MINISTRY OF HEALTH OF UKRAINE DANYLO HALYTSKYI LVIV NATIONAL MEDICAL UNIVERSITY

APPROVED BY

First Pro-rector for scientific and pedagogical work professor M.R. Hzhehotskyy

2019

WORKING PROGRAMM OF DISCIPLINE "CLINICAL IMMUNOLOGY AND ALLERGOLOGY"

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for the 5th year students of Dentistry Faculty at higher medical educational establishments of III - IV accreditation levels

Specialty: «Dentistry»

Discussed and approved

at the faculty meeting at the department of Clinical Immunology and Allergology Minutes No. 1 as of " 30 " August 2019

Head of the Department _____ MD, Prof. V.V.Chopyak

Approved by

the field-specific methodological commission for therapeutic discipline Minutes No. 1 as of "12"__sep___2019

Head of Comission _____MD, Prof. O.M. Radchenko

LVIV 2019

The curriculum is designed by the teaching staff at the department of clinical immunology and allergology with the course of paediatric clinical immunology (head of the department - M.D., prof. A. Kurchenko, head of the course - M.D., prof. V.Ye. Kazmirchuk, PhD, assoc. prof. G.V. Fedoruk) at Bohomolets National Medical University in the co-authorship with the departments:

- department of clinical immunology and allergology at Danylo Halytskyi Lviv national medical university (head of the department M.D., prof. V.V. Chopyak

REVIEWERS:

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The syllabus is discussed and approved:

At the meeting of heads of the departments and courses of clinical immunology and allergology at higher medical educational establishments of the Ministry of health care on 23rd of November 2017 (Kyiv, Bohomolets national medical university)

Cyclic methodical commission on dental subjects of NMU (Minutes No. 4 dated 27th March 2018)

Commission on the direction "Medicine" of scientific and methodical counsel of the Ministry of education and science of Ukraine (Minutes No. dated 12th March 2019)

The syllabus is reviewed and approved by the Central methodical commission at Danylo Halytskyi Lviv national medical university on _____ of ____ 2019, minutes No. _____

Corresponding editor PhD, Assoc. Prof. H.V. Fedoruk (Kyiv), editor of the department Assoc. Prof. A.M.Havrylyuk (Lviv), Assoc. Prof. Kh.O. Lishchuk-Yakymovych (Lviv)

THE SYLLABUS OF THE SUBJECT "CLINICAL IMMUNOLOGY"

for the 5th year students of higher medical educational establishments of III-IV levels of accreditation by the specialty 7.110106 "Dentistry"

The division of hours on the discipline "Clinical immunology" for 5th year students of dentistry faculty at Danylo Halytskyi Lviv national medical university

No.	Year	Semester	Lectures	Practical	SGW	Form of	Notes
	or study			classes		final control	
1.	5	IX-X	6	24	15	module	

The syllabus and academic plan are designed on the basis of typical curriculum on clinical immunology and allergology for the5th year students of dentistry faculty (Kyiv, 2008) and typical curriculum on clinical immunology and allergology for the 5th year students by medical specialties (Kyiv, 2009).

The author of the syllabus – Assoc. Prof. K.O. Lishchuk-Yakymovych

Clinical immunology is the clinical subject that studies the etiology and pathogenesis of immune disorders, clinical and laboratory signs of immunodeficiencies, significance of immunopathological changes in the development of infectious, allergic, autoimmune, oncologic diseases as well as the methods of their immunotherapy, immune-mediated correction and immune rehabilitation.

The research in the branch of clinical immunology permits to prevent the development of numerous human diseases with the help of preventive measures. Prevention of functional disorders and diseases including immune disorders should be started long before the child birth at the stage of taking care about future father and mother's health.

Qualified orientation of the raining of a future physician requires the modern raining of the medical graduate student concerning the problems of clinical immunology, immune prevention and immune rehabilitation.

