№ ЛД-16

Federal state educational institution of higher education "North Ossetian state medical Academy" of the Ministry of health of Russia

Department of otorhinolaryngology with ophthalmology

KOROEV O.A., KOROEV A.O.

TEACHING AIDS

TO PRACTICAL CLASSES IN OPHTHALMOLOGY FOR STUDENTS OF THE FACULTY OF MEDICINE

Vladikavkaz 2021

THEMATIC PLAN

practical training in ophthalmology in the 4th year (8 semester)

medical faculty (52 hours)

1 lesson. Age anatomy of the organ of vision. Physiology and functions of the components of the eye and its auxiliary (accessory) apparatus.

2 lesson. Methods of investigation of the eye and its appendages. The order of examination of the eye patient and the scheme of the history of the disease. Performing eye diagnostic and therapeutic manipulations. Visual functions and age dynamics of their development.

3 lesson. Physical and clinical refraction. Astigmatism. Accommodation. Presbyopia. The purpose of the spectacles.

4 lesson. Diseases of the orbit, eyelids, conjunctiva and lacrimal organs.

5 lesson. Diseases of the cornea, sclera and choroid.

6 lesson. Diseases of the retina and optic nerve. Ocular manifestations of General pathology of the body.

7 lesson. Diseases of the lens and vitreous.

8 lesson. Physiology and pathology of intraocular pressure. Glaucomas.

9 lesson. Binocular vision. Strabismus. Damage to the eye and its appendages. Neoplasms of the organ of vision. Professional diseases of the eye. Examination of military and labor.

10 lesson. Modular lesson. Test of practical skills. Testing of theoretical knowledge.

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Practical lesson 1

Topic: Age-related anatomy of the organ of vision. Physiology and functions of the components of the eye and its auxiliary (accessory) apparatus.

Vladikavkaz 2021

LESSON 1.

1. **TOPIC:** Age-related anatomy of the organ of vision. Physiology and functions of the components of the eye and its auxiliary (accessory) apparatus.

2. **THE PURPOSE OF THE LESSON:** to Study the age-related anatomy of the visual organ, physiology and functions of the components of the eye and its auxiliary (accessory) apparatus.

3. **TARGETS:**

The student should know: • embryology of the eye; • anatomical and optical characteristics of the visual organ of a child and an adult; • the structure of the protective apparatus of the eye; • structure of the cornea and sclera; • structure of the vascular membrane; • basic functions of the retina; • structure of the optical apparatus of the eye; • the function and innervation of the oculomotor muscles.	Recommended reading: *a) educational literature* Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p. Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p. Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - 3rd ed. - M.: GEOTAR-MED. 2013. – 640 p. Ruban E.D. Eye diseases: the newest Handbook. Rostov-on-don: Phoenix, 2016. – 622 p. Tahchidi H.P., Yartseva N.S., Gavrilova N.A., Deev L.A. Ophthalmology: textbook. - Moscow: GEOTAR-Media, 2011. – 544 p. *b) additional* Koroev O.A. Ophthalmology: appendages of the eye. - Rostov-on-don: Phoenix, 2007. Koroev O.A., Koroev A.O. Anatomical and histological features, functions and methods of investigation of the fibrous capsule of the eye. - Vladikavkaz, 2011. Koroev O.A., Koroev A.O. Educational and methodical manual for students of medical faculty to practical classes in ophthalmology. Lesson 1. - 2016. Ophthalmology: a national guide. / Ed. S.E. Avetisov. - M.: GEOTAR-Media, 2011. Somov E.E. Clinical anatomy of the human visual organ. - 4th ed. - Moscow: Medpress-inform, 2016. - 136 p.
A student should be able to: • find on the training tables subordinate education eyes; • find on the table and on the dummy skull bones that make up the eye socket; • find and determine on the training tables and the dummy layer of the eye;	Recommended literature: The same.

• find and identify the contents of the eyeball on the tables and the dummy; • indicate the correct course of the visual pathways; • find the oculomotor muscles on the table.	

4. ISSUES STUDIED PREVIOUSLY:

"Anatomy of the eye and its appendages" - Department of normal anatomy.
"Morphological structure of eye structures" - Department of histology.

5. PLAN OF PRACTICAL CLASSES:

The stages of the lesson	Technical equipment		Venue
	Equipment	Training AIDS, means of control	
1	2	3	4
1. Instructing the teacher		Lesson plan.	Training room
2. Check the source of the knowledge	Models, tables.	Control tasks.	Training room
3. Independent work of students	Microscope, microscope slide.	Table, indicative of cards, a skull, a collapsible model of the eye.	Training room
4. Analysis of results with an assistant (control of learning results).		Control tasks.	Training room
5. Task on the next attractive opportunity.		1. Textbook. 2. Additional literature. 3. Educational and methodical manual.	Training room

6. TASKS FOR CONTROL OF INITIAL KNOWLEDGE:

1. Specify how many walls the eye socket has, and what are their names?

2. What shells does the eyeball have, and what are their functions?

3. What anatomical formations belong to the optical apparatus of the eye?

4. Describe the course of the visual pathway from the peripheral to the cortical analyzer.

5. What oculomotor muscles do you know, and what cranial nerves carry out their innervation?

7. OUTLINE OF THE INDICATIVE BASIS OF ACTION:

Study of anatomical elements of the eye	Order of action execution	Criteria and methods of control
a	b	c
Study the structure and holes of the orbit.	By comparing the skull and the training table, locate each bone that makes up the orbit and determine the position and position of the orbit holes.	Comparing the bone system of the orbit, make sure the completeness of the set of bones studied. Check, what anatomical education pass in studied holes.
Examine the contents of the orbit.	Using the tutorial and training table, review and study the contents of the orbit.	On the tables, check the correct recognition of anatomical formations.
Study the structure of the nervous and vascular systems of the orbit.	Follow the training tables the course and division of the vascular and nerve bundles.	Determine whether all the shells and structures of the eye received nervous and vascular trophism.
Study the anatomical neighborhood of the orbit.	Considering the skull, determine the cavity, which borders the orbit.	Check the tables for the correct answer. Consider moving the infection from the orbit to the surrounding cavities.
Study the structure of the tear-producing and tear-conducting apparatus.	Using the tables, study the structure of the lacrimal apparatus. Consider its departments available to external inspection.	Trace the path of the tear from the lacrimal gland to the nose.
Learn the mechanism of lacrimal drainage.	Study the question from the textbook.	By dropping the dye into the conjunctival SAC, you can verify the mechanism of lacrimation.
Study the structure of the eyelids and conjunctiva.	According to the training tables, consider (using the textbook) the structure of the eyelids and conjunctiva.	Make sure there is dense cartilage in the eyelid, trying to capture it in the fold. Specify the distinctive features of the upper and lower eyelids.
Study the structure of the oculomotor apparatus.	Study the material in the textbook, using the tables. Trace the course of the muscles, dismantling the dummy orbit.	Determine what condition the eye will have with paralysis of various muscles or with pathology of the cranial nerves.
Study the structure of the cornea and sclera, their sources of nutrition, innervation, function.	Consider the training tables. Study the actual material from the textbook. Determine the relative position of the cornea and sclera on the eye	Test your knowledge on the tables. Make sure you know the morphological structure of the fibrous capsule on micropreparations.

a	b	c
	model. Consider the micropreparations.	
Study the structure of the vascular tract of the eye.	Using the textbook and tables, study the actual material. Consider the location and function of the intraocular muscles, the distribution of functions of different parts of the vascular membrane. Determine their position on the eye model and micropreparations.	Control of the obtained data is carried out on the tables. Conduct self-and mutual verification.
Learn the structure, nutrition and function of the retina.	Study the material from the textbook, using the tables.	Test yourself by naming the parts of the retina, its attachment points, feeding pathways and its layers.
Study the inner environments of the eye.	To study, use a textbook, tables, eye model. Pay attention to the structure of the angle of the anterior chamber of the eye, the histological structure of the lens.	Find all the studied eye departments on the micropreparations. Check yourself on the tables.
Learn visual pathways and centers.	The material must be studied in the textbook, using tables.	Control the quality of the study spend on the tables, naming the different departments of the visual pathway.

8. EDUCATIONAL TASK

Find test tasks and situational tasks on the topics of classes in the corresponding collections.

9. CONTROL OF RESULTS OF ASSIMILATION is made according to tables:

Table of programmed control

Anatomy of the organ of vision.

I. I. in which of the departments of the visual analyzer light energy is converted into nervous excitement: *1) receptor (eye); 2) conductive pathways; 3) subcortical and cortical centers.*

II. The main role in the visual act belongs to: *1) oculomotor apparatus; 2) optical media of the eye; 3) retina and choroid.*

III. Which of the three retinal neurons is facing the light: *1) rods and cones; 2) bipolar cells; 3) ganglion cells.*

IV. Where does the visual act begin: *1) pigment epithelium, rods and cones; 2) bipolar cells; 3) ganglion cells.*

V. Place of greatest concentration of cones: *1) the periphery of the retina; 2) the yellow spot; 3) the optic disc.*

VI. The retina is supplied with blood: *1) central retinal artery; 2) posterior long ciliary arteries; 3) posterior short ciliary arteries.*

VII. Which of the three departments of the vascular tract is in direct interaction with the optical part of the retina: *1) iris; 2) ciliary body; 3) choroid.*

VIII. The main function of the choroid: *1) restoration of disintegrating visual substances; 2) regulation of intraocular pressure; 3) absorption of light.*

IX. The main function of the iris: *1) physiological diaphragm; 2) resorption of intraocular fluid; 3) protective.*

X. The Main function of the ciliary body: *1) accommodation; 2) production of intraocular fluid; 3) protective.*

XI. The main way of outflow of intraocular fluid: *1) perivascular spaces of the iris; 2) perineural spaces of the optic nerve; 3) angle of the anterior chamber.*

XII. The anterior part of the vascular tract (iris and ciliary body) is supplied with blood: *1) anterior ciliary arteries; 2) posterior long ciliary arteries; 3) posterior short ciliary arteries.*

XIII. Main refractive medium: *1) cornea; 2) lens; 3) vitreous.*

XIV. The most rich sensitive innervation has: *1) conjunctiva; 2) cornea; 3) sclera.*

XV. The cortical visual center is located: *1) in the frontal lobe; 2) parietal lobe; 3) occipital lobe.*

XVI. In the innervation of the oculomotor muscles take part: *1) oculomotor nerve; 2) abductor nerve; 3) block nerve.*

XVII. The power of the lens is carried out by: *1) vessels of the ciliary body; 2) own vessels of the lens; 3) watery moisture.*

XVIII. The main function of the vitreous: *1) lens nutrition; 2) light transmission; 3) light absorption.*

XIX. In the normal state of the body the main production of tears occurs: *1) lacrimal gland; 2) additional lacrimal glands; 3) lacrimal meat.*

XX. The thickest is: *1) the outer edge of the orbit; 2) the upper edge of the orbit; 3) the lower edge of the orbit.*

10. TASK ON THE NEXT ATTRACTIVE OPPORTUNITY.

Topic: methods of investigation of the eye and its appendages. The order of examination of the eye patient and the scheme of the history of the disease. Performing eye diagnostic and therapeutic manipulations. Visual functions and age dynamics of their development.

Literature: *a) educational literature*

Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p.

Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. /Under the editorship of E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p.

Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - 3rd ed. - M.: GEOTAR-MED. 2013. – 640 p.

Ruban E.D. Eye diseases: the newest Handbook. Rostov-on-don: Phoenix, 2016. – 622 p.

Tahchidi H.P., Yartseva N.S., Gavrilova N.A., Deev L A. Ophthalmology: textbook. - Moscow: GEOTAR-Media, 2011. – 544 p.

b) additional

Avetisov S.E., Kashchenko T.P., Shamshinova A.M. Visual functions and their correction in children. - M.; Medicine, 2005. – 872 p.
Tucker George. C. Optical coherence tomography of the retina. - Moscow: Medpress-inform, 2016. - 192 p.
Clinical physiology of the organ of vision. Essays (edited by A.M. Shamshinova). - M., 2006.– 956 p.
Koroev O.A. Ophthalmology: appendages of the eye. - Rostov-on-don: Phoenix, 2007.
Koroev O.A., Koroev A.O. Methodical manual on practical training for students of medical, medical-preventive and pediatric faculties. - Vladikavkaz, 2012. - 35 sec. - +1 electron. Wholesale. Disk.
Koroev O.A., Koroev A.O. Methodical recommendations for mastering practical skills in ophthalmology. 2015.
Singh A.D. Ultrasonic diagnostics in ophthalmology. - Moscow: Medpress-inform, 2015. - 280 p.

11. TASKS FOR INDEPENDENT WORK ON THE TOPIC UNDER STUDY SHOULD BE TAKEN FROM THE COLLECTION OF TASKS FOR INDEPENDENT WORK OF STUDENTS.

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Practical lesson 2

Topic: Methods of investigation of the eye and its appendages. The order of examination of the eye patient and the scheme of the history of the disease. Performing eye diagnostic and therapeutic manipulations. Visual functions and age dynamics of their development.

Vladikavkaz 2021

LESSON 2.

1. TOPIC: methods of investigation of the eye and its appendages. The order of examination of the eye patient and the scheme of the history of the disease. Performing eye diagnostic and therapeutic manipulations. Visual functions and age dynamics of their development.

2. THE PURPOSE OF THE LESSON: To learn how to conduct an examination and examination of an ophthalmological patient, fill out a medical history, perform some therapeutic manipulations. Learn to conduct research of visual functions

3. TARGETS:

The student should know:	Recommended reading:
• how to conduct an external examination of the eye; • how to make eyelid eversion; • how to examine the eye with side or focal lighting; • how to examine the eye in transmitted light; • how to perform an ophthalmoscopy; • how to carry out biomicroscopy of the eye; • how to examine intraocular pressure; • how and for what is diaphanoscopy performed; • how and for what exophthalmometry is performed; • how and for what echoophthalmography is performed; • what are the methods of examination of the child; • in what order is the medical history of the ophthalmological patient drawn up; • how to determine visual acuity by different methods; • how peripheral vision is examined; • what are the normal limits of the field of vision; • what pathological changes in the field of vision are most common; • how color perception and adaptation are explored; • what types of dark adaptation disorders exist and how to treat them; • how color perception is investigated; • what are the types of congenital disorders of color vision exist.	*a) educational literature* Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p. Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. /Under the editorship of E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p. Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - 3rd ed. - M.: GEOTAR-MED. 2013. – 640 p. Ruban E.D. Eye diseases: the newest Handbook. Rostov-on-don: Phoenix, 2016. – 622 p. Tahchidi H.P., Yartseva N.S., Gavrilova N.A., Deev L.A. Ophthalmology: textbook. - Moscow: GEOTAR-Media, 2011. – 544 p. *b) additional* Avetisov S.E., Kashchenko T.P., Shamshinova A.M. Visual functions and their correction in children. - M.; Medicine, 2005. – 872 p. Avetisov S.E. Ophthalmology: national guide. - Moscow: GEOTAR-Media, 2013. – 944 p. Daker George. C. Optical coherence tomography of the retina. - Moscow: Medpress-inform, 2016. - 192 p. Clinical physiology of the organ of vision. Essays (edited by A.M. Shamshinova). - M., 2006.– 956 p. Koroev O.A. Ophthalmology: appendages of the eye. - Rostov-on-don: Phoenix, 2007. Koroev O.A., Koroev A.O. Methodical manual on practical training for students of medical, medical-preventive and pediatric faculties. - Vladikavkaz:, 2012. - 35 sec. - +1 electron. Wholesale. Disk.

	Koroev O.A., Koroev A.O. Methodical recommendations for mastering practical skills in ophthalmology. 2015. Singh A.D. Ultrasonic diagnostics in ophthalmology. - Moscow: Medpress-inform, 2015. - 280 p.
A student should be able to: • conduct an external examination of the eye; • produce eversion of the lower eyelid; • produce eversion of the upper eyelid; • explore the eye with side or focal lighting; • examine the eye in passing light; • conduct biomicroscopy of the eye; • to investigate the intraocular pressure; • locking child for eye inspection; • examine the visual acuity in the distance on the tables Sivtsev and Orlova; • to investigate the visual acuity below 0.1; • to explore the perception; • examine the field of view using the perimeter and determine its violations; • xamine the field of view in a controlled way; • explore the color perception of the tables Rabkin or Justova.	Recommended literature: The same.

4. ISSUES STUDIED PREVIOUSLY:

"Examination of the patient" - Department of propaedeutics of internal diseases.
"Functions of the visual analyzer" - Department of normal physiology.
"Optics" - Department of physics.

5. PLAN OF PRACTICAL CLASSES:

The stages of the lesson	Technical equipment		Venue
	Equipment	Training AIDS, means of control	
a	b	c	d
Check the source of the data.		Control tasks.	Study room
Instructing the teacher	Table lamps, glass sticks, ophthalmoscopes, echophthalmograph, slit lamp, Sivtsev table, perimeter, training tables.	Lesson plan.	Study room, office, office is functional diagnostics
Independent work of students.	Table lamps, glass sticks, ophthalmoscopes, echophthalmograph, slit lamp, Sivtsev table, perimeter, training tables.	Table, indicative of the card	Study room, office, office is functional diagnostics

a	b	c	d
Analysis of results with an assistant (control of results		Control tasks, visual control of the assistant.	Study room, office, office is functional diagnostics
Task on the next attractive opportunity.		1. Textbook. 2. Additional literature. 3. Educational and methodical manual.	Study room

6. ЗАДАЧИ ДЛЯ КОНТРОЛЯ ИСХОДНЫХ ЗНАНИЙ:

Anatomical structure	Methods of inspection, research
Eyelids	1.

Anatomical structure	Methods of inspection, research
Orbit	1.

Anatomical structure	Methods of inspection, research
Lacrimal organs	1.

Anatomical structure	Methods of inspection, research
Conjunctiva	1.

Anatomical structure	Methods of inspection, research
Cornea	1.

Anatomical structure	Methods of inspection, research
Iris	1.

Anatomical structure	Methods of inspection, research
Ciliary body	1.

Anatomical structure	Methods of inspection, research
Lens	1.

Anatomical structure	Methods of inspection, research
Vitreous	1.

Anatomical structure	Methods of inspection, research
Fundus	1.

Visual function	Method of research
Acuity	1.

Visual function	Method of research
Field of view	1.

Visual function	Method of research
Chromatic sensitivity	1.

Visual function	Method of research
Light perception	1.

7. **OUTLINE OF THE INDICATIVE BASIS OF ACTION:**

Learn eye examination.	The order of the action.	Criteria and methods of control
а	б	в
Conduct an external examination of the eye.	Put a table lamp to the left and front of the patient sitting on a chair. Point the light at him. First of all, examine the surrounding parts of the face, then determine the condition and position of the eyelids, the area of the lacrimal gland and the lacrimal SAC, the position of the ocular yablok in the orbit, the degree of its displacement, the width of the ocular slit and the condition of the eye membranes visible within the ocular slit. If necessary, apply palpation. Examine first the healthy and then the diseased eye. At survey age notice skin color, the position and thickness of the eyelids, the direction of eyelashes growth, width of in-thermalimaging space, condition of front and rear edges of the upper and lower eyelid, the condition and position of the lacrimal points. Estimate the size and mobility of the eyeballs by tracking your finger.	Normally, the face is symmetrical. The eye slits on both sides are the same width. The eyeballs realize a full friendly range of motion. The eyelids are tightly attached to the eyeball, the eyelashes are turned anteriorly.
Learn to eversion the lower eyelid.	Place the table lamp on the table to the left and in front of the patient sitting on the chair. Light on the patient's face. Ask the patient to look down. With the thumb of your left hand, lift the eyelid up and slightly pull it forward. With the thumb and forefinger of the right hand, grasp the ciliated edge of the eyelid. Left hand free, and right at this moment pull the eyelid Soi-memory and anteriorly. Following this, with the thumb of the left hand, create a skin fold, which press on the upper edge of the cartilage of the eyelid, and with the right hand at this point, bring up the lower edge of the eyelid. With the thumb of your left hand, fix the eyelid. The right hand remains free to carry out manipu-lations. Instead of the thumb of the left hand, a stick can be used as a lever. In order to better examine the upper transition fold, it is necessary through the lower eyelid to slightly press the eyeball upwards. It is even better to use a power lifter for this purpose. The edge of the eyelid lift is put on the skin of the	With properly performed manipulation, the inner surface of the eyelid is exposed, the conjunctiva is visible, the meibomian glands shine through.

a	b	c
	eyelid slightly drawn down at the upper edge of the cartilage. At the same time, the eyelid handle is lowered downwards. Supporting and pulling the ciliated edge of the eyelid with the other hand, the researcher begins to turn the handle of the eyelid lifter upward, turning the conjunctival side of the eyelid.	
Evaluate the condition the lacrimal organs.	Press your finger on the projection of the lacrimal SAC at the medial adhesions of the eyelids. Pay attention to the tear points of this eye.	Normal from lacrimal there are no separable points. In pathology, pus can be squeezed out.
Learn the method of examining the eye with side or focal lighting.	Place the table lamp on the table to the left and in front of the patient sitting on a chair at a distance of 50-60 cm at the level of his eyes. Sit opposite the patient, moving your knees to the right and the patient's knees to the left. Turn the patient's head slightly towards the light source. The lens power of 13 diopters keep right hand at a distance of 7-8 cm from the eye perpendicular to the rays coming from the light source. The rays are focused by the lens on the area of the eye membranes that is to be examined. Due to the contrast between a brightly lit small area and unlit neighboring parts of the eye, the changes are easier to detect. The use of a binocular magnifier or an additional lens of 20 diopters allows you to see smaller details.	Against the background of dark structures of the eye, the anatomical formations of the anterior segment of the eye are more clearly visible. The structures in question are visible in an enlarged view, a detailed inspection is possible. In the study of the sclera pay attention to its color, though blood vessels. When examining the cornea, its size, shape, transparency, sphericity, specularity are established. The anterior chamber of the eye is clearly visible through the cornea. The method of lateral illumination reveals its depth, content. In the study of the iris, its color, pattern, presence or absence of pigment inclusions, the state of the pigment fringe, the width and visibility of the pupil are noted. The pupil area at the side light seems to be black. It is very important to determine the shape, width and reaction of the pupils to light. The lens in lateral illumination is visible only when it is clouded.

a	b	c
Learn the method of exophthalmo-metry.	Place the exophthalmometer firmly against the outer arches of both eye sockets. Through the front side of the prism of the device, the profile of the anterior part of the eye and the scale indicating how far the apex of the cornea is separated from the point of application are visible. Observe with each eye in turn the marking of the prisms. Match the marks, observe the surface of the cornea in the mirror. Determine its standing on each side. Be sure to note the initial distance between the outer edges of the eye sockets, at which the measurement was made, which is very important to know when re-examining.	Normally, the top of the cornea will stand at 17-19 mm. the Difference in the cornea of both eyes should not exceed 2 mm.
Learn the method of examining the eye in passing light.	The study is carried out in a dark room. Place the table lamp to the left rear of the subject. Mirror Ophthalmoscope hold in your right hand, apply to the eye so that against the pupil was his hole. Direct the beam of light into the eye of the subject, which is better to expand the pupil. A beam of light, passing through the transparent medium of the eye, will be reflected from the fundus. Part of the reflected rays through the hole of the Ophthalmoscope fall into the eye of the doctor; the pupil of the patient at the same time "lights up" with a red light.	The pupil glows red. This glow is called the red reflex. The red color is caused by the vascular membrane filled with blood and the pigment layer of the retina. If on the way of the light beam, separated from the eye of the subject, there will be turbidity, then depending on the shape and density, they will delay part of the rays, and on the red background of the pupil there will be either dark spots or stripes and diffuse darkening.
Learn ophthalmo-scopy in the reverse form.	The research methodology corresponds to the study in transmitted light. Having red reflex, type in the path of the rays lens +13,0 diopters., placing it at a distance of 7-8 cm from the eye.	In front of the magnifier you can see the "hanging in the air" image of the fundus. Identify the optic disc and the vessels coming out of it.
Learn direct ophthalmo-scopy.	Turn on the electric Ophthalmoscope. Apply it to the eye. Bring your eye close to the eye of the subject. Look inside the eye.	With properly performed manipulation, a picture of the normal fundus is visible.
Learn the technique of biomicroscopy.	The head of the subject is placed on the front side. Turn on the slit lamp. Focus the light slit on the tissue to be examined. Use special handles to change the width of the illuminator gap and the brightness level.	The structures of the eye are visible at 4-40 times magnification. Due to the contrast of illumination, the relief of the fabric is clearly visible. It is possible to

a	b	c
		make an optical cut of transparent eye media.
Learn the technique of diaphanoscopy.	Examine the patient in a dark room after several minutes of adapting the patient to the dark note. Sit the patient in a chair. Drip 0.25% solution of dicaine into the eye of the patient. Apply the tip of the cone of diaf-nos-PA, which gives a concentrated beam of light of sufficient force to the sclera. The pupil begins to glow red.	If the tip of the diaphanoscope falls into the projection area of the tumor, the light is absorbed by it and does not penetrate into the eye, the pupil in this case will not glow. Moving the diaphanoscope along the sclera, you can determine the boundaries of the tumor.
Learn to instill drops into the conjunctival SAC.	Sit the patient on a chair and ask to look up. With your thumb and index finger, pull back the lower eyelid so that the mucous membrane of the lower arch is visible. With your right hand, remove 1-2 drops of the drug substance from the pipette to the area of the lower transition fold, making sure that the end of the pipette does not touch the edge of the eyelid with the eyelashes in order to avoid contamination. Fleece absorbs excess Le-carstva, not allowing it to drain on the cheek.	If the patient is a small child, the upper eyelid is raised with the middle finger of the left hand or the eyelids are spread with the thumb and index fingers or eyelid lifts. With instillations of potent drugs (atropine, adrenaline, etc.), it is advisable to clamp the area of the tear tubules with the index finger for 1 minute.
Learn to flush the conjunctival sac.	Sit the patient in a chair. Inject 1-2 drops of anesthetic into the conjunctival SAC. Type the disinfectant into the rubber bag.Pull the lower eyelid down, and the upper-up, and if possible, make them eversion. Under the eye, substitute a kidney-shaped basin, which held by either the patient or the nurse. Pressing the rubber pear, rinse the conjunctival SAC so that the main direction of the flowing fluid is the medial corner of the eye.	If the manipulation is performed correctly, the liquid flows freely from the conjunctival SAC, carrying out particles of foreign bodies. if necessary, weak acid and alkaline solutions can be used.
Learn to lay ointment in the conjunctival SAC.	Sit the patient on a chair and ask to look up. Pull down her eyelid. On a glass stick with a spatula, apply a small amount of ointment and pogru-zite flat for the lower eyelid. Ask the patient to close his eyes and remove the spatula. In children of younger age, dilute the eyelids with your thumb and index fingers, enter the spatula behind the lower eyelid, press to its marginal edge and pull back so that the ointment remains in the conjunctival	Make sure that the glass rod does not damage the cornea. Try not to touch the eye with the tip of the tube of ointment. If the manipulation is performed correctly, the eye ointment is evenly distributed over the conjunctival sac.

