

**Assessment tools for certification  
in the discipline "Immunology-Clinical immunology"  
for students of the educational program  
Specialist degree  
in the specialty of training 31.05.03 Dentistry,  
direction (profile) Dentistry,  
form of study is full-time  
for the 2023-2024 academic year**

Intermediate certification is carried out in the form of a credit.

Intermediate certification includes the following types of tasks: testing, clinical task, interview.

**Examples of test tasks**

Verifiable indicators of competence achievement: GPC-5.1.1.; GPC -8.1.1.; GPC -8.1.2.; GPC -13.1.2.; GPC -9.2.1.; PC -9.1.3.; PC-1.1.2.

1. A hapten is defined as:
  - a) conjugated antigen
  - b) antigen inducing the development of tolerance
  - c) incomplete antigen
  - d) T-cell receptor
2. Class II MNS molecules are required for:
  - a) endoantigen presentation
  - b) exoantigen presentation
  - c) immunoglobulin fixation
  - d) complement fixation
3. HLA antigens are absent
  - a) on trophoblast cells
  - b) leukocytes
  - c) vascular endothelium
  - d) erythrocytes
4. The following are involved in the realization of immune reactions:
  - a) MNS of classes I and III
  - b) MNS of classes II and III
  - c) MNS of classes I and II
  - d) MNS of classes III and IV
5. Transplant vs. host reaction
  - a) is detected by immunofluorescence
  - b) is protective
  - c) is a post-transplantation complication
  - d) is induced artificially before transplantation
6. Cytotoxic lymphocytes recognize the antigen
  - a) associated with MHC I
  - b) associated with MHC II
  - c) associated with CD40
  - d) associated with BCR
7. Pyrogenic reaction in infectious diseases is a consequence of the action of
  - a) IL-18
  - b) IL-2

- c) IL-4
  - d) IL-1
8. The main effector mechanisms of cellular immunity are carried out by
- a) T-lymphocytes
  - b) B-lymphocytes
  - c) macrophages
  - d) cytokines
9. Which receptor is not present on the cell surface of a T-lymphocyte?
- a) TCR
  - b) receptor for ram's erythrocyte
  - c) BCR
  - d) receptor for histamine
10. The spleen
- a) is an organ of the central immune system
  - b) is an organ of the peripheral immune system
  - c) is not an organ of the immune system
  - d) serves as a place of maturation of T-lymphocytes

## 1.2 Example of a situational task

Verifiable indicators of competence achievement: GPC -5.1.1; GPC -8.1.1.; GPC -8.1.2.; GPC -13.1.2; OPK-9.2.1.; PC-9.1.3.; PC -1.1.2.

A 42-year-old patient came to the dentist about hyperemia and moderate soreness of the tongue and gums, which appeared after rinsing the teeth with soda and iodine solution and decreased with loratadine.

On examination: the skin is clean, normal color; breathing through the nose is free, in the lungs - vesicular breathing, HR 16 per minute. Tongue and gums are hyperemic, edematous, no rashes.

From anamnesis: from the transferred diseases notes chickenpox at the age of 3 years; appendectomy at the age of 10 years. Renal stone disease was diagnosed at the age of 35, intravenous urography with the use of X-ray contrast agent was performed, during which the clinic of anaphylactic shock developed. Food intolerance is not noted, acute respiratory viral infections not more often than 1-2 times a year. No close relatives suffering from allergic diseases.

On examination: Erythrocytes  $5.2 \times 10^{12}$ ; Hb130 g/L; CP 0.95; platelets  $234 \times 10^9$ ; leukocytes  $6.4 \times 10^9$  cells/ $\mu$ L: monocytes 6%, eosinophils 2%, basophils 0%, paloconuclear 1%, segmentonuclear 52%, lymphocytes 28%; IgE 45 IU/mL (N<100).

Make a preliminary diagnosis.

Outline a plan of additional examination.

Prescribe treatment.

## 1.4 Example of a control work variant

Verifiable indicators of competence achievement: GPC -5.1.1; GPC -8.1.1.; GPC -8.1.2.; GPC -13.1.2; GPC-9.2.1.; PC -9.1.3.; PC-1.1.2.

### Variant №1

1. Central organs of the immune system. Structure. Functions.
2. Processing and presentation of antigens to T-cells. Features of antigens.

