

MINISTRY OF HEALTH OF UKRAINE
ODESA NATIONAL MEDICAL UNIVERSITY

Department of Ophthalmology

CONFIRMED by

Vice-rector for scientific and pedagogical work


Eduard BURIACHKIVSKYI

«01» 09 2023

WORKING PROGRAM IN THE DISCIPLINE

«OPHTHALMOLOGY»

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

Field of knowledge: 22 «Health care»

Specialty: 222 «Medicine»

Educational and professional program: Medicine

2023 - 2024



The working program is compiled on the basis of the educational and professional program «Medicine» for the training of specialists of the second (master's) level of higher education in the specialty 222 «Medicine» of the field of knowledge 22 «Health care», approved by the Academic Council of ONMedU (protocol № 8 dated 29/06/2023).

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The working program is approved at the meeting of the Department of Ophthalmology

Protocol № 1 dated "29" 08 2023

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Protocol № 1 dated "30" 08 2023

Head of the subject-cycle methodological commission for surgical disciplines



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Revised and approved at the department meeting _____

Protocol № ___ dated "___" _____ 20__ y.

Head of Department

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Revised and approved at the department meeting _____

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Head of Department

(_____)

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1. Description of the academic discipline

Name of indicators	Field of knowledge, specialty, specialization, level of higher education	Characteristics of the academic discipline
Total number:	Field of knowledge 22 «Health care»	<i>Full-time education</i> <i>Compulsory discipline</i>
Credits of ECTS: 3	Specialty 222 «Medicine»	<i>A year of training 4</i>
Hours: 90		<i>Semester VII-VIII</i>
Content modules: 3	Level of higher education second (master's degree)	<i>Lectures (hours) 6</i>
		<i>Seminars (hours) 0</i>
		<i>Practical classes (hours) 54</i>
		<i>Laboratories (hours) 0</i>
		<i>Independent work (hours) 30</i> <i>including individual tasks (4 hours)</i>
		<i>The form of the final control</i> <i>differential exam</i>

2. The purpose and tasks of the educational discipline, competencies, program learning outcomes.

The purpose is to master the knowledge and to form the elements of the professional competencies and practical skills in the field of ophthalmology acquired during the study of previous disciplines.

The tasks of the discipline are the following:

1. Formation of systematized knowledge on the organization of ophthalmic care.
2. Formation of practical skills in the use of ophthalmic tools; mastering the skills of examination and ophthalmological examination of the patient.
3. Mastering the skills and methods of diagnosis, treatment and prevention of the most common ophthalmic diseases.
4. Mastering the ability to determine the tactics of emergency ophthalmic care, diagnose traumatic injuries of the organ of vision and its appendages, and provide first aid.

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

– **general (GC)**:

GC1 – Ability to abstract thinking, analysis and synthesis.

GC3 – Ability to apply knowledge in practical situations.

GC4 – Knowledge and understanding of the subject area and understanding of professional activity.

GC5 – Ability to adapt and act in a new situation.

GC6 – Ability to make reasonable decisions.

GC7 – Ability to work in a team.

GC8 – Ability to interpersonal interaction.

GC10 – Ability to use information and communication technologies

GC11 – Ability to search, process and analyze information from various sources.

GC12 – Determination and persistence in relation to assigned tasks and assumed responsibilities.

– **special (SC):**

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

SC2 – Ability to determine the necessary list of laboratory and instrumental studies and evaluate their results.

SC3 – Ability to establish a preliminary and clinical diagnosis of the disease.

SC5 – Ability to determine the nature of nutrition in the treatment and prevention of diseases

SC6 – Ability to determine the principles and nature of treatment and prevention of diseases.

SC7 – Ability to diagnose emergency conditions.

SC8 – Ability to determine tactics and provide emergency medical care.

SC10 – Ability to perform medical manipulations.

SC11 – Ability to solve medical problems in new or unfamiliar environments in the presence of incomplete or limited information, taking into account aspects of social and ethical responsibility.

SC13 – Ability to carry out sanitary and hygienic and preventive measures.

SC16 – Ability to fill medical documentation, including electronic forms.

SC24 – Adherence to ethical principles when working with patients and laboratory animals.

SC25 – Adherence to professional and academic integrity, to be responsible for the reliability of the obtained scientific results.

SC27 – The ability to diagnose and determine the management tactics of patients with extrapulmonary and widespread forms of tuberculosis, including co-infection of TB/HIV with a chemoresistant course.

Program learning outcomes (PLO):

PLO1 - Have thorough knowledge of the structure of professional activity. To be able to carry out professional activities that require updating and integration of knowledge. To be responsible for professional development, the ability for further professional training with a high level of autonomy.

PLO2 – Understanding and knowledge of basic and clinical biomedical sciences, at a level sufficient for solving professional tasks in the field of health care.

PLO3 – Specialized conceptual knowledge that includes scientific achievements in the field of health care and is the basis for conducting research, critical understanding of problems in the field of medicine and related interdisciplinary problems.

PLO4 - Identifying leading clinical symptoms and syndromes (according to list 1); according to standard methods, using preliminary data of the patient's history, data of the patient's examination, knowledge about the person, his organs and systems, establish a preliminary clinical diagnosis of the disease (according to list 2).

PLO5 - Collecting complaints, history of life and diseases, assessing the psychomotor and physical development of the patient, the state of organs and systems of the body, based on the results of laboratory and instrumental studies, evaluation of the information regarding the diagnosis (according to list 4), taking into account the age of the patient.

PLO6 - Establishing the final clinical diagnosis by making a reasoned decision and analyzing the received subjective and objective data of clinical, additional examination, carrying out differential diagnosis, observing the relevant ethical and legal norms, under the control of the managing physician in the conditions of the health care institution (according to the list 2).

PLO7 - Assigning and analyzing additional (mandatory and optional) examination methods (laboratory, functional and/or instrumental) (according to list 4) of patients with diseases of organs and body systems for differential diagnosis of diseases (according to list 2).

PLO9- Determine the nature and principles of treatment (conservative, operative) of patients with diseases (according to list 2), taking into account the age of the patient, in the conditions of the health care institution, outside its borders and at the stages of medical evacuation, including in field conditions, on the basis of a preliminary clinical diagnosis, observing the relevant ethical and legal norms, by making a reasoned decision according to existing algorithms and standard

schemes, in case of the need to expand the standard scheme, be able to justify personalized recommendations under the control of the head physician in the conditions of a medical institution.

PLO14 - Determination of tactics and providing emergency medical care in emergencies (according to list 3) in limited time conditions according to existing clinical protocols and standards of treatment.

PLO17 - Performing medical manipulations (according to list 5) in the conditions of a medical institution, at home or work based on a previous clinical diagnosis and/or indicators of the patient's condition by making a reasoned decision, observing the relevant ethical and legal norms.

