

MINISTRY OF HEALTH OF UKRAINE
BOGOMOLETS NATIONAL MEDICAL UNIVERSITY
DEPARTMENT OF OPHTHALMOLOGY

"Approved"

The Vice-Rector for Scientific,
Pedagogical and Educational Work
of Bogomolets NMU, professor

_____ O.M. Vlasenko

"__" _____ 202_ year

WORKING PROGRAM OF THE EDUCATIONAL DISCIPLINE

"Ophthalmology"

Educational level second "Master"

Field of knowledge 22 "Healthcare"

Specialty 221 "Dentistry"

Educational program of the EPP "Dentistry"

Qualification Master of Dentistry, Dentist

Work program "Ophthalmology" for students in the field of training: field of knowledge 22 Health Care, specialty 221 "Dentistry", second (master's) educational level, 4th year.

Developers:

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The work program was approved at the meeting of the cyclical methodological commission on surgical disciplines

Protocol No. 6 from " 30 " August 2024

Head of the cyclical methodological commission for surgical disciplines

Candidate of Medical Sciences, Associate Professor _____ Stetsenko O.P.

Reapproved:

for 2025/2026 AD _____ " 15 " September 2025, protocol No. 1____
(signature) (full name)

on 20__/20__ AD _____ " ____ " _____ 20__ protocol No. ____
(signature) (full name)

on 20__/20__ AD _____ " ____ " _____ 20__ protocol No. ____
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on 20__/20__ AD _____ " ____ " _____ 20__ protocol No. ____
(signature) (full name)

1. Description of the academic discipline

Name of indicators	Field of knowledge, specialty, educational level	Characteristics of the academic discipline	
		full-time education	correspondence form of study
Number of credits – 1.5	Discipline <u>22 Health care</u>	Full-time study Regulatory	
Modules – 1	Specialty <u>221 "Dentistry"</u>	Year of preparation	
Content modules – 3		4	
Individual research assignment		Semester	
Total number of hours – 45		7-8	
Weekly hours for full-time study: classrooms – 30 student's independent work – 15	Educational level <u>second (master's)</u>	Lectures	
		-	-
		Practical, seminar	
		30 hours.	-
		Independent work	
		3 p.m.	-
		Individual tasks:	
		-	
Type of control:			
final control			

2. Purpose, expected learning outcomes and criteria for assessing learning outcomes.

Goal: To ensure that students acquire competencies to solve typical tasks, complex tasks and problems in the field of dentistry and healthcare or in the process of learning, which are characterized by uncertainty of conditions and requirements and aimed at training highly qualified, competitive, competent specialists.

Competencies and learning outcomes that discipline contributes to.

Competencies:

Integral: The ability to solve complex tasks and problems in the field of health care in the specialty "Dentistry" in professional activities or in the process of study, which involves conducting research and/or implementing innovations and is characterized by uncertainty of conditions and requirements .

General competences (GC) :

ZK1. Ability for abstract thinking, analysis and synthesis.

GC2. Knowledge and understanding of the subject area and understanding of professional activity.

GC3. Ability to apply knowledge in practical activities.

GC4. Ability to communicate in the state language both orally and in writing.

GC5. Ability to communicate in English.

GC6. Skills in using information and communication technologies.

GC7. Ability to search, process and analyze information from various sources.

GC8. Ability to adapt and act in a new situation.

GC9. Ability to identify, pose and solve problems.

GC10. The ability to be critical and self-critical.

GC11. Ability to work in a team.

GC13. Ability to act socially responsibly and consciously.

GC14. Ability to exercise one's rights and responsibilities as a member of society, to realize the values of a civil (free democratic) society and the need for its sustainable development, the rule of law, and the rights and freedoms of man and citizen in Ukraine.

GC15. The ability to preserve and multiply the moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and engineering, to use various types and forms of physical activity for active recreation and leading a healthy lifestyle.

Special (professional, subject) competencies (FC):

SC1. Ability to collect medical information about the patient and analyze clinical data.

SC2. Ability to interpret the results of laboratory and instrumental studies.

SC 3. Ability to diagnose: determine preliminary, clinical, final, concomitant diagnosis, emergency conditions.

SC7. Ability to determine the tactics of managing patients with diseases of the organs and tissues of the oral cavity and maxillofacial region with concomitant somatic diseases.

SC8. Ability to perform medical and dental procedures.

SC10. Capacity additional organization and implementation of medical and evacuation measures.

SC11. Ability to determine tactics, methods and provide emergency medical care.

SC13. Ability to assess the impact of the environment on the health of the population (individual, family, population).

SC14. Ability to maintain regulatory medical documentation.

SC15. Processing of state, social and medical information.

Program learning outcomes.

PLO1. To identify and identify the leading clinical symptoms and syndromes (according to list 1); using standard methods, using preliminary data from the patient's history, patient examination data, knowledge about the person, his organs and systems, to establish a probable nosological or syndromic preliminary clinical diagnosis of a dental disease (according to list 2).

PLO2. Collect information about the patient's general condition, assess the patient's psychomotor and physical development, the condition of the maxillofacial organs, and evaluate information about the diagnosis based on the results of laboratory and instrumental studies (according to list 5).

PLO3. To prescribe and analyze additional (mandatory and optional) examination methods (laboratory, radiological, functional and/or instrumental) according to list 5, patients with diseases of the organs and tissues of the oral cavity and maxillofacial region for differential diagnosis of diseases (according to list 2).

PLO4. Determine the final clinical diagnosis, adhering to relevant ethical and legal norms, by making a reasoned decision and logical analysis of the obtained subjective and objective data of clinical, additional examination, and conducting differential diagnostics under the supervision of the head physician in a medical institution (according to list 2.1).

PLO5. Establish a diagnosis of emergency conditions under any circumstances (at home, on the street, in a medical institution), in conditions of emergency, martial law, lack of information and limited time (according to list 4) .

PLO6. Plan and implement dental disease prevention measures among the population to prevent the spread of dental diseases.

PLO7. Analyze the epidemiological situation and carry out measures for mass and individual, general and local drug and non-drug prevention of dental diseases.

PLO8. Determine the approach, plan, type and principle of treatment of a dental disease (according to list 2) by making a reasoned decision based on existing algorithms and standard schemes.

PLO9. Determine the nature of the work, rest and necessary diet regime in the treatment of dental diseases (according to list 2) based on a preliminary or final clinical diagnosis by making an informed decision according to existing algorithms and standard schemes.

PLO10. Determine the tactics of managing a dental patient with somatic pathology (according to list 3) by making a reasoned decision according to existing algorithms and standard schemes.

PLO13. Determine the tactics of providing emergency medical care, using recommended algorithms, under any circumstances based on the diagnosis of an emergency condition in conditions of limited time (according to list 4) .

PLO14. Analyze and evaluate government, social, and medical information using standard approaches and computer information technologies.

PLO16. Form goals and determine the structure of personal activities based on the results of an analysis of certain social and personal needs.

