

MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION

**Federal State Autonomous Educational Institution of Higher Education  
«National Research Lobachevsky State University of Nizhny Novgorod»**

Институт клинической медицины

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УТВЕРЖДЕНО

решением Ученого совета ННГУ

протокол № 10 от 02.12.2024 г.

**Working programme of the discipline**

Ophthalmology

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Higher education level

Specialist degree

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Area of study / speciality

31.05.01 - General Medicine

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Focus /specialization of the study programme

General Medicine

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Mode of study

full-time

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Nizhny Novgorod

Year of commencement of studies 2025

## 1. Место дисциплины в структуре ОПОП

Дисциплина Б1.О.35 Офтальмология относится к обязательной части образовательной программы.

## 2. Планируемые результаты обучения по дисциплине, соотнесенные с планируемыми результатами освоения образовательной программы (компетенциями и индикаторами достижения компетенций)

| Формируемые компетенции<br>(код, содержание компетенции)  | Планируемые результаты обучения по дисциплине (модулю), в соответствии с индикатором достижения компетенции   |   | Наименование оценочного средства   |                                 |
|---|---|---|------------------------------------|---------------------------------|
|   | Индикатор достижения компетенции<br>(код, содержание индикатора)  | Результаты обучения по дисциплине   | Для текущего контроля успеваемости | Для промежуточной аттестации    |
| ОПК-5: Способен оценивать морфофункциональные, физиологические состояния и патологические процессы в организме человека для решения профессиональных задач  | ОПК-5.1: Готов применить алгоритм клинико-лабораторной, инструментальной и функциональной диагностики при решении профессиональных задач<br>ОПК-5.2: Оценивает морфофункциональные, физиологические состояния и патологические процессы в организме человека для интерпретации результатов клинико-лабораторной, инструментальной и функциональной диагностики при решении профессиональных задач<br>ОПК-5.3: Знает принципы функционирования систем органов. | ОПК-5.1:<br>ОПК-5.1:<br>Knows morpho-functional, physiological conditions and pathological processes in the human body to solve professional tasks<br><br>ОПК-5.2:<br>ОПК-5.2:<br>Be able to assess morpho-functional, physiological conditions and pathological processes in the human body to solve professional tasks<br><br>ОПК-5.3:<br>ОПК-5.3: Knows the principles of organ systems.                       | Контрольная работа                 | Экзамен:<br>Контрольные вопросы |
| ПК-3: Готовность к сбору и анализу жалоб пациента, данных его анамнеза, результатов осмотра, лабораторных, инструментальных, патолого-анатомических и иных исследований в целях распознавания состояния или установления факта наличия или отсутствия | ПК-3.1: Знать методы сбора анамнеза, жалоб, осмотра больного с терапевтической патологией для распознавания заболеваний, этиологию, патогенез, и клинику наиболее часто встречающихся заболеваний внутренних органов; современную классификацию, принципы и особенности основных методов клинических, лабораторных и инструментальных методов   | ПК-3.1:<br>3.1 Knows the methods of collecting anamnesis, complaints, examination of a patient with ophthalmological pathology for the recognition of diseases Etiology, pathogenesis, and clinic of the most common diseases of the organ of vision; modern classification, principles and features of the main methods of clinical, laboratory and instrumental methods of examination, their diagnostic value. | Задачи                             | Экзамен:<br>Контрольные вопросы |

|   |  |  |                    |                              |
|---|--|--|--------------------|------------------------------|
| заболевания, проведение дифференциальной диагностики  | <p>обследования, их диагностическое значение</p> <p>ПК-3.2: Уметь получить информацию о заболевании, интерпретировать жалобы, анамнез заболевания и жизни, данные, применить объективные методы обследования, выявить общие и специфические признаки заболевания; построить план обследования больного с учетом стандартов и интерпретировать дополнительные методы обследования (лабораторно-инструментальные) с учетом нормы</p> <p>ПК-3.3: Владеть методами сбора анамнеза, жалоб больного с терапевтической патологией; навыком составления плана дополнительного обследования больного; интерпретацией результатов лабораторных и инструментальных исследований и проведения дифференциальной диагностики</p> | <p>ПК-3.2:<br/>3.2 Is able to obtain information about the disease, interpret complaints, medical and life history, data, apply objective methods of examination, identify general and specific signs of the disease; build a plan of examination of the patient taking into account the standards and interpret additional methods of examination (laboratory and instrumental) taking into account the norm.</p> <p>ПК-3.3:<br/>3.3 Possesses the methods of collecting anamnesis, complaints of a patient with ophthalmological pathology; the skill of drawing up a plan of additional examination of a patient; interpretation of the results of laboratory and instrumental investigations and differential diagnostics.</p> |                    |                              |
| <p>ПК-4: Готовность к определению у пациента основных патологических состояний, симптомов, синдромов заболеваний, нозологических форм в соответствии с Международной статистической классификацией болезней и проблем, связанных со здоровьем, X пересмотра</p> | <p>ПК-4.1: Знать этиологию, патогенез заболеваний соответственно с Международной статистической классификацией болезней и проблем, связанных со здоровьем X пересмотра</p> <p>ПК-4.2: Уметь определить основные симптомы, синдромы нозологических форм заболеваний в соответствии с Международной статистической классификацией болезней и проблем, связанных со здоровьем X пересмотра</p> <p>ПК-4.3: Владеть навыками постановки диагноза на основании симптомов, синдромов нозологических</p>   | <p>ПК-4.1:<br/>4.1 Knows the etiology, pathogenesis of ophthalmic diseases according to the International Statistical Classification of Diseases and Health Related Problems, X revision.</p> <p>ПК-4.2:<br/>4.2 Is able to identify the main symptoms, syndromes of nosological forms of ophthalmological diseases in accordance with the International Statistical Classification of Diseases and Health Related Problems, X revision.</p> <p>ПК-4.3:</p>  | Контрольная работа | Экзамен: Контрольные вопросы |

