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Federal State Budget Educational Institution
of Higher Education
Pacific State Medical University
of the Ministry of Health of the Russian Federation

APPROVED BY

Head of the Department of Laboratory
Diagnostics in General and Clinical Practice
_____ / Prosekova E.V./
"23rd" of May 2025

SUBJECT GUIDE FOR TEACHERS AND STUDENTS FOR

Б1.О.13 Immunology - Immunology in clinical practice
(name of discipline)

Specialty	**31.05.03 Dentistry for international students (in English)** (code, name)
Degree	Specialist's degree
Profile	02 "Healthcare" (in the field of providing health care in patients with dental pathology)
Mode of study	**Full-time**
Period of mastering the BEP	**5 years** (nominal length of study)
Department	of Laboratory Diagnostics in General and Clinical Practice

Vladivostok, 2025

Subject guide for teachers and students for **Б1.О.13 Immunology - Immunology in clinical practice** is based on:

1) Federal State Educational Standard of Higher Education for the specialty approved by the Order No. 984 of Ministry of Science and Higher Education of the Russian Federation dated August 12, 2020.

2) Curriculum for the 31.05.03 Dentistry for international students (in English), profile 02 "Healthcare" (in the field of providing health care in patients with dental pathology), approved by the Academic Council of FSBEI HE PSMU of the Ministry of Health of Russia Report No. 8/24-25 dated March 31, 2025.

Subject guide for teachers and students for **Б1.О.13 Immunology - Immunology in clinical practice** was developed by the writing team of the Department of Laboratory Diagnostics in General and Clinical Practice of the FSBEI HE PSMU of the Ministry of Health of Russia, under the guidance of the head of the department Doctor of Medical Sciences, Professor Prosekova E.V.

Developed by:

Head of the Department of Laboratory Diagnostics in General and Clinical Practice	Doctor of Medical Sciences, Professor	Prosekova E.V.
(position held)	(academic degree, academic title)	(full name)

1. GENERAL PROVISIONS

Subject guide for **Б1.О.13 Immunology - Immunology in clinical practice** is a set of recommendations and explanations that facilitate to optimal organization of mastering this discipline.

Regular analysis of lecture materials and work with end-of-the-text questions are necessary for better understanding of the material and systematization of knowledge of **Б1.О.13 Immunology - Immunology in clinical practice**. Particular attention should be paid to emerging questions, confusing terms, and conflicts of points of view during the independent review of the lecture material. If necessary, a student should contact the teacher for advice. Lecture material streamlines students' thinking, while practical classes provide deeper insight into the material of the discipline.

Special attention should be paid to the content of the main provisions and conclusions, explanation of phenomena and facts, and clarification of the practical application of theoretic aspects of topic when preparing for a practical class. During this process students should aim to understand and remember the main provisions of the material under consideration, examples provided, as well as understand the illustrative material.

Collections of assessment tools are used to organize independent study of topics of **Б1.О.13 Immunology - Immunology in clinical practice**.

Independent work of students is facilitated by the following:

1. availability and accessibility of the necessary educational and reference material;
2. a system of regular quality control of completed independent work;
3. availability of teacher's advice.

Subject guides for self-study are presented as literary sources. Subject guides for independent work of students include a list of library resources of the educational institution and other materials accessible to students.

Independent work is a type of in-person extracurricular work of teachers and students of **Б1.О.13 Immunology - Immunology in clinical practice**. Control of independent work is conducted by the leading teacher. Evaluation of independent work results is taken into account when conducting interim examination of students throughout **Б1.О.13 Immunology - Immunology in clinical practice** course.

Continuous assessment during **Б1.О.13 Immunology - Immunology in clinical practice** course is implemented in order to check indicators of achieving competencies, to stimulate students' academic work, and improve methods of mastering new knowledge. Continuous assessment during **Б1.О.13 Immunology - Immunology in clinical practice** course is conducted during the semester to assess all types and sections of the academic discipline that encompass the competencies developed by the discipline: classroom questioning, conducting discussions, working with tests, preparing reports, writing library-research papers, and preparing slides presentations. Continuous assessment of students' knowledge and results of their preparation for practical classes is conducted during every class session.

