MINISTRY OF HEALTH OF UKRAINE
ODESSA NATIONAL MEDICAL UNIVERSITY
Clinical immunology, genetics and medical biology department

APPROVED
Vice-rector on scientific-academic education professor
_____ I. P. Shmakova
01 "_____09_____2021

CURRICULUM ON CYCLE «CLINICAL IMMUNOLOGY AND ALLERGOLOGY IN DENTISTRY»

Level of higher education: of the second (master's)

Field of knowledge 22 «Healthcare»

In specialty 221 «Dentistry»

Educational and professional program: Dentistry

Odesa 2021 – 2022

2

The program is based on the educational-professional program "Medicine", training of specialists of the second (master's) level of higher education in the specialty 222 "Medicine" in the field of knowledge 22 "Health", approved by the Academic Council of ONMedU, from 04.06.2020, protocol №11 .
Developers: Doctor of Medicine, Professor S.F. Goncharuk

Program was discussed on the methodical meeting of the clinical immunology, genetics and medical biology department
Protocol №1 at 27.08.2021
Head of the department, Doctor of medicine, professor S. F. Goncharuk

The program was approved at the meeting of the subject cycle commission on medical and biological disciplines of ONMedU
Protocol №1 at 27.08.2021
Chairman of the subject cycle methodical commission on medical and biological disciplines,
Doctor of medicine, professor O.L. Appelhans

The program was approved at the meeting of the Central Coordination and Methodological Council of ONMedU
Protocol №1 at 30.08.2021

1. Description of the discipline:

Name of indicators	Characteristics of the discipline	
	Full-time education	
The total number of: Credits - 4 Hours - 120 Content sections - 3	Selective	
	Year of study	1
	Semester	II
	Lectures	16 hours
	Seminars	24 hours
	SSW	80 hours
	Including individual tasks	0
	Type of control	Credit

2. Aims and tasks of the discipline

The purpose: of studying the discipline of clinical immunology and allergology is to form in future doctors an idea of the mechanisms of functioning of the immune system as a single complex; use of this knowledge in practice in solving specific clinical issues and atypical situational problems, as well as mastering the methods of clinical and laboratory diagnosis, treatment, prevention of immune disorders and immunodeficiency diseases underlying recurrent, chronic infectious diseases, allergic, autoimmune diseases, oncoimmune diseases, lymphoproliferative and other processes.

Main tasks:

- to get a modern idea of clinical immunology and allergology as a discipline in general;
- to form an idea of the importance of immunopathological changes in the development of various diseases and the dynamics of the general patterns of immunological parameters at different stages of the body's immune response in normal and in pathology;
- assess the patient's immune status according to the basic immunolaboratory methods and principles of interpretation of immunograms;
- to master modern principles of immunodiagnostics of allergic diseases;
- to master the basic principles of immunoprophylaxis, immunotherapy, to get acquainted with the methods of monitoring the effectiveness of immunotropic treatment, types of immunorehabilitation.

The process of studying the discipline is aimed at forming elements of the following competencies:

- IC **Integral competence** is the ability to solve complex problems and problems in the field of health care in the specialty "Medicine" in a professional activity or in the learning process, which involves research and / or innovation and is characterized by uncertainty of conditions and requirements.

- **General competencies:**

GC1 Ability to abstract thinking, analysis and synthesis
GC2 Knowledge and understanding of the subject area and understanding of the profession
GC3 Ability to communicate in the state language
GC4 Ability to adapt and make an informed decision in a new situation
GC5 Ability to work in a team
GC6 Ability to evaluate and ensure the quality of work performed
GC7 Ability to act on the basis of ethical considerations, socially responsible and conscious.

- **Special (professional, subject) competencies**

SC1 - Communication skills and clinical examination of the patient during diagnosis and treatment.
SC2 - Ability to determine the necessary list of clinical, laboratory and instrumental studies and evaluate their results during diagnosis and treatment.
SC3 - Ability to establish a preliminary and clinical diagnosis.
SC4 - The ability to determine the principles of treatment, the required mode of work and rest and the nature of nutrition.
SC5 - Ability to diagnose emergencies
SC6 - Ability to determine tactics and provide emergency medical care.
SC7 - Ability to perform medical manipulations.