а	б	в
	sac. When using individual tubes of ointment, squeeze it directly into the conjunctival sac. After the patient closes his eyes, with a cotton ball, make light stroking movements on the eyelids, which achieves an equal-dimensional distribution of the ointment. Remains of the ointment from the edges of the eyelids remove the same ball.	
Learn to fix small children for eye examination.	Put the child on the lap of the nurse sitting opposite the doctor. Fix the child's legs between the nurse's legs. The left hand pushes the nurse to the body of the child crossed his handle. With her right hand, the nurse fixes the child's head. The nurse, laying the child so that his head was sandwiched between the knees of the doctor, and his back lay on the lap of the sister. With one hand she holds and presses the child's legs to her, with the other she pulls and holds her hands.	Infants are examined, after swaddling them. The inability of the child to move his head sharply speaks about the rule of performing the manipulation.
Learn to determine visual acuity.	Put the subject on a chair at a distance of 5 m from the table. His left eye to cover for the valve or palm. The eye must be covered under the hood. When using Lado-Ni it is impossible to press on an eye.During the study, the patient should not squint his eyes.The optotypes in the table should be indicated with a special pointer, placing it under the necessary optotype.The exposure of each sign should not exceed 2-3 seconds.Letter opto-types or Landolt rings in the Sivtsev table are shown alternately, starting from the top row.A line is considered named if the first three lines contain one error and the next two errors.To the right of a number of opto-types is written the patient's visual acuity. Repeat the procedure with the right eye closed. In case of lower vision, bring the patient to the machine until he / she discovers the first-row optotypes. As soon as this happens, mark the distance to the table. The calculation of visual acuity is carried out according to the Snellen formula: Visus = d/D, where d is the distance from which the study is carried out; D is the distance from which the normal eye distinguishes the signs of this series. If the patient is unable to approach the table, bring it to the patient,	Examine the visual acuity of patients. Check your data with the data given in the medical history.

a	b	c
	making the calculation of acuity his is the same as in the previous case. A similar study is the demonstration from a different distance of a different number of doctor's fingers on a light background or brightly illuminated fingers on a light background. If the patient has no objective vision, sit him in a dark room. Place the table lamp on the table to the left and behind the patient. Turn on the table lamp. Close the eye of the patient who is not being examined. Ask the patient to look straight ahead. With a mirror Ophthalmoscope, aim a luminous beam of light at the patient's eye from different angles. Ask the patient to indicate from which side the light enters the eye. Instead of a mirror, you can use an electric Ophthalmoscope, in this case there is no need for a table and a Desk lamp.	
Learn to explore the field of view using the perimeter.	Set the perimeter on the table. Move a chair to the table so that the subject can sit on it, being in front of the face. Put the patient in front of the perimeter. The light source should be behind the patient. Tell the patient about the purpose of the study and its actions. Put a flap over the patient's left eye. Place the patient's chin on the left side of the facial joint so that the point of fixation on the arch is directly in front of the eye. Ask the patient to fix his gaze on the fixation point and not move his eye during the examination. As soon as it is from any side on the periphery will see a white object, it should signal you. Set the perimeter arc to the horizontal Meridian. Take in hand white object diameter of 3 mm. Start move his on arc from periphery to center with different sides, observing those, to patient not moved eye. Focusing on the calibration on the perimeter arc, establish what boundaries of the field of view the patient has from the outside and from the inside. Move the perimeter arc to the vertical Meridian and repeat the study. Record the indicators of the boundaries of the field of view up and down. If necessary, similarly examine the field of view in the oblique meridians. By the same technique, draw the perimeter for the left eye.	Recall the readings of the normal boundaries of the field of vision in the main meridians. Do some research with a friend. Compare the data with the norm.

a	b	c
Learn the approximate study of the field of vision by the control method.	Put the subject in 1 m from yourself, and the patient should be located with his back to the light source. Cover the eyes of the patient and yourself with your hand. The gaze is fixed on each other's pupils. In the middle of the distance between you, move the pen or pencil from the periphery to the center. Ask the patient to indicate when he sees the finger. Compare your field of view with the field of view of the subject.	See the handle on the nasal side so that it is not visible. Make sure the subject doesn't see it.
Learn to explore color perception with Rabkin tables.	Sit the patient in a well-lit room. Explain to him that he should see figures or figures in the tables shown and call them. On a piece of paper fix the answers test. Start the demonstration of test tables with the first number. The patient should name the image visible to him in 10 seconds. Then the following table is shown, etc. At the end of the study, the doctor conducting the study compares the responses of the subject with the standards available in the book, and identifies the existing anomaly of color vision.	Do the research in a study group. Compare the results.
Learn to study twilight vision.	In a dark room, consider the Kravkov-Purkinje table.	Make sure the yellow square appears early.

8. EDUCATIONAL TASK

Find test tasks and situational tasks on the topics of classes in the corresponding collections.

9. CONTROL OF RESULTS OF ASSIMILATION is made according to tables:

Table of programmed control

Central vision.

I. The main role in the visual act belongs to: *1) optical media; 2) oculomotor apparatus; 3) retina and choroid.*

II. Number of visual functions: *1) three; 2) four; 3) five.*

III. Central vision is carried out by: *1) sticks; 2) cones; 3) sticks and cones.*

IV. The place of the largest accumulation of sticks: *1) paracentral retinal; 2) peripheral retinal; 3) Central fossa of the macula.*

V. The acuity of central vision depends on: *1) the angle of view; 2) the anatomical size (diameter) of the cones; 3) the distance between the nodal point of the eye and the retina.*

VI. Visual acuity is studied: *1) on the perimeter; 2) on the campimeter; 3) according to Sivtsev tables.*

VII. What is the relationship between visual acuity and angle of view: *1) directly proportional; 2) inversely proportional.*

VIII. What visual acuity is taken for normal: *1) equal to 2.0; 2) equal to 1.5; 3) equal to 1.0.*

IX. From what angle do most people distinguish two points of light separately: *1) 1'; 2) 2'; 3) 5'.*

X. At what angle are the details visible in the Sivtsev table: *1) 1'; 2) 2'; 3) 5'.*

XI. At what angle is the entire letter in the Sivtsev table visible: *1) 1'; 2) 2'; 3) 5'.*

Peripheral vision.

I. The value of peripheral vision in human life: *1) determining the shape and size of objects; 2) orientation in space; 3) perception of the movement of objects.*

II. What nerve elements of the retina provide peripheral vision function: *1) cones; 2) sticks; 3) sticks and cones*.

III. What is characterized by peripheral vision: *1) visual acuity; 2) field of vision*.

IV. What are the normal boundaries of the field of vision: *1) anatomical features of the structure of the face; 2) the location of objects in space; 3) the boundary of the optically active part of the retina.*

V. What method can be most accurately determine the boundaries of the field of view: *1) perimetry; 2) campimetry; 3) control method.*

VI. What are the normal boundaries of the field of vision: *(put the numbers on the checklist, indicating the main directions).*

VII. What is meant by scotoma: *1) loss of half the field of vision; 2) limited defect in the field of vision*.

VIII. What is the reason for the existence of a physiological scotoma (blind spot): *1) the absence of neuroepithelium in the area of the optic nerve disc; 2) changes in the retina in the area of the macula.*

IX. What method determines the size of the blind spot: *1) perimetry; 2) campimetry; 3) control method.*

X. Diagnose changes in the field of vision and indicate the localization of the pathological process:

Loss of the outer halves of the visual field: *1) homonymous right-sided hemianopsia; 2) homonymous left-sided hemianopsia; 3) heteronymous bitemporal hemianopsia; 4) heteronymous binasal hemianopsia; a) the center of the chiasm; b) the right visual tract; C) the left visual tract; d) the lateral divisions of the chiasm.*

Loss of the inner halves of the field of vision: *1) homonymous right-sided hemianopsia; 2) homonymous left-sided hemianopsia; 3) heteronymous bitemporal hemianopsia; 4) heteronymous binasal hemianopsia; a) the center of the chiasm; b) the right visual tract; C) the left visual tract; d) lateral divisions of the chiasm.*

Loss of the right halves of the field of vision: *1) homonymous right-sided hemianopsia; 2) homonymous left-sided hemianopsia; 3) heteronymous bitemporal hemianopsia; 4) heteronymous binasal hemianopsia; a) the center of the chiasm; b) the right visual tract; C) the left visual tract; d) lateral divisions of the chiasm.*

Loss of the left halves of the field of vision: *1) homonymous right-sided hemianopsia; 2) homonymous left-sided hemianopsia; 3) heteronymous bitemporal hemianopsia; 4) heteronymous binasal hemianopsia; a) the center of the chiasm; b) the right visual tract; C) the left visual tract; d) lateral divisions of the chiasm.*

Twilight vision.

I. What elements of the retinal neuroepithelium are more sensitive to light: *1) cones; 2) sticks.*
II. What kind of adaptation is most important for a person: *1) light; 2) dark.*
III. What methods are used for rapid and mass determination of light sensitivity: *1) adaptometry; 2) Rabkin table; 3) Kravkov-Purkinje table.*
IV. The maximum increase in light sensitivity occurs: *1) in the first 20 minutes; 2) the next 25-60 minutes.*
V. What are the main causes of twilight vision disorders: *1) cataract; 2) retinal pigment dystrophy; 3) glaucoma; 4) alimentary A-beriberi; 5) liver disease.*

Color vision.

I. What wavelength does the human eye perceive: *1) shorter than 396 mmk; 2) longer than 760 mmk; 3) from 396 to 760 mmk.*
II. What elements of the retinal neuroepithelium carry out color perception: *1) cones; 2) sticks; 3) sticks and cones.*
III. By what basic feature trichromate determines the color: *1) tone; 2) brightness; 3) saturation.*
IV. What is the main feature of the dichromate determines the color: *1) tone; 2) brightness; 3) saturation.*
V. Which of the methods is most often used in determining color perception: *1) according to Rabkin's tables or Justova; with the help of an anomaloscope.*
VI. How is the lack of perception one of the primary colors: *1) dichromate; 2) monochromate; 3) abnormal trichromate.*
VII. The absence of perception of red color is called: *1) tritanopia; 2) protanopia; 3) deuteranopia.*
VIII. The absence of perception of green color is called: *1) tritanopia; 2) protanopia; 3) deuteranopia.*
IX. The most frequent violations of color vision: *1) dichromate; 2) monochromate; 3) abnormal trichromate.*

10. TASK ON THE NEXT ATTRACTIVE OPPORTUNITY.

Topic: Physical and clinical refraction. Astigmatism. Accommodation. Presbyopia. The purpose of the spectacles.

Literature: *a) educational literature*

Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p.

Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. /Under the editorship of E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p.

Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - 3rd ed. - M.: GEOTAR-MED. 2013. – 640 p.

Ruban E.D. Eye diseases: the newest Handbook. Rostov-on-don: Phoenix, 2016. – 622 p.

Tahchidi H.P., Yartseva N.S., Gavrilova N.A., Deev L.A. Ophthalmology: textbook. - Moscow: GEOTAR-Media, 2011. – 544 p.

b) additional

Avetisov E.S. Myopia. - M.: Medicine, 2002. - 288 p.

Koroev O.A., Koroev A.O. Methodical manual on practical training for students of medical, medical-preventive and pediatric faculties. - Vladikavkaz: 2012. - 35 sec. - +1 electron. Wholesale. Disk.
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Orlova N.S., Osipov G.I. Vision correction. - M., 2006. - 226 p.
Stukalov S.E. Clinic of various forms of myopia, treatment and prevention. - M., 2007. - 128 p.

11. TASKS FOR INDEPENDENT WORK ON THE TOPIC UNDER STUDY SHOULD BE TAKEN FROM THE COLLECTION OF TASKS FOR INDEPENDENT WORK OF STUDENTS.

Federal state educational institution of higher education "North Ossetian state medical Academy" of the Ministry of health of Russia

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TEACHING AIDS

TO PRACTICAL CLASSES IN OPHTHALMOLOGY FOR STUDENTS OF THE FACULTY OF MEDICINE

Practical lesson 3

Topic: Physical and clinical refraction. Astigmatism. Accommodation. Presbyopia. The purpose of the spectacles.

Vladikavkaz 2021

LESSON 3.

1. **TOPIC:** Physical and clinical refraction. Astigmatism. Accommodation. Presbyopia. The purpose of the spectacles.

2. **THE PURPOSE OF THE LESSON:** to learn to determine the type and degree of clinical refraction in a subjective way, correct refractive errors and prescribe glasses.

3. **TARGETS:**

The student should know: • determination of physical and clinical refraction, its types; • subjective and objective methods for determining clinical refraction; • the mechanism of accommodation and its various violations; • clinic and correction of different types of clinical refraction; • forms and degrees of myopia; • prevention of myopia; • what is presbyopia, what are its manifestations and correction; • what types of accommodation disorders exist; • principles and types of astigmatism correction; • how to write a prescription for glasses.	Recommended reading: *a) educational literature* Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p. Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. /Under the editorship of E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p. Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - 3rd ed. - M.: GEOTAR-MED. 2013. – 640 p. Ruban E.D. Eye diseases: the newest Handbook. Rostov-on-don: Phoenix, 2016. – 622 p. Tahchidi H.P., Yartseva N.S., Gavrilova N.A., Deev L.A. Ophthalmology: textbook. - Moscow: GEOTAR-Media, 2011. – 544 p. *b) additional* Avetisov E.S. Myopia. - M.: Medicine, 2002. - 288 p. Koroev O.A., Koroev A.O. Methodical manual on practical training for students of medical, medical-preventive and pediatric faculties. Vladikavkaz, 2012. - 35 sec. - +1 electron. Wholesale. Disk. Nosenko I.A. Fundamentals of optometry: practicum. - Rostov-on-don: Phoenix, 2015. - 141 p. Orlova N.S., Osipov G.I. Vision Correction. - M., 2006. - 226 p. Stukalov S.E. Clinic of various forms of myopia, treatment and prevention. - M., 2007. - 128 p.
A student should be able to: • determine the type and degree of clinical refractive error by subjective method; • to pick up glasses to the patient with refractive error; • identify measures for the prevention of myopia; • explore the scope of accommodation; • pick up glasses for presbyopia correction;	Recommended literature: The same.

• determine the type and strength of spectacle lenses by neutralization; • write prescriptions for different types of glasses.	

4. ISSUES STUDIED PREVIOUSLY:

"Optics" - Department of physics.

5. PLAN OF PRACTICAL CLASSES:

The stages of the lesson	Technical equipment		Venue
	Equipment	Training AIDS, controls	
1	2	3	4
1. Check the source of the data.		Control tasks.	Eye clinic office
2. Instructing the teacher.	Table Sivtsev, Rota apparatus, skiascope, ophthalmoscopes, skiascope ruler.	Lesson plan.	Eye clinic office
3. Independent work of students.	Table Sivtsev, Rota apparatus, skiascope, ophthalmoscopes, skiascope ruler.	Orientation cards.	Eye clinic office
4. Analysis of results with an assistant (control of learning results).		Control tasks, visual control of the assistant.	Eye clinic office
5. Task for the next lesson.		1. Textbook. 2. Additional literature. 3. Educational and methodical manual.	Eye clinic office

6. TASKS FOR CONTROL OF INITIAL KNOWLEDGE:

Questions	Emmetropia	Myopia	Hypermetropia	Astigmatism
What is larger: the optical axis or the focal length?				

Questions	Emmetropia	Myopia	Hypermetropia	Astigmatism
Where is the further point of clear vision?				

Questions	Emmetropia	Myopia	Hypermetropia	Astigmatism
Where is the main focus?				

Questions	Emmetropia	Myopia	Hypermetropia	Astigmatism
How many and what degrees of this type of refraction are distinguished?				

Questions	Emmetropia	Myopia	Hypermetropia	Astigmatism
What types of this type of refraction are distinguished?				

Questions	Emmetropia	Myopia	Hypermetropia	Astigmatism
What glasses are corrected?				

Questions	Emmetropia	Myopia	Hypermetropia	Astigmatism
What types of correction are possible?				

7. СХЕМА ОРИЕНТИРОВОЧНОЙ ОСНОВЫ ДЕЙСТВИЯ:

The purpose of performing manipulations	How to perform an action	Criteria and methods of control
а	б	в
Determine the type of refractive error.	Determine the visual acuity of each eye. Put on a trial frame and cover your eyes with the screen. Before open eye check a tick glass +0.5 D. Determine the type of refraction.	If, looking through the lens, the subject notes the deterioration of vision-he has myopia, if he sees the same or better-hypermetropia.
Determine the degree of refractive error.	Substituting alternately scattering or collecting glass (depending on the type of refraction), achieve maximum visual acuity. Determine the degree of refraction.	For the selection of scattering glasses, the minimum glass is selected, with which the patient sees well, while for the selection of plus glasses, the maximum glass is selected.
Study the clinic of myopia, hypermetropia.	Examine the fundus of the myopic patient. Note the changes around the optic disc and in the macular area. Examine the periphery of the fundus.	A myopic cone appears around the optic disc in myopia, which, as the process progresses, becomes a myopic staphyloma. Dystrophic changes appear in the macular area and on the periphery of the retina.

а	б	в
Pick up the glass with anisometropia.	Selection of glasses is carried out in the same order as when determining the type and degree of refraction. It is necessary to check the vision with two eyes together.	Due to the presence of aniseikonia, possibly wearing glasses with a difference of 2.0 diopters. A big difference requires a special correction (contact lenses, glasses sakanaka).
Make an objective study of refraction.	Conduct the study in a patient with a wide pupil, achieving cycloplegia. Take the skiascope. Sit the patient at a distance of 1m from you. Place the light source behind and to the left of it. Point the beam of light at the eye. Move the light beam horizontally and vertically. Watch the shadow move. Put a skiascope ruler to the patient's eye. Moving it, until the disappearance of the shadow. Make an amendment. Determine refraction.	If there is no shadow movement, then the subject has myopia of 1.0 D. If the shadow moves in the opposite direction from the movement of the light beam-myopia is greater than 1.0 D. If the movement of the shadow in the same direction – myopia up to 1.0 D, emmetropia or hypermetropia. When substituting a ruler with a "–" sign, one diopter is added to the data; when using a ruler with a "+" sign, it is subtracted.
Determine the type and strength of the optical glass.	Take the glass in your hand. Move it by looking through it at an object. Pay attention to the movement of the object. Having determined the type of glass, take the minimum glass with the reverse sign from the set. Put them together. Repeat the movement of the glasses. Alternately exposing the glass to the increasing optical force until the lack of displacement of the object.	The object moves in the direction of the glass-glass scattering. The object moves in the opposite direction-the glass is collective. Having picked up by neutralization glass, we found equal to the desired strength, but with the opposite sign.

8. EDUCATIONAL TASK

Find test tasks and situational tasks on the topics of classes in the corresponding collections.

9. MONITORING THE RESULTS OF ASSIMILATION. Produced by tables:

Table of programmed control

Clinical refraction.

Answer the questions according to the selected option.

1. Emmetropia. 2. Hypermetropia. 3. Myopia.

I. The position of the further point of clear vision: *1) at a finite distance in front of the eye; 2) at infinity; 3) not in positive space (in front of the eye).*

II. Refraction by degree of refraction: *1) proportionate; 2) strong; 3) weak.*
III. The position of the main focus of parallel rays in relation to the retina: *1) in front of the retina; 2) on the retina; 3) behind the retina.*
IV. Where will be the image of the object in question, located at infinity: *1) in front of the retina; 2) on the retina; 3) behind the retina.*
V. Clarity of the image of objects located in the distance: *1) the image is clear; 2) in the light scattering circles.*
VI. Perception by the eye of parallel rays from far-away objects: *1) without the use of accommodation; 2) including accommodation.*
VII. The use of accommodation in this type of clinical refraction: *1) constant voltage of accommodation; 2) the inclusion of accommodation when viewing closely spaced objects; 3) accommodation is not used; 4) accommodation is used minimally.*
VIII. Pathological conditions that occur in this type of clinical refraction: *1) spasm of accommodation; 2) muscular asthenopia; 3) accommodative asthenopia.*
IX. What glasses are necessary for correction of refraction of this type: *1) collective lenses; 2) scattering lenses; 3) correction is not required.*
X. What optical glass is used to determine the type of clinical refraction: *1) weak scattering; 2) weak collective; 3) weak cylindrical.*
XI. How to explain the change in accommodation with age: *1) compaction of the lens fibers; 2) opacity of the lens.*
XII. At what age does presbyopia develop: *1) 30 years; 2) 40 years; 3) 50 years.*

Optical glass. Extract recipes.

I. To Write out points for work to emmetropu at the age of 50 years.
II. Refraction-hypermetropia in 2.0 D. The patient is 40 years old. Write out the necessary points for work.
III. Refraction-hypermetropia in 3,0 D. The patient is 10 years old. Write out the necessary points.
IV. Refraction-emmetropia. The patient is 75 years old. Write out the necessary points for work.
V. Refraction-myopia in 2.0 D. The patient is 20 years old. Write out the necessary points.
VI. Refraction-myopia in 2.0 D. The patient is 60 years old. Write out the necessary points for work.
VII. Refraction of the right eye – myopia in 2.0 DPTR, left-myopia in 3.0 DPTR. Write out the necessary points.
VIII. Refraction of the right eye-hypermetropia in 1.0 DPTR, left-hypermetropia in 2.0 DPTR. The patient is 50 years old. Write out corrective glasses.
IX. Refraction of the right eye – myopia in 2.0 DPTR, left-myopia in 5.0 DPTR. Write out corrective glasses.
X. Refraction of the right eye – myopia in 2.0 DPTR, left-hypermetropia in 2.0 DPTR. The right eye is the best in visual acuity. Write out corrective glasses.
XI. The further point of clear vision of the patient is at a distance of 50 cm in front of the eye. Name the type of clinical refraction. Write out corrective glasses.
XII. The further point of clear vision of the patient is in infinity. The patient is 50 years old. Name the type of clinical refraction. Write out the necessary corrective glasses.
XIII. Visual acuity of both eyes = 1.0. The patient is 60 years old. Name the type of clinical refraction. Write out the necessary corrective glasses.

10. TASK FOR THE NEXT LESSON.

Subject: diseases of the orbit, eyelids, conjunctiva and lacrimal organs.

Literature: *a) educational literature*

Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p.

Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. /Under the editorship of E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p.

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Brzeski V.V. diseases of the lacrimal apparatus: a Handbook for practitioners. - Moscow: Publishing House N-L, 2011. - 108 p.

Brovkina A.F. diseases of the orbit. - Moscow: Medical news Agency (MIA), 2008. - 256 p.

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Koroev O.A., Sozaeva M.A., Alikova T.T., Koroev A.O., Laitadze I.A. Pterygium. - Vladikavkaz, 2009. - 82 p.

Penny Robert B. Oculoplasty. - Moscow: GEOTAR-Media, 2009. – 288 p.

Federal state educational institution of higher education " North Ossetian state medical Academy of the Ministry of health of Russia»

Department of otorhinolaryngology with ophthalmology

KOROEV O.A., KOROEV A.O.

TEACHING AIDS

TO PRACTICAL CLASSES FOR MEDICAL STUDENTS FACULTY'S

Practical lesson 4

Topic: diseases of the orbit, eyelids, conjunctiva and lacrimal organs.

Vladikavkaz 2021

LESSON 4.

1. **SUBJECT:** diseases of the eyelids, conjunctiva, lacrimal organs and orbit.

2. **THE PURPOSE OF THE LESSON:** to learn how to diagnose and treat the most common diseases of the orbit, eyelids, conjunctiva and lacrimal organs.

3. **TARGETS:**

The student should know: • what are exophthalmos and enophthalmos; • determination of pulsating exophthalmos; • how to distinguish between anterior and posterior periostitis; • the cause and clinic of phlegmon of the orbit and thrombosis of the cavernous sinus; • what pathological changes belong to the group of abnormalities of the eyelid development; • varieties of anomalies in the position of the eyelids; • manifestations of allergic diseases of the eyelids; • characteristic features of inflammatory diseases of the edges and other parts of the eyelids; • what abnormalities in the development and position of the eyelids require urgent surgical treatment; • what diseases are most often the causes of blepharitis; • what are the complications and how it can develop in purulent inflammatory diseases of the eyelids; • what complaints are made by patients with conjunctivitis; • what methods are used to examine the conjunctiva; • General objective signs of conjunctivitis; • infectious diseases that may cause conjunctivitis; • characteristic symptoms of diphtheria, gonorrhea, adenovirus, bacterial conjunctivitis; • symptoms of trachoma and its complications; • the main drugs used for the treatment of conjunctivitis; • prevention of inflammatory diseases of the conjunctiva;	Recommended reading: *a) educational literature* Avetisov E.S., Kovalevskiy E.I., Khvatova AV. Guidance for pediatric ophthalmology. - Moscow: Medicine, 1987. Eye diseases / edited by A.A. Bochkareva. - Moscow: Medicine, 1989. - Pp. 134-180, 351-361. Eye diseases / ed. by A.P. Nesterov and others-M.: Leader M, 2008. Kovalevsky E.I. Eye diseases. Atlas. Moscow: Medicine, 1985. Kovalevsky E.I. Ophthalmology. - Moscow: Medicine, 1995 Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - M.: GEOTAR-MED. 2002. Fedorov S.N., Yartseva N.S., Ismankulov A.O. Eye diseases: Textbook for medical students. – 2 nd ed. *b) additional* Aznabaev M.T., Malkhanov V.E., Latypova E.A., Shevchuk N.E. Chlamydial conjunctivitis (clinic, diagnosis, treatment). - M., 2003. - 132 p. Bastrikov N.I. Diseases of lacrimal organs and methods of their treatment. - M., 2007. - 256 p. Koroev O.A., Koroev A.O. Educational and methodical manual for students of the medical faculty for practical training in ophthalmology. Lesson 4. - 2016. Koroev O.A. Clinical and topographical anatomy of the orbit. - Vladikavkaz: Iriston, 2002. - 92 p. Koroev O.A. Ophthalmology: the subordinate education of the eye. - Rostov-on-don: Phoenix, 2007. – 413 p. Koroev O.A., Sozaeva M A., Alikova T.T., Koroev A.O., Laitadze I.A. Pterygium. - Vladikavkaz, 2009. - 82 p. Penn, R. B. Retina. - Moscow, 2009. – 288 p. Yushchuk N.D., Vengerov Yu.Yu., Yartseva N.S., Gavrilova N.A. Defeat of the organ of

• signs of lacrimal gland disease, clinic and treatment principles; • congenital and acquired pathology of the lacrimal pathway; • principles of treatment of pathology of the lacrimal tubules, lacrimal SAC and lacrimal-nasal canal; • possible outcomes and complications of newborn dacryocystitis; • principles and methods of sequential treatment (massage, washing, probing, etc.)	vision in infectious diseases. - M., 2006. – 176 p.
<u>The student must be able to:</u> • diagnose exophthalmos and enophthalmos; • diagnose pulsating exophthalmos; • diagnose anterior and posterior periostitis; • to diagnose phlegmon of the orbit and cavernous sinus thrombosis; • diagnose abnormalities of eyelid development; • diagnose abnormalities in the position of the eyelids; • diagnose and treat allergic diseases of the eyelids; • diagnose and treat inflammatory diseases of the edges and other parts of the eyelids; • diagnose and treat conjunctivitis; • diagnose infectious diseases that may cause conjunctivitis; • diagnose and treat trachoma; • to carry out preventive maintenance of inflammatory diseases of the conjunctiva; • diagnose and treat diseases of the lacrimal gland; • carry out functional tests for lacrimation and lacrimation; • diagnose congenital and acquired pathology of the lacrimal pathway.	<u>Recommended literature:</u> The same.

4. THE ISSUES EXAMINED EARLIER:

"Microbial and viral infections" - Department of microbiology.
"Inflammation" - Department of the Patological physiologies.
"Paresis and paralysis" - Department of neurology.
"Antibacterial agents" - Department of pharmacology.
"Inflammatory skin diseases" - Department of dermatology and venereology.
"Paranasal sinuses and their diseases" - Department of otorhinolaryngology.

5. PLAN OF PRACTICAL CLASSES:

The stages of the lesson	Technical equipment		Venue
	Equipment	Training AIDS, controls	
a	b	c	d
1. Verification of initial knowledge		Control tasks.	Eye clinic office
2. Instructing the teacher	Table lamps, glass sticks, eyelid lifter, Ophthalmoscope, slit lamp, medicine kit, dressing material.	Lesson plan.	Eye clinic office
3. Independent work of students	Table lamps, glass sticks, eyelid lifter, Ophthalmoscope, slit lamp, medicine kit, dressing material.	Orientation cards.	Eye clinic office
4. Analysis of results with an assistant (control of learning results).		Control tasks.	Eye clinic office
5. Task for the next lesson.		1.Textbook. 2.Additional literature. 3. Educational and methodical manual.	Eye clinic office

6. TASKS FOR CONTROL OF INITIAL KNOWLEDGE:

1.

Phlegmon of the orbit	Symptoms

2.

Ulcerative blepharitis	Symptoms

3.

Gonococcal conjunctivitis	Symptoms

4.