Interim assessment aims to determine the level of mastery of competency indicators. It is conducted in the pass/fail test format after the student has mastered all sections of **Б1.О.13 Immunology - Immunology in clinical practice** and takes into account learning outcomes for all types of student work over the entire period of mastering **Б1.О.13 Immunology - Immunology in clinical practice** course.

Time allotted for interim assessment is indicated in the schedule.

Assignments given during practical classes, as well as assignments aimed to prepare students for continuous and interim assessment, are included in the collection of assessment tools for **Б1.О.13 Immunology - Immunology in clinical practice**. If necessary, students should contact the teacher for advice. It is necessary to thoroughly think over questions that need clarification before seeking teacher's advice.

2. SUBJECT GUIDES FOR LECTURE CLASSES

Table 1. Subject Guides for **Б1.О.13 Immunology - Immunology in clinical practice** Lectures

Topic No.1 Introduction to general immunology. Structure and function of immune system	
Duration of the lecture (in academic hours):	2
Purpose of the lecture: 1. tell students about the subject and objectives of immunology, its fundamental and practical significance, functioning of the immune system; 2. define key terms: immunology, immunity, functional unit of the immune system; 3. examine main stages of development of immunology and its theory, aspects of immune response indifferent periods of a person's life.	
Lecture plan, order of presentation of its sections: - Introduction to immunology - Definition of immunology. Subject and objectives of immunology. Sections of immunology - Main stages of development of immunology. Theory of immunology - Definition of immunity, immune system. Main types and functions - Structure of the immune system - Functions of the immune system - Ontogeny of the immune system - Organs of the immune system - Cells and molecules of the immune system	
Recommended reading: 1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p. 2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента» 3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru	
Topic No.2 Innate immune response	
Duration of the lecture (in academic hours):	2
Purpose of the lecture: 1. tell students about mechanisms behind the innate immune response and its main characteristics; 2. define key terms: innate immune response, defence mechanisms of the innate immunity system; 3. examine functions and functional units of innate immunity, humoral and cellular factors of innate immunity.	
Lecture plan, order of presentation of its sections: - Mechanisms behind innate immune response - Main characteristics of innate immune response - Functions and functional units of innate immunity - Receptors of innate immunity system - Inflammation. Types. Classification. Mechanisms	

- Humoral factors of innate immunity
- Cellular basis of innate immunity
- Recognition in the innate immunity system

Recommended reading:
1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p.
2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента»
3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru

Topic No.3 Adaptive (acquired) immunity

Duration of the lecture (in academic hours):	2

Purpose of the lecture:
1. tell students about the link between innate and acquired immune responses, distinctive features and characteristics of the adaptive immune response;
2. define adaptive (acquired) immunity and its main components;
3. examine main properties and stages of the adaptive acquired specific immune response.

Lecture plan, order of presentation of its sections:
- Outline of the clink between the innate and acquired immune responses
- Distinctive features and characteristics of the adaptive immune response
- TLR in adaptive immune response
- Main properties of the acquired immunity
- Main stages of specific immune response
- Cells participating in the adaptive immune response
- Phases and types of immune response
- Immune response control

Recommended reading:
1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p.
2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента»
3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru

Topic No.4 Cell cooperation in immune response

Duration of the lecture (in academic hours):	2

Purpose of the lecture:
1. tell students about aspects of structure of immune cells and their cooperation in immune response;
2. define cytokines, their classification;
3. examine the role of cytokines in regulating immune response.

Lecture plan, order of presentation of its sections:

- Types and characteristics of cells that participate in immune response
- Major histocompatibility complex and its role
- Hormones and mediators of the immune system
- Classification of cytokines
- Cytokine regulatory network
- Cytokine receptors

Recommended reading:
1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p.
2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента»
3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru

Topic No.5 Introduction to clinical immunology. Methods of immunological diagnostics

Duration of the lecture (in academic hours):	2

Purpose of the lecture:
1. tell students about subject and objectives of clinical immunology;
2. define clinical immunology, immunodiagnostics, immune status;
3. examine the methods of assessing the condition of the immune system.