|   |  |  |                                      |                                 |
|---|--|--|--------------------------------------|---------------------------------|
|   | форм заболеваний в соответствии с Международной статистической классификацией болезней и проблем, связанных со здоровьем X пересмотра  | 4.3 Possesses the skills of diagnosis on the basis of symptoms, syndromes of nosological forms of ophthalmological diseases in accordance with the International Statistical Classification of Diseases and Health Related Problems, X revision.   |                                      |                                 |
| ПК-5: Готовность к определению тактики ведения пациентов с учетом возраста, с различными нозологическими формами (разработка плана лечения, назначение медикаментозных и немедикаментозных средств согласно клиническим рекомендациям) в том числе оказание паллиативной медицинской помощи | <p>ПК-5.1: Знать алгоритмы постановки диагноза и лечения и тактику ведения пациентов с различными нозологическими формами</p> <p>ПК-5.2: Уметь определять необходимую тактику ведения пациентов с различными нозологическими формами</p> <p>ПК-5.3: Владеть алгоритмами постановки диагноза и лечения и навыком определения тактики ведения пациентов с различными нозологическими формами</p> | <p>ПК-5.1:<br/>5.1 Knows algorithms of diagnosis and treatment and tactics of management of patients with various nosological forms</p> <p>ПК-5.2:<br/>5.2 Is able to determine the necessary tactics for the management of patients with various nosological forms</p> <p>ПК-5.3:<br/>5.3 Possesses algorithms of diagnosis and treatment and the skill of determining the tactics of management of patients with various nosological forms</p> | Задачи<br>Тест<br>Доклад-презентация | Экзамен:<br>Контрольные вопросы |

### 3. Структура и содержание дисциплины

#### 3.1 Трудоемкость дисциплины

|  |                |
|--|----------------|
|  | <b>очная</b>   |
| <b>Общая трудоемкость, з.е.</b>  | <b>3</b>       |
| <b>Часов по учебному плану</b>   | <b>108</b>     |
| в том числе  |                |
| <b>аудиторные занятия (контактная работа):</b>                           |                |
| - занятия лекционного типа   | <b>8</b>       |
| - занятия семинарского типа (практические занятия / лабораторные работы) | <b>48</b>      |
| - КСР  | <b>2</b>       |
| <b>самостоятельная работа</b>  | <b>14</b>      |
| <b>Промежуточная аттестация</b>  | <b>36</b>      |
|  | <b>Экзамен</b> |

#### 3.2. Содержание дисциплины

(структурированное по темам (разделам) с указанием отведенного на них количества академических часов и виды учебных занятий)

| Наименование разделов и тем дисциплины  | Всего<br>(часы) | в том числе  |  |             |   |
|---|-----------------|--|--|-------------|---|
|   |                 | Контактная работа (работа во взаимодействии с преподавателем), часы из них |  |             | Самостоятельная работа обучающегося, часы |
|   |                 | Занятия лекционного типа   | Занятия семинарского типа (практические занятия/лабораторные работы), часы | Всего       |   |
|   | 0<br>Ф<br>0     | 0<br>Ф<br>0  | 0<br>Ф<br>0  | 0<br>Ф<br>0 | 0<br>Ф<br>0                               |
| 1. Introduction to ophthalmology. Basics of the organisation of ophthalmological care in the Russian Federation . | 4               |  | 3  | 3           | 1   |
| 2 Anatomy and physiology of the eye and its auxiliary apparatus.  | 5               | 1  | 3  | 4           | 1   |
| 3. Methods of examination of an ophthalmological patient  | 4               |  | 3  | 3           | 1   |
| 4. Refraction and accommodation issues. Physiological optics.   | 4               |  | 3  | 3           | 1   |
| 5. Diseases of the eyelids, conjunctiva and lacrimal organs   | 5               |  | 4  | 4           | 1   |
| 6. Diseases of the cornea of the eye  | 5               | 1  | 3  | 4           | 1   |
| 7. Diseases of the uveal tract  | 6               | 1  | 4  | 5           | 1   |
| 8. Diseases of the crystalline lens   | 5               | 1  | 3  | 4           | 1   |
| 9. Glaucomas  | 5               | 1  | 3  | 4           | 1   |
| 10. Diseases of the retina and vitreous body  | 5               |  | 4  | 4           | 1   |
| 11. Injuries to the organ of vision   | 6               | 1  | 4  | 5           | 1   |
| 12. Visual organ damage in general diseases   | 6               | 1  | 4  | 5           | 1   |
| 13. Ophthalmology-oncology  | 6               | 1  | 4  | 5           | 1   |
| 14. Methods of treatment of ophthalmological patients   | 4               |  | 3  | 3           | 1   |
| Аттестация  | 36              |  |  |             |   |
| КСР   | 2               |  |  | 2           |   |
| Итого   | 108             | 8  | 48   | 58          | 14  |