Expected learning outcomes. As a result of studying the discipline the student must:

To know:

Structure and clinical physiology of the immune system, modern methods of its evaluation

Modern views on the etiology and pathogenesis of various immune disorders: hereditary, congenital and acquired immunodeficiency, autoimmune, allergic, cancer; immune-dependent forms of infertility and immune-dependent conditions

The structure of the immune response to infectious agents. Features of the local immune response in dentistry

Main types of pathological immune reactions

Immunological aspects of dental diseases

Be able to:

To evaluate the data of general blood analysis, immunological and allergological research, taking into account the leading mechanism of immunological disorders in the genesis of different types of immunological and allergic pathology

To determine the nature and principles of treatment of immunological disorders and allergic diseases in patients with dental pathology

To detect symptoms of immunological and allergological disorders in dental diseases

3. Content of the curriculum

Structure and principles of functioning of the immune system.

TOPIC №1. Structure and functions of the immune system. Definitions and types of immunity. Central and peripheral organs of the immune system. Factors of innate immunity: cellular (monocytic-macrophage system, killer and granulocyte cells), humoral (complement system, cytokines, etc.). Specific adaptive immunity. Populations (T- and B-lymphocytes) and subpopulations (T-helpers of types 1 and 2, T-regulatory, T-CTL) of lymphocytes, stages of their maturation and differentiation, their function. Immunoglobulins, structure, functions. Structure and properties of circulating immune complexes. The main complex of histocompatibility: structure, properties, function.

TOPIC №2. Assessment of immune status and immune disorders. Features of immunological anamnesis. Clinical and instrumental methods of assessing the immune system. Laboratory methods of assessment of the immune system: humoral innate protective factors; assessment of cellular immunity; comprehensive assessment of local immunity. Immunogram, interpretation of results. Age features of functioning of central and peripheral organs of immune system.

TOPIC №3. Factors of local immunity and systemic immune response. Microbiocinosis and the immune system of the oral mucosa. Mucosal immunity. Interaction between mucosal (local) and systemic immunity. Structural and functional organization of lymphoid tissue associated with mucous membranes. Differentiation of interpithelial lymphocytes. Inductive and effector zones of secretory (local) immunity. Structure, mechanisms of sIgE formation. Local immunity of the oral cavity. Saliva composition: lysozyme, lactoferrin, lactoperoxidase, components of the complement system, immunoglobulins. Antigenic spectrum of the normal oral mucosa.

TOPIC №4. Immunology of the infectious process. General characteristics of the infectious process. Mechanisms of immune protection in bacterial and viral infections. The role of the immune system in antifungal immunity. The importance of the immune system in the development of opportunistic infections. Immunological methods in the diagnosis of infectious diseases.

TOPIC №5. Basic principles of immunotropic therapy. Immunorehabilitation, immunoprophylaxis. Classification of immunotropic drugs, mechanism of action, side effects. Principles of clinical use of immunotropic drugs, indications and contraindications for use, dose selection, immunological control of therapeutic efficacy: immunosuppressive drugs; immunocorrective drugs; blockers of mediators of immune reactions; anti-inflammatory drugs; replacement therapy; cytokine therapy, antireceptor drugs, etc. Basic principles of immunoprophylaxis of bacterial and viral infections. The main types of immunorehabilitation, its strategy, tactics and basic principles. Approaches to the use of immunotropic therapy depending on age.

Immune-dependent pathology

TOPIC № 6. Congenital and acquired immunodeficiencies, their manifestations in the maxillofacial area. Hereditary immunodeficiency diseases: definition, classification, mechanisms of development. Clinical signs, immunodiagnostics, doctor's tactics, approaches to treatment: combined, T - and B - dependent immunodeficiencies caused by violation of the phagocytic immune system and deficiency of complement proteins. Acquired immunodeficiency diseases: definition, causes, mechanisms of development, classification, diagnosis. The role of acquired immunodeficiency diseases in the pathogenesis of various diseases. Early detection of secondary immunological insufficiency in the body. Basic approaches to treatment.