PLO32 - The ability to diagnose and determine the management tactics of patients with extrapulmonary and common forms of tuberculosis, including TB/HIV co-infection with a chemoresistant course.

As a result of studying the discipline, the student has to:

– **Know:**

- basic principles of organization of ophthalmic care for the population of Ukraine;
- theoretical aspects of ophthalmic instrumentation and methods of its application;
- classification, clinical manifestations, consequences of ophthalmic diseases, methods of providing emergency specialized care;
- basics of analgesia in ophthalmology;
- diagnosis of inflammatory diseases of the choroid of the eye, clinical manifestations, differential diagnosis, features of treatment;
- tactics for detecting glaucoma, clinical manifestations of various stages, their diagnosis, measures of conservative and surgical treatment;
- general issues of injuries to the organ of vision and its appendages;
- clinic, diagnosis and treatment of purulent-inflammatory diseases of the appendages of the organ of vision, conjunctiva and cornea;
- methods and features of examination of a patient with ophthalmopathology;
- peculiarities of the structure of the medical chart of an inpatient.

– **Be able:**

- conduct anamnesis collection and objective examination of an ophthalmic patient;
- diagnose various inflammatory and non-inflammatory processes of the organ of vision and its appendages, carry out differential diagnosis between them;
- choose appropriate conservative tactics for different stages of development of inflammation of the organ of vision and its appendages;
- to diagnose various traumatic injuries of the organ of vision and its appendages;
- provide first aid for various traumatic injuries to the organ of sight and its appendages;
- choose an adequate method of anesthesia for carrying out this or that intervention;
- choose the tactics of postoperative management of an ophthalmic patient depending on the surgical intervention;
- draw up an inpatient card for a patient with ophthalmopathy;
- to comply with the requirements of ethics, bioethics and deontology in their professional activities.

3. The content of the educational discipline

Topic 1. HISTORY OF OPHTHALMOLOGY. ANATOMO-FUNCTIONAL FEATURES AND METHODS OF EXAMINATION OF THE ORGAN OF VISION.

The history of domestic ophthalmology, its origins in the folk medicine of Kyiv Rus. The first eye clinics. The founders of domestic ophthalmology are E.V. Adamiuk, L.G. Bellyarminov, L.L. Hirshman, V.I. Dobrovolskyi, A.N. Maklakov. Further development of domestic ophthalmology (A.A. Kryukov, S.S. Golovin, V.P. Filatov, I.Y. Merkulov, A.I. Dashevskiy, N.O. Puchkovska, etc.). Achievements of modern ophthalmology.

Basic diagnostic methods. Blindness. The concept of norm and pathology of the organ of vision.

Contents of the orbit: orbital tissue, nerves, ciliary node, oculomotor muscles, place of their origin and attachment, innervation, functions. Tenon's capsule, Tenon's space, their meaning. Tarsoorbital fascia, its meaning.

The main causes of vision loss in people of different ages and sexes. Issues of peripheral eye pathology.

Blindness. Characteristics of absolute, object and everyday, professional blindness. The most common diseases that lead to blindness in people of all ages. Differences in the causes of blindness in children and adults.

Visual sensory system (visual analyzer, its main and auxiliary structures). Main structures (light-receiving and analyzing apparatus, photoreceptors and retinal neurons, optic nerves, external geniculate bodies, visual areas of the cortex). Auxiliary structures (oculomotor apparatus and light-conducting apparatus).

The eyeball, its outer capsule - sclera, cornea. Peculiarities of the structure of the cornea, its innervation, nutrition, functions (light-refracting and protective).

Choroid and its three divisions: iris, ciliary body, choroid. Iris, its structure, functions, blood supply, innervation. Ciliary (ciliary) body, ciliary processes, structure and functions (formation of intraocular fluid). Accommodation muscle, its features and innervation. The choroid, its structure and interaction with the retina. Two blood supply systems of the vascular membrane, their role in the occurrence and spread of inflammatory processes.

The retina, its optic nerve elements (cones and rods). Yellow spot, features of its structure. Visual act. Theory of vision. The main elements of the visual act: light perception, peripheral vision, form vision, binocular vision.

The optic nerve as a continuation of the inner layer of the retina, a partial crossing (chiasm) of the optic nerves, the optic tract, subcortical visual centers, visual centers of the cerebral cortex.

Contents of the eyeball and the eye chamber. Lens, functions (refracting and accommodation), features of its structure, nutrition. Zine ligaments (ciliary girdle). Vitreous body. The front camera, its contents. Intraocular fluid, its composition and role in intraocular exchange. Anterior chamber angle (iris-corneal), fountain spaces. Schlemm's canal (venous sinus of the sclera). Rear camera. Ways of outflow of intraocular fluid.

Eye socket, orbital walls. Openings of the eye socket: optic foramen (optic nerve, optic artery), superior orbital fissure (oculomotor nerve, abductor nerve, block nerve, first branch of the trigeminal nerve), inferior orbital fissure.

Topic 2. FUNCTIONS OF THE ORGAN OF VISION (VISUAL ACUITY, FIELD OF VISION)

Examination of central vision. Visual acuity, its measurement unit, visual angle. The value of the minimum angle of vision. The principle of building charts for measuring visual acuity. Determination of visual acuity using charts. The role of the optical system of the eye.

Color vision examination. Color and its main features. Conditions necessary for color recognition. Trichromasia of the normal human eye. Dichromasia. Explanation of errors made by dichromate. Diagnosis of color blindness. Polychromatic charts.

Examination of peripheral vision - field of vision. Normal limits of the field of vision, physiological scotoma. Methods of determining the field of vision: control, perimetry, campimetry. Concentric narrowing of the field of vision. Sector-like defects, half loss of the field of vision of both eyes (hemianopsia), limited defects in the field of vision (scotoma). Types of scotoma (central, peripheral, relative, absolute, negative, positive).

Examination of twilight vision. Hemeralopia symptomatic and essential.

Optical coherence tomography of the retina. Fluorescent angiography. Methodology of conducting. Evaluation of the choroidal, arterial and venous phase.

Topic 3. REFRACTION AND ACCOMMODATION OF THE EYE. STRABISMUS.

The doctrine of refraction. The optical system of the eye, its constituent parts. The unit of measurement of refraction is the diopter. The concept of physical refraction of the eye and the age-related dynamics of its development. Objective and subjective methods of determining clinical refraction. Dependence of clinical refraction on the refractive power of optical media and the length of the eye axis. Characteristics of clinical refraction and its varieties: emmetropia, myopia, hypermetropia. Astigmatism. Research methods. The concept of commensurate and incommensurate clinical refraction (emmetropia, ametropia, anisometropia). Age characteristic and specific weight of different types of refraction.