### Contents of sections and topics of the discipline

1 Basics of the organisation of ophthalmological care in the Russian Federation:

1.1 Brief history of ophthalmological service formation in the country

1.2 Procedure of ophthalmological care in the Russian Federation

1.3 Medical psychology and deontology in the practice of an ophthalmologist

1.4 Medical and social expertise and labour rehabilitation in eye diseases

2 Anatomy and physiology of the eye and its auxiliary apparatus.

2.1 General structure of the organ of vision. Visual analyser.

2.2 The concept of blindness. Causes and types of blindness

2.3 Physiology of the visual organ

2.4 Visual functions

2.5 Structure and pathology of the oculomotor apparatus.

2.6 Amblyopia. Types, methods of treatment

3 Methods of examination of an ophthalmological patient

3.1 Basic methods of examination

3.2 Additional methods of examination

4. Refractive issues

4.1 The optical system of the eye. The concept of physical and clinical refraction.

4.2 Types of clinical refraction and its correction

4.3 Myopia, hypermetropia. Classification. Complications. Modern methods of treatment

4.4 Accommodation. Types and its disorders.

4.5 Astigmatism, types, correction. Presbyopia.

4.6 Methods of refraction research in children.

4.7 Selection and prescription of glasses.

5. Diseases of the eyelids, conjunctiva and lacrimal organs

5.1 Diseases of the eyelids.

5.2 Diseases of lacrimal organs. Dry eye syndrome, lacrimal dysfunction. Dacryocystitis. Classification, diagnostics, treatment

5.3 Conjunctivitis. Classification, diagnosis, treatment

5.4 Blepharitis. Classification, diagnosis, treatment.

5.5 Sty and chalazion. Differential diagnosis, treatment

5.7 Anomalies of position and deformations of eyelids (ptosis, blepharochalasis, trichiasis, madarosis, ectropion, entropion).

6. Diseases of the cornea of the eye

6.1 Pathology of the cornea. Developmental anomalies

6.2 Keratitis. Diagnosis, treatment.

6.3 Corneal dystrophies.

6.4 Outcomes of keratitis. Keratoplasty. Keratoprosthesis

7. Diseases of the ocular vasculature

7.1 Uveitis. Etiopathogenesis

7.2 Uveitis. Classification. Diagnosis

7.3 Treatment of uveitis

8. Diseases of the crystalline lens

8.1 Cataract. Classification

8.2 Methods of examination of patients with cataract

8.3 Types of cataract surgical treatment. Aphakia. Signs. Correction. Artifacia

8.4 Complications of cataract surgery

9. Glaucomas

9.1 Intraocular pressure. Hydrostatics. Hydrodynamics. Gonioscopy

9.2 Glaucoma. Etiopathogenesis. Classification. Clinic of primary glaucoma

9.3 Secondary glaucoma  
9.4 Methods of glaucoma treatment  
9.5 Issues of early detection, prophylaxis, glaucoma dispensary 9.6 Pseudoexfoliation syndrome.  
9.6 Pseudoexfoliative syndrome

## 10. Diseases of retina and vitreous body

10.1 Pathology of vitreous body  
10.2 Dystrophic retinal diseases  
10.3 Retinal abiotrophies  
10.4 Pathology of the macular area. Age-related macular degeneration  
10.5 Inflammatory diseases of the optic nerve  
10.6 Ischaemic neuropathy  
11 Injuries to the visual organ  
11.1 Penetrating and non-penetrating injuries to the eye organ  
11.2 Eye burns  
11.3 Sympathetic ophthalmia

## 12. Visual organ damage in general diseases

12.1 Diabetic retinopathy  
12.2 Endocrine ophthalmopathy  
12.3 Hypertensive angiopathy  
12.4 Retinopathy of prematurity  
12.5 Toxicosis of pregnant women  
12.6 Hypoxia and its importance in the pathogenesis of the disease  
12.7 Acute vascular pathology (central retinal vein thrombosis, central retinal artery occlusion)

## 13. Ophthalmology

13.1 Histogenesis of intraocular neoplasms  
13.2 Classification of intraocular tumours  
13.3 Iris and ciliary body neoplasms  
13.4 Chorioideal neoplasms  
13.5 Retinal neoplasms. Retinoblastoma  
13.6 Organ preserving treatment of intraocular tumours

## 14. Methods of treatment of ophthalmological patients

14.1 Drug treatment of eye diseases (ocular pharmacology)  
14.2 Lasers in ophthalmology  
14.3 Surgical treatment of eye diseases  
14.4 Physiotherapy in ophthalmology

## **4. Учебно-методическое обеспечение самостоятельной работы обучающихся**

Самостоятельная работа обучающихся включает в себя подготовку к контрольным вопросам и заданиям для текущего контроля и промежуточной аттестации по итогам освоения дисциплины приведенным в п. 5.

## **5. Assessment tools for ongoing monitoring of learning progress and interim certification in the discipline (module)**

## 5.1 Model assignments required for assessment of learning outcomes during the ongoing monitoring of learning progress with the criteria for their assessment:

### 5.1.1 Model assignments (assessment tool - Control work) to assess the development of the competency OIK-5:

OPK-5 (Capable of assessing morphofunctional, physiological states and pathological processes in the human body to solve professional problems tasks)

- 1 History of development of ophthalmological service in Russia. 1.\*
2. Anatomy of the orbit and its contents. Connection with diseases of ENT organs.\*
- 3.Refractive surgery. Principles of planning and selection of the method of surgical correction of refractive anomalies.\* refractive anomalies.
4. Angiography of the eye. Significance of the technique for early diagnosis of vascular and inflammatory diseases of the organ of vision. diseases of the organ of vision.\*
5. Modern system of diploptic treatment of strabismus.\*

### 5.1.2 Model assignments (assessment tool - Control work) to assess the development of the competency IIK-4:

PC-4 (readiness to collect and analyse patient complaints, anamnesis data, examination results, laboratory, instrumental, pathological-anatomical and other examinations in order to recognise a condition or establish the presence or presence of a disease investigations in order to recognise a condition or establish the presence or absence of a disease, and to carry out differential diagnostics. differential diagnosis).