PLO17. Adhere to a healthy lifestyle, use self-regulation and self-control techniques.

PLO18. To be aware of and guided in their activities by civil rights, freedoms and responsibilities, to increase the general educational cultural level.

PLO19. Comply with the requirements of ethics, bioethics, and deontology in their professional activities.

PLO20. Organize the necessary level of individual safety (one's own and those in one's care) in the event of typical dangerous situations in the individual field of activity.

PLO21. Perform medical manipulations based on a preliminary and/or final clinical diagnosis (according to lists 2, 2.1) for different segments of the population and in different conditions (according to list 6) .

PLO23. Perform emergency medical care manipulations, using standard schemes, under any circumstances based on the diagnosis of an emergency condition (according to list 4) in conditions of limited time (according to lists 6, 7) .

Learning outcomes.

Know:

- general issues of organizing ophthalmological care;
- etiology, pathogenesis and classification of diseases of the organ of vision;
- features of clinical symptoms of the main diseases of the organ of vision;
- modern standards for diagnosing diseases of the organ of vision;
- modern principles of treatment of patients with various pathologies of the organ of vision.
- standards for providing emergency care in ophthalmology; standards for providing emergency care for injuries to the organ of vision.

Be able:

- make a preliminary diagnosis of the main diseases and injuries of the organ of vision;
- provide emergency medical assistance in case of emergencies and injuries to the organ of vision;
- make decisions regarding treatment tactics for diseases and injuries of the organ of vision ;
- to highlight the connection between the pathological process in the patient's body and the disease of the organ of vision, to determine and provide medical suggestions;
- be able to carry out preventive measures to prevent the occurrence of epidemiological outbreaks, damage to the organ of vision and the development of a severe form of disability - blindness.

Criteria for evaluating learning outcomes.

Assessment of learning outcomes in a practical lesson (current control) is carried out in each lesson in accordance with specific goals for each topic, namely 100% survey of students in the group and evaluation of all components (stages) of the lesson, which are provided for by the methodological development for studying the topic - test control, control of the implementation of practical skills, solving situational clinical tasks, written completion of tasks for independent work.

For each component (stage) of the practical lesson, the student receives a grade on a four-point traditional scale "5-4-3-2", from which the teacher forms the arithmetic average traditional grade. The traditional grade received by the student is then converted into points according to the scale provided for by the working curriculum for the discipline. If, during the formation of the arithmetic average traditional grade for the lesson, the student receives "2", then this grade is converted into 0 points.

The student's current academic performance can be assessed by the teacher with a maximum of 80 points.

Evaluation criteria.

The grade "excellent" is given to a student who has 90-100% of correct answers, has deeply and firmly mastered the material and presents it consistently, competently and logically, whose answer closely connects theory with practice. At the same time, the student does not have difficulties when changing the task, freely copes with tasks, questions and other types of use of knowledge, shows knowledge of literature, correctly justifies decision-making, and possesses versatile skills of practical work.

A "good" grade is given to a student who has 75-89% of correct answers, firmly knows the material, answers it competently and in essence, who does not make significant mistakes in answering questions, correctly uses theoretical provisions when solving practical issues and tasks, and possesses the necessary skills and techniques for their implementation.

A grade of "satisfactory" is given to a student who has 60-74% of correct answers, but has not mastered its details, makes mistakes, does not formulate it correctly enough, violates the consistency in presenting the material, and experiences difficulties in performing practical work.

An "unsatisfactory" grade is given to a student who does not know part of the program material, makes significant mistakes, performs practical skills uncertainly, with great difficulty, and has 59% or fewer correct answers.

The final control of the discipline is carried out upon completion of the study of the discipline. For each stage of the final control, the student receives a traditional grade on a four-point traditional scale "5-4-3-2", which the teacher converts into points in accordance with the regulations for assessing the final control. The traditional grade of 2 corresponds to 0 points. The final control of knowledge is assessed at a maximum of 120 points.

The student's performance assessment in the discipline is set on a multi-point scale as the arithmetic average of the module's mastery. The maximum number of points that a student can receive while studying the discipline is 200 points.

3. Program of the academic discipline.

The curriculum of the academic discipline consists of 1 module "Ophthalmology" and 3 content modules:

1. Anatomical and functional features of the organ of vision.
2. Inflammatory and dystrophic diseases of the organ of vision.
3. Damage to the organ of vision. Emergency conditions in ophthalmology.

CONTENT MODULE 1.

ANATOMICAL AND FUNCTIONAL FEATURES OF THE ORGAN OF VISION.

Topic 1. ANATOMY – TOPOGRAPHIC FEATURES OF THE ORGAN OF VISION.

FUNCTIONS OF THE ORGAN OF VISION AND RESEARCH METHODS.

Visual analyzer, its components. Eyeball - peripheral department of visual analyzer. Eyeball, its membranes. Outer membrane of the eye. Features of the structure of the sclera, its blood supply and innervation. Features of the structure of the cornea, its properties, innervation, nutrition, functions. The choroid, its three sections: iris, ciliary body, choroid. Iris, its structure, functions, blood supply, innervation. Ciliary body, structure and functions. Ciliary muscle, its features and innervation. Choroid, its structure, functions. Retina, its structure, blood supply, functions. Optic nerve, features of structure and topography, blood supply. Visual pathways. Contents of the eyeball and eye chamber. Lens, Features of its structure, nutrition, and functions. Vitreous body, features of its structure, nutrition, functions. Anterior chamber, its contents. Intraocular fluid, its composition and role in intraocular metabolism. Anterior chamber angle, its structure. Posterior chamber. Pathways of outflow of intraocular fluid. Eye socket, its walls. Openings and fissures of the eye socket: optic canal, superior orbital fissure, inferior orbital fissure, anterior and posterior ethmoid foramina, foramen ovale. Relation of the eye socket to the accessory sinuses and cranial cavity. Contents of the orbit: orbital fat, nerves, ciliary body (ciliary) node, oculomotor muscles: their origin and attachment, innervation, functions. Eyeball sheath (Tenon's capsule), episcleral space (Tenon's space), orbital septum (tarso-orbital fascia), their significance. Conjunctiva, its structure, properties, blood supply, innervation. Anatomical and topographic features of the eyelids, their blood supply, innervation. Eyelid muscles (orbital muscle of the eye, levator palpebrae

superioris muscle), their innervation. Lacrimal organs: tear-producing apparatus and lacrimal ducts. Lacrimal gland, structural features, blood supply and innervation. Accessory glands of the conjunctiva. Lacrimal fluid, its composition and functions. Lacrimal stream, lacrimal lake, lacrimal meatus. Lacrimal tracts (lacrimal puncta, lacrimal tubules, lacrimal sac, nasolacrimal duct), their anatomical and topographic features.

Examination of central vision. Visual acuity, definition. Angle of vision . Principle of constructing tables for studying visual acuity. Snellen formula. Studying visual acuity using tables.