TOPIC №7. Immunology and processes of regeneration of organs and tissues of the thyroid gland. Cellular and intracellular forms of regeneration. Physiological, reparative or restorative regeneration, complete regeneration. Method of directed tissue regeneration in periodontal diseases. Specific factors of growth and differentiation in the regulation of osseointegration: mitogenesis, chemotaxis, differentiation and metabolism. Methods of immunocorrection in the regulation of wound healing in dentistry. New immunotropic drugs: cytokines, drugs of human fibroblasts as optimizers of wound healing.

TOPIC №8. Immunology of nonspecific and specific inflammatory processes of the thyroid gland and prevention of their complications. Clinical and immunological response in acute and chronic inflammatory process. Acute and chronic odontogenic infection (periodontitis, periostitis, lymphadenitis, odontogenic sinusitis, abscess and phlegmon, osteomyelitis, etc.). Acute and chronic odontogenic infection Acute and chronic neodontogenic infection (boils, carbuncles, sialoadenitis, etc.). Generalized chronic inflammatory-destructive periodontal diseases. Immunoprophylaxis of complications. Mechanisms of formation and features of the immune response in specific bacterial (tuberculosis) and viral (AIDS, herpes) fungal (actinomycosis) infections in dentistry. Mechanisms of avoidance of pathogens from the action of immune defense factors. Ways of suppression of infectious agents of the immune system. Immunodiagnosis of infectious diseases. Etiology, immunopathogenesis, diagnosis and immunotherapy of AIDS. Immunological methods in the diagnosis of AIDS. Dynamics of immunogram of HIV-infected and AIDS patients. Immunoprophylaxis of HIV infection.

Allergic diseases

Topic №9. Allergic diseases. The role of genetic factors and the environment in the immunopathogenesis of allergies. Modern ideas about allergies and atopy. Atopy as a systemic disease. Types and main stages of immunological reactions. Modern aspects of allergological diagnostics. Screening methods in the assessment of allergies. Elimination and provocative tests in allergology. Types of skin tests. Principles of treatment of allergic diseases. Non-atopic diseases, immunopathogenesis, immunodiagnostics, clinical manifestations and differential diagnosis. Delayed type hypersensitivity reactions: immunopathogenesis, immunodiagnostics, immunotherapy. Contact dermatitis in the practice of a dentist and dental technician. Modern principles of antiallergic therapy and immunological treatments in allergology.

Topic №10. Allergic diseases in the practice of a dentist. Drug allergy: clinical manifestations of toxicosis-allergic reactions. Features of clinical manifestations of pathological reactions to materials for fillings and prosthetics. Treatment and prevention. Principles of emergency care for anaphylactic shock and Quincke's edema.

4. Structure of the discipline

Topic	Lectures	Seminars	SSW	Individual work
Structure and principles of functioning of the immune system				
Topic №1. Structure and functions of the immune system.	6	6	20	–
Topic №2. Assessment of immune status and immune disorders.		2	20	
Topic №3. Factors of local immunity and systemic immune response. Microbiocinosis and the immune system of the oral mucosa.		2		
Topic №4. Immunology of the infectious process			20	
Immune-dependent pathology				
Topic № 5. Basic principles of immunotropic therapy. Immunorehabilitation, immunoprophylaxis			20	–
Topic №6. Congenital and acquired immunodeficiencies, their manifestations in the maxillofacial area.	4	2		
Topic №7. Immunology and processes of regeneration of organs and tissues of the thyroid gland.		2		
Topic №8. Immunology of nonspecific and specific inflammatory processes of the thyroid gland and prevention of their complications		2		
Allergic diseases				
Topic №9. Allergic diseases	6	4		–
Topic №10. Allergic diseases in the practice of a dentist.		2		
Final control		2		
Total:	16	24	80	

5. THEMATIC PLAN OF LECTURES

№	Topic	Hours
1.	Principles of functioning of the immune system, clinical and laboratory assessment of its disorders.	6
2.	Diseases of the immune system. Congenital and acquired immunodeficiencies, their manifestations in the maxillofacial area.	4
3.	Allergic diseases.	6
Total		16

