	30	
Summative assessment			60	100	