Study of color vision . Color and its main features. Normal trichromasia . Color perception disorders. Diagnosis of color perception disorders . Polychromatic tables.

Examination of peripheral vision (field of vision) . Definition of the field of vision. Normal boundaries of the field of vision, physiological scotoma (blind spot) . Methods of examining the field of vision: control, perimetry, campimetry. Pathological changes in the field of vision: narrowing of the boundaries of the field of vision (concentric , local) and limited defects in the field of vision (scotoma) . Types of scotoma (central, paracentral , peripheral , relative , absolute , negative , positive).

Light perception, definition. Adaptation. Dark adaptation. Purkinje phenomenon. Methods of studying light sensitivity (orientational, adaptometry). Hemeralopia. Types of hemeralopia (symptomatic , essential).

Topic 2. REFRACTION AND ACCOMMODATION.

The optical system of the eye, its components. The unit of measurement of refraction is diopter. The concept of physical refraction of the eye. Characteristics of clinical refraction and its varieties: emmetropia and ametropia (myopia, hyperopia). Anisometropia. Subjective and objective methods of studying clinical refraction. Age characteristics and the specific gravity of different types of refraction. Emmetropia, its characteristics. Hypermetropia (farsightedness), classification, characteristics. Myopia (nearsightedness), modern concepts of origin and development, classification, characteristics, complications, prevention. Astigmatism, characteristics, types. Correction of ametropia with glasses, contact lenses. Surgical methods of correction of refractive errors.

Accommodation, characteristics. Physiological mechanism of accommodation. Changes in accommodation associated with age. Presbyopia and its correction.

Topic 3. DISEASES OF THE EYELIDS, LACRIMAL ORGANS, AND EYEBROWS.

Inflammatory diseases of the eyelids: blepharitis, sty, chalazion, eyelid abscess. Causes, clinical features, treatment. Diseases of the neuromuscular apparatus of the eyelids (ptosis, lagophthalmos): causes, treatment.

Dacryoadenitis. Etiology, clinical features, treatment principles. Sjögren's syndrome: pathogenesis, clinical manifestations, diagnostics and treatment tactics. Infantile dacryocystitis, causes, clinical signs, treatment tactics, complications. Chronic dacryocystitis, causes, clinical features, diagnostics, complications, surgical treatment methods. Acute dacryocystitis (phlegmon of the lacrimal sac), clinical features, complications, treatment tactics.

General symptoms characteristic of the inflammatory process in the orbit, methods of diagnosing inflammatory diseases of the orbit, principles of treatment. Inflammatory diseases of the orbit (osteoperiostitis, phlegmon of the orbit, thrombosis of the cavernous sinus) associated with diseases of the dentofacial system (acute and chronic periodontitis, radicular granuloma, osteomyelitis of the jaws, phlegmons and abscesses of the maxillofacial region and neck, furuncles or carbuncles of the face, erysipelas of the face). Ways of spreading infection into the orbit (through venous and lymphatic vessels, hematogenous-metastatic route). The role of odontogenic infection in the development of inflammatory processes in the orbit. Neoplasms of the orbit. Benign tumors (cysts, dermoid cysts, angiomas, osteomas) and malignant tumors (sarcoma, carcinoma). Features of the clinical course. Diagnostic methods. Treatment methods.

CONTENT MODULE 2.

INFLAMMATORY AND DYSTROPHIC DISEASES OF THE ORGAN OF VISION.

Topic 1. DISEASES OF THE CONJUNCTIVUS .

Conjunctivitis. Classification. Acute conjunctivitis, Complaints, clinical signs. Conjunctival injection of the vessels of the eyeball and its distinction from pericorneal. Diagnosis. Complications. Treatment.

Mass prevention and sanitary-hygienic measures. Acute epidemic conjunctivitis caused by Koch-Wicks bacillus, clinical picture, treatment. Features of the clinical picture of staphylococcal, pneumococcal, diphtheria conjunctivitis, their treatment. Gonoblenorrhoea in infants and adults, clinical picture, consequences, local and general treatment. Prevention of gonoblenorrhoea in infants. Viral conjunctivitis (adenovirus, acute hemorrhagic conjunctivitis, herpetic). Features of the clinical picture, diagnostics, treatment, prevention. Chronic conjunctivitis. Complaints, features of the clinical picture, treatment. The need to identify and eliminate chronically acting factors. Chronic conjunctivitis as an occupational pathology and preventive measures. Chlamydial conjunctivitis. Trachoma. Paratrachoma. Clinical picture, differential diagnosis, complications, treatment, prevention.

Dystrophic changes of the conjunctiva (pterygium, pinguecula). Indications for surgical treatment.

Topic 2. CORNEAL DISEASES. SCLERA PATHOLOGY.

Keratitis. Classification. Features of the clinical picture, consequences. Exogenous infectious keratitis of bacterial origin. Clinic, diagnostics, treatment. Conditions for the occurrence of ulcerative process in the cornea. Creeping corneal ulcer. Clinic, course, consequences. The role of chronic dacryocystitis. Treatment. Keratitis of viral etiology. Adenovirus keratoconjunctivitis, clinic, course, diagnostics, consequences, treatment. Herpetic keratitis, classification, clinic, course, diagnostics, consequences, treatment. Keratitis caused by diseases of the conjunctiva, eyelids and meibomian glands. Superficial catarrhal keratitis. Features of the clinic. Treatment. Prevention. Bacterial keratitis of endogenous origin. Syphilitic (parenchymal) keratitis. Clinic, course, consequences, diagnostics, treatment. Tuberculous keratitis. Metastatic tuberculous keratitis. Classification, clinical features, course, consequences, diagnosis, treatment. Tuberculous-allergic (phlyctenulosis) keratitis. Clinical features, course, consequences, diagnosis, treatment. Neurogenic keratitis. Neuroparalytic keratitis during trigeminal nerve damage. Clinical features. Fungal lesions of the cornea. Etiology, clinical features, course, consequences, diagnosis, treatment. Avitaminosis keratitis. Corneal lesions in vitamin A deficiency. Xerophthalmia. Clinical features, course, treatment, prevention.

Etiopathogenesis of inflammatory diseases of the sclera (episcleritis, scleritis). Clinical features, diagnostics and principles of treatment.

Topic 3. DISEASES OF THE VASCULAR TRACT, LENS.

Inflammation of the vascular tract (uveitis). The most common causes of uveitis. Pathogenetic mechanisms of uveitis development: infectious-metastatic and toxic-allergic. Classification of uveitis by duration, localization, morphological features, etiology. Iridocyclitis, clinical picture, diagnosis, differential diagnosis with other eye diseases. Choroiditis, clinical picture, diagnosis. Principles General and local treatment of anterior and posterior uveitis depending on the etiology and nature of the process. Consequences of uveitis. Prevention.