Dacryocystitis of newborns	Symptoms

7. СХЕМА ОРИЕНТИРОВОЧНОЙ ОСНОВЫ ДЕЙСТВИЯ:

Stages of diagnosis and treatment	Means and conditions of diagnosis and treatment, procedure	Self-control criteria
a	b	c
Learn how the diagnosis of phlegmon of the orbit.	Collect medical history. Perform an external examination, exophthalmometry. Check the mobility of the eyeballs. X-ray the skull. Perform a blood test.	Rapidly developing edema and hyperemia of the eyelids. They are dense, hot to the touch. Edema and hyperemia spread to the root and back of the nose, the cheek or the entire eponymous half of the face. The eye slit is narrowed, there is exophthalmos, chemosis. The mobility of the eyeball is limited in all directions. Complaints of severe dull pain behind the eye, which increases when trying to look away or with light pressure on the eye. The disease is accompanied by a severe General condition, high body temperature. Sharply increased ESR, there are leukocytosis, the shift of the leukocyte formula of blood to the left. Radiographically, a decrease in the transparency of the eye socket and adjacent paranasal sinuses is detected. On the fundus sometimes there are light stagnant, but more often inflammatory changes in the optic disc. Most often, the phlegmon of the eye socket is a consequence of the development of an inflammatory process in the sinuses.
Learn the principles of treatment of phlegmon of the orbit.	Prescribe intramuscular or intravenous administration of shock doses of broad-spectrum antibiotics in combination with oral sulfonamides, as well as analgesic and other symptomatic medications. Patients are subject to hospitalization in an otorhinolaryngological hospital, where they can be made in the first hours and days together with an ophthalmologist sinus puncture and opening of the orbit, followed by drainage of the wound cavity with a turunda impregnated with a solution of antibiotics. Turunda is changed daily. Children of early age are shown repeated administration of globulin, blood plasma transfusions.	To prevent damage to the cornea (due to exophthalmos) from the first day in the eye must be administered every hour fortified solutions and ointments of sulfonamides and antibiotics. Accelerates the resolution of the UHF therapy process. Prevention of phlegmon of the eye socket involves the correct sanitary and hygienic regime, timely sanitation of the oral cavity, treatment of inflammatory processes of the paranasal sinuses.

a	b	c
Learn how to diagnose simple blepharitis.	Examine the eyelids of the patient or the patient with this pathology. Pay attention to the edges of the eyelids, note their hyperemia, thickness. See if there is any discharge from the meibomian glands.	meibomian glands mixed with the tear. The edges of the eyelids are hyperemic, thickened. Complaints about the feeling of contamination. Foamy discharge at the corners of the eye slit. This is the secret of the
Learn how to treat simple blepharitis.	Brush the edges of the eyelids with alcohol. Ask the patient to look up. Pull the lower eyelid down slightly with your finger. With a cotton swab on a glass stick, pre-moistened with alcohol and pressed, treat the edge of the lower eyelid. Ask the patient to look down. Hold the upper eyelid. Similarly, treat it. Massage your eyelids. Apply a disinfectant or antibacterial ointment to the glass stick. Put a glass stick behind your eyelid. From the outside, press the eyelid to the stick with your finger and as if "rubbing" on the stick, massage the entire edge of the eyelid. Instill a disinfectant solution into the eye.	You can treat the edges of the eyelids with alcohol or an alcohol-ether mixture. It is necessary to make sure that they do not fall on the eyeball. All the solutions for the eyes are prepared in distilled water. Systematic massage is performed for 2-3 weeks. 1% tetracycline ointment or 1% liniment of syntomycin is used. The force of pressure is regulated by the appearance at the edge of the eyelid of the secret of the meibomian glands.
Learn how to diagnose scaly blepharitis.	Examine the eyelids of the patient or the patient with this pathology. Pay attention to the edges of the eyelids, note their hyperemia, thickness, the presence of scales.	The edges of the eyelids look permanently red, thickened. The skin at the roots of the eyelashes is covered with small dry or grayish-white bran-like scales.
Learn how to treat scaly blepharitis.	Treat the edges of the eyelids with alcohol according to the above method. Dip the conical probe in 1% diamond green solution. Carefully in the form of strips on the edge of the eyelid, apply it parallel to the edge of the rib. Assign hydrocortisone ointment.	Carefully remove the scales on the edges of the eyelids. Produce treatment with alcohol. If necessary, massage your eyelids, and the eyelids dushirovanie brilliant green.
Learn to diagnose ulcerative blepharitis.	Examine the eyelids of the patient or the patient with this pathology. Pay attention to the characteristic signs of the	Yellow purulent crusts are glued together in bundles of eyelashes. The crusts are a dry secret of the meibomian and sebaceous glands. In some cases,

a	b	c
	disease-yellow crusts on the edges of the eyelids, when removed, bleeding ulcers are exposed. Consider the correct growth of eyelashes.	when the crusts are rejected, pus may be released. As a result of scarring, there is an incorrect growth of eyelashes-trichiasis and areas of baldness-madarosis.
Learn how to treat ulcerative blepharitis.	Carefully remove all crusts from the edges of the eyelids, smear the edges of the eyelids with sulfanilamide ointment, then treat with alcohol and tush with diamond green. Lubricate the edges of the eyelids with antibiotic ointment.	In addition to sulfanilamide ointments, it is possible to use fish oil or vaseline oil. Well relieve inflammation lotions with antibiotics. In persistent cases, diathermocoagulation of ulcers, the appointment of autohemo - and vitamin therapy is possible.
Learn how to diagnose barley.	Examine the patient or person with this pathology. In a limited area near the edge of the eyelid, you will find redness with painful swelling. Possible swelling of the eyelid. On day 2-3, the tip of the swelling becomes yellow. On 3-4 day is usually opened.	Barley is an acute purulent inflammation of the hair follicle or sebaceous gland. It differs from simple blepharitis by local pain and hyperemia. When a purulent apex appears, the infiltrate melts. Outcomes – resorption, an autopsy or abscess formation.
Learn how to treat barley.	Lubricate the skin at the site of infiltration with 70% alcohol. Drip a 30% solution of sulfacyl-sodium into the eye. Assign it to instillation 3-4 times a day, as well as dry heat.	When abscess of barley dry heat is contraindicated. To treatment add orally sulfonamides and antibiotics, autohemotherapy. The extrusion of barley is strictly prohibited.
Learn the diagnosis and treatment of chalazion.	Examine the patient or person with this pathology. Determine the presence of a tumor-like formation, soldered to the cartilage and the mobile skin above it. Turn out the eyelid. Education shines through the conjunctiva grayish color. Assign the patient 1% yellow mercury or hydrocortisone ointment, thermal procedures. In the absence of effect – surgical treatment.	The size of the chalazion reaches the size of a pea. The skin above it must be mobile. In surgical treatment, the incision on the conjunctiva is made perpendicular to the edge of the eyelid, the skin is opened parallel to the costal edge.
Learn the diagnosis and treatment of lagophthalmos.	During external examination, pay attention to the asymmetry of the face, the width of the eye slit, the position of the lower eyelid. Note the impossibility of closing the eye gap. The main task is to	The eye slit on the affected side is always wider than on the healthy side, the lower eyelid is atonic, turned outwards. The main treatment is with a neurologist. As palliative surgical intervention can be applied

a	b	c
	prevent the eyeball from drying out. Assign the patient frequent instillation of 30% solution of sulfacyl-sodium, vaseline oil or ointment. With persistent lagophthalmos is applied surgery.	blefaroplastia.
Learn how to diagnose and learn the principles of treatment of ptosis.	When examining the patient may draw attention to the forced tilted position of the patient's head – "Stargazer's pose". Eyelids at half-mast. The eye slit is narrowed or closed. Refer the patient to a neurologist for treatment. In the absence of effect, surgical treatment is indicated.	There are unilateral and bilateral, complete and incomplete, congenital and acquired ptosis. Surgical treatment is most often associated with either shortening the levator, or lifting the eyelid to the frontal muscle.
Learn how to diagnose and learn the principles of treatment of eyelid inversion.	Examine the thematic patient or slide with this nosology. Pay attention to the ciliated edge facing the eyeball. If the inversion of the eyelid is persistent-surgical treatment. When spastic inversion-treat the underlying disease. Pull the eyelid off with a band-aid, sticking it on the face.	The eyelashes turned to the eyeball irritate the cornea. Pathology requires timely treatment due to the possibility of damage to the cornea.
Learn how to diagnose and learn the principles of treatment of eversion of the eyelids.	Examine a thematic patient or a slide with this pathology. The lower eyelid droops down, exposing the conjunctival surface. Recommend surgical treatment.	In severe cases, the conjunctiva is hypertrophic. Surgical treatment is reduced to shortening the century.
Learn how to diagnose acute infectious conjunctivitis.	Examine the subject patient or slide with the desired pathology. Before the examination, identify complaints of a feeling of blockage, burning, itching in the eye, redness of the eye and discharge from the eye slit. On examination, the conjunctiva of the eyelid is swollen, red, and edematous in the area of transitional folds.	In the morning, the eyelids are glued together with dried pus. In rare cases, the conjunctiva becomes so edematous that it protrudes from the eye slit-chemosis.
Learn how to treat acute	Flush the conjunctival SAC. To do this, take a 2% solution of	For irrigation of the conjunctiva, solutions of furacillin or potassium

a	b	c
infectious conjunctivitis.	boric acid. Spread your eyelids wide. Rinse the conjunctival SAC with an Undine or rubber spray. Assign the patient instillation of antibiotics or sulfonamides, at night-antibiotic ointment for the eyelids.	permanganate 1:5000 can be used. Eye drops are prepared on distilled water, 30% sulfacyl-sodium, 0.25% levomycetin, 1% tetracycline, etc. In no case can be applied to the eye bandage. In this case, there may be complications from the cornea.
Learn how to diagnose acute epidemic conjunctivitis.	The disease is caused by the Koch-wicks wand. Examine the diseased eye. On the first day, the discharge from the eye is mucous, and then becomes plentiful and purulent. Note the sharp hyperemia of the conjunctiva of the eyeball. Petechial hemorrhages are noted in it. Severe swelling of the lower transitional fold. Inspect the cornea – it can be formed in the surface infiltration.	The disease is very contagious. It affects organized groups. Usually both eyes are affected. The incubation period is 1-2 days. The disease is transmitted by contact and possibly drip. There may be General phenomena: malaise, fever, runny nose, headache.
Learn how to treat acute epidemic conjunctivitis.	Therapeutic measures are carried out in the same order and volume as in acute infectious conjunctivitis.	Remember about preventive measures. If possible, it is the isolation of bacilli carriers and preventive instillation of 30% sulfacyl-sodium.
Learn how to diagnose gonorrheal conjunctivitis.	Examine the patient. Note the bluish-purple swelling of the eyelids. The eyelids are dense, almost impossible to open. From the eye slit, the discharge is the color of meat slops. After 4-5 days the eyelids become testovatoy to the touch, discharge becomes purulent. Try to examine the cornea, using the eyelid lifter to open the eye slit. The cornea may become opaque, have a yellow-gray infiltrate or ulcer. The conjunctiva is hyperemic, loose, and bleeding.	In adults, the disease is more severe than in newborns and children. It is accompanied by General symptoms: fever, joint and muscle damage, and heart failure. To clarify the diagnosis, a bacteriological study of the discharge is necessary.
Learn how to wash the conjunctival SAC.	Put the patient in a chair. In the conjunctival SAC instill 1-2 drops of anesthetic. Type the disinfectant solution into a rubber bag. Lower eyelid pull down, and the upper-up, and if possible, make it eversion. Under the eye,	When properly carried out the manipulation of liquid flows freely into the basin, carrying with it the pus and pathological particles.

a	b	c
	substitute a kidney-shaped basin, which is held by either the patient or the nurse. Pressing the rubber bulb, rinse the conjunctival SAC so that the main direction of the leaking fluid is the medial corner of the eye.	
Learn how to treat gonorrheal conjunctivitis.	Perform local treatment. According to the known method, wash the conjunctival SAC with a solution of potassium permanganate (1: 5000). Drip a 30% solution of sulfacyl-sodium into the eye. Assign instillation every 3 hours. At night-laying for eyelids antibiotic ointment. The General treatment is the introduction of antibiotics intramuscularly.	With proper treatment, inflammatory phenomena stop after 10-12 days. In maternity hospitals, it is mandatory to instill a solution of sulfacyl-sodium in all newborns. In adults, to prevent infection, it is possible to sticker the watch glass on a healthy eye.
Learn how to diagnose diphtheria conjunctivitis.	Examine the slide with a picture of this disease. Note the severe swelling, hyperemia, soreness and tightness of the eyelids. When diluting the eyelids, a cloudy liquid with flakes is released from the eye slit. On the edges of the eyelids and conjunctiva visible gray plaque-film, soldered to the underlying tissues. When the film is removed, the mucosa bleeds. Examine the cornea. There may be multiple infiltrations or ulceration.	The disease is rarely seen as an isolated process, usually combined with diphtheria of the nose, throat, larynx. When the conjunctiva of the sclera is affected, a simblefaron may be observed. There are common signs of diphtheria: high fever, headaches, enlarged and painful regional lymph nodes. The final diagnosis is made on the basis of bacteriological research.
Learn how to treat diphtheria conjunctivitis.	Isolate the patient in the infection ward box. Local treatment. Wash the conjunctival SAC with a solution of potassium permanganate or boric acid according to the well-known method. Assign frequent eye washing, instillation of sulfacyl-sodium or antibiotics up to 6 times a day, at night-laying for the eyelids 1% tetracycline ointment or liniment sintomycin. General therapy: prescribe anti-diphtheria serum on a Regular	In case of complications from the cornea, appropriate treatment should be carried out. When the inflammatory phenomena subside, resorption agents are prescribed.

a	b	c
	basis, antibiotics, vitamins A and b complex.	
Learn how to diagnose trachoma.	Consider slides with different stages, complications, and consequences of trachoma. First of all, pay attention to the upper transitional fold of the conjunctiva. The mucous membrane is thickened, hyperemic, in its thickness follicles are defined in the form of deep-seated, gelatinous-turbid, grayish large grains. Follicles can merge. There is an infiltration of the surface layers of the cornea at the limb, which is visible as a film covering the cornea from above and permeated with vessels-pannus.	There is a suspicion of trachoma-there are no clear clinical signs of the disease. Pretragom – initial signs of inflammation, slight hyperemia of the conjunctiva, often expressed infiltration without follicles. Trachoma I – inthe conjunctiva follicles of varying degrees of maturity. Trachoma II-the beginning of degenerative changes in the follicles, there are scars. Trachoma III-spread of conjunctival scarring, single follicles. Trachoma IV-scarring of the conjunctiva.
Learn how to treat trachoma.	Assign the patient 1% tetracycline ointment 3-4 times a day, General therapy with tetracycline and sulfonamides. Treatment combine with the expression of the follicles.	Complications of trachoma are treated surgically. Expression of follicles is carried out no earlier than 2-3 weeks after the onset of the disease.
Learn how to diagnose acute dacryoadenitis.	Examine the patient or person with this disease. Note the swelling, soreness, and hyperemia of the outer part of the upper eyelid. Turn out the upper eyelid. Determine the hyperemia and edema of the conjunctiva of the eyeball in the upper-outer part.	The eyeball can be displaced downwards and inwards, mobility is limited. Regional lymph nodes are enlarged and painful. Fever.
Learn how to treat acute dacryoadenitis.	Assign a dry heat. UHF therapy. Inside sulfonamides, salicylates. Intramuscularly-antibiotics.	With abscess formation – the opening of the abscess with drainage.
Learn to diagnose chronic dacryocystitis.	Find out the patient's complaints about persistent lacrimation, purulent discharge from the eye. When examining the patient, pay attention to lacrimation and bean-shaped protrusion at the medial adhesions of the eyelids. Put pressure on him. Observe the discharge of mucous or purulent	Squeezing the contents from the lacrimal SAC through the lacrimal tubules and points is a cardinal sign of dacryocystitis.

a	b	c
	contents from the lacrimal points.	
Learn how to set up a tubular sample.	Put the tubule sample. Instill a 3% solution of collargol into the conjunctival SAC. Observe the evacuation of the dye.	In chronic dacryocystitis, the tubular test is positive. The eyeball discolors after 2 minutes.
Learn how to set up a tubular sample.	Put a nasal sample. Before instillation of collargol, enter a cotton swab into the lower nasal passage. Watch for the appearance of paint.	A nasal test is considered positive if the paint on the tampon appears after 3-5 minutes. In dacryocystitis, it is negative. After 3-5 minutes, there is no paint on the tampon.
Learn how to wash the lacrimal pathways.	Rinse the lacrimal drainage system. Instill the dicaine into the conjunctival SAC. Insert a conical probe into the tear duct. Remove the probe, and instead enter a blunt cannula, put on a syringe with saline solution. Ask the patient to tilt his head. Enter the solution into the lacrimal drainage system. Watch for its selection.	The conical probe and cannula are inserted without effort, in accordance with the anatomical structure of the lacrimal tubule. Diagnostic probing of the lacrimal-nasal canal is dangerous.
Learn the principles of treatment of chronic dacryocystitis.	Treatment-surgical. Surgery dacryocystorhinostomy.	The principle of the operation is to create a new anastomosis between the lacrimal SAC and the nasal cavity.
Learn how the diagnosis of dacryocystitis of newborns.	Examine the child. Determine the tear state. Press down on the projection of the tear SAC. Watch for the release of the tear points of the content. Put color samples.	The disease manifests itself in the two-month age of the child. If medical treatment was carried out with disinfectant drops, purulent discharge may not be.
Learn how to treat dacryocystitis of newborns.	Fix the child's head. Massage the area of the lacrimal SAC gently pressing your finger in the direction from top to bottom. Assign disinfectant drops.	In the absence of effect from massage resort to probing of the lacrimal-nasal duct.
Learn how to diagnose phlegmon of the lacrimal SAC.	Examine the patient. Note the hyperemia, swelling, and sharp pain in the area of the lacrimal SAC. Captures the swelling of the eyelids, nose and cheek. The eye slit is closed. An abscess may form in the center of the infiltrate.	The disease is accompanied by fever, headache, malaise.

a	b	c
Learn how to treat phlegmon of the lacrimal SAC.	Prescribe intramuscularly antibiotics. Locally-dry heat, UHF. When an abscess is formed, it is opened with drainage.	abscess formation thermal procedures are contraindicated. Timely treatment prevents spontaneous opening of phlegmon.

8. EDUCATIONAL TASK

Find test tasks and situational tasks on the topics of classes in the corresponding collections.

9. MONITORING THE RESULTS OF ASSIMILATION. Produced by tables:

Table of programmed control

Diseases of the eyelids.

Answer the questions according to the selected option.
1. Blepharitis. 2. Barley. 3. Chalazion. 4. Adenocarcinoma of the meibomian gland.

I. Subjective symptoms: *1) itching; 2) absent; 3) local pain in the ciliary body.*
II. Objective symptoms: *1) presence of purulent head in the region of the ciliary edges of the eyelids with redness, swelling, tenderness of the skin around; 2) painful tightly-elastic consistency education age fused with the skin; 3) rough, dense, painless education in the thickness of the century; 4) hyperemia, thickening of the eyelid margin with the presence of scales or crusts at the roots of eyelashes; 5) whitish frothy discharge in the corners of the eyes.*
III. Primary localization of the pathological process: *1) the sebaceous gland at the root of the eyelash; 2) the meibomian gland; 3) the edge of the eyelid.*
IV. Treatment: *1) correction of refractive errors, elimination of adverse endogenous and exogenous factors (focal infection, dust, chemical vapors, etc.); 2) local application of antibiotics, sulfonamides, antiseptic; 3) massage the eyelids for a glass rod; 4) surgical excision of education within healthy tissue with subsequent radiotherapy; 5) physical treatment (UHF, quartz, dry heat); 6) surgical treatment; 7) burning painful on the edge of the century alcohol.*

Diseases of the lacrimal drainage system.

Answer the questions according to the selected option.
1. Pathology of the lacrimal point (narrowing, eversion). 2. Pathology of the lacrimal tubules (stricture, stenosis of the mouth). 3. Chronic dacryocystitis. 4. Acute dacryocystitis (phlegmon of the lacrimal SAC). 5. Dacryocystitis of newborns.

I. Main signs: *1) lacrimation in the room; 2) discharge from the lacrimal points of Muco-purulent discharge when pressed on the area of the lacrimal SAC; 3) hyperemia of the skin, pain, swelling of tissues in the area of the lacrimal SAC; 4) headaches, fever, malaise.*
II. The cause of the disease: *1) atony of the circular muscles of the eyelids; 2) cicatricial changes of the eyelid skin; 3) obstruction of the lacrimal-nasal canal due to the development of stricture; 4) obstruction of the lacrimal-nasal channel due to the membrane in its distal part.*

III. The results of diagnostic studies: *1) positive tubular test with a negative nasal; 2) negative tubular test; 3) lack of patency of the fluid in the nose during diagnostic washing through the lacrimal points; 4) the presence on the x-ray of a clear shadow of the lacrimal SAC filled with a contrast agent.*
IV. Treatment: *1) probing of the lacrimal tubules; 2) massage of the lacrimal SAC, probing of the lacrimal-nasal canal; 3) dacryocystorinostomy; 4) conjunctivodacriostomy; 5) local and General treatment with antibiotics, sulfonamides, physiotherapy (UHF, dry heat); 6) plastic surgery on the eyelid.*

Diseases of the conjunctiva.

Answer the questions according to the selected option.
1. Folliculitis. 2. Follikuliarny acute viral conjunctivitis (adenovirus, herpes, paratrahome). 3. Trachoma. 4. Acute bacterial conjunctivitis (cocci conjunctivitis, Koch-wicks conjunctivitis). 5. Gonococcal conjunctivitis. 6. Diphtheria conjunctivitis. 7. Chronic conjunctivitis.

I. Etiology: *1) adenovirus; 2) Staphylococcus, Streptococcus, pneumococcus; 3) trachoma virus; 4) diphtheria Bacillus; 5) age-related condition or reaction of adenoid tissue; 6) gonococcus; 7) exogenous and endogenous factors; 8) Koch-wicks Bacillus.*
II. Incubation period: *1) 3-4 days; 2) 5-14 days; 3) from a few hours to 1-2 days.*
III. Localization of the main pathological process: *1) conjunctival epithelium; 2) cornea; 3) adenoid layer of the conjunctiva.*
IV. Duration of the disease: *1) months, years; 2) 5-7 days; 3) 2-7 weeks.*
V. Main subjective symptoms: *1) absent; 2) lacrimation, photophobia; 3) purulent discharge; 4) feeling of "sand", clogging; 5) malaise; 6) fever; 7) pain and swelling of parotid lymph nodes.*
VI. The main objective symptoms: *1) there is no discharge; 2) abundant Muco-purulent; 3) minor Muco-purulent; 4) thick greenish pus.*
VII. Conjunctival hyperemia: *1) sharply expressed; 2) absent; 3) expressed moderately; 4) expressed with point hemorrhages; 5) expressed with grayish films; 6) light hyperemia, roughness.*
VIII. Follicles: *1) absent; 2) superficial small pink; 3) large grayish-pink in the depth of the conjunctiva.*
IX. Conjunctival infiltration: *1) absent; 2) moderate; 3) pronounced.*
X. Scars: *1) whitish multiple; 2) absent; 3) extensive on the conjunctiva of the upper eyelid.*
XI. Corneal lesions: *1) subepithelial round infiltrates; 2) absent; 3) diffuse infiltration of the surface layers of the upper part of the cornea with vessels.*
XII. Outcomes: *1) scars in the conjunctiva, corneal opacity; 2) normal conjunctiva, no scars; 3) normal conjunctiva, corneal spot turbidity.*
XIII. Necessary diagnostic laboratory examination: *1) bacterioscopy smear from the conjunctiva of the eyelid; 2) cytological examination of scraping from the conjunctiva of the eyelid; 3) isolation of the pathogen in tissue culture or on chicken embryos.*
XIV. Treatment: *1) is not carried out; 2) local use of antibiotics, sulfonamides, antiseptics; 3) local use of astringents and anemizing agents; 4) use of deoxyribonuclease, gammaglobulin, interferon, interferonogen, kerecide; 5) General use of antibiotics, sulfonamides; 6) elimination of adverse exogenous and endogenous factors; 7) introduction of anti-diphtheria serum.*

XV. Prevention: *1) isolation of cases for the period of acute effects; 2) personal hygiene; 3) prophylactic purpose solutions of antibiotics, sulfonamides, antiseptic persons who were in contact with sick (in the presence of an epidemic outbreak); 4) prophylactic interferon interferonogene of persons who were in contact with sick (in the presence of an epidemic outbreak).*

Diseases of the orbit.

I. Phlegmon of the orbit is: *1) limited inflammation of the orbital tissues; 2) subcostal ulcer of the orbit; 3) spilled purulent inflammation of the orbit fiber; 4) inflammatory process of the orbit fascia.*
II. For phlegmon of the orbit is uncharacteristic: *1) pronounced edema and hyperemia of the eyelids; 2) lack of mobility of the eyeball; 3) chemosis of the conjunctiva; 4) abundant purulent discharge from the eye; 5) General symptoms of intoxication.*
III. The main methods of treatment of phlegmon orbit are: *1) wide opening of the eye socket already in the stage of serous edema; 2) the appointment of vitamin drops; 3) the introduction of large doses of antibiotics; 4) detoxification therapy; 5) the introduction of tetanus serum.*

10. TASK FOR THE NEXT LESSON.

Theme: Diseases of the cornea, sclera and vascular tract of the eye.

Literature: *a) educational literature*

Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p.

Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. /Under the editorship of E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p.

Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - 3rd ed. - M.: GEOTAR-MED. 2013. – 640 p.

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Takhchidi H.P., YartsevaN. S., Gavrilova N.A., Deev L.A. Ophthalmology: textbook. - Moscow: GEOTAR-Media, 2011. – 544 p.

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Krachmer D. Cornea: Atlas / per. with eng. Edited by N.I. Kurysheva. - M., 2007. - 284 p.

Panova I.E. Uveitis: a Guide for physicians. - Moscow: MIA, 2014. - 144 p.

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Sevostyanov E.N., Gorskova E.N. Keratoconus plus. - M., 2006. - 148 p.

11. TASKS FOR INDEPENDENT WORK ON THE TOPIC UNDER STUDY SHOULD BE TAKEN FROM THE COLLECTION OF TASKS FOR INDEPENDENT WORK OF STUDENTS.

Federal state educational institution of higher education " North Ossetian state medical Academy of the Ministry of health of Russia»

Department of otorhinolaryngology with ophthalmology

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TEACHING AIDS

TO PRACTICAL CLASSES FOR MEDICAL STUDENTS FACULTY'S

Practical lesson 5

Topic: Diseases of the cornea, sclera and vascular tract of the eye.

Vladikavkaz 2021

LESSON 5.

1. TOPIC: Diseases of the cornea, sclera and vascular tract of the eye.

2. PURPOSE OF THE LESSON: Learn how to diagnose and treat diseases of the cornea, sclera and vascular tract.

3. TARGETS:

The student should know:	Recommended reading:
• definition of corneal syndrome; • differences between superficial and deep keratitis; • differences in dystrophic, scarring and inflammatory processes in the cornea; • pathogenetically based treatment for the most common keratitis; • connection of local symptoms of corneal lesion with the General condition of the patient, namely with the etiology and pathogenesis of diseases by nosological forms, as well as with congenital changes in the shape of the size and transparency of the cornea; • basics of health, labour and social rehabilitation of patients with diseases of the cornea; • features of sclera pathology in comparison with diseases of other eye membranes; • * congenital abnormalities of the sclera; • clinical manifestations of scleritis; • clinical manifestations of episcleritis; • features of the structure of the vascular membrane, its blood supply and innervation; • abnormalities of the vascular membrane; • clinic and differential diagnosis of iridocyclitis and choroiditis in children and adults; • features of the course of viral, bacterial uveitis, juvenile rheumatoid uveitis; • complex of methods of examination of patients with uveitis; • principles of treatment of uveitis of various etiologies; • the origin of the complications and expected outcome of diseases of the choroid; • terms and principles of treatment of patients with vascular pathology.	*a) educational literature* Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p. Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. /Under the editorship of E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p. Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - 3rd ed. - M.: GEOTAR-MED. 2013. – 640 p. Ruban E.D. Eye diseases: the newest reference book. Rostov-on-don: Phoenix, 2016. – 622 p. Takhchidi H.P., Yartseva N.S., Gavrilova N.A., Deev L.A. Ophthalmology: textbook. - Moscow: GEOTAR-Media, 2011. – 544 p. *b) additional* Krachmer D. Cornea: Atlas / per.with eng. Edited by N.I. Kurysheva. - M., 2007. - 284 p. Panova I.E. Uveitis: a Guide for physicians. - Moscow: MIA, 2014. - 144 p. Polcanova T.I. Semiotics and differential diagnosis of inflammatory diseases of the cornea: a training manual. - Ngma, 2016. - 56 p. Rapuano K.Dzh., Heng V.-D. Cornea: Atlas / per. under the editorship of A. A. Kasparov. - M., 2010. - 160 p. Ratkina N.N. Pathogenesis and conservative treatment of corneal dystrophy. - Moscow, 2008. - 50 s. Sevostyanov E.N., Gorskova E.N. Keratoconus plus. - M., 2006. - 148 p.
The student must be able to:	Recommended literature: The same.

• to diagnose a violation of the integrity of the cornea and to determine its sensitivity; • diagnose and treat the most common forms of keratitis; • to determine the relationship of local symptoms of corneal lesions with the General condition of the patient, namely with the etiology and pathogenesis of diseases by nosological forms; • diagnose congenital changes in the shape size and transparency of the cornea; • to diagnose congenital anomalies of sclera; • diagnose and treat scleritis and episcleritis; • diagnose abnormalities of the vascular membrane; • diagnose and treat iridocyclitis and choroiditis in children and adults.	

4. THE ISSUES EXAMINED EARLIER:

"Microbial and viral infections" - Department of Microbiology and infectious diseases.
"Inflammation" - the Chair of the Patological physiologies.
"Pharmacotherapy" - Department of pharmacology.
"Physiotherapy" - a course of physiotherapy.

5. ПЛАН ПРАКТИЧЕСКОГО ЗАНЯТИЯ:

The stages of the lesson	Technical equipment		Venue
	Equipment	Training AIDS, controls	
а	б	в	г
1. Verification of initial knowledge		Control tasks.	Classroom
2. Instructing the teacher	Table lamps, Ophthalmoscope, slit lamp, electrophthalmoscope, diaphanoscope, echograph, set of medicines, dressing material.	Lesson plan, training tables	Study room, hardware room
3. Самостоятельная работа студентов.	Table lamps, Ophthalmoscope, slit lamp, electrophthalmoscope, diaphanoscope, echograph, set of medicines, dressing material.	Orientation cards, training tables, training tasks.	Study room, hardware room
4. Analysis of results with an assistant (control of learning results).		Control tasks.	Classroom
5. Task for the next lesson.		1.Textbook. 2.Additional literature. 3.Educational and methodical manual.	Classroom

6. TASKS FOR CONTROL OF INITIAL KNOWLEDGE:

1.

Creeping corneal ulcer	Symptoms

2.

Sclerite	Symptoms

3.