Lecture plan, order of presentation of its sections:
- Introduction to clinical immunology
- Definition of clinical immunology. Subject and objectives of clinical immunology
- Fundamentals of modern immunodiagnostics
- Definition of immune status. Methods of assessing the condition of components of immune system
- Algorithm of immune system examination
- Evaluating the results of immune system examination

Recommended reading:
1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p.
2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента»
3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru

Topic No.6 Immunopathology and immune disorders

Duration of the lecture (in academic hours):	2

Purpose of the lecture:
1. tell students about normal and pathologic immune responses, immunocompromise, and classification of pathologic immune processes;
2. define immunodeficiency, immunocompromise, immune pathology;
3. examine immune pathology in the practice of a dentist.

Lecture plan, order of presentation of its sections:
- Immune response variants
- Levels of immune system regulation
- Factors impacting immune system function
- Immune system pathology
- Aspects of immune disorders in dentistry
- Main principles of diagnosing immune disorders
- Stages and main methods of clinical examination of the immune system
- Laboratory tests and diagnostic procedures aimed at examining the immune system
- Diagnostic criteria of immune disorders

Recommended reading:
1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p.
2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента»
3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru

Topic No.7 Allergy and allergic reactions in clinical practice of a dentist

Duration of the lecture (in academic hours):	2

Purpose of the lecture:
1. tell students about mechanisms behind hypersensitivity, allergy, and anaphylaxis;
2. define hypersensitivity, allergy, and anaphylaxis;
3. familiarise the students with allergy and allergic reaction in the clinical practice of a dentist;
4. examine the methods of methods of diagnosing allergy, anaphylaxis, and emergency medical aid in patients with anaphylaxis.

Lecture plan, order of presentation of its sections:
- Modern concept of allergy
- Definitions of hypersensitivity, allergy, and anaphylaxis
- The most common allergens in dentistry
- Types and pathogenesis of hypersensitivity reactions
- Type I (immediate) hypersensitivity reaction
- Principles of immune disorders diagnosis
- Pathogenesis and classification of anaphylaxis
- Algorithm of first aid in patients with anaphylaxis

Recommended reading:
1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p.
2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента»
3. Аллергология и клиническая иммунология [Электронный ресурс] Р.М. Хаитов, Н.И. Ильина М. : ГЭОТАР-Медиа, 2019. - 336 с. URL: http://www.studentlibrary.ru/

Topic No.8 Basics of immunotherapy in dentistry

Duration of the lecture (in academic hours):	2

Purpose of the lecture: 1. tell students about principles and types of immunoprophylaxis, treatment of immune system pathology and oral cavity disorders; 2. define immunotherapy, immune correction, immunosuppression, and immune system stimulation; 3. examine classification, types, and methods of immunotherapy.
Lecture plan, order of presentation of its sections: - Basic definitions and principles of immunotherapy - Methods of immunotherapy - Immunotherapy in treatment of diseases of the paradontium - Immunotherapy in face and jaw surgery - Immunotherapy in chronic inflammation in dentistry - Vaccination. Mucosal vaccines
Recommended reading: 1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p. 2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента» 3. Иммунотерапия [Электронный ресурс] под ред. Р. М. Хаитова, Р. И. Атауллаханова, А. Е. Шульженко М. : ГЭОТАР-Медиа, 2020. - 768 с.: http://www.studentlibrary.ru/

3. SUBJECT GUIDES FOR PRACTICAL CLASSES

Table 2. Subject Guides for Practical **Б1.О.13 Immunology - Immunology in clinical practice** Classes

Topic No.1 Introduction to immunology and aspects of immune response indifferent periods of a person's life	
Duration of the practical class (in academic hours):	4
Purpose of the practical class: 1. consolidate acquired knowledge on the subject, objectives, and key definitions of immunology; 2. during the discussion, outline the main stages of development of immunology as a science; 3. thoroughly go over definitions and concepts of key terms: immunology, immunity, immune reaction; 4. study patterns of immune reactions; 5. develop the understanding of the modern definition of immunology. 6. consolidate acquired knowledge on structural and functional organization of immune system; 7. study the main stages of immune system ontogeny; 8. during the discussion, outline the main features of central and peripheral organs of the immune system; 9. study features of immune response indifferent periods of a person's life; 10.examine sex-related characteristics of immune reactivity.	
Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.	
Independent work of the student: Preparing slides presentations. Working with study materials.	

Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests
Recommended reading: 1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p. 2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента» 3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru
Topic No.2 Cellular basis of immune system

Duration of the practical class (in academic hours):	4

Purpose of the practical class: 1. consolidate acquired knowledge on the main cellular components of the immune system (immunocompetent, antigen-presenting, mediator cells); 2. during the discussion, outline the main stages of differentiation of cells of lymphoid and myeloid lineage; 3. thoroughly go over definitions and concepts of cells of lymphoid and myeloid lineage, including neutrophils, eosinophils, basophils, mast cells, monocytes/macrophages, T cells and their subpopulations,B cells, and natural killer cells; 4. thoroughly go over definitions and components of innate and acquired cellular immunity 5. study patterns of immune cells activation and their functions; 6. examine stages of cellular immune response 7. develop understanding of a concept of immune memory.
Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.
Independent work of the student: Preparing slides presentations. Working with study materials.
Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests
Recommended reading: 1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p. 2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента» 3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru
Topic No.3 Humoral factors of innate and acquired immunity

Duration of the practical class (in academic hours):	4

Purpose of the practical class:
1. consolidate acquired knowledge on humoral factors;
2. during the discussion, outline the main humoral factors of innate immunity, such as complement system, acute phase proteins, cytokines, etc.;
3. study patterns of activation of the complement system;
4. thoroughly go over definitions and concepts of complement system, acute phase proteins, cytokines;
5. during the discussion, outline the main humoral factors of acquired immunity, such as antibodies (immunoglobulins), their structure, classification, and interaction with antigens;
6. examine the stages of humoral immune response;
7. examine the methods of humoral factors analysis.

Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.

Independent work of the student:
Preparing slides presentations. Working with study materials.

Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests

Recommended reading:
1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p.
2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента»
3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru

Topic No.4 Hormones, cytokines, and mediators of the immune system as factors regulating immune response

Duration of the practical class (in academic hours):	4

Purpose of the practical class:
1. during the discussion, outline the modern concept of cytokines, their groups and classification, cytokine network;
2. thoroughly go over definitions and concepts of interferons, interleukins, TNF, colony-stimulating factors, chemokines, and hormones of the central organs of the immune system;
3. study thymus gland hormones and their biological effect;
4. study bone marrow peptides and their main effects;
5. examine the immune response regulation.

Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.

Independent work of the student:
Preparing slides presentations. Working with study materials.

Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests

Recommended reading:
1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p.

2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента»
3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru

Topic No.5 Immunologic defense mechanisms of the oral cavity

Duration of the practical class (in academic hours):	4

Purpose of the practical class:
1. consolidate acquired knowledge on specific and non-specific defense mechanisms of the oral cavity;
2. thoroughly go over definitions and concepts of mucosal immunity;
3. study mechanical defense mechanisms of the oral cavity;
4. examine the role of the oral fluid;
5. study the antiviral defense mechanisms of the oral cavity;
5. examine etiology, pathogenesis, and clinical manifestations of disorders of non-specific defense mechanisms and local immunity of the oral cavity.

Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.

Independent work of the student:
Preparing slides presentations. Working with study materials.

Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests

Recommended reading:
1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p.
2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента»
3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru

Topic No.6 Genetic regulation of immune response

Duration of the practical class (in academic hours):	2

Purpose of the practical class:
1. consolidate acquired knowledge on the main definition and structure of the major histocompatibility complex (MHC), molecular structure, location, and main functions of the HLA-system (human leukocyte antigen) molecules;
2. examine main mechanisms of antigen processing and presentation that include I and II classes of the HLA molecules;
3. thoroughly go over definitions and concepts of the major histocompatibility complex and organs of the human body that have immune privilege;
4. during the discussion, outline the role of the MHC in the interaction between cells: its link to diseases and antigraft reactions;

Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.
Independent work of the student: Preparing slides presentations. Working with study materials.
Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests
Recommended reading: 1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p. 2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента» 3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru
Topic No.7 Autoimmune diseases