6. THEMATIC PLAN OF SEMINARS

№	Topic	Hours
1.	Structure and functions of the immune system.	6
2.	Immunological research methods. Basic rules for assessing immune status	2
3.	Factors of local immunity and systemic immune response. Microbiocinosis and the immune system of the oral mucosa.	2
4.	Congenital and acquired immunodeficiencies, their manifestations in the maxillofacial area.	2
5.	Immunology and processes of regeneration of organs and tissues of the thyroid gland.	2
6.	Immunology of nonspecific and specific inflammatory processes of the thyroid gland and prevention of their complications.	2
7.	Allergic diseases	4
8.	Allergic diseases in the practice of a dentist.	2
	Final control	2
Total		24

7. THEMATIC PLAN OF SELF-STUDY WORK

№	Preparation to the practical classes and final module control	Hours
1.	Structure and functions of the immune system. Immunoglobulins, structure, functions. Thymus-dependent and thymus-independent mechanism of antibody synthesis.	20
2.	Assessment of immune status and immune disorders. Features of immunological anamnesis. Clinical methods of assessing the immune system. Instrumental methods for assessing the immune system. Laboratory methods for assessing the immune system. Humoral innate protection factors. Assessment of cellular immunity. Comprehensive assessment of local immunity.	20
3.	Immunology of the infectious process. General characteristics of the infectious process. Mechanisms of immune protection in bacterial and viral infections. The role of the immune system in antifungal immunity. The importance of the immune system in the development of opportunistic infections. Immunological methods in the diagnosis of infectious diseases	20
4.	Basic principles of immunotropic therapy. Immunorehabilitation, immunoprophylaxis. Classification of immunotropic drugs, mechanism of action, side effects. Principles of clinical use of immunotropic drugs, indications and contraindications for use, dose selection, immunological control of therapeutic efficacy: immunosuppressive drugs; immunocorrective drugs; blockers of	20

	mediators of immune reactions; anti-inflammatory drugs; replacement therapy; cytokine therapy, antireceptor drugs, etc. Basic principles of immunoprophylaxis of bacterial and viral infections. The main types of immunorehabilitation, its strategy, tactics and basic principles. Approaches to the use of immunotropic therapy depending on age.	
Total		80

8. Individual student work - Not provided.

9. Teaching methods

Practical classes: conversation, solving clinical situational problems, practicing patient examination skills, training exercises on differential diagnosis and treatment of immune and allergic diseases.

Independent work: independent work with the textbook, independent work with the bank of test tasks KROK-2, independent solution of clinical problems.

10. Methods of control and criteria for evaluating learning outcomes

Ongoing control: Assessment of current performance is based on the results of students' participation in discussions, in the discussion of abstracts or reports, interviews in a seminar, in the process of solving situational problems. Assessment of student activity in class.

Final control: credit
The structure of the current assessment at the seminar:
Assessment of current performance is based on the results:
- Participation of students in discussions;
- interviews at the seminar;
- activities in the preparation of abstracts, presentations on the topic of the lesson;
- solving situational problems;

1. Assessment of theoretical knowledge on the topic of the lesson:
- methods: surveys, interviews at the seminar, analysis of student activity in discussions, analysis of the quality of prepared essays or presentations on the topic of the lesson, solving situational problems;
- maximum grade - 5, minimum grade - 3, unsatisfactory grade - 2.

2. Assessment of practical skills on the topic of the lesson:
- methods: assessment of the correctness of practical skills
- maximum grade - 5, minimum grade - 3, unsatisfactory grade - 2.

Criteria for current assessment at the seminar:
The current educational activity of the student at seminars is evaluated on a 4-point (traditional) scale.
The value of the assessment is "excellent". The student shows special creative abilities, is able to acquire knowledge independently, without the help of the teacher finds and processes the necessary information, is able to use the acquired knowledge and skills for decision-making in unusual situations, convincingly argues answers, independently reveals own talents and inclinations.

The value of the assessment is "good". The student is fluent in the studied amount of material, applies it in practice, freely solves problems in standard situations, independently corrects mistakes, the number of which is insignificant.