Emmetropia, its clinical characteristics, distribution, methods of determination.

Hypermetropia (farsightedness). Age dynamics, distribution. Features of optical correction of hypermetropia.

Myopia (short-sightedness). Characteristics, age dynamics and distribution. Congenital and progressive myopia. Changes in the membranes of the eye during progressive myopia. Pathogenesis, classification, role of adverse factors. Principles of medical and surgical treatment. Prevention. Optimal ocular correction, contact correction, refractive surgery using excimer laser.

Astigmatism. Characteristics, distribution, age dynamics. Types of astigmatism, methods of its determination. Features of glasses used to correct astigmatism. Contact lenses.

Accommodation. Convergence. Age-related changes in accommodation. Spasm and paralysis of accommodation, their causes. Diagnosis of spasms of accommodation and their prevention. Visual fatigue (asthenopia) and methods of its treatment. Presbyopia and its correction depending on the initial clinical refraction and age. Hygiene of visual work in childhood and old age.

Examination of binocular vision. Binocular vision and its essence. Scheme of operation of oculomotor muscles. Methods of determining binocular vision: establishing movement, test using two pencils, examination with a "hole in the palm". Violation of binocular vision.

Changes of the oculomotor apparatus that occur most often. Disorder of depth (binocular) vision. Imaginary and hidden strabismus. Associated and paralytic strabismus. Principles of treatment of conjugal and paralytic strabismus. Prevention of strabismus.

Topic 4. DISEASES OF THE EYELIDS, LACRIMAL ORGANS, ORBIT

Blepharitis, sty, chalazion, abscess, phlegmon of the eyelid. Ptosis, lagophthalmos. Congenital anomalies (coloboma of the eyelids, ankyloblepharon, eyelid twist, inversion of the eyelids, epicanthus, ptosis). Eyelid diseases caused by demodicosis (features of the clinical picture, diagnosis, treatment and prevention).

Dacryoadenitis. Etiology, clinic, diagnostic methods, course, complications. Principles of treatment. Sjögren's syndrome ("dry" eye syndrome during damage to the lacrimal and other exocrine glands). Pathogenesis, stages of the clinical course, consequences. Methods of

diagnosis and therapy. The role of the general practitioner in the timely diagnosis and complex treatment of Sjögren's syndrome. Neoplasm of the lacrimal gland (adenocarcinoma). Clinic, course, diagnostic methods, treatment, prognosis.

Dacryocystitis of newborns. Clinical signs, causes and time of appearance. Methods of diagnosis and treatment, possible complications.

Chronic dacryocystitis. Clinic, causes, course, complications. Methods of operative treatment. Prevention.

Acute dacryocystitis (phlegmon of the lacrimal bladder). Clinic, course, consequences. Principles of treatment and prevention.

Inflammatory diseases of the orbit: phlegmon of the orbit, thrombosis of the cavernous sinus, associated with diseases of the maxillofacial system (acute and chronic periodontitis, basal granuloma, osteomyelitis of the jaws, phlegmons and abscesses of the maxillofacial area and neck, furuncles or carbuncles of the face, facial erysipelas) .

Ways of spread of infection in the orbit (via venous and lymphatic vessels, hematogenous-metastatic way). General symptomatology typical for the inflammatory process in the orbit.

Methods of diagnosis of inflammatory diseases of the orbit, clinic and course.

Topic 5. DISEASES OF THE CONJUNCTIVE

Conjunctivitis. Acute conjunctivitis, complaints, discharge, appearance of the conjunctiva, conjunctival injection of the eyeball and the difference from pericorneal. Etiology. Methods of treatment. Epidemic conjunctivitis caused by Koch-Wicks bacillus. Measures of mass prevention, sanitary and hygienic measures. Features of diagnosis of acute conjunctivitis (diplobacillary, pneumococcal, diphtheria) and treatment.

Honoblenorrhoea of newborns and adults. Its prevention and treatment. Effects. General and local treatment.

Viral conjunctivitis (herpesvirus, adenovirus). Features of diagnosis and treatment. Measles and smallpox conjunctivitis: diagnosis, clinical course, treatment and prevention.

Chronic conjunctivitis. The need to identify and eliminate chronically acting factors. Chronic conjunctivitis as an occupational pathology and preventive measures in industry and agriculture. Trachoma. Definition. Etiology. Pathogenesis. Four stages of trachoma development. Effects. Complication. Paratrachoma. Etiology. Pathogenesis, features of diagnosis and treatment.

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

Topic 6. DISEASES OF THE CORNEA AND SCLERA. DIAGNOSIS, TREATMENT.

Keratitis of exogenous origin. Infectious keratitis of bacterial origin. Corneal ulcer. Conditions for the occurrence of an ulcerative process in the cornea. Creeping corneal ulcer. Clinic, course, consequences. The role of chronic dacryocystitis. Treatment. Prevention: dacryocystorhinostomy, worker's eye protection.

Keratitis of viral etiology. Adenovirus keratoconjunctivitis. Clinic. Course. Treatment is local and general. Epidemiology. Prevention. Keratitis caused by diseases of the conjunctiva, eyelids and meibomian (tarsal) glands. Treatment. Prevention.

Keratitis of endogenous origin. Infectious keratitis. Keratitis in congenital syphilis (parenchymal). Clinic. Cyclical course. Effects. Causes of occurrence. Treatment.

Tuberculous keratitis. Hematogenous tuberculous keratitis. Pathogenesis. Clinic.

Tuberculous-allergic keratitis. Clinic and course. General condition of the child's body. Treatment. Prevention of tubercular lesions of the eye.

Neuroparalytic keratitis during trigeminal nerve damage. The features of the clinic are lack of sensitivity, areactivity of the eye. Herpetic keratitis. Clinic of various forms. Course. Effects. Treatment.

Fungal lesions of the cornea. Clinic, course, diagnostic features. Specific methods of treatment.

Avitaminosis keratitis. Damage to the cornea in vitamin deficiency A. Prexerosis. Xerosis of the cornea. Keratomalacia. Clinic. Course. Treatment. Prevention.

Corneal dystrophies. Causes, features of the clinic and treatment.

Etiology, pathogenesis of diseases of the sclera (scleritis, episcleritis, ectasia, scleral staphyloma, scleromalacia). Diagnostics and modern methods of treatment.

Topic 7. DISEASES OF THE VASCULAR MEMBRANE. DIAGNOSIS, TREATMENT.

The structure of vascular membrane diseases: inflammatory and dystrophic processes, neoplasms, congenital anomalies.

Inflammation of the vascular tract (uveitis). The most common causes of uveitis in people of different ages. Pathogenetic mechanisms of development of uveitis: infectious-metastatic and toxic-allergic. Classification of uveitis according to course, localization, clinical and morphological picture, etiology, immunological status. The main morphological, functional signs and mechanisms of uveitis (iridocyclitis, choroiditis, panuveitis). Organization, principles, methods of general and local treatment of anterior and posterior uveitis depending on the etiology and nature of the process. Effects. Prevention.