Iridocyclitis	Symptoms

7. СХЕМА ОРИЕНТИРОВОЧНОЙ ОСНОВЫ ДЕЙСТВИЯ:

Этапы диагностики и лечения	Средства и условия диагностики и лечения, порядок действия	Критерии самоконтроля
a	b	c
Learn how to diagnose corneal erosion.	Examine the cornea using the sidelight technique and then using a slit lamp. Note the roughness and unevenness of the cornea. The epithelial defect is clearly visible in the slit lamp. To clarify the diagnosis, instill a 1% solution of fluorescein into the eye. Observe the staining of the damaged area of the cornea in green.	Corneal erosion most often occurs after mechanical or chemical effects. Accompanied by photophobia, lacrimation, blepharospasm, feeling of a foreign body under the eyelid, pericorneal injection of the eye.
Learn how to treat corneal erosion.	Assign the patient instillation of 1% solution of quinine hydrochloride, Riboflavin solution 1: 1000, 30% solution of sulfacyl-sodium. Apply ointment applications.	A simultaneous combination of keratoplastics, vitamins and disinfectants is desirable. The criterion of cure is the absence of corneal staining.
Learn how to diagnose the creeping ulcer of the cornea.	Examine the patient or patient with this nosological form. Note the presence of an infiltrate in the center of the cornea or the presence of a characteristic ulcer. Mark the two edges of the ulcer-undercut and smooth. Consider the bottom of the ulcer: whether there is a black bubble. Examine	The undercut edge of the ulcer is progressive – the process is spreading in this direction. The other edge is regressive, gradually clearing and scarring. A black bubble at the bottom of the ulcer-descemetocele, indicates a threatening perforation of the ulcer. In this case, the process can go in 2 directions: the reverse development of

a	b	c
	the anterior chamber of the eye and note the level of pus-hypopion. Note also the blurring of the iris pattern and the change in its color.	ulcers or penetration of infection inside-the development of endophthalmitis or panophthalmitis. The clinic of the disease is characterized by the presence of a specific ulcer, hypopion and iridocyclitis.
Learn how to treat a creeping ulcer corneas.	Hospitalize the patient. With a microbiological loop, take a scrape from the progressive edge of the ulcer and examine the microflora. Assign instillation of 30% solution of sulfacyl-sodium or 0.25% solution of levomycetin every 2-3 hours. Enter an antibiotic under the conjunctiva (preferably taking into account the sensitivity of the flora). Produce dushirovanie progressive edge of the ulcer 1% alcoholic solution of brilliant green. Assign the instillation of hydrochloric acid quinine. Use Mydriatics. Conduct therapy with b vitamins. If there is no effect, perform diathermocoagulation of the progressive edge of the ulcer with the capture of healthy tissue. If the hypopion fills half of the anterior chamber, paracentesis is necessary.	The causative agent of the disease is most often coccal flora. The introduction of an antibiotic is produced either under the lower transitional fold, or under the conjunctiva of the eyeball. The main focus of the accumulation of microorganisms is the progressive edge of the ulcer. Solution quinine promotes epithelialization of the cornea. The introduction of Mydriatics is necessary due to the presence of iridocyclitis in the clinical picture. General restorative treatment is carried out.
Learn how to diagnose hematogenic tuberculous keratitis.	Examine the patient using focal lighting or perform a biomicroscopy of the eye. Note lacrimation, photophobia, and pericorneal injection. Pay attention to the diffuse opacity of the cornea, the presence in the deep and middle layers of yellowish-gray large non-merging foci. Using biomicroscopy, detect mixed vascularization of the eyeball. Conduct tuberculin tests.	The process is sluggish. One eye is usually affected. Remissions alternate with exacerbations. The outcome is unfavorable. Dense scars are formed. Subsequently, it is necessary to resort to keratoplasty. In the diagnosis, the focal reaction in the affected eye to the introduction of tuberculin is very important.
Learn how to treat hematogenic tuberculous keratitis.	Assign the patient a complex of drugs such as streptomycin, PASC, ftivazid, metazid, saluzid and other anti-TB chemotherapy drugs. In severe cases,	Prepatates are prescribed in the form of local and General treatment, in the form of sub-conjunctival injections and electrophoresis, in the form of intramuscular injections or orally.

a	b	c
	recommend tuberculariaceae in terms of TB dispensary. Assign infusions of 10% calcium chloride, vitamin therapy. Corticosteroid medications may be used.	When corneal integrity is violated, corticosteroids are used very carefully. Treatment is advisable to be carried out in conjunction with a phthisiologist.
Learn how the diagnosis of syphilitic parenchyma-tous keratitis.	Examine the patient, try to identify non-ocular signs of congenital syphilis. Pay attention to the cyclical, bilateral lesions, frequent involvement of the vascular tract, the absence of relapses. Try to determine the period of the disease. In the first period mild photophobia and lacrimation. Minor pericorneal injection. Usually the limb in the corneal stroma has a diffuse infiltration of grayish-white color, consisting of dots, dashes and strokes. Note the roughness of the cornea above the infiltrate. In the second period, deep vessels begin to grow into the cornea. There are signs of uveitis. Precipitates are noted. In the third period, there are regressive changes.	Signs of congenital syphilis: getchinson's teeth, saddle-shaped nose, protruding frontal bumps, etc. Distinguish three periods of keratitis: infiltration, vascularization, resorption. Precipitates can destroy the endothelium. In this case, the penetration of moisture into the corneal stroma occurs. After resorption of infiltrate in the cornea can be observed thin desolate vessels. There are atrophic lesions in the iris. There are single or multiple choroidal foci on the fundus.
Learn how to treat parenchymal syphilitic keratitis.	Assign locally mydriatic, solution of dwelt in the of increasing concentration. It is necessary to prescribe corticosteroid drugs in the form of instillations, sub-conjunctival or parabulbar injections. Useful paraffin applications, UHF therapy, sollux, electrophoresis of 1% dionine solution and 3% potassium iodide solution. General therapy is reduced to the appointment of iodine preparations, a solution of penicillin salts. Supplement treatment with the appointment of vitamins B, C, D.	Mydriatics are necessary to provide rest to the anterior parts of the vascular tract. The use of dionine promotes transparent resorption of the infiltrate. Hormones relieve the inflammatory response. Treatment should be carried out in a complex. If as a result of the disease there are persistent corneal opacities that reduce visual acuity, through keratoplasty is shown.
Learn how to diagnose treelike herpetic	This form of viral herpetic keratitis is most common. Examine the patient's eye using	Tree-like keratitis is slow and hard. Often there is a rejection of the regenerated epithelium. In the

a	b	c
keratitis.	focal combined lighting or biomicroscopy. Note the subjective sensations, photophobia, lacrimation, pericorneal injection. When viewed with a slit lamp, identify groups of small bubbles in the epithelium and surface infiltrates of gray color, which form figures in the form of tree branches, fragments of tree branches, fragments of coral, deer horn. In the case of exfoliation of the epithelium, an ulcer is formed, surrounded by a cloudy, raised epithelium. In late terms, there is a sluggish surface epithelization of the cornea. Possible phenomena of iridocyclitis.	diagnosis, the method of immunofluorescence may be crucial.
Learn how to treat herpetic keratitis.	Treatment is complex: 1) the use of antiviral agents; 2) immunotherapy; 3) methods that stimulate the regeneration and trophism of the cornea; 4) physical impact on the inflammatory focus in the cornea; 5) surgical treatment. Assign the patient a solution of kerecide and deoxyribonuclease enzymes in the form of hourly instillations, zovirax ointment or acyclovir. Possible subconjunctival injections of DNase, interferon or interferonogene. It is advisable to combine these drugs with immunotherapy (antiherpetic, anti-acne immune gammaglobulin, dry donor plasma, blood reconvalistentov). Stimulation of the corneal regeneration process and improvement of its trophic is achieved by novocaine perivasal blockades. Assign vitamins of group B. Locally instill citral and Riboflavin. Treatment is carried out against the background of Mydriatics. Stimulate the regeneration	In recent years, Poludan has been used as an antiviral agent with a good effect. Interferonogene stimulate the production of endogenous interferon. In viral keratitis, corticosteroids may be used in the absence of corneal ulceration. In order to enhance the regenerative ability of the cornea, it is advisable to assign pyrimidines inside and locally. To prevent secondary infection, use instillation of sulfacyl-sodium and laying an antibiotic ointment behind the eyelids. Dilation of the pupil prevents the occurrence of posterior synechiae and secondary glaucoma. With progressive ulcerative deep keratitis, therapeutic keratoplasty is indicated.

a	b	c
	of corneal micrometeorological or cryotherapy. If you have severe corneal opacities in the outcome of keratitis, recommend a corneal transplant.	
Learn to diagnose episcleritis and scleritis.	Examine the patient using focal lighting or biomicroscopy. Note the slight pain. Consider the inflammatory focus on the sclera as a bright red spot with a purple tinge and fuzzy borders. It rises above the surface of the shell. Check the mobility of the conjunctiva over the hearth.	In the study, photophobia is almost absent. The inflammatory focus is more often localized between the limb and the equator. Both eyes can be involved in the process. Visual acuity does not suffer. In sclerosis, all signs are more pronounced, the lesion is deeper. The process may involve the cornea and vascular membrane. The disease is prone to relapses. Possible suppuration of the hearth.
Learn how to treat episcleritis and scleritis.	Treatment depends on the etiology of the process. It is necessary to take into account the role of immune factors. Prescribe antibiotics, salicylates, immunosuppressants, antihistamines, heat treatments (UHF therapy, paraffin applications). With suppuration of the hearth, an opening of the sclera abscess is performed.	Gradually, the injection of blood vessels decreases, the foci flatten. In their place are dark ASP-colored thinned scar-altered areas of the sclera. Vision can deteriorate dramatically, sometimes to complete loss.
Learn to diagnose iridocyclitis.	Identify the patient's complaints of aching pain in the eye, increasing at night. Pay attention to photophobia, lacrimation, blepharospasm. External examination shows pericorneal injection of the eyeball, swelling and hyperemia of the eyelids, especially the upper one. Focus on the iris and moisture of the front camera. The fabric of the iris swells, its pattern is blurred. The color of the iris changes. The pupil on the affected side is narrow. Possible adhesions between the pupillary edge of the iris and the anterior capsule of the lens-posterior synechiae. When the pupil expands, they can give it an irregular shape. On the	The iris is isolated from the ciliated body is affected relatively rarely. In case of inflammation, the iris pattern is blurred due to edema and deposition of exudate in the crypts. The color of it also changes due to edema, sharp blood filling of blood vessels, the appearance of exudate with the presence of hemosiderin. Edema and reflex reactions that occur during inflammation contribute to the narrowing of the pupil. Precipitates are formed from falling into the moisture of the anterior chamber of cellular elements, which are glued together by fibrin and gradually settle on the back surface of the cornea. Their color can be white, gray-white, yellow. They can persist for months, or even years. Sometimes precipitates can be

a	b	c
	posterior surface of the cornea there are deposits of white-gray color-precipitates, located in the form of a triangle, directed top up. In the front chamber, there may be turbidity. Sometimes at the bottom of the chamber you can see a strip of pus (hypopion) or blood (hyphema). When palpation of the eyeball is determined by the pain in the projection of the ciliary body. Examine the eye in passing light. Determine the presence or absence of turbidity in the vitreous body. With a pronounced inflammatory process, the entire pupillary edge of the iris may be soldered to the lens, or there may be an enlargement of the pupil. In this case, the iris protrudes anteriorly in the form of a roller. If there is such a picture, measure the intraocular pressure.	deposited on both surfaces of the lens and on the anterior membrane of the vitreous body. Opacity of the vitreous body can be from a small diffuse to coarse flake. Fusion and overgrowth of the pupil leads to a violation of the connection between the back and front cameras. The fluid accumulates in the back chamber of the eye and protrudes the iris forward-the bombed iris. In this case, the front chamber is shallow on the periphery, and deep in the center. There is a secondary glaucoma.
Learn how to treat iridocyclitis.	The first thing instilliruut in the patient's eyes mydriatic. Assign distracting therapy (leeches on the temple, hot foot baths). If there are posterior synechiae, assign fibrinolysin electrophoresis and a mixture of Mydriatics. Conduct a course of physical therapy (UHF, DDT). Instill corticosteroid solutions into the eye 5-6 times a day. Perform sub-conjunctival or parabulbar injections. Assign vitamins b and C, desensitizing agents.	In iridocyclites, Mydriatics create rest for the iris, reduce hyperemia, prevent the formation of posterior synechiae and possible overgrowth of the pupil. If with the help of a single mydriatic to achieve pupil dilation is not possible, they are used in combination. As the inflammatory phenomena subside, resorption therapy is enhanced. All local activities should be carried out against the background of General therapy, taking into account the etiology of the process.
Learn how to diagnose choroiditis.	Find out complaints about a sharp decrease in vision, flashes and lightning in front of the eye (photopsies), distortion of the objects under consideration (metamorphopsies). The patient may complain of poor twilight vision (hemeralopia). To diagnose the disease, use ophthalmoscopy. Inflammatory foci in the choroid	Complaints of pain in the eye, photophobia, lacrimation are absent. The startled eye is calm. Photopsias and metamorphopsia show that the process involved the retina. Rarely choroidal foci are small or very large. Sometimes with choroiditis, hemorrhages are observed. In the thickness of the vascular membrane, they have a reddish-gray or purple hue.

a	b	c
	have different sizes and shapes. Size - from half to one and a half diameters of the optic disc. Fresh foci have indistinct borders and yellowish-gray color. In the future, the focus becomes whitish-gray, becomes more clear boundaries.	
Learn how to treat choroiditis.	Prescribe etiotropic treatment. Local treatment is reduced to retrobulbar injections of antibiotics and corticosteroids.	Choroiditis can be of tuberculous etiology, be a manifestation of brucellosis, toxoplasmosis, rheumatism and viral diseases.

8. EDUCATIONAL TASK

Find test tasks and situational tasks on the topics of classes in the corresponding collections.

9. MONITORING THE RESULTS OF ASSIMILATION. Produced by tables:

Table of programmed control

Diseases of the cornea.

I. The Main function of the cornea: *1) support; 2) the main refractive medium; 3) protective.*
II. The corneal transparency is due to: *1) the parallel arrangement of the plates in the stroma; 2) the absence of blood vessels; 3) the absence of myelin fibers in the nerve endings.*
III. Corneal power source: *1) marginal looped vascular network; 2) anterior chamber moisture; 3) lacrimal fluid.*
IV. The marginal looped network of the cornea is formed by: *1) anterior ciliary vessels; posterior long ciliary vessels; 3) posterior short ciliary vessels.*
V. Corneal innervation: *1) sensitive; 2) sympathetic; 3) parasympathetic.*
VI. Corneal trophy is performed mainly by: *1) sensitive nerve fibers; 2) sympathetic nerve fibers; 3) parasympathetic nerve fibers.*
VII. Anatomical substrate of the corneal infiltrate: *1) altered stroma cells; 2) scar tissue; 3) cells penetrating from the marginal loop network.*
VIII. The defect of the epithelium above the infiltrate is determined using: *1) the method of side lighting; 2) the method of passing light; 3) a fluorescein sample.*
IX. Anatomical substrate of the eyesore: *1) altered stroma cells; 2) scar tissue; 3) cells that penetrate from the marginal loop network.*
X. The most pronounced degree of corneal opacity: *1) cloud; 2) spot; 3) eyesore.*

Diseases of the cornea.

Differential diagnosis.

Nosological units: 1) Marginal surface keratitis;

1. Creeping corneal ulcer;
2. Herpetic tree keratitis;

3. Tuberculosis-allergic keratitis;
4. Discoid keratitis;
5. Parenchymal keratitis.

Symptom of disease.

I. Eyeball injection: *1) conjunctival; 2) pericorneal; 3) mixed; 4) no injection.*
II. The location of the infiltrate in the cornea: *1) Central; 2) near the limb; 3) any part of the cornea.*
III. Infiltrate form: *1) rounded; 2) tree-like; 3) irregular; 4) nodular.*
IV. Localization of infiltrate: *1) in the epithelium; 2) under the epithelium; 3) in the epithelium and surface layers of the stroma; 4) in the stroma.*
V. Infiltrate Color: *1) gray; 2) white; 3) gray-yellow; 4) yellow.*
VI. Infiltrate: *1) with a tissue defect; 2) without a defect; 3) with an ulcer that has a covered edge; 4) stained with fluorescein; 5) not stained with fluorescein.*
VII. Vessels in the cornea: *1) superficial; 2) deep; 3) no vessels.*
VIII. Corneal sensitivity: *1) preserved; 2) reduced; 3) absent.*
IX. The iris and ciliary body: *1) are involved in the process; 2) are not involved.*
X. Exudate in the moisture of the anterior chamber: *1) no exudate; 2) serous; 3) purulent.*
XI. Agents used for the treatment of: *1) sulfonamides; 2) antibiotics; 3) interferon and interferonogens; 4) deoxyribonuclease; 5) kerecide; 6 gamma-globulin.*
XII. Method of application of these funds: *1) instillation; 2) ointments; 3) subconjunctivally; 4) intramuscularly; 5) orally; 6) subcutaneously.*
XIII. Physical methods of treatment: *1) diathermocoagulation; 2) thermocoagulation; 3) iontophoresis.*
XIV. Outcomes – corneal opacity type: *1) cloud; 2) spots; 3) cataract; 4) full transparency.*

Diseases of the vascular tract and ciliary body.

I. Vessels involved in blood supply to the iris and ciliary body: *1) anterior ciliary arteries; 2) posterior long ciliary arteries; 3) posterior short ciliary arteries.*
II. Innervation of the pupil sphincter: *1) sympathetic nerve fibers; 2) parasympathetic nerve fibers; 3) I branch of the trigeminal nerve.*
III. IPupil dilator innervation: *1) sympathetic nerve fibers; 2) parasympathetic nerve fibers; 3) I branch of the trigeminal nerve.*
IV. The natural involvement of the ciliary body in the pathological process of iris inflammation is due to: *1) the proximity of the location; 2) the common blood supply; 3) the common innervation.*
V. The most characteristic complaint encountered in acute iridocyclitis: *1) pain; 2) photophobia; 3) decreased vision.*
VI. The most characteristic complaint that occurs in chronic iridocyclitis: *1) pain; 2) photophobia; 3) decreased vision.*
VII. Symptoms that indicate damage to the iris: *1) precipitates on the posterior surface of the cornea; 2) pupil constriction; 3) opacity of the vitreous body; 4) pericorneal injection.*
VIII. Symptoms that indicate a lesion of the ciliary body: *1) posterior synechiae; 2) pupil constriction; 3) precipitates on the posterior surface of the cornea; 4) pericorneal injection.*
IX. The state of ophthalmotonus that is most common in iridocyclitis: *1) normotonia; 2) hypotonia; 3) hypertension.*

X. The Most common cause of acute iridocyclitis is currently: *1) rheumatism; 2) focal infection; 3) flu.*

XI. The most common cause of chronic iridocyclitis is currently: *1) tuberculosis; 2) brucellosis; 3) sarcoidosis.*

XII. For the treatment of iridocyclitis at a young age, it is better to use: *1) 1% solution of atropine; 2) 0.25% solution of scopolamine; 3) 0.1% solution of epinephrine.*

XIII. For the treatment of iridocyclitis in an elderly person, it is more appropriate to use: *1) 1% solution of atropine; 2) 0.25% solution of scopolamine; 3) 0.1% solution of epinephrine.*

XIV. First of all, a patient with iridocyclitis must: *1) instill Mydriatics; 2) make a perivasal novocaine blockade; 3) prescribe treatment with antibiotics.*

XV. The most common cause of decreased vision in the unfavorable course of iridocyclitis: *1) overgrowth of the pupil; 2) opacity of the vitreous body; 3) secondary glaucoma; 4) complicated cataract; 5) atrophy of the eyeball.*

10. TASK FOR THE NEXT LESSON.

Topic: Diseases of the retina and optic nerve. Ocular manifestations of General pathology of the body.

Literature:

a) educational literature

Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p.

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TEACHING AIDS

TO PRACTICAL CLASSES FOR MEDICAL STUDENTS FACULTY'S

Practical lesson 6

Topic: Diseases of the retina and optic nerve. Ocular manifestations of General pathology of the body.

Vladikavkaz 2021

LESSON 6.

1. **TOPIC:** Diseases of the retina and optic nerve. Ocular manifestations of General pathology of the body.

2. **PURPOSE OF THE LESSON:** Learn how to diagnose and treat diseases of the retina and optic nerve, and learn the main ocular manifestations of common diseases.

3. **TARGETS:**

The student should know:	Recommended reading:
• retinal changes in retinal spasms, embolism, and thrombosis and their treatment; • retinal changes in angiomatosis; • signs of hereditary dystrophies of the retina and their treatment; • clinic for age-related retinal dystrophy and its treatment; • eye changes in retinal detachment and its treatment; • clinical manifestations of congenital optic nerve abnormalities; • diagnostic value identified in ophthalmoscopy of stagnation of the optic nerve, the pathogenesis of stagnation of the optic nerve in intracranial hypertension; • clinic of different stages of stagnant optic disc, the difference between inflammatory edema of the optic nerve in neuritis and non-inflammatory edema in stagnation; • methods of rehabilitation of patients with optic nerve atrophy of various origins; • etiology and pathogenesis of acute circulatory disorders in vessels that feed the optic nerve; • ophthalmic changes in hypertension; • describe the classification of hypertonic changes in the fundus and the most alarming eye symptoms in hypertension; • changes in the fundus in diseases of the cardiovascular system; • eye symptoms in diseases of the Central nervous system; • • changes in the retina in diseases of the blood; • causes of eye symptoms in diseases of the ENT organs and oral cavity; • why is fluorescein angiography of the ocular fundus allows to diagnose subclinical forms of diabetes;	*a) educational literature* Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p. Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. /Under the editorship of E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p. Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - 3rd ed. - M.: GEOTAR-MED. 2013. – 640 p. Ruban E.D. Eye diseases: the latest reference book. Rostov-on-don: Phoenix, 2016. – 622 p. Takhchidi H.P., Yartseva N.S., Gavrilova N.A., Deev L.A. Ophthalmology: textbook. - Moscow: GEOTAR-Media, 2011. – 544 p. *b) additiona* Alpatov S.A. Age-related macular degeneration. 2nd ed., pererab. and additional-M.: GEOTAR-Media, 2015. – 176 p. Katsnelson L.A. Clinical Atlas of fundus pathology. - Moscow: GEOTAR-Media, 2013. - 120 s. Lipatov D.V. Atlas of diabetic retinopathy: a Practical guide for doctors. - Moscow: MIA, 2017. - 64 p. Mozhaytsev B.N. The macula. Age - related and dystrophic changes in the fundus. - Moscow, 2006. - 170 p. Morozov V.I. Diseases of the visual pathway: Clinic. Diagnostics. Treatment. - Moscow: BINOM, 2010. – 680 p. Nikiforov A.S., Guseva M.R. Neuroophthalmology. - M.. 2008. – 624 p. Trukhan D.I., Lebedev O.I. Changes in the organ of vision in diseases of internal organs. - Moscow: Practical medicine, 2014. – 208 p. Tultseva S.N. Retinal vein Occlusions. - Moscow: NTL, 2010. - 112 p.

• ocular symptoms in connective tissue diseases; • changes in the eyes when the function of the thyroid or parathyroid glands is impaired; • eye changes in infectious diseases; • eye damage in congenital metabolic disorders; • absolute eye indications from the woman for termination of pregnancy.	
The student must be able to: • assign adequate therapy for spasms, embolism, thrombosis of retinal vessels; • prescribe treatment for hereditary retinal dystrophy; • prescribe early treatment for age-related retinal dystrophy; • prescribe timely treatment for retinal detachment; • interpret ophthalmoscopy data for differential diagnosis of neuritis and congestive optic disc; • treat patients with various types of optic nerve atrophy; • provide emergency care for acute disorders in the vessels that feed the optic nerve; • apply in practice the knowledge of eye symptoms in General diseases of the body.	Recommended literature: The same.

4. THE ISSUES EXAMINED EARLIER:

"Cardiovascular pathology, kidney diseases and bronchopulmonary pathology, blood diseases, connective tissue diseases, beriberi" - Department of therapy.
"Diseases of the Central nervous system" - Department of neurology.
"Diseases of ENT organs" - Department of otorhinolaryngology.
"Diseases of the oral cavity" - Department of dentistry.
"Diseases of the endocrine system, metabolic disorders" - Department of endocrinology.
"Infectious diseases" - Department of infectious diseases.
"Tumors" - Department of Oncology.

5. PLAN OF PRACTICAL CLASSES

The stages of the lesson	Technical equipment		Venue
	Equipment	Training manuals, controls	
a	b	c	d
1. Instructing the teacher		Lesson plan.	Classroom
2. Check the source of the knowledge	Models, tables.	Control tasks.	Classroom

a	b	c	d
3. Independent work of students	Rota apparatus, perimeter, table lamp, Ophthalmoscope, slit lamp, exophthalmometer, echoophthalmograph, diaphanoscope, medication kit.	Table, indicative of the card.	Classroom
4. Analysis of results with an assistant (control of learning results).		Control tasks.	Classroom
5. Task for the next lesson.		1. Textbook. 2. Additional literature. 3. Educational and methodical manual.	Classroom

6. TASKS FOR CONTROL OF INITIAL KNOWLEDGE:

1.

Central serous chorioretinitis	Symptoms
	1.

2.

Retinal detachment	Symptoms
	1.

3.

Optic neuritis	Symptoms
	1.

4.

Congestive optic disc	Symptoms
	1.

5.

Acute circulatory disorder in the Central retinal artery	Symptoms
	1.

6.

Advanced diabetic retinopathy	Symptoms
	1.

7. OUTLINE OF THE APPROXIMATE BASIS OF THE ACTION:

Stages of diagnosis and treatment	Means and conditions of diagnosis and treatment, procedure of action	Self-control criteria
a	b	c
Learn how to diagnose renal retinopathy.	Collect medical history. Check the patient's visual acuity. Explore the field of view, explore the presence of cattle. Perform an ophthalmoscopy or review a slide with this pathology. Pay attention to the optic disc, the stroke and caliber of the vessels, and the retinal tissue.	Retinal lesions are noted in long-term glomerulonephritis and a wrinkled kidney. There is a decrease in visual acuity. The narrowing of the field of view, scotoma, is determined. A stagnant optic disc may be visible on the fundus of the eye. There is a narrowing and uneven gauge of the retinal arteries. In the Central and peripheral areas of the fundus, there are small pockets of different sizes, and in the area of the yellow spot, the foci resemble the figure of a star. In the course of blood vessels-hemorrhages.
Learn the principles of treatment of renal retinopathy.	It is necessary to stop the inflammatory process in the kidneys. Locally assign vitamins A, C, B group, angioprotectors, oxygen.	The basis of therapy is the treatment of renal pathology. Under the influence of treatment, changes in the fundus can be significantly reversed.
Learn how to diagnose diabetic retinopathy.	Collect medical history. Examine your visual acuity and field of view. Perform an ophthalmoscopy or review a slide with this pathology. Pay attention to the optic disc, the stroke and caliber of the vessels, and the retinal tissue.	The involvement of the retina occurs more often with prolonged duration of diabetes. Depending on the severity of the changes, acuity and field of vision suffer. There are hemorrhages of different intensity and location. The retina is swollen and cloudy. The disk has similar changes. There are solid yellowish-white waxy exudates in the retinal tissue.
Learn the principles of treating diabetic retinopathy.	First of all, it is necessary to normalize the level of glucose in the blood. Assign anti-sclerotic agents, vitamins B1, P, E, hormones, lipocaine, anticoagulants of direct and indirect action, enzymes and coenzymes, tissue preparations, oxygen therapy, angioprotectors, antioxidants. In the initial stages, laser coagulation is used. For proliferative retinopathy, a vitrectomy with an endolaser is performed.	The main treatment is with an endocrinologist. Ophthalmologists perform symptomatic treatment: strengthening of the vascular wall, antioxidant therapy, fighting hemorrhages and proliferative syndrome. Diabetic retinopathy is one of the main causes of blindness.