The value of the assessment is "satisfactory". The student reproduces a significant part of the theoretical material, shows knowledge and understanding of the basic principles; with the help of the teacher can analyze the educational material, correct mistakes, among which there are a significant number of significant ones.

The value of the assessment is "unsatisfactory". The student has the material at the level of individual fragments, which are an insignificant part of the study material.

Assessment of the learning performance of all students is not required in every seminar. At least 30% of students must be evaluated.

At the end of the study, the current performance is calculated - the average current score (arithmetic mean of all current grades on a traditional scale, rounded to two decimal places).

Final control of the discipline - credit.

The test is evaluated on a two-point scale - "credited" / "not credited".

Students who have fully completed the curriculum in the discipline, have no academic debt, have an average score of current performance of 3.00 or more, in the last class receive credit.

Criteria for evaluating the learning outcomes of students on the test:

The grade "passed" is given to a student who has completed the curriculum of the discipline, has no academic debt; level of competence - high (creative);

the grade "not credited" is given to a student who has not fulfilled the curriculum of the discipline, has an academic debt (average score below 3.0 and / or absences); level of competence - low (receptive-productive).

11. The list of theoretical questions to the differential test

1. The main biological tasks and functions of the body's immune system.
2. Classification of immune system organs. Apoptosis (concept and role in the functioning of the organism).
3. Differences between specific and nonspecific immune response.
4. The main factors of nonspecific immune response.
5. The main factors of specific (adaptive) immune response.
6. Antigen presentation: a role in the formation of the immune response. Antigen-presenting cells.
7. Phagocytosis: a role in the implementation of nonspecific and specific immune response. Phagocytosis of cells.
8. Humoral factors of nonspecific immune protection of an organism.
9. Killer cells: basic types, their functions and features.
10. Granulocytes: functions and role in the immune response. Diagnostic significance in various pathological conditions.
11. Agranulocytes: functions and role in the immune response. Diagnostic significance in various pathological conditions.
12. Complement system. Biological consequences of complement system activation. Ways of activation.
13. B-lymphocytes: markers and functions. Diagnostic significance in various pathological conditions.

14. T-lymphocytes: types and main markers. Diagnostic significance in various pathological conditions.
15. T-helpers of II types and I: differences in mechanisms of action.
16. Immunoglobulins: structure, function, classes. Diagnostic significance in various pathological conditions of Ig M and IgG
17. Immunoglobulins: structure, function, classes. Diagnostic significance in various pathological conditions Ig E and Ig A
18. Cellular and humoral immune response of adaptive immunity: features and differences.
19. Cytokines: basic classes and their functions.
20. The main complex of human histocompatibility. Classes of antigens and their role in the formation of the immune response.
21. The main complex of human histocompatibility. Concept. Location. Mechanisms of imitation.
22. Factors of antibacterial immune protection of an organism. Cellular and humoral immune response.
23. Antiviral immune response.
24. Mechanisms of protection of an organism against multicellular parasites.
25. Classification of immunodeficiency states. Diagnostic criteria.
26. Classification of immunodeficiency states. Primary immunodeficiency states with disorders in the humoral (B-cell) and T-cell links: basic syndromes, features of the clinical course, diagnosis, principles of therapy.
27. Classification of immunodeficiency states. Primary immunodeficiency states with deficiency of phagocyte functions, insufficiency of the complement system and combined primary immunodeficiency states: basic syndromes, features of the clinical course, diagnosis, principles of therapy.
28. Secondary immunodeficiency states: causes, classification, features of the clinical course, diagnosis, principles of therapy.
29. The mechanism of cell-induced cytotoxicity (mechanism of action of killer cells).
30. The role and mechanisms of participation in antitumor protection of the body T-killers, T-helpers type I, natural killers, LAK-cells, specific antibodies.
31. The concept of immune hypersensitivity. Classification by Jell and Coombs.
32. The concept of immune hypersensitivity. Modern classification of hypersensitivity reactions.
33. Mechanisms of development of anaphylactic reactions. Diseases caused by anaphylactic reactions.
34. Mechanisms of cytotoxic reactions. Diseases caused by cytotoxic reactions.
35. Mechanisms of development of immunocomplex reactions. Diseases caused by immunocomplex reactions.
36. Mechanisms of development of cell-mediated reactions. Diseases caused by cell-mediated reactions.
37. Mechanisms of development of reactions of stimulating type. Diseases caused by stimulant-type reactions.
38. The concept - autoimmune reaction and autoimmune disease. The differences between them. Classification of autoimmune diseases.
39. Methods of diagnosis of autoimmune diseases.
40. Principles of treatment of autoimmune diseases.
41. The reasons for the formation of allergic pathology. Stages of pathogenesis of allergic reactions.
42. Classification of allergens.
43. Pseudoallergy: concepts and causes.
44. Allergological anamnesis (components). Clinical manifestations of allergic diseases. Provocative tests with allergens.
45. Laboratory methods for diagnosing allergic diseases.