1. blepharitis.
2. Posterior uveitis. Differential diagnostics of secondary chorioiditis and primary choriocapillaritis. choriocapillaritis.
3. Early diagnosis of glaucoma: optical coherence tomography, threshold perimetry.
4. Contusion injury to the eye.
5. Retinoblastoma

#### Assessment criteria (assessment tool — Control work)

| Grade       | Assessment criteria   |
|-------------|---|
| outstanding | Perfect High level of preparation, impeccable mastery of theoretical material, the student demonstrates a creative approach to solving non-standard situations. The student gave a full and detailed answer to all theoretical questions, confirming the theoretical material with practical examples. The student actively worked at the practical training. 100% fulfilment of control tasks. |
| excellent   | excellent High level of preparation with minor errors. The student gave a full and detailed answer to all theoretical questions, confirms the theoretical material with practical examples. The student actively worked at the practical training. Fulfilment of control tasks by 90% and higher.   |
| very good   | very good Good preparation. The student answers all theoretical questions, but there are inaccuracies in the definitions of concepts, processes, etc. The student actively worked at the practical training. Fulfilment of control tasks from 80 to 90%.  |
| good        | good Generally good preparation with notable errors or deficiencies. The student gives a complete answer to all theoretical questions of the ticket, but there are inaccuracies in the definitions of concepts, processes, etc. There are mistakes in answering additional and  |



| Grade          | Assessment criteria   |
|----------------|---|
|                | clarifying questions. The student worked at the practical training. Fulfilment of control tasks from 70 to 80%.   |
| satisfactory   | satisfactory Minimally sufficient level of preparation. The student shows a minimal level of theoretical knowledge, makes significant mistakes, but when answering leading questions, can correctly orientate himself/herself and give a correct answer in general terms. The student has attended practical classes. Fulfilment of control tasks from 50 to 70%. |
| unsatisfactory | unsatisfactory The preparation is insufficient and requires additional study of the material. The student gives erroneous answers both to theoretical questions and to leading and additional questions. The student missed most of the practical classes. Fulfilment of control tasks up to 50%.   |
| poor           | badly Preparation is totally inadequate. Student does not answer the questions posed. The student was absent from the class. Fulfilment of control examination tasks is less than 20%.  |

### 5.1.3 Model assignments (assessment tool - Tasks) to assess the development of the competency ПК-3:

#### Task \*

A seventeen-year-old patient complained of deterioration of vision in both eyes.

During examination it turned out that he is able to count fingers only from a distance of 3 metres, correction does not improve.

What is the visual acuity of the patient? What formula can be used to calculate it?

#### Task \*\*

A 35-year-old patient complains that she has not been able to see well in the dark for many years.

When she picks up

something from the table, she tilts the object next to it,

when walking, she bumps into the surrounding objects. Visual acuity of 0.3 -

0.4, correction does not improve.

What investigation should be performed on the patient to clarify the diagnosis? What elements of the retina are affected.

#### Task \*

A 45-year-old patient, a locksmith.

Complaints about a painless mass in the upper eyelid area, which appeared 5 months ago. During a month he notes an increase in the mass.

Objectively: in the middle third of the eyelid in 3 mm from the edge there is a painless mass approximately 4 mm in diameter; the skin over it is mobile, not changed. Moderate hyperaemia of conjunctiva over the mass. The rest of the eye are unchanged.

VOD = 1.0; VOS = 1.0

#### TASK\*

A patient came to the eye clinic with complaints of tearing from the right eye.  
eye.

External examination revealed no pathology. The doctor instilled 3% collargol solution into the conjunctival sac and simultaneously inserted a probe with a cotton swab at the end into the right nasal passage under the lower shell. After 5 minutes, the probe was removed; the cotton swab was partially stained with collargol.

What is the purpose of the examination?

What is the name of this test? Describe its result.

Task\*\*

A patient came to the eye doctor with complaints of persistent lacrimation,  
purulent discharge from the left eye.

Examination of the patient noted: excessive tears on the edge of the lower eyelid,  
bean-shaped soft bulge of the skin under the inner ligament of the eyelids. When  
pressing on the area of the lacrimal sac, abundant mucopurulent content flows from the lacrimal  
points.

muco-purulent content. Lacrimal-nasal test is negative. When lavage - liquid does not enter the nose  
and flows out with the contents of the bag through the upper lacrimal point.

Evaluate the results of the examination.

Make a diagnosis. Treatment tactics.

#### **5.1.4 Model assignments (assessment tool - Tasks) to assess the development of the competency ПК-5:**

Task\*

An ophthalmologist's office was visited by a patient complaining of a feeling of a foreign body in the  
eye.

in the eye, blockage, slight photophobia, lacrimation, some redness of the right eye.

It was found out that a week ago the patient had a cold.

On examination: Vis OD - 0.6; Vis OS - 1.0. Slight pericorneal injection. At lateral illumination no  
changes in conjunctiva of eyelids, eyeball are determined; cornea without pathology.

Slit-lamp examination revealed groups of small vesicles in the  
epithelium and superficial grey infiltrates merged with each other,  
which became clearly visible after injecting fluorescein solution into the conjunctival cavity. The  
ulcerations looked like a twig of a tree.

Make a diagnosis. Prescribe treatment.

Task \*\*

A patient came to an ophthalmologist with complaints of sharp pain, redness, and decreased visual  
acuity of the right eye. The pain increases mainly at night and is accompanied by lacrimation and  
photophobia. Anamnesis revealed that the patient suffers from chronic tonsillitis with frequent  
exacerbations. Eye disease is associated with hypothermia. Objective examination revealed  
pronounced pericorneal injection of the eyeball, hypopyon, grey exudate in the pupil area, posterior  
synechiae. Palpatory intraocular pressure is normal. Make a diagnosis and prescribe appropriate  
treatment.

### Task\*\*

Patient K.. 57 years old, a teacher at a technical institute.

He came to the doctor with complaints of deterioration of vision in both eyes, difficulties in working with drawings.

when working with drawings. Vision was gradually decreasing.