Dystrophic diseases of the iris and ciliary body. Causes of occurrence..

Anomalies of the development of the choroid (coloboma of the iris, coloboma of the ciliary body, coloboma of the choroid, aniridia, polycoria, chorioderma, albinism, residual pupillary membrane).

Neoplasm of the vascular membrane. Benign tumors (cysts, nevi, neurofibromas, neurinomas, leiomyomas). Malignant tumors (melanoma, melanosa). Tactics of a general practitioner.

Topic 8. PATHOLOGY OF THE LENS AND VITREOUS BODY. FEATURES OF OPHTHALMIC SURGERY. CURATION.

Congenital and acquired cataract (senile, secondary, complicated, traumatic), its development, pathogenesis, classification. Methods of treatment.

Aphakia, methods of correction.

Congenital cataract (clinic, diagnosis, treatment). Anomalies of lens development.

Congenital pathology of the vitreous body (primary hyperplasia, remnants of the hyaloid artery). Diagnosis, treatment. Acquired pathology of the vitreous body (hemorrhage, destruction). Diagnostics, modern methods of treatment.

Features of modern ophthalmic surgery. Requirements for ophthalmic surgical equipment, instruments and suture material. Types of eye implants. Indications for planned and urgent surgical interventions.

Curation of a patient with ophthalmopathology.

Topic 9. GLAUCOMA. INTRAOCULAR PRESSURE METHODS OF EXAMINATION.

Classification. Open-angle and closed-angle glaucoma (diagnosis, clinical course). Acute attack of glaucoma. Differential diagnosis with acute iritis. Treatment is urgent: conservative general and local. Indications and terms of surgical treatment.

Differential diagnosis of primary open-angle glaucoma with initial senile cataract. Course. Treatment: regimen of instillation of hypotensive drops, indications for surgical and laser treatment, principles of surgical treatment. Regimen of a glaucoma patient. Dispensary.

Congenital glaucoma (etiology, pathogenesis), clinical features and treatment.

Secondary glaucoma, clinical forms, principles of diagnosis and treatment.

Blindness due to glaucoma. Prevention, methods of early diagnosis of glaucoma.

Topic 10. DAMAGE TO THE ORGAN OF VISION. EMERGENCY AID.

Classification of eye injuries. Contusions of the organ of vision.

Contusion of the eyelids. Hemorrhages under the skin of the eyelids, their sources. Subcutaneous emphysema. Contusions of the eyeball: damage to the cornea, sclera, iris, subconjunctival scleral tears, ciliary body damage, vitreous hemorrhage, lens damage (traumatic cataract), retinal shock, retinal tears and detachment, optic nerve damage. Symptoms and diagnostic methods.

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

Penetrating injuries of the eyeball, absolute and relative signs of penetrating injuries of the eye. Principles of providing specialized care, complications. Dispensary.

Burns of the eye and its appendages. Symptoms and clinical course of burns of the eyelids, conjunctiva, cornea in acid, alkaline and thermal burns. Burns with radiant energy (ultraviolet, infrared, X-ray, ultrasonic radiation). First aid. Treatment is pathogenetic, symptomatic, medicinal, surgical. Complications and modern methods of treatment.

Topic 11. GRADUAL AND SUDDEN DECREASE OF VISION. RETINA AND OPTIC NERVE DISEASES. CHANGES IN THE ORGAN OF VISION IN GENERAL DISEASES. PROTECTION OF THE HISTORY OF DISEASE.

Acute obstruction of the central vein of the retina and its branches. Clinic, diagnosis, treatment. Emergency aid. Prognosis, consequences. Embolism of the central retinal artery, features of the clinical course, diagnosis, treatment, emergency care, consequences.

Detachment of the retina. Etiology, pathogenesis, features of the ophthalmological picture. Terms and methods of operative interventions. Use of modern methods of treatment. The role of photo- and laser coagulation in the prevention and treatment of retinal detachment. Effects.

Neoplasm of the retina. Features of the clinical course, ophthalmoscopic picture of retinoblastoma. Modern methods of diagnosis and treatment.

Dystrophies of the retina in the area of the macula (hereditary, age-related). Pigmentary dystrophy of the retina.

Eye changes in cardiovascular diseases (hypertensive and hypotensive diseases, atherosclerosis).

Changes in the organ of vision in blood diseases (leukemia, malignant anemia), toxicosis of pregnant women, kidney diseases, in AIDS patients.

Changes in the organ of vision in diseases of the endocrine system (diabetes, diseases of the thyroid gland, hypophysis).

Classification and spread of diseases of the optic nerve in adults and children.

Inflammation of the optic nerve (neuritis). Papillitis and retrobulbar neuritis (etiology, clinic), diagnostic features. Emergency aid. Principles of treatment. Effects.

Acute and chronic poisoning (methyl, ethyl alcohol, lead, quinine, narcotic substances, tobacco smoking), features of the clinical course. Emergency care, consequences.

Congestive disc of the optic nerve. Causes of development, stages of development. Features of each stage. Differential diagnosis with optic neuritis. Features of treatment.

Atrophy of the optic nerve. Anomalies of optic disc development (coloboma, fossa, myelin fibers, pseudoneuritis).

Medical examination of eye diseases. Resolving the issue of temporary incapacity for work and its duration, as well as permanent incapacity in connection with the profession. Definition of disability group.

Etiology, pathogenesis, clinic, methods of diagnosis and treatment of the patient subject to curation. Carrying out a differential diagnosis. Prognosis for recovery and further management of the patient.

DIFFERENTIAL EXAM.

The student solves 2 test tasks of the type «Step – 2», answers theoretical questions to them, demonstrates 2 practical skills.

4. The structure of the academic discipline

The total number of hours by topic should correspond to the total number of hours indicated in section 1. The names of the topics in this section are formed in a general form, so that in subsequent sections (seminar classes, practical classes, laboratory classes, independent work) they are specified, detailed and specify the type of work.