Congenital cataract, etiopathogenesis, classification, clinical picture, diagnosis, course. Acquired cataract. Etiopathogenesis, classification. Senile cataract, classification, complaints, clinical picture, diagnosis. Cataract in general diseases, complicated cataract, secondary cataract. Causes, characteristic clinical symptoms. Methods of cataract treatment. Indications for surgical treatment. Aphakia, clinical signs, methods of correction.

Topic 4. GLAUCOMA.

Definition and cardinal clinical symptoms of glaucoma. Classification. Diagnosis of glaucoma. Methods of early diagnosis of glaucoma. Primary narrow-angle glaucoma, features of the clinical picture and course. Differential diagnosis of primary open-angle glaucoma with age-related cataract. Primary angle-closure glaucoma, features of the clinical picture and course. Acute attack of glaucoma. Complaints. Clinical symptoms, local and general. Course. Consequences. Differential diagnosis of acute attack of glaucoma with acute iridocyclitis. Emergency care. Indications for surgical treatment. Conservative treatment of glaucoma. Indications for laser and surgical treatment. Medical examination of patients with glaucoma. Congenital glaucoma, etiology, pathogenesis, features of the clinic and treatment. Secondary glaucoma, clinical forms, principles of diagnosis and treatment.

Topic 5. PATHOLOGY OF THE RETINA AND OPTIC NERVE, VITREOUS BODY.

Inflammation of the optic nerve (neuritis). Papillitis and retrobulbar neuritis, etiopathogenesis, clinical picture, diagnostics, treatment tactics, consequences. Differential diagnosis with congestive optic disc.

Congestive optic disc, causes, clinical picture, diagnostics. Optic nerve atrophy, etiopathogenesis, clinical picture, types of optic nerve atrophy, diagnostics, treatment tactics.

Retinal dystrophies in the macula (hereditary, age-related). Pigmentary dystrophy of the retina. Retinal detachment, etiopathogenesis, clinical symptoms, treatment tactics, consequences.

Acute retinal circulatory disorders (acute central retinal artery occlusion, central retinal vein thrombosis), causes, clinical features, diagnostics, emergency care, treatment tactics, prognosis, consequences.

Acquired pathology of the vitreous body (hemorrhage, destruction). Diagnostics, modern methods of treatment.

CONTENT MODULE 3.

TRAUMATIC INJURIES TO THE ORGAN OF VISION. EMERGENCIES IN OPHTHALMOLOGY.

Topic 1. DAMAGE TO THE ORGAN OF VISION. EMERGENCIES IN OPHTHALMOLOGY.

Classification of eye injuries.

Contusions of the organ of vision. Classification. Eyelid contusions. Hemorrhages under the skin of the eyelids. Subcutaneous emphysema. Contusions of the orbit, general symptoms. Traumatic fracture of the fundus of the orbit, superior orbital fissure syndrome, traumatic fracture of the inner and outer walls of the orbit, fracture of the walls of the bone canal of the optic nerve. Contusions of the eyeball: damage to the cornea, sclera, iris, ciliary body, hemorrhages into the anterior chamber and vitreous body, damage to the lens (traumatic cataract), ruptures of the choroid itself, retinal contusion, retinal tears and detachments, damage to the optic nerve. Clinical symptoms and diagnostic methods. Treatment of the consequences of contusions of the organ of vision.

Foreign bodies of the conjunctival cavity and cornea. Methods of removal.

Penetrating injuries of the eyeball, absolute and relative signs of penetrating eye injuries. Emergency care. Principles of providing specialized care. Complications (metallosis, purulent iridocyclitis, endophthalmitis, panophthalmitis, sympathetic inflammation).

Burns of the organ of vision. Classification. Clinical symptoms and features of the course of acid, alkaline and thermal burns. Burns with radiant energy. Electrophthalmia. Burns with infrared rays. Burns when working with a polymerization lamp. Emergency care. Treatment tactics. Complications and modern methods of their treatment.

Topic 2. PATHOLOGY OF THE OCCUPATIONAL APPARATUS.

Binocular vision, its essence, formation and conditions necessary for the existence of binocular vision. Binocular vision disorders: monocular and simultaneous vision. Methods of studying binocular vision. The concept of correspondent and disparate areas of the retina. Fusion reflex. Scheme of action of oculomotor muscles.

Apparent and latent strabismus. Congenital strabismus: etiopathogenesis, classification, clinical picture, diagnosis, consequences. Principles of treatment of congenital strabismus. Prevention of strabismus. Paralytic strabismus, causes, differential diagnosis with congenital strabismus, treatment tactics.

Topic 3. CHANGES IN THE ORGAN OF VISION IN GENERAL DISEASES OF THE ORGANISM. DISEASES WITH SIMULTANEOUS INVOLVEMENT OF THE EYE AND THE MAXILLODENTAL SYSTEM.

Changes in the organ of vision in diseases of the cardiovascular system (arterial hypotension and hypertension, atherosclerosis); in blood diseases (leukemia, anemia), toxicosis of pregnant women, kidney diseases, in patients with AIDS.

Changes in the organ of vision in diseases of the endocrine system (diabetes mellitus, thyroid diseases, pathology of the hypothalamic-pituitary area).

Changes in the organ of vision in systemic diseases: reactive arthritis (urethro-oculo-synovial syndrome, Reiter's syndrome/disease), Stevens-Johnson syndrome, Rossolimo-Melkersson-Rosenthal syndrome, Sjögren's syndrome (Sjögren, Gougerot-Sjögren), Mikulich's disease, sarcoidosis (Benner-Beck-Schaumann disease), Behçet's disease.

Pain syndrome in the eye and upper jaw area: nasolabial neuralgia (Charlin syndrome), ganglionitis of the nasolabial node (Oppenheim syndrome), pterygoid neuralgia (Slader syndrome), dysfunction of the temporomandibular joint.

4. Structure of sections of the academic discipline "Ophthalmology".

STRUCTURE OF SECTIONS IN 7-8 SEMESTER (4th year)

Semester number number of study hours/number of ECTS credits	Number of sections, their numbers	Number of practical classes	Number of seminar classes	Conversion to traditional grades					Maximum number of points per discipline
				Traditional assessments				Points for completing an individual task as a type of VTS	
				"5"	"4"	"3"	"2"		
7-8 semester, 45/1.5	3 (No. 1-3)	5	-	16	13	10	0	-	80
Topic names			Number of hours						
			Day uniform						
			Total	Including					Indus · CRC
Lectures	Practical classes	Seminar classes		CRC					
1	2	3	4	5	6	7			
<i>Content module 1. Anatomical and functional features of the organ of vision.</i>									
1. Anatomical and topographic features of the organ of vision.	9		2		3				
2. Functions of the organ of vision.			2						
3. Refraction and accommodation.			2						
4. Eyelid diseases.			1						
5. Diseases of the lacrimal organs.			1						
6. Orbital diseases.			1						
<i>Content module 2. Inflammatory and dystrophic diseases of the organ of vision.</i>									
7. Conjunctival diseases.	9		1	-	3				
8. Corneal diseases.			1	-					
9. Diseases of the choroid.			1						
10. Disease of the lens.			2						
11. Glaucoma.			2						
12. Diseases of the retina and optic nerve.			2						
<i>Content module 3. Traumatic injuries of the organ of vision. Emergencies in ophthalmology.</i>									
13. Damage to the organ of vision. Emergency care.	12		4		4				
14. Emergencies in ophthalmology.			2						
15. Strabismus.			1						
16. Changes in the organ of vision in general diseases of the body. Final control.			5						
Writing workbooks. Preparing for a PC, reviewing scientific literature or conducting research (individual work). Topics proposed for independent study:					5				

1. History of the development of ophthalmology in the 17th-20th centuries. 2. Scleral diseases. 3. Vitreous disease. 4. Expertise in ophthalmology.						
Total hours – 45			30		15	
ECTS credits – 1.5						
Classroom work – 67 %, CPC 33%						

5. Lecture topics.

Lectures are not included in the curriculum.