a	b	c
Learn how to diagnose hypertensive retinopathy.	Collect medical history. Examine your visual acuity. Perform an ophthalmoscopy or review a slide with this pathology. Pay attention to the optic disc, the stroke and caliber of the vessels, and the retinal tissue.	Distinguish between phase changes in the retina: angiopathy, angiosclerosis, the angioretinopathia, angioneiropatia. In stage I - uneven vessel gauge, Gwist symptom, Salus- Gunn symptom I. in stage II: Salus-Gunn symptom II-III, symptoms of "copper" or "silver" wire. In stage III: in addition to the above symptoms, there are edema, hemorrhages and white foci, it is possible to form a star shape in the macular region. In stage IV: the optic nerve is involved in the process, its swelling develops, sometimes-a stagnant disk.
Learn the principles of treatment of hypertensive retinopathy.	Treatment of changes in the fundus consists mainly in the normalization of blood pressure. Local treatment is symptomatic.	In the initial stages of the disease, the changes are reversible. In the future, the manifestation of atrophic processes is possible.
Learn how to diagnose rheumatic retinopathy.	Collect medical history. Examine the visual acuity, field of view. Perform an ophthalmoscopy or review a slide with this pathology. Pay attention to the optic disc, the stroke and caliber of the vessels, and the retinal tissue.	During ophthalmoscopy seen of the phenomenon of retinovascular. Vessels in the area of the optic disc may be affected, and retinal vascular thrombosis may develop. There is a concentric narrowing of the field of view.
Learn how to treat rheumatic retinopathy.	It is necessary to stop the active rheumatic process. Assign locally-salicylates, glucocorticoids. Conduct therapy with angioprotectors, vitamins.	Active and early treatment often causes the process to reverse and restore vision.
Learn how to diagnose leukemic retinopathy.	Collect medical history. Examine your visual acuity. Perform an ophthalmoscopy or review a slide with this pathology. Pay attention to the optic disc, the stroke and caliber of the vessels, and the retinal tissue.	The picture of the fundus is characterized by a General paleness and yellowish background color. Tortuosity and vasodilatation appear. Hemorrhages in severe leukemia can be massive preretinal, often in the Central zone, and then significantly reduced visual acuity. Perhaps the appearance of focal opacities in the vitreous body. The pressure of infiltrates on the optic nerve and an increase in intracranial pressure lead to the appearance of a stagnant optic disc, and changes in the eye socket lead to exophthalmos. Diplopia and limited eye mobility may appear. The process

a	b	c
		is often two-way. To clarify the essence of the process, a blood test (hemogram) and bone marrow (sternal puncture) are always shown.
Learn the principles of treatment for leukemic retinopathy.	Treatment should be General and intensive (cytostatics, glucocorticoids), which often leads to resorption of exudate and hemorrhages with simultaneous restoration of eye functions.	Relapses of the disease can again affect the condition of the eyes and worsen vision.
Learn how the diagnosis of periflebit the Eels'.	Collect medical history. Examine your visual acuity. Perform an ophthalmoscopy or review a slide with this pathology. Pay attention to the optic disc, the stroke and caliber of the vessels, and the retinal tissue.	Occurs in adolescence and older age. It is characterized by a sudden decrease in visual acuity due to hemorrhages in the vitreous body. Along the periphery of the fundus, altered convoluted, clear-cut veins are detected, and perivasal couplings appear. Relapses are frequent.
Learn the principles of treatment of periflebit the Eels'.	Assign vasoconstrictors (ascorutin, angioprotectors, etc.), as well as tools that contribute to the resorption of the process (enzymes – lekozim, papain, potassium iodide, Ethylmorphine hydrochloride, oxygen, etc.).	Treatment is aimed at improving the General condition and eliminating certain pathological changes in the body. In recent years, laser, photo, and cryocoagulation of areas with altered retinal veins have been used with favorable results.
Learn how to diagnose retinal pigment degeneration.	Collect medical history. Explore visual acuity, field of view, and dark adaptation. Perform an ophthalmoscopy or review a slide with this pathology. Pay attention to the optic disc, the stroke and caliber of the vessels, and the retinal tissue.	The narrowing of the field of view borders and a sharp decrease in dark adaptation are determined. On the periphery of the fundus of the eye, "bony corpuscles" are found – black pigmented process formations. Gradually, the number of them increases, they become large in size, sometimes merge into conglomerates and more and more close to the center of the fundus. At the same time, peripheral vision deteriorates to "tubular" vision, and the ability to navigate at dusk is lost. The disc of the optic nerve atrophies, its color from pink to yellowish. The retinal vessels are narrowed, sklerosiruta. The process of bilateral, congenital, hereditary, and irreversible.

a	b	c
Learn how to treat retinal pigment degeneration.	Assign the patient a complex of vitamins (C, PP, E, group B, etc.), vasodilators, anticoagulants of direct and indirect action, metabolic steroids. Effective injections under the conjunctiva of ATP, oxygen, ENCAD drugs, DNA, taufon. Laser coagulation and surgical retinal revascularization are possible.	All these complex measures often delay the progression of the process for many years and help to improve visual functions.
Learn how to diagnose acute obstruction of the Central retinal artery.	Collect medical history. Examine your visual acuity. Perform an ophthalmoscopy or review a slide with this pathology. Pay attention to the optic disc, the stroke and caliber of the vessels, and the retinal tissue.	Occurs mainly in rheumatic endocarditis. Often caused by hypertension, the decay of cancer, a disease, etc. Can be sudden, complete blindness in one eye or reduced vision and sectoral field loss, usually in one eye. Sharply narrowed arteries are visible on the eye area, large trunks seem to be thin threads, and small ones are often impossible to see at all. The vein gauge does not change noticeably. The retina around the disc, the spots turn milky white. On this muddy background, a cherry-red spot is clearly visible in the Central fossa-a symptom of a"cherry stone". It is explained by the fact that the retina is very thin in the Central fossa, through which the bright red vascular membrane clearly shines, which stands out especially sharply against the background of the milky white retina. The optic disc gradually pales and atrophies.
Learn how to treat acute obstruction Central retinal artery.	Immediately assign vasodilators and antispasmodic agents: inhalation of amyl nitrite Carbogen inside nitroglycerin; 0.1% solution of atropine sulfate retrobulbarno; intramuscularly sodium nitrate according to the scheme with a gradual increase in concentration; intramuscularly 1 % solution of nicotinic acid; inside eufillin, no-shpa,	Despite the treatment, it is quite rare to improve visual functions. As a rule, they remain low.

a	b	c
	nigexin, papaverine, Dibazol, etc. Apply direct-acting anticoagulants. Then they replace it with anticoagulants of indirect action. Appropriate osmotherapy. Assign funds that promote resorption, vitamins, ATP, cocarboxylase.	
Learn how to diagnose Central retinal vein thrombosis.	Collect medical history. Examine your visual acuity. Perform an ophthalmoscopy or review a slide with this pathology. Pay attention to the optic disc, the stroke and caliber of the vessels, and the retinal tissue.	The disease develops mainly in the elderly. Develop gradually. Typical photopsias, decreased vision. The optic disc and retina are swollen. The vessels disappear in the edematous tissue. Veins are dilated, twisted. Polymorphic hemorrhages all over the retina. Hemophthalmos may be observed.
Learn how to treat Central retinal vein thrombosis.	Prescribe anticoagulants under the control of blood and urine tests. To prevent bleeding at the same time as anticoagulants, also prescribe means that strengthen the vascular wall and give it elasticity – rutin and ascorbic acid, angioprotectors. Widely used medical leeches that produce hirudin, dissolving the blood clot. Assign vitamins A, B6 B2, iodine preparations, fibrinolysin, lipotropic agents. Successfully used drugs such as lekozim, papain, streptodekaza, and laser photocoagulation.	It is possible to improve visual functions to a large extent. A very serious complication of vein thrombosis is secondary glaucoma.
Learn how to diagnose retinal detachment.	Collect complaints and anamnesis. Explore the acuity and field of view. Perform a passing light examination, ophthalmoscopy, and ultrasound.	The disease has a different origin: injuries, high myopia, and other Complaints of reduced vision are caused by the localization of the detachment and its prevalence. When examining the field of vision, narrowing or loss of it is detected. A prerequisite for retinal detachment is its rupture, which can be of various sizes. In the transmitted light, a pale

a	b	c
		or grayish reflex from the fundus is detected in the area of retinal detachment. The detached retina is visible in the form of a gray bubble during ophthalmoscopy. Echobiometry provides clear indications of the location, area, and height of retinal detachment.
Learn how to treat retinal detachment.	For flat detachment, photo -, laser -, cryo -, diathermocoagulation of the edges and areas of retinal rupture are preferred. With high vesicular retinal detachment, especially with an altered vitreous body, a variety of complex scleroplastic operations or vitreous operations are shown to ensure complete closure of the retinal defect.	Repeated operations are often required. Even successfully completed operations may not restore high acuity and normal peripheral vision. This can be due to dystrophic changes in the retina. However, even for the sake of obtaining minimal vision, if there are no contraindications, you should operate on a patient with retinal detachment.
Learn how to diagnose optic neuritis.	Collect complaints and anamnesis. Explore the acuity and field of view, color perception. Perform an ophthalmoscopy or review a slide with this pathology. Pay attention to the optic disc, the course and caliber of the vessels.	The disease is characterized by a rapid and significant drop in acuity and visual field impairment, and a deterioration in color perception. Ophthalmoscopically determined hyperemia of the disk, blurring of its borders, expansion of veins, sometimes exudate in the course of blood vessels and in the vascular funnel. There may be hemorrhages in the disc tissue, as well as the retina.
Learn how to treat optic neuritis.	Prescribe antibiotics, sulfonamides, dehydration therapy, vitamins, glucocorticoids in the form of forced instillations and parabulbarno. Use distraction tools such as hot foot-baths, dry-heat baths. With a decrease in acute events, assign vasodilators, as well as biogenic stimulants. Treatment of neuritis should be long-term. Shown by the introduction of electro - and phonophoresis of vitamins, adenosine triphosphate, etc.	In case of sinus disease, high tamponades of the middle nasal passage with a solution of cocaine and epinephrine are necessary. Intracranial neuritis is subject to both conservative and surgical treatment.

a	b	c
Learn how to diagnose a congestive optic disc.	Collect complaints and anamnesis. Explore the acuity and field of view. Perform an ophthalmoscopy or review a slide with this pathology. Pay attention to the optic disc, the course and caliber of the vessels.	It is caused, as a rule, by an increase in intracranial pressure. Occurs in connection with the presence of volume processes in the brain, hydrocephalus, as well as with skull trauma, tumors and trauma to the eye socket, etc. the Ophthalmoscopic picture is diverse and dynamic. In the initial stage, there is hyperemia and blurring of the outlines of the nasal part of the optic nerve disk. Later, the edema engulfs the temporal zone. There is swelling of the entire disc tissue. The disk can take such dimensions that it does not fit in the field of view even with an enlarged pupil, and it will stand sharply above the level of the retina for 2-3 mm in the form of a mushroom. Vessels sometimes sink into edematous tissue, veins are significantly expanded and twisted, arteries are narrow, and hemorrhages may appear. Visual functions are usually reduced very little and the blind spot is mostly increased.
Learn how to treat a congestive optic disc.	Assign dehydration, anti-inflammatory and desensitizing therapy. Refer the patient to the neurological Department.	Treatment of this pathology is the prerogative of neuropathologists and neurosurgeons. Possible atrophy of the optic nerve.
Learn how to diagnose optic nerve atrophy.	Collect complaints and anamnesis. Explore the acuity and field of view. Perform an ophthalmoscopy or review a slide with this pathology. Pay attention to the optic disc, the course and caliber of the vessels.	It occurs as a result of inflammatory or stagnant phenomena, and is always accompanied by a decrease in acuity and narrowing of the boundaries of the field of vision up to blindness. In addition, atrophy of the optic nerve can be congenital, as well as occur due to intoxication. A funduscopic examination is marked pallor of the disc and narrowing of the blood vessels. According to the state of the disk boundaries, optic nerve atrophy is divided into primary or simple (the disk boundaries are clear) and secondary (the disk boundaries are blurred).
Learn how to treat optic nerve atrophy.	Assign vasodilating and improving trophic processes means: nicotinic acid, priscol, ENCAD, no-shpu, Dibazol, b vitamins, glucose, pyrogenal, ginseng root,	The treatment performed in many ways allows you to preserve and sometimes improve the existing visual functions.

a	b	c
	Eleutherococcus extract, as well as autohemotherapy, blood transfusions; oxygen, ultrasound, laser, reflexology, etc.	

8. EDUCATIONAL TASK

Find test tasks and situational tasks on the topics of classes in the corresponding collections.

9. MONITORING THE RESULTS OF ASSIMILATION. Produced by tables:

Table of programmed control

Theme: Diseases of the retina

I. For renal retinopathy, it is not typical: *1) narrowing of the retinal arteries; 2) the "silver wire" symptom; 3) the Gwist symptom; 4) the Salus-Hun symptom.*

II. What retinal changes are not typical for hypertensive retinopathy*? 1) Gwist symptom; 2) Salus-Gunn symptom; 3) "silver wire" symptom; 4) congestive optic disc; 5) "copper wire"symptom.*

III. Which of the symptoms is most characteristic of rheumatic changes in the fundus? *1) narrowing of the arteries; 2) Salus-Gunn symptom; 3) the presence of "clutches" around the vessels; 4) atrophy of the optic nerve.*

IV. For reasons of vision loss in diabetes, it is unusual: *1) diabetic retinopathy; 2) diabetic complicated myopia; 3) diabetic complicated cataract; 4) hemophthalmos; 5) traction retinal detachment.*

V. For retinal pigment degeneration is not typical: *1) narrowing of the field of vision; 2) violation of dark adaptation; 3) a sharp deterioration in color perception; 4) the presence of pigment deposits in the form of "bone bodies".*

VI. What is the main cause of retrolental fibroplasia? *1) prematurity of the child; 2) intrauterine diseases; 3) diseases of the mother during pregnancy; 4) increased oxygenation of the child after birth; 5) congenital pathology.*

VII. For acute obstruction of the Central retinal artery, it is unusual*: 1) sudden loss of vision; 2) the occurrence of sharp pain in the depth of the eye; 3) opacity of the retina; 4) the presence of massive hemorrhages in the retinal tissue; 5) the symptom of "cherry stone".*

VIII. When the Central retinal vein thrombosis is not observed: *1) retinal detachment; 2) retinal hemorrhage; 3) sharp pain in the depth of the eye; 4) sharp expansion of the veins; 5) edema of the optic nerve disk.*

IX. For the clinical picture of retinal detachment, it is unusual: *1) the presence of a gray veil-like film on the background of a red reflex; 2) a change in the color and shape of blood vessels;3) an increase in intraocular pressure;4) the presence of a narrowing of the field of vision;5) the presence of a retinal tear.*

X. What type of treatment is not used to treat retinal detachment?*1) vitrectomy; 2) sclera filling; 3) keratoplasty; 3) laser coagulation; 4) cryopexy.*

Topic: Diseases of the optic nerve and orbit.

I. What visual functions in optic neuritis should be investigated first? *1) visual acuity; 2) color perception; 3) field of view; 4) light perception; 5) binocular vision.*
II. What changes in the fundus are unusual for optic neuritis? *1) hyperemia of the optic disc; 2) vasodilation; 3) paling of the optic disc; 4) blurring of the borders of the optic disc; 5) filling of the vascular funnel of the disc with exudate.*
III. What therapy should be prescribed to a patient with optic neuritis in the first place? *1) vitamin; 2) anti-inflammatory; 3) vasodilator; 4) dehydration; 5) tissue.*
IV. What changes in the fundus are characteristic of the initial stages of retrobulbar neuritis? *1) hyperemia of the optic disc; 2) paling of the optic disc; 3) no visible changes; 4) blurring of the borders of the optic disc; 5) filling of the vascular funnel of the disc with exudate.*
V. Congestive optic disc is usually determined in patients with: *1) intracranial hypertension; 2) arterial hypertension; 3) diabetes mellitus; 4) glaucoma; 5) volumetric processes of the brain.*
VI. Who should carry out the main treatment of patients with congestive disks of optic nerves? *1) ophthalmologist; 2) therapist; 3) endocrinologist; 4) neurosurgeon; 5) otorhinolaryngologist.*
VII. For atrophy of the optic nerve, uncharacteristic symptoms are: *1) hyperemia of the optic nerve disk; 2) paleness of the optic nerve disk; 3) vasodilatation; 4) narrowing of the vessels; 5) the presence of pain in the eye.*
VIII. Phlegmon of the orbit is: *1) limited inflammation of the orbital tissues; 2) subcostal abscess of the orbit; 3) spilled purulent inflammation of the orbital fiber; 4) inflammatory process of the orbital fascia.*
IX. For phlegmon of the orbit, it is unusual: 1*) pronounced edema and hyperemia of the eyelids; 2) lack of mobility of the eyeball; 3) conjunctival chemosis; 4) abundant purulent discharge from the eye; 5) General symptoms of intoxication.*
X. The Main methods of treatment for phlegmon of the orbit are: *1) wide opening of the eye socket already in the stage of serous edema; 2) the appointment of vitamin drops; 3) the introduction of large doses of antibiotics; 4) detoxification therapy; 5) the introduction of tetanus serum.*

10. TASK FOR THE NEXT LESSON.

Topic: Diseases of the lens and vitreous body. Physiology and pathology of intraocular pressure. Glaucomas.

Literature: *a) educational literature*

Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p.

Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. /Under the editorship of E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p.

Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - 3rd ed. - M.: GEOTAR-MED. 2013. – 640 p.

Ruban E.D. Eye diseases: the latest reference book. Rostov-on-Don: Phoenix, 2016. – 622 p.

Takhchidi H.P., Yartseva N.S., Gavrilova N.A., Deev L.A. Ophthalmology: textbook. - Moscow: GEOTAR-Media, 2011. – 544 p.

b) additional

Aznabaev B.M. Ultrasonic cataract surgery-phacoemulsification. - Moscow: August Borg,2005. - 136 p.

Aznabaev R.A. Secondary implantation of posterior chamber intraocular lenses in children. - Ufa: Ufa, 2009. 120 p.
Charles Steve. Microsurgery of the vitreous body and retina. Moscow: Medpress, 2012. - 400 p.
Chen T. Glaucoma Surgery. Moscow: Logosphere, 2013. 320 p.
Egorov E.A. Glaucoma. National leadership. - Moscow: GEOTAR-Media, 2014. 824 PP.
Evgrafov V.Yu., Batmanov Yu.E. Cataract. - Moscow, 2005. – 368 p.
Nesterov A.P. Glaucoma.ed.2nd-M.: Medical news Agency, 2014. - 360 sec.
Nechiporenko P.A. Medical treatment of glaucoma translation from English. - Moscow: N-L, 2014. – 384 p.
Takhchidi H.P., Egorova E.V., Tolchinskaya A.I. Intraocular correction in surgery of complicated cataracts. - Moscow, 2004. – 176 p.
Volkov V.V. Open-angle Glaucoma. - Moscow, 2008. – 352 p.

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TEACHING AIDS

TO PRACTICAL CLASSES FOR MEDICAL STUDENTS FACULTY'S

Practical lesson 7

Topic: Diseases of the lens and vitreous body.

Vladikavkaz 2021

LESSON 7.

1. **TOPIC:** Diseases of the lens and vitreous body.

2. **PURPOSE OF THE LESSON:** Learn how to diagnose and treat diseases of the lens and vitreous body. Learn how to perform a point correction of afakia. To form concepts about methods of correction of aphakia.

3. **TARGETS:**

The student should know: • what is the lens normally, with abnormalities of its development and diseases; • how does the lens grow over the course of a person's life, thereby ensuring a stable Central position of the lens; • in which parts of the lens changes are observed in different clinical forms of cataract; • what types of cataracts are distinguished; • what methods can be used to examine the lens; • definition of cataract; • methods for the treatment of cataract; • definition of aphakia; • ways to correct aphakia; • anatomical features of the vitreous body; • explain the appearance of ocular symptoms in diseases of the vitreous body; • know abnormalities of the vitreous body and conduct differential diagnostics with tumor and inflammatory processes.	Recommended reading: *a) educational literature* Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p. Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. /Under the editorship of E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p. Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - 3rd ed. - M.: GEOTAR-MED. 2013. – 640 p. Ruban E.D. Eye diseases: the latest reference book. Rostov-on-don: Phoenix, 2016. – 622 p. Takhchidi H.P., Yartseva N.S., Gavrilova N.A., Deev L.A. Ophthalmology: textbook. - Moscow: GEOTAR-Media, 2011. – 544 p. *b) additional* Aznabaev B.M. Ultrasonic cataract surgery-phacoemulsification. - Moscow: August Borg, 2005. - 136 p. Aznabaev R.A. Secondary implantation of posterior chamber intraocular lenses in children. - Ufa: Ufa, 2009. 120 p. Evgrafov V.Yu., Batmanov Yu.E. Cataract. - Moscow, 2005. – 368 p. Takhchidi H.P., Egorova E.V., Tolchinskaya A.I. Intraocular correction in surgery of complicated cataracts. - Moscow, 2004. – 176 p. Charles Steve. Microsurgery of the vitreous body and retina. Moscow: Medpress, 2012. - 400 p.
The student must be able to: • inspect the lens, using techniques of lateral illumination, transmitted light and biomicroscopy; • diagnose various types of cataracts; • treat incipient cataracts; • to diagnose the aphakia and make it a spectacle correction; • to diagnose artificiu; • diagnose and treat vitreous opacity.	Recommended reading: The same.

4. THE ISSUES EXAMINED EARLIER:

"Anatomy of the lens and vitreous body" - Department of normal anatomy.
"Protein metabolism in the body" - Department of biochemistry.
"Optical apparatus of the eye. Pressure " - Department of physics.
"Inflammation" - the Chair of the Pat. physiologies.
"Pharmacotherapy" - Department of pharmacology.
"Local and General anesthesia, antiseptics and aseptics" - Department of General surgery.

5. PLAN OF PRACTICAL CLASSES:

The stages of the lesson	Technical equipment		Venue
	Equipment	Training manuals, controls	
1	2	3	4
1. Check the source of the knowledge		Control tasks.	Study room
2. Instructing the teacher	Table lamp, slit lamp, a set of test eyeglass lenses, electrooculogram, hoopcharmer, gonioscopy, goniolens, elastotonometry Filatov-Kalfa, perimeter, electronic tonograph, medical kit, bandages, slides, slider.	Lesson plan, study tables, slides, slider.	Study room, hardware room
3. Independent work of students	The same as in paragraph 2.	Orientation cards, training tables, training tasks, clinical material.	Study room, hardware room
4. Analysis of results with an assistant (control of learning results).		Control tasks.	Study room
5. Task for the next lesson.		1.Textbook. 2.Additional literature. 3.Educational and methodical manual.	Study room

6. TASKS FOR CONTROL OF INITIAL KNOWLEDGE:

1.

Immature cataract	Symptoms
	1.

2.

Birth defects of the lens	Names
	1.

3.

Aphakia	Methods of correction
	1.

7. OUTLINE OF THE APPROXIMATE BASIS OF THE ACTION:

Stages of diagnosis and treatment	Means and conditions of diagnosis and treatment, procedure of action	Self-control criteria
a	b	c
Learn how to diagnose an incipient cataract.	Find out the patient's complaints. Determine visual acuity. To examine the front segment of the eye, use the side lighting technique. Pre-install a short-term mydriatic in the eye. To study the transparency of the lens, use the technique of studying in transmitted light. Perform a lens biomicroscopy.	Some patients note "flies" in front of their eyes, polyopia, and deterioration of vision in the distance. On the black background of the pupil, spicelike opacities of gray color are visible, with the tops directed to the center. Against the background of the red reflex of the pupil, the above-described opacities appear black. Water slits and lamellar dissociation of fibers are observed in the lens.
Learn how to treat an incipient cataract.	Prescribe vitamin-containing drops that improve the metabolism of the lens to the patient. Recommend taking a complex of geriatric vitamins.	In cataracts, the patient has a violation of both local and General metabolic processes. Treatment contributes to the absence of disease progression.
Learn how to diagnose immature cataracts.	Find out the patient's complaints. Determine visual acuity. Using the technique of focal lighting, examine the pupil area. Carefully examine the lens opacities. Note the depth of the anterior chamber of the eye, as well as the shadow of the iris on the lens. Perform a lens biomicroscopy. Observe the transparency of the fibers, consider the water slits. Try to conduct research in passing light.	Complaints about a sharp decrease in vision, up to light perception. In side lighting, the lens is gray-white. You can see the semilunar shadow of the iris on the deep cloudy layers of the lens. Swelling of the lens leads to a decrease in the depth of the anterior chamber of the eye. Biomicroscopy shows that some of the fibers remain transparent. The number of water slots increases, they are filled with detritus. When examined in passing light, a dim red reflex is sometimes detected.

a	b	c
Learn how to diagnose mature cataracts.	Find out the patient's complaints. Determine visual acuity. Use the side lighting technique for inspection. Examine the pupil area. Using biomicroscopy, carefully examine the lens.	Complaints about a sharp decrease in vision, up to light perception. In side lighting, the front camera is of normal depth. Clouding of the lens of a homogeneous, dirty-gray color. There is no shadow from the iris. Biomicroscopically, opacities capture almost the entire lens.
Learn how to diagnose an overripe cataract.	Find out the patient's complaints. Determine visual acuity. Use the side lighting technique. Examine the pupil area. Using biomicroscopy, carefully inspect the lens. Do the research in passing light.	Complaints about low vision, although in some cases, object vision may appear. Is there a lens in side lighting? as if filled with milk. When resorption of lens masses, the dense core descends downwards, and in rare cases it resolves. In biomicroscopy, all changes in the lens are homogeneous. In the later stages of lens resorption, a red reflex appears.
Learn the principles of treating immature, mature, and overripe cataracts.	Explain the essence of the disease to the patient. Tell us about the principles of cataract treatment.	The main method of treatment is surgical cataract extraction. It is performed in two main types – intra- and extracapsular.
Learn how to diagnose and correct aphakia.	Examine the operated eye of the patient using the technique of side lighting. Note the depth of the anterior chamber of the eye and the iris. Use biomicroscopy to examine these formations. Determine the presence of Purkinje figures. In a dark room, put a candle in front of the patient. Observe the reflection of the candle flame on the structures of the eye. Use skiascopy or refractometry. Determine the type and degree of refraction of the eye. Perform ametropia correction using a well-known technique.	When viewing the aphakic eye, side lighting determines the recess of the anterior chamber, the tremor of the iris, and sometimes the presence of a postoperative coloboma of the iris. Biomicroscopic examination of the optical section allows you to determine the absence of the lens. When studying Purkinje figures with a candle, you can see one or two reflections of the candle (instead of three) in afakia. When examining the refraction of the eye, as a rule, hypermetropia is determined in 10-12 D. Quite often, the optical part of the artificial lens can be observed in the pupil area.
Learn how to diagnose turbidity vitreous.	Use eye examination in passing light. Watch in the background red reflex from the fundus moving or partially fixed dark-colored opacities. In some cases,	In case of destructive changes of the vitreous body opacities are often local in nature and move when the eye moves. Diffuse opacification of the vitreous body or

a	b	c
	you can observe a weakening of the reflex or its absence. Run the study of the vitreous in the mydriasis. Determine the structural changes in the vitreous body.	partial hemophthalmos give a weakening of the red reflex from the fundus. With total opacity of the vitreous body, for example, with complete hemophthalmia, there is no reflex from the fundus.
Learn how to treat opacity of the vitreous body.	When hemorrhage into the vitreous assign dicynonum, fibrinolysin, autohaemotherapy, of the enzyme. Vitamin therapy and enzyme therapy are also indicated for destructive changes of the vitreous body. Electrophoresis and ultrasound therapy are useful.	Small hemorrhages in the vitreous body are quite well resolved. Transparency is restored even with minor destructive changes. For severe lesions of the vitreous body, surgical treatment is necessary – vitrectomy.

8. EDUCATIONAL TASK

Find test tasks and situational tasks on the topics of classes in the corresponding collections.

9. MONITORING THE RESULTS OF ASSIMILATION. Produced by tables:

Table of programmed control

Topic: Diseases of the lens.

I. Which of the transparent media of the eye has the strongest, refractive light property? *1) the lens; 2) the cornea; 3) the vitreous body; 4) the moisture of the anterior chamber of the eye.*

II. What is the refractive index of the lens? *1) 1-5 D; 2) 10-18 D; 3) 40 D.*

III. What causes the nutrition of the lens? *1) vessels of the iris; 2) vessels of the ciliary body; 3) vessels of the choroid; 4) intraocular fluid.*

IV. The main factor determining changes in the ability of the lens to accommodate with age: *1) changes in the strength of the ciliary muscle; 2) changes in the state of the zinc ligament; 3) changes in the elasticity of the lens.*

V. The Main method for determining the transparency of the lens: *1) external examination; 2) side lighting; 3) examination in transmitted light.*

VI. The main method for determining the transparency of the lens: *1) external examination; 2) side lighting; 3) research in transmitted light; 4) biomicroscopy.*

VII. The degree of maturity of the cataract that is most convenient for surgery: *1) initial; 2) immature; 3) Mature; 4) overripe.*

VIII. Type of refraction that occurs in the eye after cataract removal: *1) emmetropia; 2) hypermetropia; 3) myopia.*

IX. Does it matter the age at appointment glasses for near after cataract surgery? *1) has; 2) does not.*

X. What types of cataracts are more likely to be congenital? *1) polar; 2) layered; 3) cortical; 4) posterior capsular; 5) nuclear.*

XI. Causes of congenital cataracts: *1) iridocyclitis; 2) intrauterine diseases; 3) embryonic pathology; 4) trauma.*

XII. What types of cataracts are more likely to be age-related? *1) polar; 2) layered; 3) cortical; 4) posterior capsular; 5) nuclear.*

XIII. Causes of complicated cataracts: *1) iridocyclitis; 2) trauma; 3) diabetes; 4) high-grade myopia; 5) tetany; 6) hypertension; 7) ciliary body dysfunction.*

XIV. The most physiological method of correction of afakia is: *1) eyeglass correction; 2) contact lenses; 3) keratofakia; 4) implantation of an artificial lens.*

10. TASK FOR THE NEXT LESSON.

Topic: Physiology and pathology of intraocular pressure. Glaucomas.

Literature: *a) educational literature*

Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p.

Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. /Under the editorship of E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p.

Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - 3rd ed. - M.: GEOTAR-MED. 2013. – 640 p.

Ruban E.D. Eye diseases: the latest reference book. Rostov-on-Don: Phoenix, 2016. – 622 p.

Takhchidi H.P., Yartseva N.S., Gavrilova N.A., Deev L.A. Ophthalmology: textbook. - Moscow: GEOTAR-Media, 2011. – 544 p.

b) additional

Volkov V.V. Open-angle Glaucoma. - Moscow, 2008. – 352 p.

Egorov E A. Glaucoma. National leadership. - Moscow: GEOTAR-Media, 2014. 824 p.

Nesterov A.P. Glaucoma. ed.2nd - M.: Medical news Agency, 2014. - 360 p.

Nechiporenko P.A. Medical treatment of glaucoma translation from English. - Moscow: N-L, 2014. – 384 p.

Chen T. Glaucoma Surgery. Moscow: Logosphere, 2013. 320 p.