Clinical immunology has a significant position in modern medicine and practical health care which is first of all connected with the following factors:

- The formation of fundamental basics of knowledge of clinical immunology which are based on the knowledge of connected subjects – pathological anatomy, pathological physiology, histology, microbiology, clinical biochemistry;
- Identification of diseases connected with the immune system damage (excess activation or depression, disturbance of regulatory mechanisms);
- finding and improving immunological laboratory methods which aid in the early diagnostics of the diseases, development of therapeutic medications;
- development the possibilities of therapeutic influence on the immune system, development of immune therapeutic drugs;
- active development of immune rehabilitation;
- implementing the findings of clinical immunology to the therapy, surgery, traumatic surgery, dentistry;
- development of new directions in medical science psychoneuroimmunology, immune reproductology, immunology of mucous membranes, etc.;
- the appearance of new pharmacological drugs able to influence a human immune system including the development of allergic and non-allergic reactions and diseases.

Due to everything listed above it is obvious that the role of clinical immunology as a clinical subject nowadays is very important. The significant attention is paid to the study of local immunity factors, ability of the organism to destroy antigens with the help of intraepithelial immune-competent cells and protective mucous factors. Thus, the study of the basics of clinical immunology by students-dentists is becoming more current.

After learning the course of clinical immunology:

A student-dentist should know: physiology of the immune system, modern methods of its evaluation, modern approaches to etiology and pathogenesis of different immune disorders (congenital and acquired immunodeficiencies, allergic, oncologic diseases and other immune dependent conditions); clinical symptoms and syndromes of various types of immunopathologies and their laboratory signs; principles of immunotropic therapy administration, immune rehabilitation and immune prevention performance.

A student-dentist should be able to: assess the data of immunological laboratory essay taking into account leading mechanism of immunologic disorders in the genesis of various immune pathology types; detect the symptoms and syndromes of immunodeficiencies estimating the data of immunological anamnesis, clinical and laboratory examination; identify allergic diseases or reactions, and perform differential diagnostics with non-allergic reactions; to administer anti-allergic therapy.

A student-dentist should be aware of: typical methods of clinical and immunological examination and he estimation of laboratory methods of the immune system examination taking into account the condition of the patient and stages of pathological process in various dental pathologies; methods of performing allergic tests for the anesthetics and antibiotics as well as to be able to assess their results; methods of administering the aid to the patients with urgent allergic reactions; methods of first aid administration to the patients with immunopathological conditions.

MAIN TASKS:

- to obtain up to date understanding of clinical immunology as the subject in general
- to gain the understanding of the significance of immunopathologic changes in the development of various diseases
- to assess the patient's immune status on the basis of main immunologic laboratory methods and principles of the immunogram interpretation
- to acquire the knowledge of modern principles of immunodiagnostics of atopic diseases
- to know modern points of view on the etiology and pathogenesis of various immune disorders: congenital and acquired immunodeficiencies, autoimmune. Allergic, oncologic diseases and other immune-dependent conditions;
- to gain the knowledge of main principles of immune prevention and immunotherapy

The subject "Clinical immunology" is planned to provide the solution of situational tasks of obligatory immunogram interpretation, performance of test starting, formative and final control.

ACADEMIC PLAN

on clinical immunology for the 5rd year students of dentistry faculty at Danylo Halytskyi Lviv national medical university

	Total:	24	6	15	15
3.2.	Classification of immunotropic drugs.	-		5	5
	- autoimmune diseases				
	- allergic diseases				
	immunodeficiencies				
	- primary and secondary				
3.1.	Immune diseases	10	2	-	12
	immunology				
3.	Applied problems of clinical				
2.5.	Onco-immunology in dentistry	2		-	2
2.4.	Transplantation immunity in dentistry	2		-	2
2.3.	Immunology of infectious process	4	2	5	11
	system				
2.2.	Complex assessment of the immune			-	
	Local immunity				
2.1.	Immunology of mucous membranes.	2		5	7
2.	Basics of clinical immunology				
	immune system functioning				
1.1.	Structure and principles of human	4	2	-	6
	immunology				
1.	Subject and tasks of clinical				
		(hours)			
	includes the themes of classes	class	(hours)	(hours)	
No.	Section of clinical immunology which	Practical	Lrctures	SGW	Total

Namely: lectures - 6 hours, practical classes - 24 hours, self-guided work - 15 hours

SYLLABUS CONTENT

INTRODUCTION

Modern clinical immunology is a clinical and laboratory subject practicing the diagnostics and treatment of patients with immune pathologies as well as the immune rehabilitation of such patients.