Names of topics	Number of hours					
	In total	including				
		lectures	seminars	practical	laboratory	IW
Content module 1. Anatomical and functional features of the organ of vision, functions of the organ of vision and methods of their examination.						
Topic 1. History of ophthalmology. Anatomical and functional features and methods of examination of the organ of vision.	4	-	-	4	-	-
Topic 2. Functions of the organ of vision (visual acuity, visual field)	9,5	0,5	-	4	-	5
Topic 3. Refraction and accommodation of the eye. Strabismus	11,5	0,5	-	6	-	5
<i>Together according to the content module 1</i>	25	1	-	14	-	10
Content module 2. Diseases of the appendages and the anterior part of the eye.						
Topic 4. Diseases of the eyelids, lacrimal organs, orbit	6,5	0,5	-	4	-	2
Topic 5. Diseases of the conjunctiva.	6,5	0,5	-	6	-	2
Topic 6. Diseases of the cornea and sclera. Diagnosis, treatment.	8,5	0,5	-	4	-	2
Topic 7. Diseases of the vascular membrane. Diagnosis, treatment.	6,5	0,5	-	4	-	2
<i>Together according to the content module 2</i>	28	2	-	18	-	8
Content module 3. Gradual and sudden decrease in vision.						
Topic 8. Pathology of lens and vitreous body. Features of ophthalmic surgery. Curation.	7	1	-	4	-	2
Topic 9. Glaucoma.	7	1	-	4	-	2

Methods of examination of IOP.						
Topic 10. Damage to the organ of vision. Emergency aid.	6	-	-	6	-	2
Topic 11. Gradual and sudden decrease in vision. Diseases of the retina and optic nerve. Changes in the organ of vision in general diseases. Protection of the history of disease.	11	1	-	6	-	2
<i>Individual tasks</i>	4	-	-	-	-	4
Differential exam	2	-	-	2	-	-
Total hours	90	6	-	54		30

5. Topics of lectures / seminars / practical / laboratory classes

5.1. Topics of lectures

№	Topic name	Number of hours
1	Introductory lecture. Physiology of the visual analyzer. Refraction and accommodation of the eye. (Eye functions at different ages. Presbyopia. Types of clinical refraction. Prevention, methods of surgical and conservative treatment of ametropia.). Cataract: congenital, acquired (traumatic, complicated, secondary, senile).	2
2	„Red eye”. (Diagnosis and emergency care, prevention of inflammation of the eyelids, lacrimal organs, conjunctiva and orbit (stye, eyelid abscess, dacryocystitis, conjunctivitis, periostitis, orbital phlegmon). Inflammatory diseases of the cornea, vascular tract (keratitis, uveitis, endophthalmitis, panophthalmitis). Diagnosis and treatment. Prevention.)	2
3	Glaucoma. Mechanisms of regulation, methods of examination of intraocular pressure. Classification, clinic and treatment of glaucoma. Diseases of the retina and optic nerve. Neoplasm of the eyeball. Changes in the organ of vision in general diseases. Diagnosis, treatment, prevention.)	2
	Total	6

5.2. Topics of seminar classes

Seminar classes are not provided.

5.3. Topics of practical classes

№	Topic name	Number of hours
1	Topic 1. Practical lesson 1. History of ophthalmology. Anatomical and functional features of the organ of vision.	2
2	Topic 1. Practical lesson 2.	2

	Methods of examination of the organ of vision.	
3	Topic 2. Practical lesson 1. Functions of the organ of vision (visual acuity, color perception)	2
4	Topic 2. Practical lesson 2. Functions of the organ of vision (field of vision, twilight vision)	2
5	Topic 3. Practical lesson 1. Refraction and accommodation of the eye.	2
6	Topic 3. Practical lesson 2. Astigmatism.	2
7	Topic 3. Practical lesson 3. Strabismus.	2
8	Topic 4. Practical lesson 1. Diseases of the eyelids, orbits	2
9	Topic 4. Practical lesson 2. Diseases of lacrimal organs.	2
10	Topic 5. Practical lesson 1. Diseases of the conjunctiva (bacterial).	2
11	Topic 5. Practical lesson 2. Diseases of the conjunctiva (viral).	2
12	Topic 5. Practical lesson 3. Diseases of the conjunctiva (allergic, fungal, dystrophic, neoplasms).	2
13	Topic 6. Practical lesson 1. Diseases of the cornea and sclera (inflammatory). Diagnosis, treatment.	2
14	Topic 6. Practical lesson 2. Diseases of the cornea and sclera (congenital, dystrophic). Diagnosis, treatment.	2
15	Topic 7. Practical lesson 1. Diseases of the choroid (anterior uveitis). Diagnosis, treatment.	2
16	Topic 7. Practical lesson 2. Diseases of the choroid (posterior uveitis). Diagnosis, treatment.	2
17	Topic 8. Practical lesson 1. Pathology of lens and vitreous body.	2
18	Topic 8. Practical lesson 2. Features of ophthalmic surgery. Curation.	2
19	Topic 9. Practical lesson 1. Glaucoma (congenital, complicated). Methods of IOP examination.	2
20	Topic 9. Practical lesson 2. Glaucoma (primary). Methods of IOP examination.	2
21	Topic 10. Practical lesson 1. Damage to the organ of vision (blunt trauma). Emergency aid.	2
22	Topic 10. Practical lesson 2. Damage to the organ of vision (penetrating damage). Emergency aid.	2
23	Topic 10. Practical lesson 3. Damage to the organ of vision (burns). Emergency aid.	2
24	Topic 11. Practical lesson 1. Gradual and sudden decrease in vision. Retinal disease.	2
25	Topic 11. Practical lesson 2. Gradual and sudden decrease in vision. Disease of the optic nerve.	2

26	Topic 11. Practical lesson 3. Changes in the organ of vision in general diseases. Protection of the history of disease.	2
27	Differential exam	2
	Total	54

5.4. Topics of laboratory classes

Laboratory classes are not provided.

6. Independent work of a student of higher education

№	Title of the topic / types of tasks	Number of hours
1	Trachoma.	2
2	Changes in the organ of vision in vitamin deficiency.	2
3	Individual tasks - preparation for practical classes - theoretical preparation and development of practical skills	
	1. Determine visual acuity for distance (topic 2)	1
	2. Determine the field of vision (topic 2)	2
	3. Define color vision (topic 2)	1
	4. Determine visual acuity at a close distance (topic 2)	1
	5. Define clinical refraction (topic 3)	2
	6. Master the ability to determine the angle of squint according to Hirshberg (topic 3)	2
	7. Determination of eyeball mobility (topic 3)	1
	8. Determine tear production (topic 4)	1
	9. Determine patency of tear ducts and interpret changes (topic 4)	1
	10. Perform a corneal examination using lateral illumination (topic 6)	1
	11. Carry out an examination of the anterior chamber with the help of lateral illumination (topic 6, 8)	1
	12. Carry out an examination of the optical environment of the eye in transmitted light (topic 6, 8)	2
	13. Determine ciliary sensitivity (topic 7)	2
	14. Interpret the state of intraocular pressure according to palpatory (topic 9)	2
	15. Be able to provide first aid for penetrating injuries (topic 10)	1
	16. Be able to provide first aid for chemical and thermal burns (topic 10)	1
	17. Carry out direct ophthalmoscopy of the fundus (optic disc, vessels, macula) (topic 11)	2
4	Preparation of a review of scientific literature or research (abstract).	2
	Total	30

7. Teaching methods

The following methods will be used during lectures and practical classes:

- *Verbal*: lectures (problematic, lectures with analysis of specific situations), story, explanation, conversation, discussion, discussion of problematic situations, discussion of clinical situations.