Examination of the organ of vision revealed: VOD - 0.2 - 0.3, vision correction does not improve. The eye is calm. There is partial clouding of the crystalline lens.

The reflex from the eye fundus is dim, details of the eye fundus cannot be seen.

VOS - 0.5, correction does not improve. The eye is calm. Initial opacities in the crystalline lens, mainly in the periphery. The ocular fundus is foggy, the optic disc is pink.

optic nerve disc is pink, borders are clear, no pathology is detected in the periphery. IOP of both eyes is 19 mm Hg.

Make a diagnosis. What should be recommended to the patient?

### Task\*\*

A 57-year-old patient complained of severe pain in the right eye, irradiating to the right side of the head, nausea, vomiting. The eye became ill suddenly in the morning after a nervous shock.

Objectively: OD - congestive injection, corneal oedema. Anterior chamber shallow. The pupil is wide. Deeper sections are not clearly visible. After injection of 40% glucose solution the corneal oedema disappeared. It was found that the deep-lying media were not changed, the ocular fundus was normal. Visual acuity was 1.0. IOP

= 41 mm Hg.

OS: anterior section, media, fundus are normal. Visual acuity - 1.0. Field of vision is normal. It is found that the anterior chamber in this eye is also small. Gonioscopy: the angle of the anterior chamber in both eyes is closed. After pressing the gonioscope on the cornea, the iris moved flat to the back, all elements of the angle became visible.

What is your diagnosis? Treatment?

### Task\*\*\*

Patient M., 31 years old, went to an ophthalmologist for the first time because a spot appeared in front of one and the other eye. After treatment it disappears and then reappears. The examination showed a decrease in central visual acuity to 0.7, vision correction does not improve.

in the field of vision of both eyes - relative central scotomas. Ocular fundus: pallor.

of the temporal half of the optic disc, more on the right.

Diagnosis? Which specialist should be consulted?

### Assessment criteria (assessment tool — Tasks)

| Grade | Assessment criteria   |
|-------|---|
| pass  | The level of knowledge in the scope corresponding to the training programme. A correct detailed answer is given. A few minor mistakes are made. |
| fail  | The level of knowledge is below the minimum requirements. There were gross errors.  |

### **5.1.5 Model assignments (assessment tool - Test) to assess the development of the competency ПК-5:**

#### **1.The anterior chamber of the eye is the space between**

- 1)cornea and iris
- 2)iris and crystalline lens
- 3)lens and vitreous body
- 4)lens and retina
- 5)vitreous body and retina

#### **2.The posterior chamber of the eye is the space between**

- 1) cornea and iris
- 2) iris and crystalline lens
- 3) lens and vitreous body
- 4) lens and retina
- 5) vitreous body and retina

#### **3.The cornea consists of layers**

- 1)posterior epithelium
- 2)Bruch's membrane
- 3)anterior epithelium
- 4)descemetal membrane
- 5 ) stroma

#### **4.The cornea consists of layers**

- 1)anterior epithelium
- 2)vascular
- 3)pigment epithelium

- 4) bowmen's membrane
- 5) posterior epithelium

**5. The pre-corneal film includes(s)**

- 1) lacrimal fluid
- 2) secretion of conjunctival globular cells (mucin)
- 3) fibrin
- 4) aqueous humour (intraocular fluid)
- 5) meibomian gland secretion

**6. The cornea has function(s)**

- 1) light-refractive
- 2) accommodative
- 3) protective
- 4) light receiving
- 5) light-conducting

**7. The sclera has function(s)**

- 1) supporting
- 2) protective
- 3) light refractive
- 4) light-conductive
- 5) shaping

**8. The drainage system of the eye**

- 1) is intended for drainage of aqueous humour (intraocular fluid)
- 2) necessary for tear outflow
- 3) it is designed for venous blood outflow
- 4) includes trabecular meshwork

5) located in anterior chamber corner

### **9. The drainage system of the eye**

1) is intended for drainage of aqueous humour (intraocular fluid)

2) necessary for outflow of tears

3) includes intrascleral collectors

4) includes trabecular network

5) includes schlemm's canal

### **10. The ciliary body has function(s)**

1) protective

2) accommodative 3) production of aqueous humour (intraocular fluid)

4) tear production

5) light conduction

### **11. The accommodation apparatus includes**

1) cornea

2) lens

3) suspensory ligament

4) ciliary muscle

5) pupil sphincter

### **12. The optic nerve consists of sections**

1) intraocular (optic disc, optic nerve head)

2) optic cross section (chiasma)

3) orbital (ophthalmic)

4) intracranial

5) intracanal

### **13.The conjunctiva contains glands**

- 1)meibomian
- 2)bocalyptic cells
- 3)sweat cells
- 4)accessory lacrimal (Krause, Wolfring)
- 5)sebaceous (Zeiss glands)

### **14.Photoreceptors are**

- 1)M?ller cells
- 2)cones
- 3)bipolar cells
- 4)pigment epithelium
- 5)rods

### **15.Meibomian glands**

- 1)are located in the tarsal plate (cartilage) of the eyelids
- 2)are located in conjunctiva
- 3)are modified sebaceous glands
- 4) are sweat glands
- 5) are close to hair follicles of eyela

### **16.The limbus is**

- 1) border between iris and ciliary body
- 2) border between cornea and sclera
- 3) border between ciliary body and chorioidea
- 4) border of light receiving section of retina
- 5) border of optic nerve disc

**17.The component(s) of visual analyzer function is/are**

- 1)central vision
- 2)peripheral vision
- 3)colour vision
- 4)twentieth vision (twilight vision)
- 5)binocular vision

**18.The cones provide**

- 1)central vision
- 2)peripheral vision
- 3)colour vision
- 4)light perception (twilight vision)
- 5)binocular vision