1. SUBJECT AND TASKS OF CLINICAL IMMUNOLOGY. BASICS OF CLINICAL IMMUNOLOGY.

1.1. STRUCTURE AND PRINCIPLES OF HUMAN IMMUNE SYSTEM FUNCTIONING.

The development and the usage of immunological and allergological analysis methods, immune status assessment, methods of immune therapy, immune correction, immune prevention and immune rehabilitation. The connection of clinical immunology with other subjects and practical activity of a doctor. Principles of the clinical immunology service organization in Ukraine.

Central and peripheral organs of human immune system. Functions of congenital immunity. Humoral factors of congenital immunity. Cell-mediated factors of congenital immunity. System of phagocytosis. System of cytotoxic cells. Complement system. Systems associated with complement system. Proteins of acute phase. Cytokines: classification, functions. Functions of acquired (adaptive) immunity. Cell-mediated factors of acquired immunity: T-cells and their sub-populations, B-cells. Immunoglobulins, immune complexes. Types of human immune response regulation.

1.2.IMMUNOLOGY OF MUCOUS MEMBRANES

Mucous-associated lymphoid tissue (MALT). Structure of mucous membranes and their role as barriers. Immune response in mucous membranes: induction sites, effector phase. Secretory immunoglobulins. Mechanisms regulating the occurrence of plasmatic cells synthesizing secretory immunoglobulins. Structure and functions of sIg A. Role of intraepithelial lymphocytes. Importance of B1lymphocytes in the local mucous immunity.

1.3. MICROBIOCENOSIS AND CONDITION OF THE IMMUNE SYSTEM OF ORAL MUCOUS MEMBRAME

Local immunity of oral cavity. Composition of saliva; lysocyme, lactoferrin, lactoperoxidase, complement system components, secretory immunoglobulins. Antigen range of normal oral mucosa.

Physiological (obligatory) and pathogenic microflora of oral cavity. Role of obligatory microflora in local immune protection. Non-specific factors of oral defense from cariogenic and other bacteria (antimicrobial features of saliva, barrier function of mucous and sub-mucous cells).

2. COMPLEX EVALUATION OF THE STATE OF IMMUNE SYSTEM

2.1.ANTIBACTERIAL, ANTIVIRAL, ANTIFUNGAL AND ANTIPARASITE IMMUNITY

Mechanism of immune protection and infection. Immune system and viral infections. Immune system and bacterial infections. Immune system and parasite infection. Immune system and fungal infection. Definition of TORCH-complex. Peculiarities of primary immunological screening. Methods of estimating humoral (complement system, cytokines, lysocyme, sIg A) and cell-mediated (granulocytes, killer-cells, intraepithelial cells of monocytes and macrophage row) body congenital defense factors. Methods of estimating quantitive indexes and functional activity of cellular factors of acquired immunity. Estimation of local immunity factors.

2.2.CLINICAL AND IMMUNOLOGICAL PECULIARITIES OF ACUTE AND CHRONIC ODONTOGENIC, PARODONTOGENIC AND ODONTOGENIC INFLAMMATORY PROCESSES OF MAXILLO-FACIAL REGION AND PREVENTION OF COMPLICATIONS. IMMUNE ONCOLOGIC DISEASES IN DENTAL PRACTICE

General characteristics of infectious process. main cellular and humoral factors of congenital immunity which participate in the realization of acute inflammatory process. Immune factors determining the chronisation of the inflammatory process. Main reasons of recurrent acute inflammatory process.

Oncoimmunology in dentistry. Difinition of tumour-associated antigens. Tumour and immunity: role of natural killers, LAK-cells, T- and B-cells. Cytokines and tumours. Tumour immunosuppressive action. Immune changes in cancer patients. Immune diagnostics in oncology.

2.3. CLINICAL AND IMMUNOLOGIC PECULIARITIES OF SPECIFIC INFLAMMATORY PROCESSES OF MAXILLO-FACIAL REGION (TUBERCULOSIS, SYPHILIS, AIDS, ACTINOMYCOSIS)

Peculiarities of the course of "weak" intracellular infections. Immune reaction oo such infections, mechanism of the ceasing of the immune response at the inflammatory stage. Ways of omitting the agents from the action of the factors of immune defense. Peculiarities of filling the immune anamnesis in patients with specific inflammatory processes. Methods of instrumental examinations of such patients. Clinical and laboratory algorithm of the curation of such patients by the dentist. Prevention of HIV-infection.