#### 1.6 Examples of control questions for the interview

Verifiable indicators of competence achievement: GPC-5.1.1; GPC-8.1.1.; GPC-8.1.2.; GPC-13.1.2; GPC-9.2.1.; PC-9.1.3.; PC-1.1.2.

1. Central organs of the immune system. Structure. Functions.
2. Antigens. Structure, properties, biological role. The concept of antigenic determinants and epitopes
3. Innate immunity. Components of innate immunity: physical, chemical, biological barriers.
4. Immunoglobulins. Chemical structure, organization and functions of the immunoglobulin molecule.
5. General ideas about the complement system. Composition and main functions. Methods of determination.

#### 1.7 Examples of report topics

Verifiable indicators of competence achievement: GPC-5.1.1; GPC-8.1.1.; GPC-8.1.2.; GPC -13.1.2; GPC-9.2.1.; PC -9.1.3.; PC-1.1.2.

1. History of immunology. Review of Nobel prizes in immunology received in the field of medicine.
2. Genetic mechanisms of antibody diversity. VDJ recombination
3. Immunological phenomena based on antigen-antibody interaction: agglutination, precipitation, lysis, neutralization, etc., their identification
4. Regulation of immune response. Regulatory T-cells. Immunologic memory.
5. Immunologic responses in dental prosthetics in dentistry. Rejection of dental implants

#### Questions for intermediate certification

№	Questions	Verifiable indicators of competence achievement
1.	Subject and objectives of immunology. The main aspects of fundamental immunology. The main directions in the development of immunology.	GPC-13.1.2,
2.	Central and peripheral immune system: anatomy and basic functions.	GPC-5.1.1, PC-1.1.2,
3.	Central organs of the immune system. Structure. Functions.	GPC-5.1.1,

4.	Peripheral organs of the immune system. Structure. Functions.	GPC-5.1.1, PC-1.1.2,
5.	Antigens. Structure, properties, biological role. The concept of antigenic determinants and epitopes	GPC-8.1.1,
6.	Innate immunity. Components of innate immunity: physical, chemical, biological barriers.	GPC-5.1.1, GPC-8.1.1, PC-1.1.2,
7.	Antigen processing and presentation of antigens to T-cells. The main stages. Peculiarities of antigens.	GPC-8.1.1,
8.	Major histocompatibility complex (MHC). Presentation of endogenous and exogenous antigens. Functions of MHC class I and II molecules, interaction with CD8 <sup>+</sup> - or CD4 <sup>+</sup> -cells, respectively	GPC-8.1.1,
9.	T-lymphocyte activation processes and the choice of immune response (CD8 <sup>+</sup> - or CD4 <sup>+</sup> -dependent).	GPC-5.1.1, GPC-8.1.1,
10.	Cellular (T) link of immunity. CD4 <sup>+</sup> -dependent immune response. Factors determining the choice of Th1- or Th2-variant. Realization of Th1-pathway of immune response. Biological role. Mechanisms.	GPC-5.1.1, GPC-8.1.1,
11.	Mechanisms of activation and differentiation of B-lymphocytes. B-cell receptor (BCR), molecular components, functions.	GPC-5.1.1,
12.	Immunoglobulins. Chemical structure, organization and functions of the immunoglobulin molecule.	GPC-5.1.1, GPC-8.1.1,
13.	General ideas about the complement system. Composition and main functions. Methods of determination.	GPC-5.1.1, GPC-8.1.1, GPC-8.1.2,
14.	The complement system. Classical and alternative pathways of complement activation. Clinical significance.	GPC-5.1.1, GPC-8.1.1, GPC-8.1.2,
15.	Cytokine system. Basic concepts. Types of cytokines. Basic properties of cytokines. Structure and types of cytokine receptors. Interaction of cytokines with specific receptors.	GPC-8.1.1,
16.	Immunologic factors of antiviral immunity. Mechanisms of eluding immune elimination.	GPC-5.1.1, GPC-8.1.1,
17.	Basic factors of antimicrobial immunity. Pathways of pathogen elimination. Mechanisms of eluding immune defense.	GPC-8.1.1, PC-1.1.2,
18.	Subject and tasks of clinical immunology. The main forms of human immunopathology.	GPC-13.1.2, PC-1.1.2,
19.	Primary immunodeficiency states. Classification. Pathogenesis. Clinical picture. General principles of diagnosis and treatment.	GPC-5.1.1, GPC-8.1.2, GPC-9.2.1, PC-1.1.2,
20.	Secondary immunodeficiency states. Classification and their features. Pathogenesis. Clinical picture. General principles of diagnosis and treatment.	GPC-5.1.1, GPC-8.1.2, GPC-9.2.1, PC-1.1.2, PC-9.1.3
21.	The concept of vaccination. History of development. Goals and objectives of vaccination.	GPC-5.1.1, GPC-9.2.1, PC-9.1.3