- *Visually*: illustrations (including multimedia presentations), demonstrations, the method of direct observation.

- *Practical*: solving clinical tasks; simulation training; practicing practical skills on

dummies, mannequins; curation of patients; writing an educational history of disease; performance of individual tasks.

Practical training: conversation, role-playing, solving clinical situational problems, practicing the skills of patient examination, practicing the skills of performing manipulations according to list 5, instruction and practicing skills on simulation dummies.

During practical classes, a large part of the time (at least 60%) should be devoted to working with patients, the results of laboratory tests, X-rays, etc. The rest of the time is for analysis and joint discussion of the results of students' independent work with error correction.

Independent and individual work when studying an academic discipline, it is provided by methodical developments for independent work of students, visual teaching aids (presentations, educational films), information resources of the department, the subject of independent and individual tasks for each task, algorithms for performing practical skills, algorithms for self- and mutual control of knowledge and skills, test tasks of the "Step-2" type for each class. Mastery of topics that are assigned only to independent work is checked during differential exam.

8. Forms of control and evaluation methods (including criteria for evaluating learning outcomes)

Current control is carried out at each practical session by means of an oral survey or written control. After studying each section, the mastery of practical skills is monitored based on the control of theoretical knowledge, practical skills and abilities.

Evaluation of the current educational activity in a practical session:

1. Evaluation of theoretical knowledge on the subject of the lesson:
 - methods: survey, solving a situational clinical problem
 - the maximum score is 5, the minimum score is 3, the unsatisfactory score is 2.
2. Evaluation of practical skills and manipulations on the subject of the lesson:
 - methods: assessment of the correctness of the performance of practical skills
 - the maximum score is 5, the minimum score is 3, the unsatisfactory score is 2.
3. Evaluation of work with a patient on the subject of the lesson:
 - methods: assessment: a) communication skills of communication with the patient, b) the correctness of prescribing and evaluating laboratory and instrumental studies, c) compliance with the differential diagnosis algorithm, d) substantiating the clinical diagnosis, e) drawing up a treatment plan;
 - the maximum score is 5, the minimum score is 3, the unsatisfactory score is 2.

The grade for one practical lesson is the arithmetic average of all components and can only have an integer value (5, 4, 3, 2), which is rounded according to the statistical method.

The average grade for all activities of a student of higher education during the practical session becomes final.

Evaluation of the educational activity of all higher education students is not mandatory at every practical session. However, at least 50% of higher education applicants should be interviewed at the practical session.

At the end of the study of the discipline, the current success rate is calculated as the average score of all grades received by the student of higher education on a traditional scale, rounded to two decimal places.

Criteria for evaluating the student's work in a practical session

Оцінка	Критерії оцінювання
Excellent «5»	The student works systematically, shows versatile and in-depth knowledge of the program material during classes, is able to successfully perform the tasks provided for in the program, learns the content of the main and additional literature, is aware of the interrelationship of individual sections of the discipline, their importance for the future profession, shows creative abilities in understanding and the use of educational program material, shows the ability to independently update and replenish knowledge; level of competence - high (creative)
Good «4»	The student demonstrates full knowledge of the educational program material, successfully completes the tasks prescribed by the program, learns the basic literature recommended by the program, shows a sufficient level of knowledge in the discipline and is capable of their independent updating and renewal during further training and professional activity; level of competence - sufficient (constructive and variable)
Satisfactory «3»	The student demonstrates knowledge of the basic curriculum material to the extent necessary for further study and subsequent work in the profession, copes with the tasks provided for by the program, makes individual mistakes in answers, but possesses the necessary knowledge to overcome the mistakes made under the guidance of a scientific and pedagogical worker; level of competence — average (reproductive)
Unsatisfactory «2»	The student does not demonstrate sufficient knowledge of the basic curriculum material, makes fundamental mistakes in the performance of the tasks provided for by the program, cannot use the knowledge in further studies without the help of a teacher, has not managed to master the skills of independent work; the level of competence is low (receptive-productive).

A student of higher education can receive additional (bonus) points for completing individual tasks:

- participation and report in the student scientific conference;
- participation in the subject Olympiad in ophthalmology, report at the student scientific circle;
- preparation of multimedia slides and design of tests;
- translations of scientific articles from foreign languages;
- abstract work on a certain topic.

Bonus points are added to the sum of points earned by the student of higher education for the current educational activity for a certain section only under the conditions of successful completion of individual tasks and their defense. Also, the performance of the above-mentioned individual tasks gives an opportunity to receive, if necessary, an additional point during the differential assessment.

Final control: differential exam.

The form of final control is a differential exam, which is evaluated on a 4-point scale.

The differential exam is given at the last lesson in the discipline based on the results of the final interview, with the mandatory performance by the student of all types of work provided for in the work curriculum (provided that he attends all classes, receives a positive evaluation from the control of the acquisition of practical skills) and is evaluated for the current educational activity on average not lower than 3.00.

The means of diagnosing the assimilation of the material are control of the performance of practical skills (demonstration of the methodology and technique of performance of the

proposed practical skills in the discipline), oral answers to 2 clinical tasks of the Step-2 type and theoretical questions.

The grade received for the answer to the differential exam and the average current success score during the study of the discipline are used to calculate the arithmetic average, which makes up the overall grade in the discipline.

In the student's record book, the teacher enters the assessment of the discipline according to the traditional and 200-point scales.

Assessment of learning outcomes during differential exam

The content of the evaluated activity	Scores
Performance of practical skills (2 skills)	1
Solving 2 clinical tasks of the Step-2 type	1
Answers to theoretical questions	1
Additional (bonus) points	1

Example:

1. Practical skills: a) Determination of eyeball mobility
b) Examination of the cornea using lateral illumination
2. Clinical tasks of the KROK-2 type:
 - a) Patient T., 55 years old, asked for reading glasses. Vis OU = 1.0; R Em, closely reads font No. 7, ss sph + 2.5 D = font No. 3. Fundus OU - optic nerve disc is pale, borders are clear, arteries of uneven caliber, "silver wire" symptom, along the course of the vessels there are small dots of waxy hemorrhage day exudates. Your diagnosis?
 - A. Hypermetropia
 - B. Chorioretinitis
 - C. Hypertensive angioretinopathy
 - D. Diabetic retinopathy
 - E. Pigmentary degeneration of the retina
 - b) A second-grade student complains of reduced distance vision, especially after prolonged visual stress. Near sees well. When checking distance visual acuity in both eyes = 0.3 with sph -1.0 correction, D is 1.0. Objectively: the optical environment is transparent, the fundus is normal, the intraocular pressure is normal. With cycloplegia, refraction is emmetropia. What pathology causes a decrease in distance vision?
 - A. Spasm of accommodation
 - B. Myopia
 - C. Presbyopia
 - D. Congenital glaucoma
 - E. Paralysis of accommodation
3. Theoretical question: Ways of outflow of intraocular fluid.