6. Topics of seminar classes.

Seminar classes are not included in the curriculum.

7. Topics of practical classes.

No.	Lesson topic	Practical classes
1.	Anatomical and topographic features of the organ of vision. Functions of the organ of vision. Refraction and accommodation.	6.0
2.	Diseases of the eyelids, lacrimal organs, orbit. Diseases of the conjunctiva. Diseases of the cornea. Diseases of the vascular tract.	6.0
3.	Diseases of the lens. Glaucoma. Diseases of the retina and optic nerve.	6.0
4.	Damage to the organ of vision. Emergency care. Emergencies in ophthalmology.	6.0
5.	Strabismus. Changes in the organ of vision in common diseases. Final modular control.	6.0
Total		30

8. Topics of laboratory classes.

Laboratory classes are not included in the curriculum.

9. Independent work.

No.	Topic	Number of hours	Types of control
1.	Preparation for practical classes: theoretical preparation, writing workbooks and working on practical skills of content module 1. 1. Determine visual acuity by a subjective method. 2. Determine the field of vision using the control method. 3. Determine color vision using Rabkin 's polychromatic tables . 4. Determine dark adaptation using an approximate method. 5. Perform eyelid examination and inversion and evaluate the results.	3	Current control in practical classes
2.	Preparing a review of scientific literature or conducting research (individual work).	0.5	Current control
3.	Topics proposed for independent study: 1. History of the development of ophthalmology.	0.7	Final control

Content module 2			
4.	Preparation for practical classes - theoretical preparation , writing workbooks and working on practical skills of content module 2. 1. Perform a corneal examination using focal illumination and evaluate the results. 2. Perform corneal sensitivity testing and evaluate the results. 3. Be able to conduct studies of the transparent media of the eye using the ophthalmoscopic transillumination method and evaluate the results. 4. Palpator to determine the sensitivity of the eyelashes body and evaluate the results. 5. Palpate intraocular pressure and evaluate the results .	3	Current control in practical classes
5.	Preparing a review of scientific literature or conducting research (individual work).	0.5	Current control
6.	Topics proposed for independent study: 1. Vitreous disease. 2. Scleral diseases.	1.1	Final control
Content module 3			
7.	Preparation for practical classes - theoretical preparation , writing workbooks and working on practical skills of content module 3. 1. Be able to provide emergency care for chemical burns . 2. Be able to provide emergency care for penetrating eye injuries . 3. Be able to provide emergency care for acute iridocyclitis. 4. Be able to provide emergency care for acute conjunctivitis . 5. Be able to provide emergency care for an acute attack of glaucoma. 6. Be able to provide emergency care for a conjunctival foreign body . 7. Determine the angle of strabismus by Hirschberg and evaluate the results.	4	Current control in practical classes
8.	Preparing a review of scientific literature or conducting research (individual work).	0.5	Current control
9.	Topics proposed for independent study: 1. Expertise in ophthalmology.	0.7	Final control
10.	Individual educational and research tasks (IRT).	-	
11.	Preparation for the final module control.	1	
	Together	15	

10. Individual tasks.

- Abstract presentation at a practical session.
- Report at clinical conferences of department bases .
- Patient history report at a practical session .
- Writing theses and articles.

11. Teaching methods.

By sources of knowledge: verbal (explanation, lecture, conversation, educational discussion, story); visual (illustration, demonstration); practical (practical work, mastering practical skills), working with a book.

According to the logic of presenting the educational material: analytical, synthetic, analytical-synthetic, inductive, deductive and translational methods.

By the level of cognitive activity: explanatory-illustrative, reproductive, problem-based, partially search-based, research, problem-based presentation method.

Interactive: role-playing, work in small groups (teams), case method, creative tasks, use of educational interactive video courses, attending medical conferences, consultations, "brainstorming", "discussion".

Distance learning methods using modern educational platforms and educational resources (LIKAR.nmu, Zoom, Skype, Classroom, etc.).

12. Methods and forms of control, distribution of points received by students, evaluation.

Control methods: oral, written, test, practical.

The regulations for assessing current and final discipline control were developed in accordance with the Regulations "On the procedure for assessing students' knowledge during current and final discipline control at the Bogomolets National Medical University", approved by the Academic Council of the university (Protocol No. 1 dated 05.09.2019), instructions for assessing students' educational activities when working on the "NEURON" platform (NMU, Kyiv, 2020), methodological recommendations for working on the LIKAR_NMU distance learning platform, approved by the decision of the Academic Council of the university (Protocol No. 10 dated 01.04.2021).

When organizing training under the credit transfer system, session-module control is used, which provides for the following types of control:

The initial knowledge control involves determining the initial level of students' knowledge in related disciplines, which is necessary for mastering the discipline that the student is studying. The results of the initial knowledge control are not taken into account in the student's current education, since they are only informative for the teacher.

Current control involves 100% surveying of students in a group during a practical lesson with mandatory assessment of all components (stages) of the lesson . For each component (stage) of a practical lesson, the student receives a grade on a four-point traditional scale "5-4-3-2", from which the teacher forms the arithmetic average traditional grade. The traditional grade received by the student is then converted into points according to the scale provided for by the working curriculum for the discipline. After the practical lesson, the teacher announces to the students their average grade.

If during the formation of the arithmetic average traditional grade for the lesson the student receives "2", then this grade is converted into 0 points. The student has the right to improve his knowledge and skills on the topic for which he was an overall score of "2" and, accordingly, 0 points, during the next training session during the current control without receiving points.

Classes that were missed by a student for any reason, including illness, are mastered by him independently in extracurricular time according to the department's regulations (by writing a summary of the academic topic, medical history, distance learning, consultations, demonstration of practical skills, etc.). The student demonstrates the summary of the missed topic to the group teacher during the next academic session or after the class, and the group teacher, upon the fact of the availability of the summary, makes a mark in the form of the letter "K" in the student attendance and performance journal in the column of the missed topic, without assigning a grade. The presence of a summary of the missed class is confirmation of the student's fulfillment of the curriculum. The teacher returns the summary of the missed class to the

student. The department does not establish a separate schedule indicating the hours for accepting summaries of missed classes.