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TEACHING AIDS

TO PRACTICAL CLASSES FOR MEDICAL STUDENTS FACULTY'S

Practical lesson 8

Topic: Physiology and pathology of intraocular pressure. Glaucomas.

Vladikavkaz 2021

LESSON 8.

1. TOPIC: Physiology and pathology of intraocular pressure. Glaucomas.

2. PURPOSE OF THE LESSON: Learn how to diagnose and treat glaucoma.

3. TARGETS:

The student should know: • what is tonometric, true, and tolerant intraocular pressure; • movement of intraocular fluid in the eye; • the main places of retention of its movement in the eye; • determination of eye hypertension; • definition of the term glaucoma; • the main signs of glaucoma; • causes of irreversible blindness in glaucoma; • the cause of errors in the diagnosis of acute glaucoma attack, which General somatic symptoms lead to gross errors in the diagnosis (poisoning, "acute stomach", cardiac pathology); • first aid for a patient with an acute attack of glaucoma; • measures to prevent the development of blindness in glaucoma.	Recommended reading: *a) educational literature* Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p. Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. /Under the editorship of E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p. Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - 3rd ed. - M.: GEOTAR-MED. 2013. – 640 p. Ruban E.D. Eye diseases: the latest reference book. Rostov-on-Don: Phoenix, 2016. – 622 p. Takhchidi H.P., Yartseva N.S., Gavrilova N.A., Deev L.A. Ophthalmology: textbook. - Moscow: GEOTAR-Media, 2011. – 544 p. *b) additional* Volkov V.V. open-angle Glaucoma. - Moscow, 2008. – 352 p. Egorov E A. Glaucoma. National leadership. - Moscow: GEOTAR-Media, 2014. 824 p. Nesterov A.P. Glaucoma.ed.2nd - Moscow: Medical news Agency, 2014. - 360 sec. Nechiporenko P.A. Medical treatment of glaucoma translation from English. - Moscow: N-L, 2014. – 384 p. Chen T. Glaucoma Surgery. Moscow: Logosphere, 2013. 320 p.
The student must be able to: • to investigate the intraocular pressure by various methods; • diagnose glaucoma of various types and prescribe its treatment; • provide first aid for an acute attack of angle-closure glaucoma; • organize preventive measures for early detection of glaucoma.	Recommended reading: Same.

4. THE ISSUES EXAMINED EARLIER:

"Pressure" - Department of physics.
"Pharmacotherapy" - Department of pharmacology.
"Local and General anesthesia, antiseptics and aseptics" - Department of General surgery.

5. PLAN OF PRACTICAL CLASSES:

The stages of the lesson	Technical equipment		Venue
	Equipment	Training manuals, controls	
1	2	3	4
1. Check the source of the knowledge		Control tasks.	Training room
2. Instructing the teacher	Table lamp, slit lamp, a set of test eyeglass lenses, electrooculogram, hoopcharmer, gonioscopy, goniolens, elastotonometry Filatov-Kalfa, perimeter, electronic tonograph, medical kit, bandages, slides, slider.	Lesson plan, study tables, slides, slider.	Study room, hardware room
3. Independent work of students	The same as in paragraph 2.	Orientation cards, training tables, training tasks, clinical material.	Study room, hardware room
4. Analysis of results with an assistant (control of learning results).		Control tasks.	Training room
5. Task for the next lesson.		1.Textbook. 2.Additional literature. 3.Educational and methodical manual.	Training room

6. TASKS FOR CONTROL OF INITIAL KNOWLEDGE:

1.

The drainage system of the eye	Anatomical formations
	1.

2.

Primary glaucoma	Stages
	1.

3.

Congenital glaucoma	Symptoms
	1.

4.

Secondary glaucoma	Types
	1.

5.

Hypotensive treatment	Group of medicines
	1.

7. OUTLINE OF THE APPROXIMATE BASIS OF THE ACTION:

Stages of diagnosis and treatment	Means and conditions of diagnosis and treatment, procedure of action	Self-control criteria
a	b	c
Learn how to determine the width of the angle of the front camera of the eye by Vurgaft.	Sit the patient on a chair in a dark room. When the electric Ophthalmoscope is turned on, bring it to the subject's face from the side and slightly behind, so that its beam falls on the cornea at a tangent to the limb. Observe the patient's limb.	When the angle of the anterior chamber is open, the patient will experience a local glow in the form of a Bunny on the limb. If the angle of the front camera is closed, there will be no such glow.
Learn how to measure intraocular pressure.	Lay the patient face up on the couch. Into the conjunctival SAC twice with an interval of 2-3 minutes, put 0.5% solution of tetracaine or any other anesthetic. Ask the patient to look at the fixation point or your finger so that the cornea is in the center of the eye gap. With one hand, push the patient's eyelids apart, and with the other, place the tonometer on the eye so that the weight falls on the center of the cornea when lowering. Under the action of the load, the cornea flattens. At the point of contact of the platform with the cornea, the paint is washed off with a tear. On the site of the tonometer, a disc is left devoid of paint. The print is transferred to a paper slightly moistened with alcohol. By the size of the disc diameter, the level of intraocular pressure is judged. The smaller the disc, the higher the pressure, and Vice versa, the larger the disc diameter, the lower the pressure.	To translate linear values into millimeters of mercury, use the Pole measuring ruler, which allows you to immediately get the answer in millimeters of mercury. The ruler is applied to the print so that the straight lines on the ruler form tangents to the disc with the washed paint. To calculate the value of intraocular pressure, use a scale above which 10.0 g is written. Next to the circle, there will be a figure corresponding to the level of intraocular pressure.
Learn how to diagnose and treat congenital glaucoma.	Perform an external examination of the child's face. Pay attention to the possible asymmetry, the presence of age spots. Using the	Congenital glaucoma is often combined with other developmental defects in the child's eye or body. Stretching of the cornea leads to irritation of the nerve

a	b	c
	technique of side lighting, examine the front segment of the eye. Focus on the cornea, the anterior chamber of the eye, and the pupil of the subject. Perform an ophthalmoscopy. Place the index fingers of both hands on the child's eyeball (through the eyelid) and alternately palpate it. Assess the state of intraocular pressure. Perform an ophthalmoscopy and observe the optic disc. Determine the state of the front camera angle by Vurgaft. After making sure that the child has congenital glaucoma, recommend early surgical treatment.	elements in it. First, there is lacrimation, then an increase in the size of the cornea and the entire eyeball. Gradually, the cornea loses its transparency. There is an increase in the width of the limb and a deepening of the anterior chamber. When examining the fundus in the later stages of the disease, glaucomatous excavation of the optic nerve is detected. The angle of the anterior chamber in congenital glaucoma is usually closed by embryonic mesodermal tissue. The operations of choice are goniotomy, goniopuncture, and trabeculectomy.
Learn how to diagnose primary open-angle glaucoma.	Find out the patient's complaints, focusing on pathognomonic complaints in glaucoma. Before examining the patient, it is advisable to conduct a study of the visual fields with a thorough study of the boundaries of the blind spot and paracental sections. Perform a sequential external examination, a side-light examination, a Vurgaft study of the angle of the front camera, biomicroscopy, and ophthalmoscopy. Perform tonometry on Maklakov.	Open-angle glaucoma very often occurs almost without symptoms. Sometimes patients note periodic blurring of vision, the presence of iridescent circles in front of their eyes when looking at the light. In open-angle glaucoma, determining the state of the anterior chamber by Vurgaft gives a wide light beam on the limb. As a rule, with increased intraocular pressure, there is an expansion and tortuosity of the anterior ciliary arteries (a "Cobra" symptom). On the fundus, an excavation of the optic nerve is detected. Initially there is the boundary of the excavation. There is an increase in the size of the blind spot, the appearance of paracentral cattle. Intraocular pressure increases periodically, although it may be mostly at normal levels. The developed stage of glaucoma is characterized by a persistent narrowing of the field of vision by more than 10° from the nasal side. There is a marginal excavation of the optic nerve. Intraocular pressure is almost constantly increased, but under the influence of medications can decrease. In far-advanced glaucoma, the field of vision narrows to 15° around the

a	b	c
		fixation point. On the fundus of the eye, a picture of optic nerve atrophy is visible. Intraocular pressure is almost not reduced to normal figures. The diagnosis of terminal glaucoma is made when visual functions are lost.
Learn how to treat primary open-angle glaucoma.	If glaucoma is detected for the first time, assign myotic instillation to the patient (pilocarpine 1-2%). It is possible to combine it with instillations of 0.1% adrenaline. A good hypotensive effect is given preparaty timololom series, which reduce the production of intraocular fluid (arutimol, ocupress, optimol, etc.). Preparations of the first choice are derivatives of latanoprost (xalatan, travatan). It is necessary to conduct courses of vasodilator and metabolism-enhancing therapy once every 6 months. If there is no effect, recommend laser or surgical treatment.	Vary the prescription of medication. The maximum frequency of instillations should not exceed 3 times a day. The effectiveness of therapy is checked by monitoring peripheral vision and daily tonometry. Laser trabeculoplasty is currently the most effective method of this type of treatment. The choice of surgical intervention technique belongs to the surgeon. There are different types of pathogenetically oriented operations.
Learn how to diagnose an acute attack of angle-closure glaucoma.	Find out the patient's complaints. Collect medical history. Assess the General condition of the patient. Examine the eye. Use side lighting, biomicroscopy, transmitted light examination, ophthalmoscopy, tonometry, and Vurgaft examination of the front camera angle.	The patient complains of pain in the eye and head, blurred vision, the appearance of rainbow circles when looking at the light source. The attack often occurs during emotional stress, prolonged stay in the dark without sleep, and with drug-induced pupil dilation. With a pronounced attack, there may be nausea and vomiting. Pain can radiate to the heart, stomach. During the inspection you can clearly see the symptom of "Cobra". The cornea is edematous, sometimes translucent. The front chamber is small, and the moisture opalesces it. The pupil is dilated due to sphincter paresis. The fundus is visible in the fog. The disc of the optic nerve is edematous, often there is a pulsation of the Central retinal artery, hemorrhages.
Learn how to treat an acute	Assign the patient instillation of 1-2% pilocarpine solution for 1	Monitoring the effectiveness of therapy-tonometry. If there is no

a	b	c
attack of angle-closure glaucoma.	hour-every 15 minutes, then 2-3 times-hourly. In the future-6 times a day. At the same time assign a 0.5% timolol. For dehydration-diacarb, glycerin, lasix. As a means of distracting – a hot foot bath.	sufficient effect, the patient can be injected with aminazine or a lytic mixture. If the attack does not stop after 24 hours, perform an operation-iridectomy.

8. EDUCATIONAL TASK

Find test tasks and situational tasks on the topics of classes in the corresponding collections.

9. MONITORING THE RESULTS OF ASSIMILATION. Produced by tables:

Table of programmed control

Subject: Glaucoma.

I. The Main cardinal symptom of glaucoma: *1) excavation of the optic nerve disk; 2) increase in intraocular pressure; 3) drop in visual functions.*

II. The two most significant factors that form intraocular pressure are: *1) changes in blood filling of the vascular tract; 2) production and outflow of intraocular fluid; 3) changes in the volume of the lens and vitreous body; 4) elasticity of the outer capsule of the eye.*

III. The main path of outflow of intraocular fluid: *1) perivascular spaces of the iris; 2) angle of the anterior chamber; 3) perivascular spaces of the optic nerve; 4) uveoscleral space.*

IV. Limits of normal daily fluctuations of ophthalmotonus: *1) up to 5 mm Hg.; 2) over 5 mm Hg.; 3) over 10 mm Hg.*

V. Which of these visual functions of the eye is usually impaired in glaucoma earlier? *1) visual acuity; 2) field of view; 3) color vision.*

VI. The nature of early changes in peripheral vision in glaucoma: *1) concentric narrowing; 2) restriction in the temporal half; 3) restriction in the upper nasal quadrant; 4) expansion of the blind spot boundaries and the appearance of paracentral cattle.*

VII. Specify the three most common subjective signs of initial angle-closure glaucoma: *1) pain; 2) blurred vision; 3) iridescent circles; 4) lacrimation; 5) apparent moistening of the eye; 6) flashing of midges before the eyes.*

VIII. The most frequent objective sign of initial angle-closure glaucoma: *1) dilation of the anterior ciliary arteries; 2) opalescence of the cornea; 3) decrease in the depth of the anterior chamber; 4) dilation of the pupil.*

IX. The main methods of early diagnosis of glaucoma in a hospital: *1) elastotonometry; 2) daily tonometry; 3) tonography; 4) campimetry.*

X. Ehe Basis of medical treatment of glaucoma patients: *1) ophthalmic hypotensive drugs; 2) sedatives; 3) vitamin preparations.*

XI. The optimal permissible frequency of instillation of medications to a patient with chronic glaucoma: *1) 2 times a day; 2) 3-4 times a day; 3) 5-6 times a day.*

XII. The main type of operations for open-angle glaucoma: *1) anti-glaucomatous iridectomy; 2) fistulizing operations; 3) operations aimed at reducing the production of intraocular fluid.*

XIII. The main type of operations for acute attacks of angle-closure glaucoma*: 1) anti-glaucomatous iridectomy; 2) fistulizing operations; 3) operations aimed at reducing the production of intraocular fluid.*

XIV. The most rational medical tactics for terminal painful glaucoma: *1) conservative therapy; 2) enucleation; 3) operations aimed at reducing pain and preserving the eye.*

XV. What is contraindicated for a glaucoma patient? *1) the use of preparations of belladone, caffeine; 2) taking large amounts of liquid; 3) long stay in the dark; 4) long stay in the light; 5) easy physical work; 6) reading; 7) work in hot shops.*

Subject: Glaucoma.

Differential diagnosis of chronic glaucoma and initial cataract.
Option 1-closed-angle glaucoma.
Option 2-open-angle glaucoma.
Option 3-incipient cataract.

I. Subjective signs: 1*) reduced vision; 2) visual disorders – short-term blurring, iridescent circles; 3) pain – pain, heaviness in the eye, headaches; 4) no.*

II. Objective signs, side-lighting examination: *1) dilation of the anterior ciliary vessels, corneal opalescence, small anterior chamber, pupil tendency to dilate; 2) there are no changes; 3) the lens in the pupil area may have a light grayish tint.*

III. Examination in transmitted light: *1) the reflex from the fundus is uniformly pink; 2) the presence of dark shadows on the background of the reflex.*

IV. Results of tonometry: *1) intraocular pressure within normal limits; 2) intraocular pressure increased.*

Subject: Glaucoma.

Differential diagnosis of acute bacterial conjunctivitis, acute iridocyclitis, and acute glaucoma.
Option 1-acute bacterial conjunctivitis;
Option 2-acute iridocyclitis
Option 3-an acute attack of glaucoma.

I. Subjective signs: *1) gluing of the eyelids in the morning with purulent discharge; 2) sharp pain in the eye; 3) severe headache in the area of the brow, forehead, temple with irradiation to the back of the head; 4) nausea, vomiting.*

II. Objective signs, the nature of vascular injection: *1) severe conjunctival hyperemia; 2) mixed injection with a predominance of pericorneal; 3) injection of a stagnant nature.*

III. Cornea: *1) dull, sharply opalescent; 2) not changed.*

IV. Front camera: *1) shallow; 2) deep; 3) medium depth.*

V. Iris: *1) the color is not changed; 2) the color is changed; 3) the drawing is blurred.*

VI. Pupil: *1) narrow, reacts to light sluggishly; 2) sharply expanded, does not react to light; 3) normal width, the reaction to light is alive.*

VII. Intraocular pressure: *1) not changed; 2) lowered; 3) increased.*

VIII. Emergency measures. Local measures: *1) instillation of solutions of antibiotics, sulfonamides, disinfectants; 2) instillation of myotics; 3) instillation of Mydriatics.*

IX. Emergency measures. General therapy: *1) analgesic; 2) distractions; 3) desensitizing agents; 4) anti-inflammatory agents (antibiotics, sulfonamides).*

11. TASK FOR THE NEXT LESSON.

Topic: Binocular vision. Strabismus. Damage to the eye and its appendages. Neoplasms of the visual organ.

Literature: *a) educational literature*

Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p.

Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. /Under the editorship of E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p.

Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - 3rd ed. - M.: GEOTAR-MED. 2013. – 640 p.

Ruban E.D. Eye diseases: the latest reference book. Rostov-on-Don: Phoenix, 2016. – 622 p.

Takhchidi H.P., Yartseva N.S., Gavrilova N.A., Deev L.A. Ophthalmology: textbook. - Moscow: GEOTAR-Media, 2011. – 544 p.

b) additional

Arkhipova L.T. Sympathetic ophthalmia. - Moscow, 2006. – 248 p.

Vazhenin AV., Panova I.E. Selected issues of ophthalmic Oncology. - Moscow, 2006. - 156 p.

Goncharova S.A., Panteleev G.V. Functional treatment of friendly strabismus. - Moscow, 2005. – 224 p.

Goncharova S.A., Panteleev G.V., Tyrlova E.I. Amblyopia. - Moscow, 2006. - 256 p.

Gundorova R.A., Neroev V V., Kashnikov V.V. Eye Injuries. - Moscow: GEOTAR-Media, 2013. – 560 p.

Likhvantseva V.G., Anurova O.A. Eyelid Tumors: clinic, diagnosis, treatment. - Moscow, 2007. – 448 p.

Neroev V.V. Burns of the eye: a manual for physicians. - M. GEOTAR-MED, 2013. – 224 p.

Saakyan S.V. Retinoblastoma. - Moscow, 2005. - 200 p.

Stuchilov V.A. Traumatic injuries of the eye socket and tear ducts. - M.: GEOTAR-MED., 2015. – 248 p.

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TEACHING AIDS

TO PRACTICAL CLASSES FOR MEDICAL STUDENTS FACULTY'S

Practical lesson 9

Topic: Binocular vision. Strabismus. Damage to the eye and its appendages. Eye tumors. Professional diseases of the eye. Military and labor expertise.

Vladikavkaz 2021

LESSON 9.

1. **TOPIC:** Binocular vision. Strabismus. Damage to the eye and its appendages. Eye tumors. Professional diseases of the eye. Military and labor expertise.

2. **PURPOSE OF THE LESSON:** Learn to determine the presence of binocular vision. Learn how to diagnose strabismus. To study the principles of treatment of strabismus and amblyopia. Learn to diagnose various types of eye injuries and their appendages. Learn how to provide first aid for eye injuries, as well as familiarize yourself with the principles of their treatment. Get acquainted with the basics of ophthalmic Oncology. Learn how to identify possible professional eye damage, conduct the main stages of ophthalmological military and labor examination.

3. TARGETS:

The student should know:	Recommended reading:
• how is stereoscopic perception of space achieved by joint activity of the sensory and oculomotor (motor) systems of both eyes; • definition of binocular vision; • what conditions are necessary for the development of binocular vision in a child; • what methods can be used to check the character of a person's vision with two open eyes; • what is strabismus; • how to determine the primary and secondary angle of strabismus using the Hirschberg method; • what is the difference between secondary strabismus and primary strabismus; • clinical signs of friendly and paralytic strabismus; • methods of prevention and treatment of amblyopia in children; • what is artoptika and diploptera and at what stages of treatment of strabismus in children these methods are used; • symptoms of soft tissue contusions of the eye socket; • a classification of injuries of the eyeball; • symptoms of eye socket fractures; • eye chalcosis and siderosis clinic; • diagnostics of foreign bodies of the eye; • what is sympathetic ophthalmia and what is its prevention; • features of child and military eye injuries; • methods of treatment with chemical and thermal burns of the eye; • prevention of eye injuries; • types of tumors;	*a) educational literature* Egorov E.A. Ophthalmology. National leadership. A brief edition. - Moscow: GEOTAR-Media, 2016. – 736 p. Ophthalmology: textbook. V.N. Alekseev, Yu.S. Astakhov, S.N. Basinsky, etc. /Under the editorship of E.A. Egorov. - Moscow: GEOTAR-Media, 2010. - 240 p. Ophthalmology: Textbook / under the editorship of E.I. Sidorenko. - 3rd ed. - M.: GEOTAR-MED. 2013. – 640 p. Ruban E.D. Eye diseases: the latest reference book. Rostov-on-Don: Phoenix, 2016. – 622 p. Takhchidi H.P., Yartseva N.S., Gavrilova N.A., Deev L.A. Ophthalmology: textbook. - Moscow: GEOTAR-Media, 2011. – 544 p. *b) additional* Arkhipova L.T. Sympathetic ophthalmia. - Moscow, 2006. – 248 p. Vazhenin AV., Panova I.E. Selected issues of ophthalmic Oncology. - Moscow, 2006. - 156 p. Viktorova I.A. Examination of temporary disability and medical and social expertise in outpatient practice. - Moscow: GEOTAR-MED, 2015. - 144 p. Goncharova S.A., Panteleev G.V. Functional treatment of friendly strabismus. - Moscow, 2005. – 224 p. Goncharova S.A., Panteleev G.V., Tyrlova E.I. Amblyopia. - Moscow, 2006. - 256 p. Gundorova R.A., Neroev V.V., Kashnikov V.V. Eye Injuries. - Moscow: GEOTAR-Media, 2013. – 560 p.

• methods for diagnosing tumors; • clinic for malignant and benign diseases; • optimal terms and methods of tumor treatment; • factors that lead to occupational eye lesions; • methods of prevention of occupational diseases of the eye; • methods of first aid for professional lesions of the visual organ; • what is blindness; • what is low vision; • who is disabled; • what is disability; • the main causes of blindness and low vision; • how rehabilitation of visually impaired people is carried out.	Likhvantseva V.G., Anurova O.A. Eyelid Tumors: clinic, diagnosis, treatment. - Moscow, 2007. – 448 p. Neroev V.V. Burns of the eye: a manual for physicians. - M. GEOTAR-MED, 2013. – 224 p. Saakyan S.V. Retinoblastoma. - Moscow, 2005. - 200 s. Stuchilov V.A. Traumatic injuries of the eye socket and tear ducts. - M.: GEOTAR-MED., 2015. – 248 p.
The student must be able to: • examine binocular vision using approximate methods; • diagnose friendly and paralytic strabismus; • determine the angle of strabismus by Hirschberg; • diagnose blunt trauma to the eye and its appendages; • diagnose a penetrating eye injury; • diagnose burn the eyes; • provide first aid for eye injuries; • implement the prevention of eye injuries; • diagnosing tumors of the eye and epibulbar tumors; • determine the level of disability of the patient; • to organize activities for the prevention of occupational diseases of the eye% • provide first aid for occupational injuries of the organ of vision.	Recommended reading: Same.

4. THE ISSUES EXAMINED EARLIER:

"Optics" - Department of physics.
"Local and General anesthesia, antiseptics and aseptics" - Department of General surgery.
"Neutralization reactions" - Department of General chemistry.
"Inflammation" - Department of pathophysiology.
"Enzymes" - Department of biochemistry.
"Injuries to the bones of the skull and paranasal sinuses" - Department of otorhinolaryngology, maxillofacial surgery, neurosurgery, radiology.
"Tumors" - Department of Oncology.
"Occupational diseases" - Department of occupational pathology.
«Health. Morbidity. Disability. Disability " - Department of hygiene, public health.

5. TASKS FOR CONTROL OF INITIAL KNOWLEDGE:

1.

Concomitant strabismus	Symptoms
	1.

2.

Paralytic strabismus	Symptoms
	1.

3.

Fracture of the inner wall of the orbit with the displacement of fragments and the exit of air into the retrobulbar tissue	Symptoms
	1.

4.

A penetrating wound of the cornea	Symptoms
	1.

5.

Retinoblastoma	Symptoms
	1.

1. What is the most common eye lesion in tetraethyl lead poisoning?

2. Which organization is responsible for determining the level of disability?

3. What is the main task of the military medical Commission?

6. PLAN OF PRACTICAL CLASSES:

The stages of the lesson	Technical equipment		Venue
	Equipment	Training manuals, controls	
a	b	c	d
1. Check the source of the knowledge		Control tasks.	Training room
2. Instructing the teacher	Table lamps, slit lamp, Rota apparatus, Sivtsev and Orlova tables, a set of trial eyeglass lenses, electrophthalmoscope, Refractometer, Meddox wand, Meddox scale, four-point color test, echoophthalmograph, rubber pear, eyelid lifter, a set of medications, dressing material, Komberg-Baltin prostheses, localizer circuits, a set of x-rays, eye	Lesson plan, study tables.	Study room, hardware room

a	b	c	d
	magnet, negatoscope, exophthalmometer, perimeter, Ophthalmoscope, Diaphanoscope.		
3. Independent work of students	The same as in paragraph 2.	Orientation cards, training tables, training tasks, clinical material.	Study room, hardware room
4. Analysis of results with an assistant (control of learning results).		Control tasks.	Training room
5. Task for the next lesson.		1.Textbook. 2.Additional literature. 3.Educational and methodical manual.	Training room

7. СХЕМА ОРИЕНТИРОВОЧНОЙ ОСНОВЫ ДЕЙСТВИЯ:

Stages of diagnosis and treatment	Means and conditions of diagnosis and treatment, procedure of action	Self-control criteria
a	b	c
Learn how to detect the presence of binocular vision.	Conduct the Sokolov experiment. Roll up a sheet of paper or notebook and put it to your right eye. Put your hand to the end of the tube at the side. Look with two eyes.	If you have binocular vision, you get the impression of a "hole" in the palm of your hand.
	To study binocular vision, use a four-point color test. Turn on the power supply. Put on red-green glasses (red filter on the right, green – on the left). Ask the subject about the visible picture.	In the presence of binocular vision, the subject sees 4 circles, with simultaneous – 5, with monocular – either 2 or 3 circles.
Learn how the diagnosis of concomitant strabismus.	Ask the patient about diplopia. After performing an external examination, make sure that there is a strabismus. Check the completeness of the volume of movements of the eyeballs (tracking the moving finger). Explore the	With friendly strabismus, the full volume of movements of the eyeballs is preserved, the primary and secondary angles of deviation of the eyes are equal, and there is no diplopia.

a	b	c
	angle of strabismus on Girshberg. Compare the primary angle of strabismus (deviation of the squinting eye) with the secondary angle (deviation of the healthy eye. Examine visual acuity and refraction. Define aniseikonia.	In paralytic strabismus, there is no or limited mobility of the eyeball towards the paralyzed muscle.
Learn the principles of treatment of concomitant strabismus.	Refer the patient to an ophthalmologist as soon as possible. Explain the principles of treatment of strabismus: optical vision correction is possible, exercises for the development of binocular vision, stimulation of the macula, etc. if there is no effect from treatment, recommend surgical treatment.	The complex of conservative measures to restore binocular vision and eliminate strabismus is called orthoptic treatment. Restoring or improving the functions of a weakly-looking (amblyopic) eye is called orthotic vision. The main methods of surgical treatment of obliquity are resection and muscle recession.
Learn how to diagnose paralytic strabismus and how to treat it.	Examine the primary and secondary angles of eye deviation. Pay attention to the possible forced position of the subject's head. Ask the patient about diplopia. Perform an external inspection. Determine whether the patient has an obvious strabismus. Check the completeness of the volume of movements of the eyeballs. Recommend consultation and possible treatment with a neurologist. If there is no effect, surgical treatment is necessary.	With fractures of the walls of the orbit, the eyeball may shift. The eye gap may be widened or narrowed. In retrobulbar hemorrhage, the mobility of the eyeball is impaired. Enophthalm or exophthalmos tells about the displacement of the fragments outwards or inwards of the orbit. In the presence of subcutaneous emphysema of the eyelids, you can think of a violation of the integrity of the paranasal sinuses. Violation of the integrity of the optic nerve leads to loss of vision.
Learn how to diagnose orbital damage.	Perform an external eye examination. Evaluate the position of the eyeballs, the width of the eye gap, and the condition of the eye appendages. Determine the mobility of the eyeball and	With fractures of the walls of the orbit, the eyeball may shift. The eye gap may be widened or narrowed. In retrobulbar hemorrhage, the mobility of the eyeball is impaired. Enophthalm or exophthalmos tells about the displacement of the fragments outwards or inwards of the orbit. In the

a	b	c
	identify possible double vision. Perform exophthalmometry. Palpate the eyelids and the edges of the orbit. If you suspect a bone fracture, assign the patient a radiography of the orbit in 2 projections. Review the images and assess the state of the orbit walls. Perform an ophthalmoscopy. Assess the state of the optic nerve.	presence of subcutaneous emphysema of the eyelids, you can think of a violation of the integrity of the paranasal sinuses. Violation of the integrity of the optic nerve leads to loss of vision.
Learn how to diagnose orbital damage.	Perform an external eye examination. Evaluate the position of the eyeballs, the width of the eye gap, and the condition of the eye appendages. Determine the mobility of the eyeball and identify possible double vision. Perform exophthalmometry. Palpate the eyelids and the edges of the orbit. If you suspect a bone fracture, assign the patient a radiography of the orbit in 2 projections. Review the images and assess the state of the orbit walls. Perform an ophthalmoscopy. Assess the state of the optic nerve.	If it enters the eye, a foreign body may be localized on the conjunctiva or cornea. The General practitioner removes only superficial, protruding foreign bodies. When removing a foreign body of the cornea, you need to act delicately, observing extreme caution.
Learn how to diagnose and remove superficial foreign bodies of the eyeball.	Using the side lighting method, examine the conjunctiva of the eyelids (with their preliminary inversion) and the eyeball, as well as the cornea. Determine the presence of a surface foreign body. To clarify the depth of the foreign body, use biomicroscopy. Intelliroute twice in the conjunctival SAC of 0.5% solution dikaina. Try to remove the foreign body with a wet	If the bandage is applied correctly, the eye is completely closed and the bandage is motionless.