Criteria for evaluating the learning outcomes of students on differential exam

Rating	Evaluation criteria
Excellent «5»	The student completed all the tasks correctly, accurately and completely, clearly and logically answered the questions posed by the examiners. Thoroughly and comprehensively knows the content of theoretical issues, fluent in professional and scientific terminology. Thinks logically and constructs an answer, freely uses acquired theoretical knowledge when

	analyzing practical tasks. When solving a clinical problem, he correctly interpreted the anamnesis data, examination results, answered all the questions correctly and convincingly substantiated his point of view, could propose and justify an alternative version of the decision on individual issues. When performing practical skills, he demonstrated them correctly, strictly followed the algorithm of their implementation. Has additional bonus points.
Good «4»	The student completed all the tasks sufficiently fully, clearly and logically answered the questions posed by the examiners. He knows the content of theoretical issues deeply and comprehensively, and has professional and scientific terminology. Thinks logically and constructs an answer, uses acquired theoretical knowledge when analyzing practical tasks. But when teaching some questions, there is not enough depth and argumentation, it makes insignificant mistakes, which are eliminated by the applicant himself when the examiner points them out. When solving a clinical problem, he assumed insignificant errors or inaccuracies in the interpretation of anamnesis data, examination results, answered all the questions without significant errors, fully substantiated his point of view, but the proposal of an alternative option caused difficulties. When performing practical skills, he made minor errors in the algorithm and performance technique, which were corrected at the instruction of the teacher.
Satisfactory«3»	The learner completed all the tasks incompletely, the answers to additional and leading questions are vague. Possesses a basic amount of theoretical knowledge, uses professional and scientific terminology inaccurately. Experiences significant difficulties in constructing an independent logical answer, in applying theoretical knowledge in the analysis of practical tasks. There are significant errors in the answers. When solving a clinical problem, he interpreted the anamnesis data, examination results, did not know individual details, made inaccuracies in the answers to questions, did not sufficiently justify his answers and interpret the wording correctly, experienced difficulties in completing tasks and proposing alternative options. When performing practical skills, significant errors were made in the algorithm and skill performance technique.
Unsatisfactory «2»	The student did not complete the task, in most cases did not answer the additional and leading questions of the examiners. He did not master the basic amount of theoretical knowledge, he showed a low level of mastery of professional and scientific terminology. Answers to questions are fragmentary, inconsistent, illogical, cannot apply theoretical knowledge when analyzing practical tasks. There are a significant number of gross errors in the answers. When solving a clinical problem, he could not interpret the obtained history data, examination results, answer the questions, or made significant mistakes in the answers; could not justify his decisions or did it unconvincingly. He did not offer alternative options. When performing practical skills, he did not demonstrate or made gross errors and mistakes in the algorithm and technique of their implementation.

9. Distribution of points received by higher education applicants

The conversion of a traditional grade from a discipline to a 200-point grade is performed by the information and computing center of the university using the "Contingent" program according to the formula:

Conversion table of a traditional assessment into a multi-point scale

Traditional four-point scale	Multipoint 200-point scale
Excellent «5»	185-200
Good «4»	151-184
Satisfactory «3»	120-150
Unsatisfactory «2»	Less than 120

A multi-point scale (200-point scale) characterizes the actual success of each applicant in learning the educational component. The conversion of the traditional grade (average score for the academic discipline) into a 200-point grade is performed by the information and technical department of the University.

According to the obtained points on a 200-point scale, the achievements of the applicants are evaluated according to the ECTS rating scale. Further ranking according to the ECTS rating scale allows you to evaluate the achievements of students from the educational component who are studying in the same course of the same specialty, according to the points they received.

The ECTS scale establishes whether a student of higher education belongs to the group of better or worse among the reference group of fellow students (faculty, specialty).

An "A" grade on the ECTS scale cannot be equal to an "excellent" grade, and a "B" grade cannot be equal to a "good" grade, etc. Applicants of higher education who received grades "FX" and "F" ("2") are not included in the list of applicants who are ranked. Such students of higher education automatically receive an "E" score after retaking.

The grade "FX" is assigned to students of higher education who have scored the minimum number of points for the current educational activity, but who have not passed the final examination. A grade of "F" is assigned to students of higher education who attended all classroom classes in the discipline, but did not receive an average score (3.00) for the current educational activity and were not admitted to the final examination.

According to the ECTS rating scale, the achievements of students in the discipline who are studying in the same course of the same specialty are evaluated, according to the points they received, by ranking, namely:

Conversion of the traditional grade from the discipline and the sum of points on the ECTS scale

ECTS assessment	Statistical indicator
«A»	The best 10% of students
«B»	The next 25% of students
«C»	The next 30% of students
«D»	The next 25% of students
«E»	The last 10% of students

10. Methodical support

The teaching of the academic discipline in lectures is provided by methodical development of each lecture, published lecture texts, visual teaching aids for each lecture (presentations, educational films), information resource of the department.

Teaching the academic discipline **in practical classes** is provided by methodological developments of each practical lesson, visual teaching aids for each lesson (presentations, educational films), sets of diagnostic and therapeutic tools, information resources of the departments, topics of independent and individual tasks for each task, algorithms for performing practical skills and structured algorithms for controlling skills, test tasks of the "Step-2" type for each lesson.

Independent and individual work when studying an academic discipline, it is provided by methodological developments for independent work of students, visual teaching aids (presentations, educational films), information resources of departments, topics of independent and individual tasks for each task, algorithms for performing practical skills, algorithms for self- and mutual control of knowledge and skills, test tasks of the "Step-2" type for each lesson.

Carrying out **final differential control** is provided by methodological developments of lectures and practical classes, information resources of departments, test tasks of the "Step-2" type for admitting students to differentiated exam, standardized control questions, structured algorithms for control of practical skills.