Students have the right to review the written work checked by the teacher and, in case of disagreement, appeal to the assistant head of academic work at the department. or to the head of the department.

Also subject to evaluation are: written academic papers , the writing of which is provided for by the curriculum for the discipline, and academic topics submitted as independent work outside of class time.

The department also awards additional points for participation and winning prizes in all-Ukrainian and other Olympiads in the academic discipline.

Points are assigned to individual work for ongoing control by decision of the department.

The head of the department constantly monitors the current study of students in the discipline, paying special attention to students at risk (a significant number of "NB", unsatisfactory grades). At methodological meetings of the department, the results of the current study of students are discussed. For students at risk, if desired, in time, in advance, before the final control or after the last, the opportunity to provide in-depth study, in accordance with the procedure provision of educational services at the University.

The final score for the current activity is determined as the arithmetic sum of the scores for each activity. The sum of points accumulated by the student as a result of current studies is a component of the overall grade for the discipline . No minimum score for admission to the final examination for the discipline is set for the current examination.

The maximum number of points for current studies is 80 points .

Final control involves determining the level of knowledge and skills acquired. It is carried out upon completion of the study of the discipline. at the last lesson. It includes control of theoretical and practical training. The final control is carried out in the form of a summary control.

The volume of educational questions submitted for final control should contain the most important questions in the discipline, and should not constitute all the educational material, the study of which is provided for by the curriculum in the discipline.

Students are allowed to take the final examination in the discipline provided they attend at least 75% of classroom classes (lectures, practical classes) with the entire accumulated amount of points during the study of the discipline. Admission in terms of points is not established. The student's ability to pass the PC in the discipline is not affected by the results of passing other disciplines.

If a student has attended less than 75% (missed more than 25% of classes) of classroom classes, he is considered to have failed the curriculum and syllabus for the discipline, and therefore must re-study the discipline.

The regulations for conducting final control with a list of questions are discussed and approved at the methodological meeting of the department, the Central Medical Committee for Surgical Disciplines, approved by the Vice-Rector for Scientific, Pedagogical and Educational Work and published before the beginning of the training (website, stand, introduction at the first lecture or practical session).

The final knowledge test is rated at a maximum of 120 points.

Discipline assessment.

When assigning a grade for a discipline, the student's accumulated points for current studies and the result of passing the PC in points are taken into account. The maximum number of points that a student can receive while studying the discipline is 200 points. The student's performance assessment for the discipline is rated and is assigned on a multi-point scale as the arithmetic mean of the module's mastery and is defined according to the ECTS system and the traditional scale adopted in Ukraine. The score is reflected in the relevant information. To enroll in the discipline, the total number of points received by the student must be at least the minimum, which is determined by the working curriculum for the discipline and corresponds to the minimum value of the grade E, and therefore is 111 points.

Procedure for calculating points for the discipline .

The marks given on the traditional scale are converted into points depending on the number of topics in the module. The number of points corresponding to the mark "5" is calculated by dividing the maximum number of points for the current educational activity, namely 80 , by the number of practical

classes. To calculate the mark " 3 ", the number of points is calculated, which is 60% of the maximum number of points for the current educational activity. The weight of each topic within one module in points must be the same.

Distribution of points received by students.

Evaluation of current learning activities.

Traditional assessment	Conversion into points
"5"	16
"4"	13
"3"	10
"2"	0

Assessment of students' independent work, which is provided for in a practical lesson along with classroom work, is carried out during the current control of the topic in the corresponding classroom lesson. Assessment of topics that are assigned only for independent work and are not included in the topic of classroom training sessions is controlled during the final control.

Regulations for conducting final inspection.

Conducting the final (summary) control consists of answering 3 theoretical questions, writing tests on emergency conditions, performing a practical skill, and solving a situational problem.

Evaluation criteria for the final examination.

Criteria for evaluating answers to theoretical questions.

Traditional assessment	Conversion into points
"5"	24
"4"	18
"3"	13
"2"	0

Writing tests on emergency conditions (and/or oral response):

12 questions (2 points for each correct answer).

Implementation of practical skills by students.

12 points	The student performs the manipulation without any comments from the teacher.
6 points	The student can perform a manipulation with difficulties that can be eliminated with the help of the teacher.
0 points	The student cannot perform the manipulation.

Assessment for a situational task.

12 points	Full answer
6 points	Incomplete answer
0 points	Wrong answer

Assessment of the quality of learning material is carried out using the national scale and the ECTS scale.

At the same time, to pass the discipline, the total number of points received by the student must be at least the minimum, which is determined by the working curriculum for the discipline and corresponds to the minimum value of the grade E , and therefore is 111. points.

Correspondence of scales for assessing the quality of learning material:

<i>Score</i>	<i>National scale assessment</i>	<i>ECTS grade</i>	<i>Explanation</i>
170-200	Perfect	A	Excellent (excellent performance with only a few errors).
155-169	Good	B	Very good (above average with a few errors).

140-154		C	Good (generally correct execution with a certain number of significant errors).
125-139	Satisfactorily	D	Satisfactory (not bad, but with a significant number of shortcomings).
111-124		E	Sufficient (performance meets minimum criteria).
60—110	Unsatisfactorily	FX	Unsatisfactory (with the possibility of reassembly).
1-59		F	Unsatisfactory (with mandatory re-study of the discipline).

Procedure for liquidating academic debt.

When receiving an unsatisfactory grade in the discipline within the range of 60-110 points (FX) The student has the right to retake it 2 times: once - by the departmental commission with the participation of the head of the department, and the last time - by the commission with the participation of the head of the department and the dean.

Retaking of subjects with unsatisfactory grades is carried out according to the schedule drawn up by the department and agreed with the dean (the interval between attempts or subjects is at least 3 days). Subjects studied in the relevant course must be completed before the beginning of the new academic year. The presence of academic debt before the beginning of the new academic year is grounds for expelling a student from the university for failure to fulfill the requirements of the curriculum (or for issuing an academic leave and retaking the course due to health reasons).

If a student receives an unsatisfactory grade in a discipline within the range of 1-59 points (F), he/she is required to re-study it outside of class time on a paid basis. If a student receives an unsatisfactory grade again as a result of re-studying it, taking into account two retakes of the discipline or unsatisfactory grades in 3 disciplines, as well as missed classroom classes without good reason, the sum of which is 120 hours or more, leads to his/her expulsion from the university for failure to complete the curriculum.

For the possibility of the student taking the final (summary) test The results of the other disciplines are not affected by the discipline.

Course policy.

Mandatory adherence to academic integrity by students, namely:

independent performance of all types of work, tasks, and forms of control provided for by the work program of the academic discipline "Ophthalmology";
 references to sources of information when using ideas, developments, statements, and information;

compliance with the norms of legislation on copyright and related rights;

providing reliable information about the results of one's own educational (scientific, creative) activities, use of research methods and sources of information.