a	b	c
	swab. If it fails, the foreign body is removed with a special spear or the tip of an injection needle.	
Learn how to apply monocular and binocular bandages.	Sit the patient on a chair. On the eye, apply a gauze circle, layered with cotton or a gauze napkin. Spend two or three circular fixing rounds of the bandage from the back of the head to the forehead. Then alternate fixing circular tours with tours through the sore eye, bandaging from the back of the head down under the earlobe. Then up through the diseased eye to the opposite side of the forehead and again to the back of the head. Tie a bandage on your forehead or in front of your ear. Sit the patient on a chair. On the eyes, apply gauze circles, layered with cotton or gauze napkins. Spend two or three circular fixing rounds of the bandage from the back of the head to the forehead. Then alternate fixing circular tours with tours through the eye, bandaging from the back of the head down under the earlobe. Then up through the eye to the opposite side of the forehead and back to the back of the head. Pass the bandage through the second eye, but in the opposite direction-from the forehead through the eye and then under the earlobe and on the back of the head. Tie a bandage on your forehead or in front of your ear.	With a properly applied bandage, the eyes under it are almost motionless. The pads are tightly fixed on the eyes.

a	b	c
Learn how to diagnose penetrating eye injuries.	Perform an examination of the patient with side lighting or a combined method. If necessary, perform a biomicroscopy. Pay attention to the condition of the fibrous capsule of the eye, the anterior chamber, the iris, and the lens. Gently palpate the eyeball. Evaluate the state of ophthalmotonus. After making sure that there is a penetrating injury to the eye, perform x-ray localization on the Comberg-Baltin. To do this, after instillation anesthesia, put a prosthetic indicator on the eye and make a profile and profile pictures. Using the measuring circuits, determine the Meridian and depth of the intraocular foreign body.	During the examination, the absolute signs of a corneal through wound are determined – loss of internal membranes, an opening in the iris, and the presence of an intraocular foreign body. A relative sign is hypotension. It is possible to grind or deepen the anterior chamber, change the shape of the pupil. To perform x-ray localization, you must carefully lay the prosthetic indi-cator, placing lead marks on the limb at 12-3-6-9 hours. To clarify the localization of an intraocular foreign body, a combination of x-ray and ultra-sound research methods is possible.
Learn how to provide first aid for penetrating eye injuries.	Instill a disinfectant into the eye. Anesthetize the patient. Apply a binocular bandage. Take the patient to an ophthalmological hospital.	As disinfecting drops, a 30% solution of sulfacyl-sodium is used. The application of a binocular bandage is justified by the need to limit the mobility of the injured eye.
Learn how to diagnose hemoph-thalmos.	Find out the patient's history. Check your visual acuity. Proceed with the eye examination. Use the methodology of the research in transmitted light. Pay attention to the presence of the pupil glow.	In patients with partial hemophthalmia, dark flakes-visible floating opacities (blood clots)-appear from the fundus of the eye against the background of a pink reflex. With complete hemophthalmia, there is no reflex from the fundus, and vision falls to light perception.
Learn how to treat hemoph-thalmos.	In this case, assign the patient complete rest, hemostatic therapy. A few days after the injury, start resorption therapy. If there is no proper effect, recommend surgical treatment.	For hemostatic therapy, you can use vikasol dicinon and other drugs. As biodegradable treatment good effect gives the application of fibrinolysin, streptodekaza, gamasy etc. are Also shown autohaemotherapy and ultrasound. Various types of vitrectomy are used as surgical treatment.

a	b	c
Learn how to diagnose eye burns.	Anesthetize the patient with double instillation of 0.5% dikain solution. Perform an external inspection. Pay attention to the condition of the skin of the eyelids and eyelashes. Use the techniques of eyelid inversion and side lighting, carefully examine the conjunctiva of the eyelids and eyeball, as well as the cornea. If you suspect erosion of the latter, paint it with fluorescein.	With burns of the first degree, there is hyperemia of the conjunctiva, surface erosion and slight edema of the cornea. Conjunctival ischemia, significant areas of corneal erosion and opacity are common for grade II lesions. In case of third-degree burns, the cornea is diffusely cloudy and has the appearance of frosted glass. Burns of the IV degree – deep necrosis of the conjunctiva and cornea.
Learn how to provide first aid for eye burns.	Rinse the burned eye thoroughly for 5-30 minutes. To do this, pre - turn your eyelids. Use a damp swab to carefully remove foreign bodies from the conjunctival SAC. Eye wash with water jet. For acid burns, use weak alkaline solutions as a neutralizer (if possible), and acid solutions for alkaline burns. Drip a disinfectant solution into the eye, put an antibiotic ointment. For severe burns, enter tetanus toxoid and serum at Regular intervals.	For eye washing, it is most convenient to use a rubber pear. As disinfectant solutions, use a 30% solution of sodium sulfacyl or 0.25% solution of levomycetin. The most commonly used 1% tetracylin or erythromycin ointments.
Learn how to diagnose dermoid tumors.	Perform an external inspection and a focal light inspection. Perform a biomicroscopy.	Dermoids are usually located in the upper lateral part of the eye socket and are determined by a limited bulge in the upper eyelid area. Less often they are localized in the area of the medial angle of the eye socket. Dermoids are elastic to the touch, not compressible, round or oval in shape; with the skin and surrounding tissues are not soldered, mobile. On palpation, the tumor is painless. The tumor can grow very slowly. Dermoids can be found not only in the eye socket, but also in the limbus and cornea, as well as in the conjunctiva of the eye.

a	b	c
Learn the principles of treatment of dermoid tumors.	Refer the patient for surgical treatment.	Operations are performed under General anesthesia in a hospital. The outcomes are favorable, relapses do not occur.
Learn how to diagnose nevi.	Perform an external inspection and a focal light inspection. Perform a biomicroscopy.	Neoplasms are localized in the conjunctiva, as well as in the vascular membrane and the edge of the eyelids. Epibulbar nevi, covered with a wide network of vascular anastomoses, sometimes have pigment inclusions and stand somewhat above the surrounding unchanged conjunctiva. The contours of these formations cannot be determined. The color depends on the severity of pigmentation and varies from barely yellowish to black. They are localized most often on the conjunctiva in the area of the eye slit. They can be detected at any age.
Learn the principles of treating nevi.	Refer the patient for surgical treatment.	Excision of the tumor is performed within the healthy tissue. Excision of the tumor is performed within the healthy tissue.
Learn how to diagnose pigmented tumors.	Perform an external inspection and a focal light inspection. Perform a biomicroscopy. Examine the fundus.	Pigmented neoplasms can be found on the eyelids (birthmarks), in the vascular membrane (melanomas), and in some cases in the retina. On the eyelids, pigment spots are located at the base of the eyelashes. They have the appearance of smooth, soft, sometimes velvety, pigmented formations or individual lobes of various sizes and shapes.
Learn the principles of treatment of pigmented tumors.	Refer the patient for surgical treatment.	Operative treatment or with the help of x-ray-laser-cryotherapy.
Learn how to diagnose hemangiomas.	Perform an external inspection and a focal light inspection. Perform a biomicroscopy. Examine the fundus.	They are mainly congenital benign tumors. They grow especially fast in the first months and years of a child's life. They have very expansive growth. According to the form and localization of hemangiomas can be divided into simple, or capillary, cavernous, or cavernous, racemous, or cluster-like, and mixed. Each of these hemangiomas can be localized in the eyelids, the conjunctiva of the eyelids and the eyeball, as well as in the retrobulbar space and the vascular membrane of the eye.

a	b	c
Learn the principles of hemangioma treatment.	Refer the child for surgical treatment.	Treatment should begin immediately after diagnosis. Treatment methods depend on the type of tumor, its location and size, growth rates, complications, as well as the age and General condition of the patient. Preferably, surgical treatment, which consists of radical removal of the tumor. Then, according to the frequency of use and the degree of effectiveness, cryotherapy and sclerosing therapy follow. Cryo - electrocoagulation and is indicated for superficial hemangiomas size up to 3 mm. When massive hemangiomas, the boundaries of which are specified, in cases of sprouting them in the eye socket shows the x-ray. Hemangiomas of the actual vascular membrane and iris that cause glaucoma are treated with laser and photocoagulation, and cryo-and diathermocoagulation is indicated for hemangiomas of the ciliary body.
Learn how to diagnose gliomas.	Examine your visual acuity. Perform an external examination and exophthalmometry.	The clinical picture consists of three features. The appearance and slow increase of unilateral exophthalmos. It is not portable, it is usually located "straight ahead". The size of the exophthalmus does not always reflect the true size of the tumor due to the fact that the tumor can grow along the optic nerve inside the skull. The second sign is a decrease in visual acuity. Due to compression of the optic nerve fibers by the tumor, visual functions are reduced to complete blindness. The third symptom of the disease is edema of the optic disc. The optic disc can become very large, along with massive hemorrhages and retinal edema. Atrophy of the optic nerve and blindness quickly occur.
Learn the principles of glioma treatment.	Refer the patient for surgical treatment.	Perform surgical removal of the tumor with the preservation of the eyeball. Operations are performed in conjunction with a neurosurgeon.
Learn how to diagnose basal cell carcinoma.	Perform an external inspection.	Most striking in the area of the lower eyelid. They are dense, smooth, permeated with vessels and significantly protrude above the surface. Over time, they erode with minimal trauma. The growth of the tumor is slow, but as it increases, ulcers with a roller-like edge may appear in the center. The tumor process gradually spreads to the skin of the face.

a	b	c
Learn the principles of basal cell carcinoma treatment.	Refer the patient to hospital treatment.	Treatment consists of short-focus x-ray therapy, cryo-and laser destruction, and for small tumor sizes – surgical removal.
Learn how to diagnose sarcoma.	Perform an external examination, exophthalmometry, and ophthalmoscopy. Perform an orbit x-ray.	Sarcoma develops from the periosteum of the orbit, episclera, etc. Rapid growth of the tumor, causing displacement of the eyeball, restriction of its mobility, exophthalmos and the appearance of diplopia indicate the malignancy of the process. Palpation the tumor is defined as elastic or hard, depending on the source of her development and education. On the fundus, due to the pressure of the tumor, a stagnant disk of the optic nerve may appear, and then its atrophy and blindness occurs. The tumor grows early in the nasal cavity, paranasal sinuses.
Learn the principles of sarcoma treatment.	Refer the patient to hospital treatment.	Treatment of sarcoma consists of urgent removal of the tumor within healthy tissue, up to the exenteration of the eye socket. In the postoperative period, radiation and chemotherapy are performed in combination with regular blood transfusions (blood transfusions). But often, due to early generalization of the process and metastasis, a fatal outcome is possible, despite the treatment.
Learn how to diagnose melanoma.	Explore the acuity and field of view. Perform biomicroscopy, gonioscopy, ophthalmoscopy, and echography.	The most common form of melanoblastoma is nodular, and diffuse and planar forms of the tumor are much less common. The contours of the nodular tumor are initially clear. It gradually increases in size, stands in the anterior chamber, closes the iris-corneal angle, which causes hypertension of the eye. Melanoma, which occurs in the iris, can also spread to all other parts of the eye. If it is initially localized in the ciliated body, then diagnosis in the early stages is almost impossible and can only be accidental. Melanoma in the vascular membrane itself can remain unnoticed for a long time. Ophthalmoscopically determined pigmented, and sometimes non-pigmented tumors, different in size, shape and location. The retina mines above them.

a	b	c
Learn the principles of melanoma treatment.	Refer the patient to hospital treatment.	Treatment in the initial stages consists in their operative removal of the tumor within the unchanged tissue in combination with energy effects. It is also possible to destroy the tumor by cryo -, diathermic -, laser -, photocoagulation. If the tumor is extensive, located in the iris or ciliated body, its borders are not visible, there is necrosis, then enucleation is shown.
Learn how to diagnose retinoblastoma.	Check your visual acuity. Perform a biomicroscopy of the eye. Perform an ophthalmoscopy. Examine the intraocular pressure. Make echofloripa, diaphanoscopy and assign x-rays of the orbit.	Clinically, the tumor can manifest at various times after birth. It is most often detected in children under the age of 3 years, although cases of its occurrence in 10-20 years have been described. Characteristic features are the following: a yellowish glow in the area of the dilated pupil, a decrease and uneven thickness of the anterior chamber, a sharp decrease in visual acuity, the presence of a different type of tumor-like formation of a yellowish-white color on the fundus. There are four stages of the disease. The first stage is detected only ophthalmoscopically. At this stage, the eye is calm and its media is transparent. There is a grayish loose focus of small sizes on the eye area, located in any part of the optically active retina. In the second stage of the disease, the tumor captures most of the retina, sharply protrudes into the vitreous body, and intraocular pressure may increase. Visual acuity is gradually reduced to complete blindness. The pupil expands and "glows", especially at dusk, with a yellow light ("amaurotic cat's eye"). Sometimes in connection with the collapse of the tumor appear pseudomyopia and deposits on the back the surface of the cornea, which give the impression of the precipitates. When necrosis of the tumor is detected floating opacities in the vitreous body, there may be hemorrhages. The third stage is characterized by the fact that the tumor sprouts the walls of the eyeball. The spread of the tumor to the eye socket is accompanied by rapidly increasing exophthalmos. The progress of the tumor along the optic nerve into the skull cavity can cause brain symptoms. The fourth stage is manifested by the appearance of metastases in regional lymph nodes, mainly parotid and cervical. Hematogenically, metastases can be

a	b	c
		transferred to the bones of the skull and to various organs.
Learn the principles of retinoblastoma treatment.	Refer the patient to hospital treatment.	Treatment depends on the stage. In the first stage, local application of laser photocoagulation, radioactive applicators and chemo-rapy (TET, TEM, cyclophosphane, etc.) is preferred. In the second stage, enucleation is recommended, followed by radiation and chemotherapy. In the third stage, exenteration of the eye socket is shown, in the future, radiation and chemotherapy are performed. In the fourth stage, treatment is only conservative, symptomatic, and almost unsuccessful. In a bilateral process, it is recommended to remove the worst eye followed by radiation and chemotherapy of the best eye and radiation therapy of the eye socket on the side of the removed eye.
Learn how to diagnose professional eye damage with infrared radiation.	Collect medical history. Note the possibility of exposure to infrared radiation. Determine the visual acuity of each eye. By external examination, examine the condition and position of the eyelids, evaluate the growth of eyelashes and the condition of the eye slit. Examine the different parts of the conjunctiva. Use a side-lighting technique or biomicroscopy. Examine the cornea. Examine the iris, determine the change in its color, pattern. Examine the lens. Try to identify its opacities, for which use the research method in the transmitted light. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to detect the pathology.	Infrared radiation has a pronounced thermal effect on the eyelids, conjunctiva, and certain structures, especially in the upper part of the eye. Prolonged work with sources of intense infrared radiation can cause chronic blepharitis and blepharoconjunctivitis, often in combination with a weakening of accommodation. Corneal opacities and iris atrophy are possible in workers with molten glass. Professional thermal cataract (cataract of glassblowers, metallurgists) in the initial stage of development has characteristic clinical features. Opacities occur first in the posterior cortical layer of the lens. Damage to the retina and the vascular membrane itself is possible when looking at a strong light source.
Learn how to diagnose	Collect medical history. Note the possibility of	Natural and artificial UV rays are almost completely absorbed by the cornea and lens.

a	b	c
professional eye damage with UV radiation.	exposure to ultraviolet radiation. Determine the visual acuity of each eye. Use a side-lighting technique or biomicroscopy. Examine the cornea. Examine the lens. Try to identify its opacities, for which use the research method in the transmitted light.	With significant and prolonged ultraviolet irradiation, persistent opacities of the corneal stroma are possible, but damage to its endothelium is most dangerous. The core of the lens is colored yellow or brown, and the ability of the lens to pass visible light is reduced.
Learn how to diagnose professional eye damage during welding.	Collect medical history. Note the possibility of welding affecting the eye. Determine the visual acuity of each eye. By external examination, examine the condition and position of the eyelids, evaluate the growth of eyelashes and the condition of the eye slit. Examine the different parts of the conjunctiva. Use a side-lighting technique or biomicroscopy. Examine the cornea.	During welding, foreign bodies may enter the eye, burn the skin, conjunctiva, and eyelids. Exposure eye ultraviolet rays when welding causes the development of fotoatelje or electronically. The duration of the hidden period after irradiation is on average 6-8 hours. First, there is a feeling of a foreign body in both eyes. Then this feeling increases, there is photophobia and lacrimation. Gradually, the pain in the eyes increases, and blepharospasm appears. On examination, edema and hyperemia of the eyelids, conjunctival edema, sometimes with chemosis, pronounced pericorneal and conjunctival injection of the eyeball, and pupil constriction are detected. Acute inflammation lasts 6-8 hours, but stops completely only after 1-2 days. In severe cases, eye irritation may persist for several days. Repeated eye irradiation leads to the development of chronic blepharoconjunctivitis.
Learn how to treat professional eye damage when welding.	Make the patient cold cotton lotions on the eyelids, drip a solution of antibiotic and anesthetic into the eye.	Treatment of photophthalmia consists in the appointment of cold lotions, antibacterial drops and local anesthetics (lidocaine, novocaine).
Learn how to diagnose professional eye damage when exposed to laser radiation.	Collect medical history. Note the possibility of welding affecting the eye. Determine the visual acuity of each eye. Explore the field of view. Perform an external eye examination. Use a side-lighting technique or	Eye damage can occur as a result of accidental action of a direct or reflected high-intensity laser beam. At the site of the lesion, a burn occurs, and sometimes a hole is formed in the retina without its detachment. In some cases, hemorrhages occur both in the retina and in neighboring structures, including the vitreous body. The possible margin of tissue without coagulation and

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	biomicroscopy. Examine the cornea. Examine the iris, determine the change in its color and pattern. Examine the lens. Try to identify its opacities, for which use the research method in the transmitted light. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to detect the pathology.	bleeding. As the edema and hemorrhage resolve, visual functions are fully or partially restored, and a chorioretinal scar is formed at the site of the lesion.
Learn how to diagnose professional eye damage when exposed to ionizing radiation.	Collect medical history. Note the possibility of exposure to ionizing radiation on the eye. Determine the visual axis of each eye. By external examination, examine the condition and position of the eyelids, evaluate the growth of eyelashes and the condition of the eye slit. Determine the state of the lacrimal organs. At the medial junction of the eyelids, examine the tear points, check their position. Apply pressure to the tear SAC injection site. At the same time, observe the tear points. Examine the different parts of the conjunctiva and evaluate the type of eyeball injection. Use a side-lighting technique or biomicroscopy. Examine the cornea. Note its sphericity, smoothness, transparency, and brilliance. Examine the front camera of the eye. Pay attention to its depth and equivariance. Mark the depth level (shallow, medium depth, deep). Pay attention to the transparency of moisture.	The eyeball is completely permeable to almost all types of ionizing radiation. When ionizing radiation in high doses, atrophy of the eyelid skin develops, which consists in its thinning and depigmentation. The edge of the eyelid is also thinning, and the evil eye is getting worse. The lesion of hair follicles leads to the loss of eyelashes. In severe cases, as a result of scarring of the conjunctival arches, a closed eyelid appears. When the lacrimal tubules are affected, their scarring and obliteration occur. Damage to the lacrimal glands leads to xerophthalmia. Radiation kerato-conjunctivitis is observed. The latent period varies from a few hours to several days depending on the radiation dose. In severe cases, there are erosions and ulcers of the cornea, turbidity of the deep parts of the corneal stroma, combined with anterior uveitis. Radiation cataract can develop both after a single mass irradiation of the eye, and with repeated action of small doses of ionizing radiation. The duration of the latent period preceding the appearance of a radiation cataract varies from a few months to 10-12 years. First, there is a cluster of tiny opacities in the sub-capsular layer in the region of the posterior pole of the lens. Gradually, this cluster becomes ring-shaped, and vacuoles appear in the posterior cortical layer. The Central part of the opacity is less dense than its edges. Weak subcapsular opacity also occurs in the area of the anterior lens pole. In the future, vacuolation and turbidity spread to the rest of the cortical sections and the radiation cataract loses its

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	Check the width of the angle of the front camera of the eye by Vurgaft. Examine the iris, determine the change in its color and pattern. Consider the pupil, its pigment border. Evaluate its shape, width, and mobility. Note the presence of anterior or posterior synechiae. Determine the level of intraocular pressure. Examine the lens. Try to identify its opacities, for which use the research methodology in a passing light. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to detect the pathology.	characteristic appearance. The development of radiation cataracts can be stopped at any stage. Retinal lesions are manifested in changes in retinal vessels, especially capillaries, the development of microaneurysms, retinal edema, hemorrhage and exudative foci. There is a strong similarity between retinopathy caused by ionizing radiation and diabetic retinopathy. Secondary glaucoma may occur when the drainage system of the eye is directly damaged, especially in the intra-scleral part of the eye, or it may be the result of radiation damage to the vessels of the retina.
Learn how to diagnose professional eye damage when exposed to ionizing radiation.	Collect medical history. Note the possibility of exposure to ionizing radiation on the eye. Determine the visual axis of each eye. By external examination, examine the condition and position of the eyelids, evaluate the growth of eyelashes and the condition of the eye slit. Determine the state of the lacrimal organs. At the medial junction of the eyelids, examine the tear points, check their position. Apply pressure to the tear SAC injection site. At the same time, observe the tear points. Examine the different parts of the conjunctiva and evaluate the type of eyeball injection. Use a side-lighting technique or biomicroscopy. Examine the ro-GOV shell. Note its sphericity, smoothness,	The eyeball is completely permeable to almost all types of ionizing radiation. When ionizing radiation in high doses, atrophy of the eyelid skin develops, which consists in its thinning and depigmentation. The edge of the eyelid is also thinning, and the evil eye is getting worse. The lesion of hair follicles leads to the loss of eyelashes. In severe cases, as a result of scarring of the conjunctival arches, a closed eyelid appears. When the lacrimal tubules are affected, their scarring and obliteration occur. Damage to the lacrimal glands leads to xerophthalmia. Radiation kerato-conjunctivitis is observed. The latent period varies from a few hours to several days depending on the radiation dose. In severe cases, there are erosions and ulcers of the cornea, turbidity of the deep parts of the corneal stroma, combined with anterior uveitis. Radiation cataract can develop both after a single mass irradiation of the eye, and with repeated action of small doses of ionizing radiation. The duration of the latent period preceding the appearance of a radiation cataract varies from a few months to 10-12 years. First, there is a cluster of tiny opacities in the sub-capsular layer in the region of the posterior pole of the lens.

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	transparency, and brilliance. Examine the front camera of the eye. Pay attention to its depth, its equidistance. Mark the depth level (shallow, medium depth, deep). Pay attention to the transparency of moisture. Check the width of the angle of the front camera of the eye by Vurgaft. Examine the iris, determine the change in its color and pattern. Consider the pupil, its pigment border. Evaluate its shape, width, and mobility. Note the presence of anterior or posterior synechiae. Determine the level of intraocular pressure. Examine the lens. Try to identify its opacities, for which use the research methodology in a passing light. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to detect the pathology.	Gradually, this cluster becomes ring-shaped, and vacuoles appear in the posterior cortical layer. The Central part of the opacity is less dense than its edges. Weak subcapsular opacity also occurs in the area of the anterior lens pole. In the future, vacuolation and turbidity spread to the rest of the cortical sections and the radiation cataract loses its characteristic appearance. The development of radiation cataracts can be stopped at any stage. Retinal lesions are manifested in changes in retinal vessels, especially capillaries, the development of microaneurysms, retinal edema, hemorrhage and exudative foci. There is a strong similarity between retinopathy caused by ionizing radiation and diabetic retinopathy. Secondary glaucoma may occur when the drainage system of the eye is directly damaged, especially in the intra-scleral part of the eye, or it may be the result of radiation damage to the retinal vessels.
Learn how to diagnose professional eye damage when exposed to vibration.	Collect medical history. Note the possibility of vibration affecting the eye. Determine the visual acuity of each eye. Explore the field of view. Check the color perception. Examine the different parts of the conjunctiva, evaluate the type of eyeball injection. Use a side-lighting technique or biomicroscopy. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to detect the pathology.	Patients with this pathology most often complain of poor vision, especially when performing work that requires stress accommodation, a feeling of sand in the eyes, redness of the eyes and watery eyes. The most noticeable changes are the weakening of accommodation. There is an expansion of the blind spot, a concentric narrowing of the field of view to white and chromatic colors. Biomicroscopy of the eye reveals changes in the vessels of the conjunctiva and episclera. Spasm of blood vessels is often combined with their expansion, atony. There is an uneven gauge of blood vessels, their tortuosity, ampoule-like veins, the formation of microaneurysms, the appearance of small hemorrhages. Changes in retinal vessels are similar. A picture of both hypertensive angiopathy and hypotonic retinal angiopathy is possible.

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Learn how to diagnose professional eye damage with mercury.	Collect medical history. Note the possibility of mercury exposure to the eye. Determine the visual acuity of each eye. Explore the field of view. Check the light perception. By external examination, examine the condition and position of the eyelids, evaluate the growth of eyelashes and the condition of the eye slit. Use a side-lighting technique or biomicroscopy. Examine the cornea. Note its sphericity, smoothness, transparency, and brilliance. Examine the iris, determine the change in its color and pattern. Consider the pupil, its pigment border. Evaluate its shape, width, and mobility. Determine the level of intraocular pressure. Examine the lens. Try to identify its opacities, for which use the research method in the transmitted light. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to detect the pathology.	With mercury intoxication, the eye muscles are often affected, there is a tremor of the eyelids, a violation of the size, shape and reaction of the pupils, and diplopia. Inflammatory and degenerative changes are detected in the form of conjunctivitis, blepharitis, pinguecula, and pterygium. Impregnation of mercury into the cornea and lens is accompanied by their staining in gray-brown or pink-cinnamon color. The tactile sensitivity of the cornea is reduced, and in some cases, there are unstable opacities in the form of rosettes in its deep layers. A circular ring appears on the surface of the cornea, located concentrically with respect to the limb. In more severe lesions, the Central corneal stroma becomes clouded. Under the influence of mercury, a metallic gray-brown or gray-brown-pink reflex from the anterior surface of the lens appears. The reflex can be combined with point-like turbidity of the anterior cortical layers of the lens. Chronic mercury intoxication is manifested in the main narrowing of the peripheral borders of the visual field. This narrowing and reduction of visual acuity is evidence of an atrophic process in the optic nerve. Under the influence of mercury intoxication, light perception is disrupted early.
Learn how to diagnose professional eye damage with lead.	Collect medical history. Note the possibility of lead exposure to the eye. Determine the visual acuity of each eye. Explore the field of view. By external examination, examine the condition of the conjunctiva. Use a side-lighting technique or biomicroscopy. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to detect the pathology.	Ophthalmosaurus – defeat the eye of the lead compounds. Tetraethyl lead (TES) is considered the best anti-detonator, it is added to gasoline. TES is the only lead compound that can be easily dissolved in fats and absorbed through intact skin. If lead is present, there may be periodic loss of vision without changes in the fundus. Quickly comes the irritation of the conjunctiva. Prolonged exposure to even small concentrations of TES results in retinal edema, especially in the peripapillary and Central zones. The horizontal expansion of the physiological scotoma occurs when the optic nerve discs become pale, retinal vessels

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	Determine the level of intraocular pressure.	narrow and the peripapillary zone becomes swollen. The vertical boundaries of the physiological scotoma often merge with significantly expanded angioscotomas, which are defined paracentrically over a significant length and have the form of closed or almost closed rings. There may be a persistent violation of the regulation of ophthalmotonus.
Learn how to diagnose professional eye damage with silver.	Collect medical history. Note the possibility of silver exposure to the eye. Determine the visual acuity of each eye. By external examination, examine the condition and position of the eyelids, evaluate the growth of eyelashes and the condition of the eye slit. Determine the state of the lacrimal organs. Examine the different parts of the conjunctiva. Use a side-lighting technique or biomicroscopy. Examine the cornea. Examine the iris, determine the change in its color, pattern. Examine the pupil. Examine the lens. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to detect the pathology.	The influence of silver or its compounds can lead to argyria. Ophthalmoargyria is manifested by gray-brown staining of the eye tissues with restored sulfur-bromine. Silver accumulates directly under the conjunctival epithelium and in the posterior border plate of the cornea. It is mainly colored by the conjunctiva of the lower half of the eyeball, the semilunar fold, the lacrimal muscle and the lacrimal tubules. Coloration is often more intense around the limb. It can be colored on the conjunctiva of the eyelids, more often inthe lower arch, mainly from the inner side. Silver particles accumulate around the sebaceous and sweat glands, hair roots, and along the walls of blood vessels, especially along the con-cernal branches of arterioles, veins, and lymphatic vessels. Sometimes the tear SAC is stained. In the cornea, argyria affects its own tissue in the main. When viewed in reflected light, the cornea appears to be colored gray. In lateral illumination, blue-green-gold stripes can be seen in the deeper layers and in the posterior border plate in the gray-sconce granule deposits. During biomicroscopic examination, the outlined pattern of a dense network of twisting, intertwining lines with silver inclusions that have a bluish-gray color is determined. Argyria crunch-face is rarely observed. Possible staining of the front, less often the posterior capsule of the lens. When particularly severe forms are observed, silver imprecation of the Seth-Chatka and optic nerve tissue is observed. Visual acuity, as a rule, does not suffer.
Learn how to diagnose professional eye damage with	Collect medical history. Note the possibility of carbon disulfide exposure to the eye. Determine the	If a solution of carbon disulfide gets into the eye, burns develop. The effect of carbon disulfide becomes noticeable only after a few hours of contact. Even when the eyes are