Duration of the practical class (in academic hours):	2

Purpose of the practical class: 1. consolidate acquired knowledge on the concept of immune surveillance and immune tolerance; 2. thoroughly go over definitions and concepts of autoantigens, autoantibodies, autoimmune conditions and diseases; 3. study patterns of immune tolerance: definitions, mechanisms, main forms; 4. during the discussion, outline the mechanisms behind the formation of artificial tolerance: after radiation exposure and medication-induced; 5. Study the mechanisms of self-tolerance failure and autoimmune disorders; 6. Examine etiology, pathogenesis, and clinical manifestations of the main autoimmune diseases of the oral cavity.
Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.
Independent work of the student: Preparing slides presentations. Working with study materials.
Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests
Recommended reading: Рекомендованная литература: 1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p. 2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента» 3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru
Topic No.8 Transplant immunology

Duration of the practical class (in academic hours):	2

Purpose of the practical class:
1. consolidate acquired knowledge on the modern concept of transplant immunology;
2. Examine aspects and mechanisms behind transplant immunity;
3. thoroughly go over definitions and concepts of transplantation, transplant (graft), donor, recipient, autotransplantation, isotransplantation, allotransplantation, xenotransplantation;
4. study the graft-versus-host and host-versus-graft reactions;
5. examine immunologic mechanisms and clinical characteristic of the hyperacute, acute, and delayed graft rejection;
6. during the discussion, outline aspects of transplantology in the clinical practice of a dentist: types of transplantation, complications.

Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.

Independent work of the student:
Preparing slides presentations. Working with study materials.

Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests

Recommended reading:
1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p.
2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента»
3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru

Topic No.9 Antitumor immunity

Duration of the practical class (in academic hours):	2

Purpose of the practical class:
1. consolidate acquired knowledge of the modern concept of antitumor immunity;
2. during the discussion, focus of tumor cells as antigens, proof of participation of the immune system in the tumor growth;
3. thoroughly go over definitions and concepts of tumor antigens, tumor markers;
4. examine the role of NK (natural killer) cells, cytotoxic T cells, IFNγ, TNFα, and cytotoxic reactions in antitumor defense;
5. study immune system incompetence and causes of tumor growth;
6. during the discussion, outline the mechanisms of tumor antigenic escape.

Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.

Independent work of the student:
Preparing slides presentations. Working with study materials.

Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests

Recommended reading:
1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p.
2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС

«Консультант студента» 3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru
Topic No.10 Interim knowledge control on Module 1 "General immunology"
Duration of the practical class (in academic hours): 4
Purpose of the practical class: 1. estimate the level of mastery of concept of immunology as a discipline and of immune system as one of the most important systems of the human body; 2. Evaluate the students' knowledge on the Module 1 "General immunology".
Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.
Independent work of the student: Preparing slides presentations. Working with study materials.
Methods of evaluation of acquired knowledge and skills: tests, quizzes, evaluation of lecture and practical classes notes
Recommended reading: 1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p. 2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента» 3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru
Topic No.11 Introduction to clinical immunology
Duration of the practical class (in academic hours): 2
Purpose of the practical class: 1. consolidate acquired knowledge on the subject, objectives, and main concepts of the clinical immunology; 2. thoroughly go over definitions and concepts of clinical immunology, immunodiagnostics, immune status; 3. during the discussion, outline the algorithm of immune system examination; 4. examine the various methods of immune system examination; 5. assessment of the immune system examination results.
Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.
Independent work of the student: Preparing slides presentations. Working with study materials.
Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests
Recommended reading: 1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media,

2019. - 263 p.
2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента»
3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru

Topic No.12 Immune disorders; HIV infection and its features

Duration of the practical class (in academic hours):	2

Purpose of the practical class:
1. consolidate acquired knowledge of HIV infections, its etiology, epidemiology, and pathogenesis;
2. examine the structure of the virus and its lifecycle;
3. during the discussion, outline the aspects of immune response and mechanisms of immunity suppression in patients with HIV infection;
4. study the aspects of HIV infection in the clinical practice of a dentist;
5. examine the HIV diagnostics methods.

Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.

Independent work of the student:
Preparing slides presentations. Working with study materials.

Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests

Recommended reading:
1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p.
2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента»
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Topic No.13 Primary and secondary immunodeficiency: aspects, causes, mechanisms, clinical manifestations, and diagnostics

Duration of the practical class (in academic hours):	4

Purpose of the practical class:
1. consolidate acquired knowledge on primary and secondary immunodeficiency conditions;
2. thoroughly go over definitions and concepts of immunodeficiency condition, primary immunodeficiency, secondary immunodeficiency;
3. study primary immunodeficiency: classification, clinical manifestation, diagnosis, and treatment principles;
4. during the discussion, outline the specific forms of primary immunodeficiency;
5. study secondary immunodeficiency: etiology, pathogenesis, classification, diagnosis, treatment and prevention;
6. examine the main clinical manifestations of immunodeficiency in the clinical practice of a dentist.

Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.
Independent work of the student: Preparing slides presentations. Working with study materials.
Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests
Recommended reading: 1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p. 2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента» 3. Иммунология и клиническая иммунология : учеб. пособие [Электронный ресурс] Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. М. : ГЭОТАР-Медиа, 2023. - 160 с. URL: http://www.studentlibrary.ru
Topic No.14 Allergy and allergic reactions in clinical practice of a dentist

Duration of the practical class (in academic hours):	4

Purpose of the practical class: 1. consolidate acquired knowledge of the modern concept of allergy and allergic reactions in clinical practice of a dentist; 2. during the discussion, outline the definition, classification, and stages of an allergic reaction, mechanisms behind the development of hypersensitivity, and differences between allergic and pseudoallergic reactions; 3. thoroughly go over definitions and concepts of hypersensitivity, allergic reaction, anaphylaxis, pseudoallergy, allergen, and histamine liberator; 4. examine the most common allergens in dentistry; 5. study clinical manifestations of allergy and allergic reactions in the clinical practice of a dentist; 6.examine principles of allergy treatment.
Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.
Independent work of the student: Preparing slides presentations. Working with study materials.
Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests
Recommended reading: 1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p. 2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента» 3. Аллергология и клиническая иммунология [Электронный ресурс] Р.М. Хаитов, Н.И. Ильина М. : ГЭОТАР-Медиа, 2019. - 336 с. URL: http://www.studentlibrary.ru/
Topic No.15 Drug allergy and its manifestations, including anaphylaxis, in clinical practice of a dentist

Duration of the practical class (in academic hours):	4

Purpose of the practical class:
1. consolidate acquired knowledge of the modern concept of drug allergy and its manifestations in clinical practice of a dentist;
2. during the discussion, outline the classification, stages, and mechanisms behind drug allergy;
3. thoroughly go over definitions and concepts of hypersensitivity, allergic reaction, anaphylaxis, drug allergy, haptene;
4. examine medications as allergens, main categories of medications used in dentistry and able to cause allergic reactions;
5. study anaphylaxis: its etiology, pathogenesis, aspects of immunologic, pathochemical, and pathophysiological stages; variants of clinical progression depending on the severity and main symptoms; complications;
6. during the discussion, outline emergency treatment in acute allergic reactions;
7. examine the anaphylaxis first aid algorithm.

Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.

Independent work of the student:
Preparing slides presentations. Working with study materials.

Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests

Recommended reading:
1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p.
2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента»
3. Аллергология и клиническая иммунология [Электронный ресурс] Р.М. Хаитов, Н.И. Ильина М. : ГЭОТАР-Медиа, 2019. - 336 с. URL: http://www.studentlibrary.ru/

Topic No.16 Basics of immunotherapy in dentistry

Duration of the practical class (in academic hours):	4

Purpose of the practical class:
1. consolidate acquired knowledge on the principles and types of immunoprophylaxis, treatment of immune system pathology and diseases of the oral cavity;
2. during the discussion, outline the classification, types, and methods of immunotherapy;
3. thoroughly go over definitions and concepts of immunotherapy, immune correction, immunosuppression, immune system stimulation, vaccination, and vaccine;
4. study immunotherapy in treatment of diseases of the paradontium;
5. examine immunotherapy methods in face and jaw surgery;
6. during the discussion, outline the role of immunotherapy in chronic inflammation in dentistry;
7. examine concepts of vaccination and mucosal vaccines

Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.

Independent work of the student:
Preparing slides presentations. Working with study materials.