12. Methodical support:

- Curriculum of the discipline
- The syllabus of the discipline
- Textbook: Bajora YI, Goncharuk SF Clinical immunology and allergology. Textbook: ed. 4th, add. // Odessa: Press - Courier, 2018. - 264 p.
- Multimedia presentations
- Situational clinical tasks
- Methodical development of practical classes
- Electronic bank of test tasks by divisions of the discipline.

13. Recommended literature

Main:

1. Training manual "Clinical Immunology": in the discipline "Clinical Immunology and Allergology" for students of the 5th year of medical faculty, specialty "Dentistry", / Dotsenko SY, Rekalov DG, Shekhovtseva TG . [etc.]. - Zaporozhye, 2019. - 163 p.

2. Immunology in modern dentistry: a method. guide for stomatology students. faculty, interns-dentists and dentists. profile. - Kharkiv, 2018. - 116 p.

3. Bajora YI, Goncharuk SF Clinical immunology and allergology. Textbook: ed. 4th, add. // Odessa: Press - Courier, 2018. - 264 p.

Additional:

1. Oxford Handbook of Clinical Immunology and Allergy /G. Spickett. – 2nd ed. // Oxford University Press, USA, 2006. – 584 p.

2. Clinical Immunology: Disease, Principles, Mechanisms /J. Bellanti. – 1st ed. // Informa Health Care, 2010. – 500 p.

3. Clinical Immunology: Principles and Practice /Robert R. Rich, Thomas A. Fleisher, William T. Shearer, Harry W. Schroeder, Anthony J. Frew, Cornelia M. Weyand. – 3rd ed. // Mosby, 2008. – 1616 p.

4. Immunology for Medical Students /R. Nairn, M. Helbert – 2nd ed. // Mosby, 2006. – 320 p.

5. EAACI European Academy of Allergy and Clinical Immunology White Paper on Research, Innovation and Quality Care. Published by the European Academy of Allergy and Clinical Immunology 2018

6. Global Atlas of ALLERGY. Published by the European Academy of Allergy and Clinical Immunology 2014.

7. GLOBAL ATLAS OF SKIN ALLERGY. Published by the European Academy of Allergy and Clinical Immunology 2019.

8. Basic immunology : functions and disorders of the immune system / Abul K. Abbas, Andrew H. Lichtman, Shiv Pillai ; Illustrations by David L. Baker, Alexandra Baker. -- Fifth edition. 318 p. ; cm. Includes bibliographical references and index.

9. ISBN 978-0-323-39082-8 I. Lichtman, Andrew H., author. II. Pillai, Shiv, author. III. Title. [DNLM: 1. Immunity. 2. Hypersensitivity. 3. Immune System--physiology. 4. Immunologic Deficiency Syndromes. QW 504] QR181 616.07’9--dc23.

10. 5th Edition of Clinical Immunology: Principles and Practice / Robert R. Rich. Elsevier – 2019. C. – 1323.

14. Electronic information resources

http://moz.gov.ua
https://elifesciences.org/subjects/immunology-inflammation
https://www.eaaci.org/
https://www.facebook.com/EAACI
http://aalu.org.ua/
https://allergy.immunologyconferences.com/events-list/asthma
https://www.immunopaedia.org.za/
https://www.worldallergy.org/meetings