List of theoretical questions and practical skills for the final examination in the discipline "Ophthalmology" for students in specialty 221 "Dentistry".

List of theoretical questions for the final test.

1. The visual analyzer, its importance in the cognition of the surrounding world.
2. History of the development of ophthalmology. Founders of domestic ophthalmology. Kyiv school of ophthalmology.
3. Cornea. Its structure, blood supply, properties and functions.
4. The vascular membrane. Its structure, blood supply, properties and functions.
5. The reticular membrane. Its structure, functions of rods and cones.
6. Optic nerve. Features of its structure and topography.
7. The lens. Its functions, nutrition, properties.
8. Blood supply to the eyeball.
9. The structure of the conjunctiva. Clinical signs of its normal state.
10. Eyelid muscles. Their functions and innervation.

11. Anatomy of the lacrimal organs. Research methods.
12. The structure of the eye socket and its contents.
13. External muscles of the eye. Their innervation and functions.
14. Twilight vision, its disorders, research methods.
15. Visual acuity testing. Visual acuity formula.
16. Principles of constructing tables for determining visual acuity. Angle of vision.
17. Peripheral vision, research methods. Types of visual field disorders.
18. Color perception, its disorders, research methods.
19. The main elements of the refractive system of the eye. The concept of diopter.
20. Types of clinical refraction. The role of the environment in the formation of refraction. Age-related changes in refraction.
21. Methods of determining refraction (objective and subjective).
22. Hyperopia, its clinical manifestations, diagnostics and correction.
23. Myopia, its clinical manifestations, complications, diagnosis and correction. Prevention of myopia progression.
24. Astigmatism, its types and correction.
25. Features of ametropia correction in children.
26. Accommodation and its age-related changes. Presbyopia.
27. The main conditions of binocular vision. The importance of binocular vision for choosing a profession.
28. Congenital strabismus, diagnostics, types.
29. Principles of treatment of congenital strabismus in children.
30. Latent strabismus, clinical features, diagnostics.
31. Paralytic strabismus, its signs, differential diagnosis of paralytic and concomitant strabismus, treatment methods.
32. Abnormalities of eyelid position (entropion, ectropion, ptosis, lagophthalmos). Causes of their occurrence, clinical features, treatment methods.
33. Stye, chalazion. Clinic, treatment.
34. Blepharitis, its clinical manifestations and treatment.
35. Chronic dacryocystitis, its etiology, clinical manifestations and treatment.
36. Acute dacryocystitis, clinical manifestations and treatment.
37. Infantile dacryocystitis, its etiology, clinical features and treatment.
38. Etiology, clinical picture and treatment of acute conjunctivitis.
39. Etiology, clinical picture and treatment of chronic conjunctivitis.
40. Gonoblenorrhoea in infants and adults. Prevention of gonoblenorrhoea in infants.
41. Adenovirus conjunctivitis. Its clinical manifestations and treatment.
42. Diphtheria of the eye. Its clinical features, diagnostics, treatment.
43. Trachoma, stages, complications, general principles of treatment. Social and personal prevention of trachoma.
44. Classification of keratitis. Clinical picture of keratitis.
45. Consequences of keratitis. General principles of keratitis treatment.
46. Creeping corneal ulcer. Its clinical features and treatment.
47. Parenchymal keratitis. Its clinical manifestations and treatment.
48. Herpetic keratitis. Their diagnosis and treatment.
49. Clinical signs of serous iridocyclitis.
50. Clinical signs of fibrinous iridocyclitis.
51. Complications of iridocyclitis.
52. Treatment of iridocyclitis. Pupil dilators. Indications and contraindications for their use.
53. Orbital phlegmon, its clinical manifestations and treatment (conservative and surgical).
54. Orbital tumors, diagnostics, clinical features, treatment tactics.
55. Congenital cataract. Etiology, clinical features, diagnostics, treatment tactics.
56. Stages of development of senile cataract. Diagnosis and treatment.

57. Traumatic cataract. Features of its course, treatment.
58. Complicated cataract. Its causes, clinical features, treatment.
59. Cataract in common diseases, treatment.
60. Secondary cataract, its clinical manifestations, causes, treatment.
61. Aphakia. Its signs, correction.
62. Anomalies of the lens position, diagnosis, complications, treatment tactics.
63. Signs of penetrating injuries of the eyeball. Emergency care for them.
64. Penetrating eye injuries complicated by the presence of a foreign body inside the eye. Methods for locating a foreign body in the eye. Principles of removal.
65. Contusions of the eyeball. Their clinical manifestations and treatment.
66. Corneal foreign bodies and emergency care.
67. Electrophthalmia. Its clinical manifestations and first aid.
68. Endophthalmitis and panophthalmitis. Their clinical features, causes, treatment.
69. Eye burns, clinic, emergency care.
70. Sympathetic inflammation, its clinical manifestations, prevention, treatment.
71. Metallosis (siderosis and chalcosis), its clinical features, treatment.
72. Ophthalmoscopy, its types. Picture of a normal fundus.
73. Pathways of outflow of intraocular fluid.
74. Dynamic classification of glaucoma.
75. Methods of early diagnosis of glaucoma. The importance of a dispensary examination of patients with glaucoma.
76. Clinical forms of primary glaucoma. Differential diagnosis of primary open-angle glaucoma and cataract.
77. Treatment of primary glaucoma.
78. Acute glaucoma attack, its clinical features. Differential diagnosis with acute iridocyclitis.
79. Emergency care for an acute attack of glaucoma.
80. Secondary glaucoma, its causes, clinical manifestations, treatment tactics.
81. Congenital glaucoma, its causes, clinical manifestations, treatment tactics.
82. Optic neuritis. Causes, clinical features, treatment tactics. Differential diagnosis with retrobulbar neuritis and congestive optic disc.
83. Ophthalmoscopic picture of congestive optic disc. Its significance in the diagnosis of intracranial cerebrospinal fluid hypertension.
84. Optic nerve atrophy, causes, clinical picture, types, treatment tactics.
85. Changes in the fundus of the eye in hypertension and diabetes mellitus.
86. Retinal detachment, etiology, clinical manifestations, treatment.
87. Acute circulatory disorders of the retina. Causes, clinical features, treatment.

List of practical skills for the final test.

Be able to determine:

1. visual acuity by subjective method ;
2. color perception using Rabkin's polychromatic tables ;
3. field of vision by control method and using arc perimeter ;
4. dark adaptation by the orientation method.

Be able to conduct research and evaluate the results:

5. examination and inversion of the eyelids ;
6. examination of the cornea using the side illumination method ;
7. examine corneal sensitivity ;
8. palpate to determine the sensitivity of the ciliary body ;
9. palpatory determination of intraocular pressure ;
10. ophthalmoscopic examination;
11. to determine the angle of strabismus according to Hirschberg.

Be able to provide emergency assistance:

12. in acute iridocyclitis ;

13. with acute conjunctivitis ;
14. with a foreign body in the conjunctiva ;
15. in acute glaucoma attack ;
16. with a penetrating eye injury ;
17. for chemical and thermal burns.