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carbon disulfide.	visual acuity of each eye. Explore the field of view. Explore the field of view. By external examination, examine the condition and position of the eyelids, evaluate the growth of eyelashes and the condition of the eye slit. Determine the state of the lacrimal organs. Examine the different parts of the conjunctiva. Use a side-lighting technique or biomicroscopy. Examine the cornea. Examine the iris, determine the change in its color, pattern. Examine the pupil. Examine its reaction to light. Use any method of ophthalmoscopythat is convenient for you. Examine the fundus. Try to detect the pathology.	calm, victims complain of an unpleasant sensation in the eyes and the appearance of colored circles in front of the eyes. Later, lacrimation, hyperemia, and sometimes conjunctival hemorrhages develop. Under the long-term influence of high concentrations of carbon disulfide, conjunctivitis, corneal edema and its small-scale infiltrates develop, bubbles appear on the cornea, which soon burst, which is accompanied by sharp pain. After the infiltrates are absorbed, the corneal transparency is restored. In severe carbon disulfide intoxication, ocular muscle paralysis, myosis, corneal and pupillary reflexes, nystagmus accommodation paralysis, and optic nerve damage are possible. Typical manifestations of carbon disulfide intoxication are considered to be the Central area and the concentric shift of the peripheral edges of the visual field to red. Light sensitivity is reduced, and there are wounds-the action of carbon disulfide. There are sclerotic changes in the retinal vessels. Retinal vascular spasm is considered a manifestation of General angio-spasm in toxic fundus, microaneurysms of the retinal capillaries are often detected.
Learn how to diagnose professional eye damage with arsenic and its compounds.	Collect medical history. Note the possibility of exposure of arsenic and its compounds to the eye. Determine the visual acuity of each eye. Explore the field of view. By external examination, examine the condition and position of the eyelids, evaluate the growth of eyelashes and the condition of the eye slit. Examine the different parts of the conjunctiva. Use a side-lighting technique or biomicroscopy. Examine the cornea. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to detect the pathology.	When Arsenium disulfide powder enters the eye, the pore-tions end in corneal opacity. Insecticides containing calcium arsenate can cause keratoconjunctivitis. Arsenic oxide can cause turbidity, ulceration, and even perforation of the cornea. Arsenic trichloride has a strong toxic effect, as a result of which severe conjunctivitis develops with chemosis and necrotic lesions of the cornea, ending in its vascularized opacity. Severe eye damage with lewisite causes a rapid exfoliation of the corneal epithelium and destructive inflammation of the entire eyeball, which quickly rotates into a scar-born, dysfunctional mass. Long-term exposure to even small doses of arsenic is manifested by the age of the eyelids in the form of dermatitis with irritation and peeling of the skin. Rapid pigmentation of the eyelid skin is possible. In acute lesions, a kind of arsenic keratitis develops with severe pain in the eyes, photophobia, lacrimation, mixed injection of

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		the eyeball, epithelial erosions and significant edema of the cornea's own tissue. In chronic cases, interstitial keratitis develops with a pan-NUS. Exfoliative keratitis can be superficial, spotty, or accompanied by a massive loss of the corneal epithelium, which can lead to ulceration and even corneal perforation and panophthalmitis. In acute cases, there is corneal edema, in chronic cases-interstitial keratitis with a pronounced pan-NUS. There are cases of optic nerve damage in conjunction with amblyopia and its subsequent atrophy. An early signal of optic nerve disease is a narrowing of the peripheral borders of the visual field. Visual functions start early, and visual acuity decreases rapidly. The narrowing of the field of vision can be combined with periodic loss of vision, a sense of flickering light. With increasing intoxication, the visual field is progressively reduced up to the tubular and the disc of the visual nerve is more pronounced. In chronic intoxication, retrobulbar neuritis, usually bilateral, may develop.
Learn how to diagnose professional eye damage with carbon monoxide.	Collect medical history. Note the possibility of carbon monoxide exposure to the eye. Determine the visual acuity of each eye. Explore the field of view and color perception. Examine the mobility of the eyeballs. Examine the different parts of the conjunctiva. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to detect the pathology.	In acute carbon monoxide poisoning, narrowing of the arteries and dilation of the retinal veins, dark color of the retinal vessels and its edema, foci of exudate and hemorrhage are determined on the fundus. Neuritis of the optic nerve may develop with the outcome in its atrophy. There are disorders of the oculomotor muscles in the form of paresis or paralysis, and sub-conjunctival hemorrhages are possible. In mild cases of intoxication, patients complain of flickering, double vision, micropsia, impaired color perception and vision at dusk. There is a paresis of the oculomotor muscles. When carbon monoxide is intoxicated, the narrowing of the field of vision for colors and the loss of color perception are persistent. In severe cases, optic neuritis and neuroretinitis with hemorrhages are observed.
Learn how to diagnose tobacco amblyopia.	Collect medical history. Note the possibility of exposure to tobacco dust or possible addiction to	As a rule, tobacco ambiopia occurs after many years of contact with tobacco dust or Smoking. The disease is caused by common diseases, especially diabetes, atherosclerosis,

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	tobacco. Find out if there are comorbidities. Determine the visual acuity of each eye. Explore the field of view. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to detect the pathology.	pernicious anemia, and various causes that lead to hypovitaminosis and malnutrition. In patients with tobacco amblyopia, both eyes usually suffer, but to different degrees. The process begins with a violation of the red color perception. This leads to complaints of visual impairment and difficulty reading. When visual functions are checked, a decrease in visual acuity (up to 0.1 and below) and a carrier centrocecal scotoma are detected (a scotoma that captures the blind spot and extends to the fixation point). The scotoma on the red light appears earlier and is larger than the scotoma on the white color. With tabach-ing amblyopia, the scotoma becomes flat over time, the visual acuity progressively decreases, but there is never complete blindness. In ophthalmoscopy, the optic disc first has a normal appearance, in the future, partial atrophy of the optic nerve is possible.
Learn how to diagnose damage to the visual organ with trinitrotoluene (TNT).	Collect medical history. Note the possibility of exposure to trinitrotoluene on the eye. Determine the visual acuity of each eye. Examine the different parts of the conjunctiva. Use a side-lighting technique or biomicroscopy. Examine the lens and vitreous body. Try to identify its opacities, for which use the research method in the transmitted light.	When TNT is intoxicated, a toxic cataract occurs with opacities in the form of wedges, mainly in the Equatorial zone of the crunch, facing the tip of the lens axis. As the intoxication develops, an additional, initially incomplete, and then a closed paracentral ring, a visible opacity, appears. At the height of intoxication, two rings of opacity are observed: well-defined in the center of the lens in the area of the pupil projection, concentric to its edge and located at the equator, correctly outlined on the periphery and with serrated protrusions on the inner edge. The extreme periphery of the lens remains transparent. Opacities develop in both eyes at the same time and are slowly expressed. Opacities in the initial stage are detected in the cortical layers near the lens capsule in the form of a few small grayish dots or spots of various shapes, located mainly at the lens sutures. Dense clusters are visible in the transmitted light as opacities in the Equatorial zone of the lens and the parapacular region. In the future, the turbidity spreads to the entire lens. Toxic cataracts, usually two-sided, are formed slowly and almost do not respond to reverse development, and can progress after contact

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		with TNT has ceased. Full opacity of the crunch-face is rarely observed. In almost all patients, there are changes in the perilymbal network: increased vascular izvi-tost, their uneven gauge, ampoule-different extensions and point hemorrhages, and fibrosis of the vitreous body in the form of its filamentous destruction. In the vascular envelope, there is a sharply increased dilution of the pigment at the extreme periphery.
Learn how to diagnose damage to the visual organ with hydroquinone.	Collect medical history. Note the possibility of hydroquinone exposure to the eye. Determine the visual acuity of each eye and record it. Perform optical vision correction. Examine the different parts of the conjunctiva. Use a side-lighting technique or biomicroscopy. Examine the cornea.	There is irritation of the conjunctiva, photophobia, lacrimation. In the area of the eye slit, a ribbon-like coloration of the conjunctiva appears (from yellow-brown to purple); later, the cornea is also colored. Determine the dryness of the conjunctiva, which is closely adjacent to the surface of dark brown foam-different deposits. The conjunctiva thickens, white spots appear on its dry surface, and in the deeper layers, small pigment grains are observed, which partiallymigrate to the cornea through the limb. In the upper layers of the conjunctiva, spherical cysts resembling cysts are identified, which are observed in chronic conjunctivitis, but with the difference that they follow the course of the upper veins only in the interpalpebral zone. The conjunctiva thickens and becomes pasty with brown granules of various shapes embedded in it. Severe changes occur in the cornea. There are high cylindrical brown-green grains that are located primarily near the limb. In the upper layers of the cornea under the Bowman membrane, there are many gray translucent points that resemble the luster of silver, the folding of the posterior border plate is determined, and the thickening of the nerve endings in this zone of the cornea. As intoxication increases, the green-brown homogeneous color spreads to all layers of the cornea, which is bordered by the edges of the eyelids. Many craters appear in deeper-lying areas, indicating damage to the Bowman membrane and corneal edema. The posterior sections of the corneal stroma usually remain transparent. The vertical folding of the posterior border plate increases significantly. Sometimes, along the corneal

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		periphery, there is a cluster of superficially distributed small brown grains that resemble the colored old corneal arch. Heavy changes in the cornea lead to a sharp decrease in sensitivity and turbidity, and in some cases to ulceration with the subsequent development of predominantly corneal non-linear astigmatism and even keratoconus.
Learn how to diagnose damage to the organ of vision with organochlorine pesticides.	Collect medical history. Note the possibility of exposure of organochlorine compounds to the eye. Determine the visual acuity of each eye. Examine the state of the eyelids. Examine the different parts of the conjunctiva. Use a side-lighting technique or biomicroscopy. Examine the cornea. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to detect the pathology. Explore the field of view and color perception.	Organochlorine pesticides have a sensitizing and pronounced local irritant effect. With acute intoxication, lacrimation, blepharospasm, hyperemia of the conjunctiva of the eyelids are observed. Acute conjunctivitis may develop with severe edema of the eyelids, infiltration of the mucous membrane, sub-conjunctival hemorrhages and purulent discharge. Eczematous blepharitis, blepharoconjunctivitis, and deep keratitis with pronounced corneal vascularization and concomitant iritis are prone to relapses.Outcome aktirovanie become rough and vascularized leukoma. The clinical picture includes spasm of accommodation and decreased tactile sensitivity of the cornea. Optic neuritis is accompanied by a decrease in visual acuity, a violation of light and color perception, and a narrowing of the peripheral borders of the visual field. In severe cases, atrophy of the optic nerve with complete loss of vision is possible.
Learn how to diagnose damage to the organ of vision by organophos-phorus compounds.	Collect medical history. Note the possibility of exposure of organophosphates to the eye. Determine the visual acuity, the field of view of each eye. Check the mobility of the eyeball. Examine the different parts of the conjunctiva, evaluate the type of eyeball injection. Use a side-lighting technique or biomicroscopy. Examine the cornea. Examine the iris, determine the change in	In acute poisoning, there is copious lacrimation, pronounced myosis, and a sluggish reaction of the pupils to light. Myosis and spasm of accommodation cause a significant decrease in visual acuity, pain in the eyeballs and periorbital area, headache, especially when focusing the eyes, which is explained by spasm of the ciliary muscle. Long-term myosis, spasmaccomodia, macropsia, and a drop in intraocular pressure are explained by the ability of organophosphorus compounds to inhibit cholinesterase. Myosis, being a constant and characteristic feature of the action of organophosphorus compounds, can be different in the eyes of the same person. In

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	its color, pattern. Consider the pupil, its pigment border. Evaluate its shape, width, and mobility. Determine the level of intraocular pressure. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to detect the pathology.	case of severe intoxication, mydriasis may follow it. There are fibrillar twitching of the eye muscles, nystagmus, ptosis and diplopia. Signs of severe poisoning include yellow staining of the conjunctiva of the eyeball (an early sign of current jaundice), and retinal hemorrhage. With chronic organophosphorus compounds intoxication, corneal reflexes are reduced. Against the background of severe neurological symptoms, the threshold of visual perception and indicators of optical chromacy increase. Chronic optic neuropathy is often observed in people who have been exposed to toxic organophosphorus compounds.
Learn how to diagnose visual organ damage with methyl alcohol.	Collect medical history. Note the possibility of exposure to methyl alcohol on the eye. Determine the visual acuity of each eye. Use a side-lighting technique or biomicroscopy. Examine the pupil. Evaluate its shape and width, mobility. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to detect the pathology.	When poisoning with methyl alcohol, the leading clinical symptom is a visual disorder. Visual impairment is usually detected not immediately, but after 2-3 days of apparent well-being. At first, patients are disturbed by flickering and fog before their eyes, after a few minutes hours (sometimes after 1-2 days) sharply reduced visual acuity up to complete blindness. Sometimes blindness comes on suddenly. Visual disturbances are accompanied by dilation of the pupils and inhibition of their reaction to light. The fundus of the eye may at first be little changed; there is hyperemia of the optic nerve discs or mild neuritis, sometimes papillitis develops with edema of the type of stagnant discs. With severe visual impairment, there are pronounced phenomena of stagnation and edema with hemorrhages around the discs and along the periphery, as well as in the vitreous body. Sometimes vision temporarily improves, followed by a sharp drop down to amaurosis. The outcome of the disease is atrophy of the optic nerve. Workers in the production of ethyl alcohol do not show changes in the optic nerve when the conjunctiva is affected and the tactile sensitivity of the cornea is reduced. Conjunctival hyperemia is more common with less than 5 years of work experience. There is an expansion of the physiological scotoma. Blind spots reach the largest size in workers producing synthetic ethyl alcohol; their increase progresses in accordance with

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		the increase in work experience. Under the influence of calcium electrophoresis, blind spots are reduced almost to normal. People with mostly long-term work experience have a slight narrowing of the field of view to red. This functional phenomenon is reversible. With 10-12 years of experience, the threshold color perception for red and green colors increases, the boundaries of the field of vision narrow, paracentral scotomas appear, and the vertical size of the blind spot increases. Changes in the organ of vision disappear when the contact with alcohols and keys is temporarily stopped and become stable after prolonged contact.
Learn how to determine the level of disability of the patient and the suitability of the conscript for military service.	Determine the visual acuity of each eye and record it. Perform optical vision correction. Write down the data you received. By external examination, examine the condition and position of the eyelids, evaluate the growth of eyelashes and the condition of the eye slit. Determine the state of the lacrimal organs. At the medial junction of the eyelids, examine the tear points, check their position. Press your finger on the projection of the tear SAC. At the same time, observe the tear points. Examine the different parts of the conjunctiva, evaluate the type of eyeball injection. Pay attention to the position of the eyeball in the orbit, note its displacement. Check the mobility of the eyeball. If there is a strabismus, determine its angle. Use a side-lighting technique or biomicroscopy. Examine the cornea. Note its sphericity, smoothness,	Examination of persons with visual organ pathology in order to determine the Inva-lidity is carried out in the specialized offices of the ITU office of ophthalmology or the office of the General profile.In the case of ITU patients with ophthalmopathology, the clinical and functional diagnosis and prognosis are determined taking into account: - hereditary severity; - anamnesis and prognosis of the disease;-signs of onset of visual disorders; - nosological form of ophthalmopathology; - detailed characteristics of visual organ disorders; - state and dynamics of visual functions; - data on visual performance; - information about concomitant pathology of other organs and organ systems; - assessment of the possibility of restorative treatment, vision correction.Among the social factors, it is necessary to take into account the age, marital status, living conditions, education, profession, length of service, conditions and nature of work, salary, psychological characteristics of the patient and personal attitude to work, the possibility of social adaptation, the need for various types of social assistance. Based on the comparison of the results of such a comprehensive analysis with the content of the main categories of life activity, a judgment is made on the ability of the examined person to live. Vision impairment affects almost all aspects of life, but the severity of this effect is different. An integrated assessment of the functional state

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	transparency, Shine, sensitivity (check with a hair of cotton wool. If there is a pathological focus, describe its shape, size, and location. Examine the front camera of the eye. Pay attention to its depth and equidistance. Note the degree of depth (shallow, medium depth, deep). Pay attention to the transparency of moisture. Check the width of the anterior chamber of the eye by Vurgaft. Examine the iris, determine the change in its color and pattern. Consider the pupil and its pigmented border. Evaluate its shape, width, and mobility. Note the presence of anterior or posterior synechiae. Ask the patient to look down. Through the eyelid, Pro-palpate the eyeball. Note the tenderness of the Central body during palpation. Determine the level of intraocular pressure. Examine the lens. Try to identify its turbidity, which is why use the method of research in the transmitted light. Use any method of ophthalmoscopy that is convenient for you. Examine the fundus. Try to find the path. If the determination of the level of intraocular pressure palpation way, difficult for You, perform tonometry on Maklakova. Examine the field of view with a control probe. Based on the data you have about pathologic changes in the patient's eyeball, make a diagnosis. The diagnosis should reflect	of the visual analyzer, taking into account the International classification of visual disorders (ICD x), allows us to classify the severity of its violation by 4 degrees: I-small degree of low vision; II-average degree of low vision; III-high degree of low vision; IV-practical or absolute blindness. A comprehensive assessment of all the above-mentioned positions makes it possible to determine the disability and its group in accordance with the General criteria of disability, as well as to determine the need for social protection of the disabled person, including rehabilitation. The disability of group I is established pre-owned with the restriction of life-inactivity, conditional complete or practical blindness. The validity of group II is determined mainly when the main categories of life activity are reduced due to a high degree of low vision. The disability of group III is established mainly when the ability to perform professional activities is limited, due to moderate or low level of weakness or other moderate visual impairments. In determining the validity, in addition to the state of the visual organ, many social and psychological factors, clinical and rehabilitation forecasts are taken into account, as indicated above. Military medical expertise is conducted in accordance with the Order of the Minister of defense of the Russian Federation "on the procedure for conducting military medical expertise in the Armed forces of the Russian Federation". According to the categories of fitness for military service specified in it, a conclusion is issued with the following wording: "A" - qualified for military service; " B "-qualified for military service with minor restrictions;" C "-limited qualified for military service;" D " – temporarily unfit for military service;" D " -unfit for military service. Citizens who have:- pronounced anatomical changes or deficiencies in the position of the eyelids, eye sockets or conjunctiva with a significant violation of visual or motor functions in both eyes (inversion, eversion of the eyelids, their scar deformation, pronounced trichiasis, simblefaron) are considered unfit for military service); diseases of the cornea, sclera, iris,

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	the full nosological form in accordance with the generally accepted classification. Determine the level of disability or fitness for military service in accordance with the requirements of the law	ciliary body, lens, the actual SAC-distal membrane, retina, vitreous body, optic nerve are pronounced, with a progressive decrease in visual functions or frequent exacerbations in both eyes (diseases that are not amenable to conservative or surgical treatment, occurring after keratoprosthesis, tapetoretinal abiotrophy, regardless of the functions of the eye, retinal pigment degeneration, retinal detachment of non-traumatic etiology in both eyes); glaucoma in the advanced and subsequent stages in both eyes; nearsightedness or farsightedness of any eye in one of the meridians more than 12.0 D or astigmatism of any kind in any eye with a refractive difference in the two main meridians more than 6.0 D; reduced vision when the visual acuity of one eye is 0.09 and lower, and the other-0.3 with correction and lower, and the absence of an eyeball when the visual acuity of the other eye is 0.3 with correction and lower, or the visual acuity of both eyes is 0.2 with correction and lower. The visual acuity at which the subject is considered fit for military service must be at least 0.5 for one eye and not less than 0.1 for the other eye, or at least 0.4 for each eye. In this case, the visual axis is taken into account with the portable cortex. The permissible refractive error for drill service is determined by the "best" eye and should not exceed 6 D for myopia, 8 D for hypermetropia, and the degree of astigmatism should not be greater than 4 D.

8. EDUCATIONAL TASK

Find test tasks and situational tasks on the topics of classes in the corresponding collections.

9. MONITORING THE RESULTS OF ASSIMILATION. Produced by tables:

Table of programmed control

Subject: Damage to the visual organ.

I. What a wound is called a perforated? *1) injuries to the fibrous capsule of the eye; 2) injuries to the vascular tract; 3) injuries to the retina.*

II. Signs of perforated wounds of the anterior eye: *1) eye gipotonica; 2) its pressure is normal; 3) front camera normal depth; 4) anterior chamber is deep; 5) front camera is missing.*

III. Signs of a perforated wound of the posterior eye: *1) intraocular pressure is normal; 2) eyes gipotonica; 3) front camera is fine; 4) anterior chamber normal depth; 5) anterior chamber deep.*
IV. How can I localize an intraocular foreign body? *1) radiography of the orbit in one projection; 2) radiography of the orbit in two projections; 3) radiography with the Komberg-Baltin prosthesis.*
V. What are the complications of a perforated eye injury? *1) purulent iridocyclitis; 2) non-purulent iridocyclitis; 3) atrophy of the eyeball; 4) sympathetic inflammation.*
VI. What is the prevention of sympathetic inflammation? *1) in timely enucleation of the eye with posttraumatic purulent iridocyclitis; 2) in timely enucleation of the eye with posttraumatic chronic iridocyclitis; 3) in enucleation of the eye with a foreign body.*
VII. Name blunt injuries that require surgical treatment: *1) dislocation of the lens in the anterior chamber of the eye; 2) subluxation of the lens; 3) concussion of the retina.*
VIII. Treatment of traumatic corneal erosion: *1) medication; 2) medication and dressing; 3) conjunctival corneal coating.*
IX. How to remove a foreign body from the conjunctival SAC? *1) rinse the eye; 2) remove with tweezers; 3) remove with a wet cotton swab.*
X. What foreign bodies of the cornea can be removed by a General practitioner: *1) superficially located foreign bodies that protrude above the surface of the cornea; 2) superficially located foreign bodies that do not protrude above its surface; 3) foreign bodies in the middle and deep layers of the cornea.*
XI. The most common method of removing foreign bodies from the cornea: *1) with a spear, chisel, or injection needle; 2) with tweezers; 3) with a magnet.*
XII. First aid for chemical burns of the eye: *1) wash the eye with water; 2) drip a 30% solution of sulfacyl-sodium into the conjunctival SAC; 3) inject autokrov mixed with penicillin under the conjunctiva of the eyeball.*

Topic: Oculomotor apparatus and binocular vision.

I. The Oculomotor apparatus of both eyes consists of: *1) five; 2) ten; 3) twelve muscles.*
II. Oculomotor muscles-abductors: *1) external rectus muscle; 2) upper oblique muscle; 3) upper rectus muscle; 4) lower oblique muscle.*
III. Oculomotor adductor muscles: *1) internal rectus muscle; 2) upper oblique muscle; 3) upper rectus muscle; 4) lower rectus muscle.*
IV. The oculomotor nerve innervates: *1) the lower rectus muscle; 2) the outer rectus muscle; 3) the inner rectus muscle; 4) the upper rectus muscle; 5) the lower oblique muscle.*
V. The Excretory nerve innervates: *1) the internal rectus muscle; 2) the external rectus muscle; 3) the upper oblique muscle.*
VI. The block nerve innervates: *1) the lower oblique muscle; 2) the upper oblique muscle; 3) the external rectus muscle.*
VII. Binocular vision is necessary mainly for: *1) determining the shape of the object; 2) orientation in space; 3) depth assessment.*
VIII. Fusion of images of both eyes-binocular vision-is performed: *1) when the corresponding points of the retina are irritated; 2) when the disparate points of the retina are irritated; 3) when the associated function of all the oculomotor muscles and the correct position of the visual axes; 4) when strabismus occurs.*
IX. The feeling of depth is obtained on the basis of: *1) physiological double vision; 2) binocular vision; 3) monocular vision; 4) muscle sense.*

Topic: Binocular vision and strabismus.

The first option is the concomitant strabismus.

Option II-paralytic strabismus.
The third option is the correct position of the eyes with normal binocular vision.

I. Complaints: *1) double vision; 2) no double vision.*
II. The direction of the visual axes: *1) there is a deviation of the eyeball inside or out; 2) there is no deviation.*
III. The state of the oculomotor apparatus in both eyes: *1) there is a limitation of the eye; 2) eye movements are normal; 3) primary angle of deviation is equal to secondary; 4) secondary deviation angle is more primary.*
IV. Reduced visual acuity of the squinting eye-amblyopia: *1) happens; 2) does not happen.*
V. Spatial binocular vision: *1) present; 2) absent.*
VI. Treatment: *1) conservative, a combination of surgical and orthoptic; 2) only surgical; 3) does not require treatment.*

Topic: Tumors of the eye and its appendages.

I. Dermoid tumor can be localized: *1) in the eye socket; 2) in the limb; 3) on the cornea; in the iris; in the retina.*
II. Nevus is most often: *1) cystic neoplasm; 2) pigmented neoplasm; 3) vascular neoplasm.*
III. If there is a hemangioma, it is not indicated: *1) surgical treatment; 2) cryotherapy; 3) antibacterial therapy; 4) sclerosing therapy.*
IV. Characteristic signs of glioma are: *1) non-reducible exophthalmos; 2) decreased visual acuity; 3) pain when moving the eyeball; 4) congestive optic disc.*
V. Symptoms that are not typical for neurofibromatosis are: *1) pallor of the skin; 2) cyanosis of the skin; 3) "coffee" spots on the skin; 4) superficial ulceration on the skin; 5) exophthalmos.*
VI. In the presence of basal cell carcinoma, it is usually not used: *1) blizkofokusnuyu x-ray therapy; 2) surgical treatment; 3) chemotherapy; 4) cryodestruction; 5) laser destruction.*
VII. Sarcoma can be localized: *1) in the area of the eye socket; 2) on the eyelids; 3) on the mucous membrane; 4) on the retina.*
VIII. Melanoma has the following forms: *1) nodular; 2) diffuse; 3) bumpy; 4) planar; 5) limited.*
IX. Congenital malignancies include: *1) melanoma; 2) retinoblastoma; 3) pigment xeroderma; 4) adenocarcinoma; 5) basal cell carcinoma.*
X. The Main feature of the third stage of retinoblasoma is: *1) a grayish loose focus in the retina; 2) "amaurotic cat's eye"; 3) sprouting of the walls of the eyeball; 4) metastasis of the tumor.*

Subject: Occupational eye diseases.

I. The short-Wave part of electromagnetic radiation passing through the eye causes: *1) keratitis; 2) does not pass through the eye; 3) temperature increase.*
II. Infrared radiation when exposed to the eye causes: *1) cataract; 2) keratitis; 3) glaucoma.*
III. The cause of blindness in methyl alcohol poisoning is: *1) glaucoma; 2) corneal cataract; 3) cataract; 4) optic nerve atrophy.*
IV. First aid for eye burns by welding is performed in the form of: *1) applying a binocular bandage; 2) instilling an anesthetic; 3) laying a hydrocortisone ointment; 4) instilling sulfacl-sodium.*

V. Which of the following clinical manifestations is not characteristic of eye damage with organochlorine pesticides? *1) keratitis with corneal vascularization; 2) cataract); 3) acute conjunctivitis; 4) sub-conjunctival hemorrhages.*

VI. A characteristic manifestation of professional eye lesions with trinitrotoluene is: *1) conjunctivitis; 2) blepharitis; 3) keratitis; 4) cataract; 5) glaucoma.*

Subject: military and labor Expertise.

I. If a conscript has a sharpness of both eyes equal to 0.3, he is: *1) fit for military service; 2) fit for military service with relative restrictions; 3) limited fit for military service; 4) temporarily unfit for military service; 5) unfit for military service.*

II. If a conscript has a developed degree of glaucoma, he is: *1) fit for military service; 2) fit for military service with relative restrictions; 3) limited fit for military service; 4) temporarily unfit for military service; 5) unfit for military service.*

III. If a conscript has astigmatism in both eyes of 4.5 D, then he is: *1) fit for military service; 2) fit for military service with relative restrictions; 3) limited fit for military service; 4) temporarily unfit for military service; 5) unfit for military service.*

IV. If a conscript has a farsightedness of both eyes of 12.5 D, then he is: *1) fit for military service; 2) fit for military service with relative restrictions; 3) limited fit for military service; 4) temporarily unfit for military service; 5) unfit for military service.*

V. When examined in msec, the patient was diagnosed with immature age-related cataracts in both eyes. Visual acuity of the right eye = 0.3 (not corr.); visual acuity of the left eye = 0.8 (not corr.). The patient must: *1) be certified for group I of disability; 2) recommend surgical treatment of cataracts; 3) refuse to be assigned to the group of disability; 4) be certified for group III of disability.*

VI. When examined in msec, the patient was diagnosed with primary open-angle III a non-stabilized glaucoma of both eyes. Visual acuity of the right eye = 0.2 (not corr.); visual acuity of the left eye = 0.1 (not corr.). At perimetry, the tubular field of view of both eyes is determined. The patient must: *1) be certified for group I of disability; 2) recommend surgical treatment of cataracts; 3) refuse to be assigned to the group of disability; 4) be certified for group III of disability.*