11. Questions for preparing for the final control

1. The history of the development of ophthalmology. Founders of domestic ophthalmology. Odesa School of Ophthalmology.
2. Cornea. Its structure, blood supply, properties and functions.
3. The choroid of the eye. Muscles of the iris and ciliary body. Their structure, blood supply, properties and functions.
4. The retina, its structure, functions of rods and cones.
5. Anatomy of the optic nerve, features of its structure and topography.
6. The structure of the orbit and its contents.
7. The structure of the conjunctiva. Clinical signs of her normal state.
8. Anatomy of lacrimal organs. Examination methods of tear ducts.
9. Study of visual acuity. Visual acuity formula.
10. Peripheral vision and its examination. Types of visual field disorders.
11. Color perception, its disorders, examination methods. Theories of color perception.
12. Methods of examination of the anterior segment of the eye (focal, bifocal illumination, biomicroscopy).
13. Types of clinical refraction. The role of the external environment in the formation of refraction.
14. Accommodation and its age changes. Presbyopia.
15. Hypermetropia, its clinic, diagnosis and correction.
16. Myopia, its clinic, causes of development, complications, prevention, progression.
17. Astigmatism, its types and correction.
18. The main conditions of binocular vision. The importance of binocular vision in choosing a profession. Strabismus: classification, diagnosis, clinic, treatment.
19. Anomalies of the position of the eyelids (entropion, ectropion, ptosis, lagophthalmos). Causes of their occurrence, clinic, methods of treatment.
20. Inflammatory diseases of the eyelids: stye, chalazion, blepharitis. Clinic, treatment.
21. Dacryocystitis, etiology, clinic, treatment.
22. Inflammatory diseases of the orbit (osteoperiostitis, phlegmon of the orbit, thrombosis of the cavernous sinus), clinic and treatment.
23. Clinical course, etiology and methods of treatment of acute inflammation of the mucous membrane.
24. Clinical manifestations, etiology and methods of treatment of chronic conjunctivitis.
25. Stages of trachoma, their clinic, general principles of treatment. Complications of trachoma from the side of the eyelids and cornea.
26. Classification, clinic and consequences of keratitis.
27. Creeping corneal ulcer, its clinic and treatment.
28. Parenchymal keratitis, clinic and treatment.
29. Herpetic keratitis. Their diagnosis and treatment.
30. Serous iridocyclitis. Its clinical features, course, diagnosis, treatment.
31. Clinical signs of fibrinous iridocyclitis, etiology, pathogenesis, methods of treatment.

32. Anomalies of lens position, diagnosis, complications, treatment.
33. Congenital cataract. Clinic, diagnostics, methods of treatment.
34. Stages of age-related cataract development. Diagnosis and treatment.
35. Traumatic cataract. Features of its course, complications, surgical treatment.
36. Secondary cataract, its clinic, causes, surgical treatment.
37. Aphakia, its signs, correction.
38. Ophthalmoscopy, its types. A picture of a normal fundus.
39. Ways of outflow of intraocular fluid.
40. Methods of early diagnosis of glaucoma. The value of dispensary examination of glaucoma patients.
41. Clinical forms of primary glaucoma, treatment.
42. Acute attack of glaucoma, its clinic, emergency care, treatment. Differential diagnosis with iridocyclitis.
43. Secondary glaucoma, its causes, clinic, treatment.
44. Congenital glaucoma, its causes, clinic and treatment.
45. Signs of penetrating injuries of the eyeball. Methods of localization of a foreign body in the eye. Emergency aid.
46. Principles of removal of intraocular foreign bodies in penetrating eye injuries.
47. Sympathetic inflammation, its clinic, prevention, treatment.
48. Contusions of the eyeball. Their manifestations and treatment.
49. Corneal foreign bodies and emergency care for them.
50. Electroophthalmia, its clinical manifestations and first aid.
51. Endophthalmitis and panophthalmitis. Their clinic, causes, treatment.
52. Chemical eye burns, clinic, emergency care.
53. Thermal eye burns, clinic, emergency care.
54. Detection of aggravation and simulation. Control methods for checking visual acuity.
55. Optic neuritis clinic. Reasons, differential diagnosis with congestive optic disc.
56. Ophthalmoscopic picture of a stagnant optic disc. Its value in the diagnosis of brain tumors.
57. Changes in the fundus in hypertensive disease, diabetes, blood diseases, AIDS.
58. Retinal detachment, etiology, clinic, treatment.
59. Acute retinal blood circulation disorders. Causes, clinic, treatment
60. Retinoblastoma. Diagnostics. Clinic. Treatment.

12. List of recommended literature:

Basic:

1. Ophthalmology: textbook / O. P. Vitovska, P. A. Bezditko, I. M. Bezkorovayna et al.; edited by O. P. Vitovska. -2nd edition. - Kyiv: AUS Medicine Publishing, 2020. - 648 p.
2. Ophthalmology: textbook / O. P. Vitovska, P. A. Bezditko, I. M. Bezkorovayna et al.; edited by O. P. Vitovska. - Kyiv: AUS Medicine Publishing, 2017. - 648 p.
3. Atlas of Glaucoma. Second edition: textbook / Neil T. Choplin, Diane C. Lundy. - Informa healthcare, United Kingdom, 2007. -364 p. ISBN-10: 1841845183.
4. Common Eye Diseases and their Management: textbook / N. R. Galloway, W.M.K. Amoaku, P. H. Galloway and A. C. Browning; -Springer - Verlag London Limited, 2006. – 208 p. ISBN 1-85233-050-32.
5. Ophthalmology at a Glance: textbook / JANE OLVER, LORRAINE CASSIDY; - by Blackwell Science Ltd a Blackwell Publishing company, USA, 2005. -113 p. ISBN-10: 0-632-06473-0.

Additional:

1. Eye Diseases. Course of lectures: textbook / G. E. Venger, A. M. Soldatova, L. V. Venger;

- edited by V. M.Zaporozhan. - Odessa: Odessa Medical University, 2005. – 157p.
2. Ophthalmology: textbook. / Gerhard K. Lang, edited by J. Amann, O. Gareis, Gabriele E. Lang, Doris Recker, C.W. Spraul, P. Wagner. - Thieme Stuttgart. New York, 2000. - 604 p. ISBN 0-86577-936-8.
 3. EYE Atlas. Online Atlas of Ophthalmology. / All rights Reserved, Oculisti Online. Copyright 2001. -408 p.
 4. ABC of Eyes, Fourth Edition: textbook / P. T. Khaw, P. Shah, A. R. Elkington. - by BMJ Publishing Group Ltd, BMA House, Tavistock Square, London, 2005. - 97 p. ISBN 0 7279 1659

13. Electronic information resources

1. <https://info.odmu.edu.ua/chair/ophthalmology/>
2. <https://repo.odmu.edu.ua/xmlui/>
3. <http://library.gov.ua/>
4. <http://www.nbu.gov.ua/>
5. https://library.gov.ua/svitovi-e-resursy/dir_category/general/
6. <http://nmuofficial.com/zagalni-vidomosti/biblioteky/>
7. <https://guidelines.moz.gov.ua/documents>
8. www.ama-assn.org – American Medical Association
9. www.dec.gov.ua/mtd/home/
10. <http://bma.org.uk>
11. www.gmc-uk.org