**19.Rods provide**

- 1) central vision
- 2) peripheral vision
- 3)colour vision
- 4)light perception (twilight vision)
- 5)binocular vision

**20.The concept of "visual acuity" refers to the following**

- 1) central vision
- 2) peripheral vision
- 3) colour vision
- 4) light perception (twilight vision)
- 5) binocular vision

**21.Central vision is impaired by the following anatomical structure(s)**

- 1) cones



- 2) rods
- 3) optic nerve
- 4) central retinal region (macular region)
- 5) peripheral sections of retina

**22. Central visual acuity is measured in**

- 1) dioptries
- 2) relative units
- 3) centimetres
- 4) meters
- 5) degrees

**23. Determination of central visual acuity is called**

- 1) Visometry
- 2) Perimetry
- 3) refractometry
- 4) tonometry
- 5) biometry

**24. Peripheral vision is provided by the following anatomical structure(s)**

- 1) cones
- 2) rods
- 3) optic nerve
- 4) central retinal region (macular region)
- 5) peripheral regions of the retina

**25. Boundary detection of peripheral vision (visual fields) is called**

- 1) visometry
- 2) perimetry
- 3) refractometry
- 4) tonometry
- 5) biometry

**26. The main colours perceived by human receptors are**

- 1) blue

2)violet

3)green

4)yellow

5)red

**27.To correct myopia: the following type(s) of spectacle lens(s) are used**

1) spherical correcting (convex)

2) spherical scattering (concav)

3)cylindrical convex

4)cylindrical scattering

5)flat (vitrum planum)

**28.All parallel rays after refraction by optical media of eye are collected in focus behind retina in state of rest accommodation. This statement: corresponds to the following type of clinical refraction**

1) emmetropia

2) hyperopia

3) myopia

4) myopic astigmatism

5) hyperopic astigmatism

**29.The distant visual acuity of both eyes of a 20-year-old patient is 1.0. Specify the possible type(s) of clinical refraction**

1) myopia

2) latent hyperopia

3) apparent hyperopia

4) emmetropia

5) astigmatism

**30.The following types of spectacle lenses are used to correct hyperopia**

1) spherical concentric (convex)

2) spherical scattering (concav)

3) cylindrical concentrating

4) cylindrical scattering

5) flat (vitrum planum)

**31. Blepharitis is an inflammation of**

- 1) lacrimal gland
- 2) margins of eyelids
- 3) lacrimal duct
- 4) eyelid conjunctiva
- 5) eyelid sebaceous gland (Zeiss gland)

**32. Hordeolum - is**

- 1) inflammation of the eyelid edge
- 2) acute purulent inflammation of eyelash hair follicle or (and) Zeiss gland
- 3) inflammation of the lacrimal gland
- 4) neoplasia of meibomian gland
- 5) inflammation of lacrimal sac

**33. Chalazia is a disease of**

- 1) lacrimal gland
- 2) lacrimal ducts
- 3) meibomian gland
- 4) eyelash hair follicle
- 5) eyelid skin

**34. Trichiasis is**

- 1) absence of eyelashes
- 2) an extra row of eyelashes
- 3) irregular growth of eyelashes
- 4) bleaching of eyelashes
- 5) lash extension

**35. Madarosis is**

- 1)absence of eyelashes
- 2)additional row of eyelashes
- 3)irregular growth of eyelashes
- 4)bleaching of eyelashes
- 5)lash extension

**36.The signs of chronic dacryocystitis are**

- 1) unilateral persistent lacrimation
- 2) localised swelling of tissue in the area of the inner angle of the fissure
- 3) purulent discharge from lacrimal punctures if pressure is applied to the lacrimal sac projection area
- 4) exophthalmus
- 5) pain in periorbital area

**37.The treatment methods for lacrimal sac phlegmons are**

- 1) dacryocystorhinostomy
- 2) parenteral or oral broad spectrum antibiotics
- 3) lacrimal sac exploration
- 4) steroids in drops
- 5) surgical treatment (dissection) in case of abscess formation

**38.Clinical signs of iridocyclitis**

- 1)pericorneal injection of eyeball
- 2)conjunctival injection of eyeball
- 3)pupil constriction
- 4)pupil dilation
- 5)posterior synechiae

**39..Clinical signs of iridocyclitis**

- 1)corneal precipitates

- 2) corneal infiltrates
- 3) purulent discharge in conjunctival sac
- 4) purulent exudate in anterior chamber (hypopyon)
- 5) dilated pupil

**40. Clinical signs of keratitis**

- 1) Conjunctival injection of the eyeball
- 2) mixed injection of the eyeball
- 3) corneal infiltration
- 4) bleeding under conjunctiva
- 5) blepharospasm

**41. Pain in the eye is a sign of disease(s)**

- 1) conjunctivitis
- 2) keratitis
- 3) blepharitis
- 4) iridocyclitis
- 5) acute attack of glaucoma

**42. Corneal syndrome includes signs of**

- 1) blepharospasm
- 2) discharge in the conjunctival sac
- 3) lacrimation
- 4) sensation of foreign body behind the eyelids
- 5) photophobia

**43. Corneal infiltrate is a sign of disease(s)**

- 1) iridocyclitis
- 2) keratitis

- 3)corneal dystrophy
- 4)acute onset of glaucoma
- 5)cataract

**44.Hypopyion is**

- 1)vitreous hemorrhage
- 2)anterior chamber hemorrhage
- 3)purulent exudate in anterior chamber
- 4) purulent exudate in vitreous body
- 5)purulent discharge in conjunctival sac

**45. Hyphema is**

- 1)bleeding in the vitreous body
- 2)bleeding into anterior chamber
- 3)purulent exudate in anterior chamber
- 4)bleeding under conjunctiva
- 5)purulent discharge in conjunctival sac