3. APPLIED PROBLEMS OF CLINICAL IMMUNOLOGY

3.1. PRIMARY AND SECONDARY IMMUNODEFICIENCIES IN DENTAL PRACTICE

Primary immunodeficiencies – definition, classification, mechanisms of development. Primary immunodeficiencies and their clinical manifestations in dentistry

Acquired immunodeficiencies: definition, causes and mechanisms of development, classification, diagnostics. Role of acquired immunodeficiencies in pathogenesis of different complications. Acquired immunodeficiencies and their role in dentistry. Infectious immune dependent post-surgical complications.

Herpetic and Epstein-Barr virus-associated damages of oral mucous membranes, clinical and immunologic diagnostics, immune therapy and prevention.

3.2.CLINICAL AND IMMUNOLOGIC PECULIARITIES OF AUTOIMMUNE DISEASES AND REGENERATIVE PROCESSES OF ORGANS AND TISSUES OF MAXILLO-FACIAL REGION

Autoimmune diseases: etiology, immune pathogenesis, clinics, immune diagnostics and approaches to immune therapy. Systemic autoimmune diseases and their clinical manifestations on oral mucous membranes. Sjögren's syndrome. Organ-specific autoimmune diseases of gastro-intestinal tract. Generalized parodontitis as an organ-specific autoimmune disease.

3.3 IMMUNO-TRANSPLANT PROBLEMS IN DENTAL PRACTICE

Organs and tissues most frequently transplanted. Types of transplants. Immune response on transplant. Non-mediatory and mediatory antigen presentation in allogenic transplantation. Types of transplant rejection: supra-acute, quickened, acute, chronic. Typing of HLA-antigens. Desease "transplant against the host". Xenotransplantation. Implants in dentistry.

4. ALLERGIC DISEASES AND REACTIONS IN DENTISTRY

4.1. ALLERGIC DISEASES IN DENTIST'S PRACTICE

Types of hypersensitivity reactions. Allergic and non-allergic diseases. Clinics, diagnostics, approaches to treatment. Prevention of allergic pathology development. Atopic diseases: genetic susceptibility, immune pathogenesis, clinics and allergic diagnostics.

4.2.URGENT ACUTE ALLERGIC CONDITIONS AND REACTIONS IN DENTAL PRACTICE. MEDICATION ALLERGY IN DENTISTRY.

First aid in acute conditions in allergology. Usage of modern immunotropic drugs with suppressive action in case of the administration of first aid to the patient in dental chair.

Medication allergy: etiology, pathogenesis, clinics and diagnostics. Immunological problems of prosthetic dentistry. Development of allergic reactions with the usage of modern dental material. Allergic stomatitis as the reaction on metals and acrylates. Differential diagnostics of diseases with the complains of burning sensation of the tongue.

THEMATIC LECTURE PLAN on the subject "Clinical immunology" for the 5th year students of dentistry faculty

No.	Theme	Hours
1.	Structure and principles of human immune system functioning	2
2.	Anti-infection immunity in dental practice	2
3.	Immune-dependent diseases in dental practice	2

THEMATIC PLAN OF PRACTICAL CLASSES, SELF-GUIDED WORK on the subject "Clinical immunology" for the 5th year students of dentistry faculty

No.	Theme of the class	Hours
1.	1. Modern points of view concerning the structure and functions of the immune	4
	system and possibility of assessing the state of immune system.	
	2. Local immunity and development of system immune response	
	3. Microbiocenosis on the immune condition of oral mucosa.	
2.	1. Antibacterial, antiviral, antifungal and antiparasite immunity.	4
	2. Clinical and immunological peculiarities of acute and chronic odontogenic and	
	non-odontogenic inflammatory processes of maxillo-facial region and prevention of	
	their complications. Immune cancer diseases in dental practice.	
	3. clinical and immunologic peculiarities of specific inflammatory processes of	
	maxillo-facial region (tuberculosis, syphilis, AIDS, actinomycosis).	
3.	1. Primary and secondary immunodeficiencies in dental practice.	4
	2. Clinical and immunologic peculiarities of autoimmune diseases and processes of	
	regenerating the organs and tissues of maxillo-facial region.	
	3. Immuno-transplantation problems in dental practice.	
4.	Herpetic infections in dentistry	4
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5.	Mucosal vaccines: indications and contra-indications of their usage.	4
	T	4
6	Immunotropic therapy in dental practice.	4
Total	hours 24	4