Methods of evaluation of acquired knowledge and skills: review of reports, discussions, quizzes, tests

Recommended reading:

1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p. 2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента» 3. Иммунотерапия [Электронный ресурс] под ред. Р. М. Хаитова, Р. И. Атауллаханова, А. Е. Шульженко М. : ГЭОТАР-Медиа, 2020. - 768 с.: http://www.studentlibrary.ru/
Topic No.17 Interim knowledge control on Module 2 "Clinical immunology"

Duration of the practical class (in academic hours):	4

Purpose of the practical class: 1. estimate the level of mastery of concept of clinical immunology as a discipline; development of competencies related to immune disorders, ability to use acquired knowledge in diagnosis, treatment, and disease prevention ion dentistry; 2. Evaluate the students' knowledge on the Module 1 "Clinical immunology".
Practical classes requirements: classrooms equipped with multimedia equipment, blackboards, and subject guides for the discipline.
Independent work of the student: Preparing slides presentations. Working with study materials.
Methods of evaluation of acquired knowledge and skills: tests, quizzes, evaluation of lecture and practical classes notes.
Recommended reading: 1. Immunology : textbook (in English). R. M. Khaitov. - Upd. 2nd ed. M. : GEOTAR-Media, 2019. - 263 p. 2. Immunology : textbook. Khaitov R.M. Moscow : GEOTAR-Media, 2008. - 256 p. ЭБС «Консультант студента» 3. Аллергология и клиническая иммунология [Электронный ресурс] Р.М. Хаитов, Н.И. Ильина М. : ГЭОТАР-Медиа, 2019. - 336 с. URL: http://www.studentlibrary.ru/ 4. Иммунотерапия [Электронный ресурс] под ред. Р. М. Хаитова, Р. И. Атауллаханова, А. Е. Шульженко М. : ГЭОТАР-Медиа, 2020. - 768 с.: http://www.studentlibrary.ru/

4. GUIDELINES FOR CONTINUOUS AND INTERIM ASSESSMENT

Table 3. Guidelines for Conducting Continuous and Interim Assessment during the **Б1.О.13 Immunology - Immunology in clinical practice** Course

Type of assessment	Assessment format
Continuous assessment	- tests; - conducting and evaluating oral or written quizzes during practical classes; - assessment and evaluation of completion and results of assignments and exam tasks given during practical classes.
Interim certification	- test; - verbal interview; - assessing quality of lecture and practical classes notes.

5 ASPECTS OF THE IMPLEMENTATION OF THE COURSE FOR STUDENTS WITH DISABILITIES AND SPECIAL NEEDS

5.1. Availability of accessible environment

For students with disabilities and special needs, if a written application is submitted, lectures and practical classes are carried out taking into account health limitations, individual capabilities and medical status (hereinafter referred to as individual characteristics) of the student. Compliance with the following general requirements is ensured: teaching aids for collective and individual use are provided, required technical assistance is provided by an assistant, buildings and premises where lectures and practical classes are taking place meet accessibility requirements, other arrangements lack of which makes it impossible or difficult to master the discipline are made.

5.2. Compliance with general requirements

When lectures and practical classes are carried out at the written application of the student, the following general requirements are met: lectures and practical classes for students with disabilities and special needs take place at the same location as for students who do not have disabilities, if this does not cause difficulties for students; an assistant (assistants), who provide(s) students with the necessary technical assistance taking into account individual characteristics of the student, is (are) provided; necessary teaching aids are provided, taking into account individual characteristics of the student.

5.3. Availability of the internal policies and procedures of FSBEI HE PSMU of the Ministry of Health of Russia to students with disabilities in a form accessible to them.

All internal policies and procedures of FSBEI HE PSMU of the Ministry of Health of Russia concerning the discipline (module) are made available to students with disabilities in a form accessible to them.

5.4. Increase in the duration of interim assessment of students with disabilities and special needs in relation to the established duration

Format of the interim assessment of academic performance within the scope of the discipline for students with disabilities and special needs is selected taking into account individual characteristics (orally, by writing on paper, by typing on a computer, as a test, etc.). The duration of the interim assessment in relation to the established duration is increased at the written application of the student with disabilities. Time limit for the student's preparation for the test is increased by at least 0.5 hours

6. STAFFING REQUIREMENTS OF THE DISCIPLINE

Academic teaching personnel that ensure the implementation of the discipline education process meet the requirements of the Federal State Educational Standard of Higher Education for the 31.05.03 Dentistry for international students (in English) specialty; list of the aforementioned personnel is available on the website of the educational organization.