**46. Precipitates**

- 1)foci of inflammation in cornea
- 2)deposits on the posterior surface of the cornea
- 3) consist of inflammatory cells and fibrin
- 4) is a sign of iridocyclitis
- 5) are a sign of conjunctivitis

**47.Posterior synechiae**

- 1)fusion of iris with cornea
- 2) fusion of iris and crystalline lens
- 3) fusion of eyelid conjunctiva with conjunctiva of eyeball
- 4) is a sign of iridocyclitis

5) is a sign of conjunctivitis

**48.Dilation of the pupil is a sign of disease(s)**

- 1) conjunctivitis
- 2) iridocyclitis
- 3) glaucoma acute attack
- 4) blepharitis
- 5) gorner's syndrome

**49.Inflammation of the cornea is called**

- 1)iridocyclitis
- 2)keratitis
- 3)dacryocystitis
- 4)dacrioadenitis
- 5)blepharitis

**50.iridocyclitis is**

- 1) corneal inflammation
- 2) inflammation of iris and ciliary body
- 3) inflammation of lacrimal gland
- 4) iris and ciliary body dystrophy
- 5) inflammation of optic nerve

**51.The crystalline lens is shaped .**

- 1) convex-concave
- 2) flat-concave
- 3) biconvex
- 4) convex-planar
- 5) plano-concave

**52.Optical power of the lens at accommodation rest is**

- 1) 15 Diopters
- 2) 19 Dioptries
- 3) 26 Dioptries
- 4) 20 Dioptries
- 5) 10 Dioptries

**53. the lens is located**

- 1)in posterior chamber
- 2)anterior chamber
- 3)between iris and vitreous body
- 4)on the retina
- 5) in vitreous body.

**54. Source(s) of trophic activity of the crystalline lens is/are**

- 1)arteries
- 2)veins
- 3)lacrimal fluid
- 4)intraocular fluid
- 5)vitreous body

**55)lens has layers of**

- 1)nucleus
- 2)cortex
- 3)anterior capsule
- 4)posterior capsule
- 5)pigmental

**56.Cataracts are**

- 1) abnormal development of the lens
- 2) clouding of the lens
- 3) inflammation of the crystalline lens



- 4) neoplasms of the crystalline lens
- 5) lens dislocation

**57. cataract development stages**

- 1) initial
- 2) immature
- 3) advanced
- 4) mature
- 5) terminal

**58. Methods of cataract treatment are**

- 1) laser
- 2) conservative
- 3) X-ray
- 4) radioisotope
- 5) surgical

**59. Main methods of cataract extraction**

- 1) intracapsular
- 2) corneal transplantation
- 3) extracapsular

**60. The indication(s) for conservative cataract treatment is (are)**

- 1) initial cataract
- 2) immature cataract
- 3) mature cataract
- 4) hyper-mature cataract
- 5) nuclear cataract

**61. Aphakia is**

- 1) clouding of the lens
- 2) absence of the lens

3) lens subluxation

4) artificial lens

5) dislocation of the crystalline lens

## **62. Methods of aphakia correction**

1) spectacle correction

2) intraocular lens (IOL) correction

3) vitrectomy

4) contact lens correction

5) sinuotrabeculectomy

## **63. Arthiphakia is**

1) condition after corneal transplantation

2) condition after anti-glaucoma surgery

3) condition after implantation of artificial lens

4) state after contact lens correction

5) state after laser correction of ametropia

## **64) Signs of mature cataract**

1) decreased visual acuity - correct light projection

2) polymorphic clouding of all lens layers

3) clouding of the crystalline lens nuclear layers

4) swelling of the crystalline lens substance

5) formation of watery slits and vacuoles visible by biomicroscopy

## **65. Signs of an hyper-mature cataract are**

1) no visual acuity

2) diffuse clouding of all lens layers

- 3) liquefaction of crystalline lens cortex (milky cataract)
- 4) partial dissolution of the crystalline lens substance
- 5) blink cataract (a mobile lens nucleus is located in the capsular bag)

**66.The functions of the lens include .**

- 1) involvement in accommodation
- 2) light conduction
- 3) light refractive
- 4) light-receiving
- 5) aperture of the eye

**67.Tension of accommodation occurs**

- 1) ciliary muscle contracts
- 2) cinnamic ligaments relax
- 3) the lens becomes convex
- 4) refractive power increases
- 5) refractive force becomes weaker

**68.Clinic of primary open-angle glaucoma**

- 1) acute course with irreversible loss of visual function
- 2) chronic course with irreversible loss of visual function
- 3) acute course with reversible loss of visual function
- 4)chronic course with reversible loss of visual function
- 5) sharp pain, redness of the eyeball

**69.normal values of intraocular pressure, in mmHg**

- 1)0-9
- 2)5-17 ,
- 3)9-21
- 4)17-26
- 5)21-32

**70. Normal tonometric IOP values in McLàkow tonometry, in mmHg**

- 1)0-9

2)5-17

3)9-21

4)17-26

5)21-32

**71.The immediate cause(s) of visual impairment in glaucoma are**

- 1) clouding of the lens
- 2)disruption of aqueous outflow
- 3)increase in IOP
- 4)glaucoma optic neuropathy
- 5) macular dystrophy in the retina

**72.The forms of glaucoma according to the condition of the anterior chamber angle are**

- 1) initial
- 2) closed-angle
- 3) immature
- 4) advanced
- 5) open-angle

**73.The stages of glaucoma are determined by signs of**

- 1) condition of anterior chamber angle
- 2)state of peripheral vision
- 3)pupil diameter
- 4)size of optic nerve disc excavation
- 5)magnitude of intraocular pressure