13. Methodological support.

1. Textbooks, study guides.
2. Methodological recommendations for lectures, video presentations of lectures.
3. Plans for practical classes and lectures.
4. Tasks for independent work.
5. Methodological developments for practical classes.
6. Algorithms for performing practical skills, medical manipulations, videos.
7. Standardized results of laboratory and instrumental research methods.
8. Dummies, phantoms, etc.
9. Electronic directories, computers with appropriate information support.
10. Workbooks on the topics of practical classes.
11. Test questions, situational tasks, format A test tasks for current and final control of students' knowledge and skills.
12. Theoretical questions, practical tasks for the final test.

Methodological support materials in two languages (Ukrainian, English) on the WEB page of this department (at the address <https://nmuofficial.com/studentu/kafedri/kafedra-oftalmology/>).

14. Recommended reading.

Basic

1. Ophthalmology: textbook /ed. G.D. Zhaboyedova, R.L. Skrypnyk. - K.: VSV "Medicine", 2011. - 424 p.
2. "Ophthalmology": a textbook for students of dental faculties of medical institutions of higher education / Zhaboyedov D.G., Serdyuk V.M., Skrypnyk R.L. -K.: VSV "Medicine", 2022. – 128 p.
3. Zhaboyedov G.D., Kireev V.V. Ophthalmology: practical course: textbook. – K.: VSV "Medicine", 2013. – 280 p.
4. Ophthalmology : textbook / OP Vitovska, PA Bezditko, IM Bezkorovaynaand etc. — 2nd edition. – Kyiv: AUS Medicine Publishing, 2020. – 648 p.

Auxiliary

1. Butterbury M., Murphy K. Ophthalmology: text and color illustrations: 4th edition. – Kyiv: VSV "Medicine", 2024. – 135 p.
2. Bezditko P.A., Panchenko M.V., Duras I.G. et al. Conjunctival diseases. Methodological guidelines for students and interns. – Kharkiv: KhNMU, 2018. – 24 p.
3. Bezditko P.A., Panchenko M.V., Duras I.G. et al. Orbital diseases. Methodological guidelines for students and interns. – Kharkiv: KhNMU, 2019. – 16 p.
4. Bezditko P.A., Panchenko M.V., Duras I.G. et al. Modern methods of ophthalmological diagnostics. Methodological guidelines for students and interns. – Kharkiv: KhNMU, 2016. – 20 p.
5. Bezkorovayna I.M., Ryadnova V.V., Voskresenska L.K. Ophthalmology. Textbook for students of higher medical institutions of III-II levels of accreditation. – Poltava: "Dyvosvit", 2012. – 248 p.
6. Wenger G.Yu., Soldatova A.M., Wenger L.V. Ophthalmology. Lecture course: textbook – Odessa: Odessa Medical University, 2010. - 180 p.
7. Zhaboyedov D.G., Skrypnyk R.L., Tikhonchuk N.A. Dry eye disease (features of pathogenesis, diagnostics and treatment). – K.: FOP Lopatina O.O., 2024. – 184 p.
8. Zavgorodnya N.G., Sarzhevskaya L.E., Ivakhnenko O.M. et al. Anatomy of the eye. Research methods in ophthalmology: a textbook for students of medical faculties. – Zaporizhzhia, 2017. – 76 p.
9. Krasnovyd T.A. Traumatic eye injuries. Intraocular foreign bodies. – Odessa: Astroprint, 2013. – 124 p.

10. Lutsenko N.S., Rudycheva O.A., Isakova O.A. et al. Macula. Modern diagnostics. Optical coherence tomography and optical coherence tomography angiography. Teaching and methodical manual. – Orbita-South Agency, 2019. – 144 p.
11. Davidson's Medicine: Principles and Practice. /Edited by Stuart G. Ralston, Ian D. Penman, Mark W. J. Stracken, Richard P. Hobson. Translation of the 23rd English edition; in 3 volumes. – Volume 3. – Kyiv: VSV "Medicine", 2021. – 642 p.
12. Microprism diagnostics and treatment of strabismus in children: collection of scientific papers: Institute of Information Registration Problems of the NAS of Ukraine, 2020. – 316 p.
13. Novytsky I.Ya. Modern surgery of primary open-angle glaucoma. Transition to minimally invasive operations. - Lviv: Litopys, 2018. - 120 p.
14. Novytskyi I.Ya., Demchuk V.V., Gvozdyarova T.A. Static perimetry in the glaucoma clinic. – Lviv: Litopys, 2020. – 68 p.
15. Fundamentals of clinical ophthalmology: textbook /ed. Z.F. Veselovska. – Knyga plyus, 2023. – 336 p.
16. Peculiarities of providing medical care for traumatic eye injuries in the conditions of an anti-terrorist operation: methodological recommendations / compiled by: Krasnovyd T.A., Sidak-Petretska O.S., Isko K.D. et al. – Odessa: Pluton, 2014. – 19 p.
17. Ophthalmology in schemes: a textbook for students of higher educational institutions of the IY accreditation level / Ministry of Health, Kharkiv National Medical University; compilers: P.A. Bezditko et al. – Kh.: “Golden Pages”, 2008. – 84 p.
18. Glaucoma Terminology and Guidelines. 5th edition. European Glaucoma Society. – 2021. – 170 p.
19. Improvement of primary surgical treatment of penetrating corneal wounds: methodological recommendations /compiled by: Bobrova N.F., Shevchik V.I., Dembovetska G.M. – Kyiv, 2013. – 21 p.
20. The Will's Eye Manual . Office and emergency room diagnosis and treatment of yes disease / Dr. Kalla Gervasio, Dr. TravisPeck. – Philadelphia: Wolters Kluwer, 2021. – 426 p .
21. Image analysis and modeling in about ophthalmology /Edited by Eddie Y. K. Ng. - CRC Press, 2017. – 412 pages .
- 22 . Handbook of visual optics . Two-Volume Set /Pablo Artal. - CRC Press, 2021. – 832 p .

15. Information resources .

1. Official Internet representation of the President of Ukraine <http://www.president.gov.ua/>
2. Verkhovna Rada of Ukraine <http://www.rada.gov.ua/>
3. Cabinet of Ministers of Ukraine <http://www.kmu.gov.ua/>
4. Ministry of Education and Science of Ukraine <http://www.mon.gov.ua/>
5. Ministry of Ecology and Natural Resources of Ukraine <http://www.menr.gov.ua/>
6. State Emergency Service of Ukraine <http://www.dsns.gov.ua/>
7. National Security and Defense Council of Ukraine <http://www.rnbo.gov.ua/>
8. Permanent Mission of Ukraine to the UN <http://ukraineun.org/>
9. North Atlantic Treaty Organization (NATO) <http://www.nato.int/>
10. World Health Organization <http://www.who.int/en/>
11. Centers for disease control and prevention www.cdc.gov