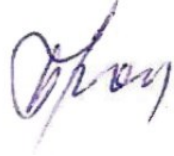
22.	Intrauterine period of immune system development. Features of the structure and functioning of the immune system at birth.	GPC-5.1.1, GPC-9.2.1, PC-1.1.2,
23.	The immune system of a newborn baby. Features of the structure, functioning. Dynamics of development.	GPC-5.1.1, GPC-9.2.1, PC-1.1.2,
24.	The immune system in early childhood. Features of structure, functioning. Dynamics of development.	GPC-5.1.1, GPC-9.2.1, PC-1.1.2,
25.	Methods of laboratory assessment of immune status. Tests of the first and second levels.	GPC-5.1.1, GPC-8.1.2, GPC-9.2.1,
26.	The concept of allergy: definition, etiology, pathogenesis, clinical manifestations.	GPC-5.1.1, GPC-8.1.1, GPC-9.2.1,
27.	Classification of hypersensitivity reactions. Mechanisms of hypersensitivity development.	GPC-5.1.1, GPC-8.1.1,
28.	IgE-dependent allergic reactions. Etiology, types of allergens and their features. Pathogenesis. Features of the structure, functioning and receptivity of IgE.	GPC-5.1.1, GPC-8.1.1,
29.	Pseudoallergic reactions. Classification with characterization of the main etiological factors.	GPC-5.1.1, GPC-8.1.1, GPC-9.2.1, PC-9.1.3
30.	The main stages and mechanisms of allergic reaction development in reactive type of reaction.	GPC-5.1.1,
31.	The main methods of diagnostics of allergic diseases.	GPC-5.1.1, GPC-8.1.2, GPC-9.2.1,
32.	Therapeutic measures, prevention of allergic diseases.	GPC-5.1.1, GPC-9.2.1, PC-9.1.3
33.	Food allergy. Concept. Epidemiology. Classification.	GPC-5.1.1, PC-1.1.2,
34.	Allergic diseases of the respiratory tract. Main allergens. General principles of diagnosis and treatment.	GPC-5.1.1, GPC-8.1.2, GPC-9.2.1, PC-1.1.2,
35.	Allergic rhinitis. Definition, etiology, pathogenesis, clinical manifestations, classification.	GPC-5.1.1, GPC-9.2.1,
36.	Atopic bronchial asthma as an allergic disease. Definition, etiology, pathogenesis, clinical manifestations, classification. General principles of diagnosis and treatment.	GPC-5.1.1, GPC-8.1.2, GPC-9.2.1,
37.	Allergic reactions to medications. Concept. Epidemiology. Clinical manifestations of drug allergy. General principles of diagnosis and treatment.	GPC-5.1.1, GPC-8.1.2, GPC-9.2.1, PC-1.1.2,
38.	Mechanisms of drug allergy development.	GPC-5.1.1, GPC-9.2.1,
39.	Diagnosis and treatment of drug allergy. Emergency medical care in immunopathologic conditions.	GPC-5.1.1, GPC-8.1.2, GPC-9.2.1, GPC-13.1.2,
40.	General concepts of immunocorrection, immunostimulation, immunomodulation	GPC-5.1.1, GPC-8.1.1, GPC-9.2.1, GPC-13.1.2,

The full fund of assessment tools for discipline / practice is available in the EIES of VolgSMU at the link (s):

<https://elearning.volgmed.ru/course/view.php?id=3300>

Considered at the meeting of the department of Immunology and allergology "31"  
May 2023, protocol No 16

Head of the Department

A handwritten signature in blue ink, appearing to read 'Belan E.B.', written in a cursive style.

Belan E.B.