TOPICS OF SELF-GUIDED WORK

for the 5-year students of medical faculties on clinical immunology and allergology

№ 3/n	Theme	Hours
1.	Mucosal immunity: laboratory diagnostics and approaches to correction	5
2.	Assessment of the state of antibacterial, anti-fungal and anti-parasite immunities in patients	5
3.	Herpetic immunotropic infections	10
4.	Hey fever: diagnostics and immune therapy	5
5.	Medication allergy	5
Total		30

7. LIST OF QUESTIONS FOR THE STUDENTS' PREPARATION FOR THE FINAL MODULAR CONTROL

- 1. Current understanding of the structure, functions and development of the immune system.
- 2. Central and peripheral immune organs.
- 3. Cellular congenital protective factors, their interaction in the realization of the immune response.
- 4. Monocyte-macrophage system: functions, peculiarities, role in the development and realization of the immune response.
- 5. Killing effect as the component of immune-biological surveillance. Main types of killer-cells, their function and properties. Role of blood granulocytes in the formation of immune response.
- 6. Humoral factors of congenital immunity.
- 7. Complement system. Biological consequences of complement system activation.
- 8. Antigens: structure, functions. Haptens.
- 9. Stages of maturation and differentiation of T- and B-cells.
- 10. T-cells. Structure of T-cellular receptor. Sub-population of T-lymphocytes. Main markers and differentiation clusters.
- 11. T-helper cells of the 1st and 2nd types. The importance of functional balance between T-helper cells (Th1/Th2).
- 12. Regulatory T-cells, main functions.
- 13. Apoptosis as a special type of cell death. Its role in functional and pathological processes.
- 14. B-cells. Main markers and functions. Receptor structure recognizing antigen. Definition of T-dependent and non-T-dependent types of immune response.
- 15. Immunoglobulins: structure, functions, classes. Role of immune complexes in the development of pathology.
- 16. Cytokines mediators of immune system. Interleukins, classification, classes and participation in immune processes.
- 17. Growth factors, tumour-necrosis factors, interferons and adhesion molecules. Characteristics. Participation in the development of immune system.\
- 18. Immunological system of mucous membranes. Lymphoid tissue associated with gastro-intestinal tract.
- 19. Main classification principles of immunodeficiencies. Congenital combined immune deficiencies and immunodeficiencies of B-, T-cell mediated immunities: mechanisms of development, peculiarities of clinical course, immunodiagnostics and treatment.
- 20. Congenital immunodeficiencies of phagocyte-mediated immune system and complement system: mechanisms of development, peculiarities of clinical course, immunodiagnostics and treatment.
- 21. Definition of acquired immunity. Causes, clinical signs, immunodiagnostics, immunotherapy.

- 22. Syndrome of long-term fever: etiology, clinical, instrumental, laboratory and immunological diagnostic criteria, differential diagnostics, main principles of immunotherapy and immune prevention.
- 23. Immune pathogenesis, stages of development, classification of HIV-infection/AIDS.
- 24. Clinical and laboratory diagnostic criteria, principles of HIV-infection/AIDS treatment.
- 25. Main principles of HIV-infection/AIDS prevention in Ukraine. Medical personnel as risk-group persons for the development of HIV-infection/AIDS.
- 26. Stresses, neuro-humoral and immune regulation disturbances. Fatigue syndrome.
- 27. Classification of harmful environmental factors, periods of their influence on the state of immune system.
- 28. Transplant immunology. Immunological indications and contraindications for the organ and tissue transplantations. Selection of donor-recipient pairs. Preexisting antilymphocyte toxicantibodies, their prognostic value.
- 29. Anti-tumour factors, factors of tumour immune-resistance, problast factors suppressing the immunity and problast factors stimulating tumour growth. Definition of tumour-associated antigens.
- 30. Immune changes in cancer patients. Immunodiagnostics in oncology. Modern approaches to the immunotherapy of patients with oncologic diseases.
- 31. Causes of the formation of allergic pathology. Stages of allergic reaction formation.
- 32. Allergy and atopy. Classification of allergens. Causes and mechanisms of the development of allergic conditions.
- 33. Methods of allergy diagnostics: laboratory methods, skin tests and provocative tests.
- 34. Principles of anti-allergic therapy and immunotropic treatment methods in allergology. Specific immunotherapy, mechanism of action, indications and contraindications, prognosis of effectiveness.
- 35. Hey fever, allergic rhinitis, allergic conjunctivitis: etiology, immune pathogenesis, clinics, allegro-diagnostics main principles of immunotherapy.
- 36. Drug allergy. Immune pathogenesis, clinics, allegro-diagnostics, treatment, allegro-prevention.
- 37. Definition of the term of autoimmunity, autoimmune disease, syndrome. Mechanisms of tolerance disruption, genetic basis of the development of autoimmune diseases.
- 38. Classification, main immune-laboratory diagnostics principles of autoimmune diseases. Modern approaches to the usage of immunotropic drugs.
- 39. Laboratory immunodiagnostic criteria of autoimmune diseases.
- 40. Classification of immunotropic medications, mechanism of action and sideeffects.

8. APPROXIMATE LIST OF PRACTICAL SKILLS AND TASKS FOR THE FINAL CONTROL

- 1. To interview and perform physical examinations of patients with immunodeficiency diseases (to collect immunological anamnesis, to determine the inherited susceptibility to the development of immunodeficiencies, to assess the data of physical methods of examination, etc.).
- 2. To be able to fill the patient's immunological history and to determine the "risk group" according to the pathology on its basis.
- 3. To acquire the skills of determining the required range of immunological tests for the examination of patients with immune-dependent pathology.
- 4. To determine the presence of main clinical symptoms and symptoms of immune disorders.
- 5. To carry out differentiated diagnosis, to ground and formulate he diagnosis in main immunodeficiency syndromes on the basis the data of laboratory and instrumental examination.
- 6. To perform clinical and immunological differentiation diagnostics of congenital and acquired immune deficiencies.
- 7. To acquire the skills of data interpretation and main principles of interpreting the data of leukogram and immunogram considering the clinics, period of disease, immunological anamnesis, etc.
- 8. To acquire the skills of influence estimation of the action of negative factors of the external environment and immunological indexes.
- 9. To detect clinical signs of local immunity decompensation.
- 10. To detect the signs of immune system irritation by the data of leukogram.
- 11. To administrate immunotropic treatment, determine pathogenesis, carry out primary and secondary immune prevention in the immune-dependent diseases.
- 12. To know main principles of immunotropic treatment administration in the complex treatment of immune dependent diseases.
- 13. To be able to carry out preventive measures during vaccination. To know the principles of immune-prophylaxis.
- 14. To acquire the skills of determining the necessity of clinical and allergological examination.
- 15. To interview and perform physical examination of the patients with allegopathology (to be able to fill allergological anamnesis, to determine the presence of genetic susceptibility to the development of allergological pathology).

9. ASSESSMENT OF ACADEMIC ACTIVITY

Assessment is one of the final stages of the academic activity and determination of academic performance. The mark for the discipline is determined as average of the marks for modules structured by the academic discipline.

The mark for the module is determined as the sum of marks of formative academic activity (in points) and the mark of final modular control (in points) put at the assessment of theoretic knowledge and practical skills according to the lists determined by the curriculum

The maximum number of points received by the student during the module is 200 points.

Self-guided work of students planned in the theme together with classroom studies is estimated during formative control of the theme at the respective class. The knowledge of themes planned only for the self-guided work is controlled during the final modular control as "passed".

Final modular control is performed after studying all themed of the module during the last control class of the module.

The students, who attended all classes planned in the curriculum of the subject and received more than minimum number of points for the module are admitted to the final modular control. The student who missed the classes on serious reasons can have corrections in his/her individual plan and is permitted to make up academic debts in the determined term.