**74.stages of glaucoma are**

- 1)mature
- 2)developed
- 3) initial
- 4)far advanced
- 5) terminal

**75.The stage of glaucoma is determined by the following tests**

- 1)perimetry
- 2)gonioscopy
- 3)ophthalmoscopy
- 4)tonometry
- 5)binocular vision status determination

**76. The form of glaucoma is determined by the following examinations**

- 1) perimetry
- 2)gonioscopy
- 3)ophthalmoscopy
- 4)tonometry
- 5) binocular vision test

**77.The clinical signs of an acute attack of closed angle glaucoma include**

- 1)mixed injection of the eyeball
- 2)pupil dilation
- 3)discharge in conjunctival sac
- 4)corneal infiltrate
- 5)decrease in intraocular pressure

**78. Clinical signs of an acute attack of closed angle glaucoma include**

- 1)pain in the eye
- 2)conjunctival injection of eyeball
- 3)pupil constriction
- 4)shallow anterior chamber
- 5)decreased corneal transparency due to oedema

**79.The clinical signs of an acute attack of closed angle glaucoma include**

- 1)Conjunctival injection of the eyeball

2)congestive injection of the eyeball

3)mydriasis

4)miosis

5)increase in intraocular pressure

**80. The main structural membranes of the eyeball:**

1. Fibrous capsule, chorioidea, retina.
2. Conjunctiva, cornea, iris.
3. Eyelids, tenon capsule, extraocular muscles.
4. Cornea, lens, vitreous body .

**81.. The anteroposterior dimension of the eyeball in emmetropia averages :**

1. 20 mm.
2. 26 mm.
3. 24 mm.
4. 28 mm.

**82. Thickness of the cornea from the centre to the periphery:**

1. Increasing.
2. Decreases.
3. does not change.

**83.Corneal function:**

1. Optical.
2. Secretory.
3. trophic.
4. accommodative.
5. Protective

**84.Function of ciliary body:**

1. optical.
2. Frame function.
3. Protective.
4. accommodative.
5. Intraocular fluid production.

**85. Iris function:**

1. Light refraction.
2. accommodation.
3. Diaphragm
4. Light perception.

**86.The transparency of the cornea is due to:**

1. Diffusion of moisture from the anterior chamber.
2. Orderly histological structure.
3. Rich innervation.
4. Absence of blood vessels.
5. Mucopolysaccharide content.

**87. Location of meibomian glands:**

1. In the thickness of the cartilage.
2. At the edge of the eyelids.
3. In lower transitional fold.
4. In the upper transitional fold.

**88. Location of sebaceous and sweat glands on the eyelids:**

1. In the thickness of the cartilage.
2. Along the edge of the eyelids.
3. In lower transitional fold.
4. In the upper transitional fold.

**89. The lacrimal apparatus includes:**

1. Lacrimal gland, lacrimal lake, lacrimal sac, nasolacrimal duct.
2. Krause's lacrimal glands, lacrimal gland, lacrimal points.
3. Lacrimal points, lacrimal ducts, lacrimal sac, nasolacrimal duct.

**90. Constriction of the pupil is:**

1. Miosis.
2. Mydriasis.
3. anisocoria.
4. Polycoria.

**91. Dilation of the pupil is:**

1. Miosis.
2. Mydriasis.
3. anisocoria.
4. Polycoria.

**92. Minimum retinal thickness:**

1. At the site of attachment to the optic nerve disc.
2. At the dentate line.
3. In the macular region.
4. In the equatorial area.

**93. Area of cone dominance in the retina:**

1. Macula.
2. equator.
3. Periphery.
4. Near the optic disc.

**94. Area dominated by rods in the retina:**

1. Macula.
2. equator.
3. Periphery.
4. Near the optic disc.

**95. "Blind spot" is a physiological loss of the visual field in projection:**

1. Large retinal vessels.
2. Macula.
3. Optic disc.
4. the equator.

**96. If the patient is able to distinguish light from dark, visual acuity is indicated as:**

1. 0.01.
2. 0.05.
3. 0.001.
4. Light perception.
5. Amaurosis.

**97. Correct projection of light is designated as:**

1. Minimum visibile.
2. Proectio lucis certa.
3. Proectio lucis incerta.

**98. Incorrect projection of light is indicated as:**

1. Minimum visibile.
2. Proectio lucis certa.
3. Proectio lucis incerta.

**99. Blindness to the colour red is called:**

1. Deuteranomalialia.
2. Protanopia.
3. Tritanopia.
4. Protanomaly.
5. Deuteranopia.

**100. Green blindness is called:**

1. Deuteranomalialia.
2. Protanopia .
3. Tritanopia
4. Protanomaly.
5. Deuteranopia.

**101. Blindness to the colour blue is called:**

1. Deuteranomacialia.
2. Protanopia.
3. Tritanopia.
4. Protanomaly.
5. Deuteranopia.

**102. Visometry is an examination technique:**

1. Visual fields.
2. visual acuity.
3. binocular vision.
4. accommodatio

**103. Highest visual acuity is due to anatomical features:**

1. In the macular region.
2. Around the optic disc.
3. At 15 degrees from the macula.

**104. Highest clinical refraction:**

1. Emmetropia.
2. Hyperopia.
3. myopia.



**105.Parallel light rays in myopic eye:**

1. Focused in front of the retina.
2. Focused on the retina.
3. Focused behind the retina.
4. Have no real focus.

**106. Parallel light rays in the hyperopic eye:**

1. Focused in front of the retina.
2. Focused on the retina.
3. Focused behind the retina.
4. Have no real focus.

**107.The optical system of the eye does not include:**

1. Cornea.
2. The humor of the anterior chamber.
3. the lens.
4. The vitreous body.
5. Vascular membrane.
6. Sclera.

**108.Accommodation in the elderly:**

1. Strengthened.
2. Weakening.
3. does not change.

**109.Structures of the eye most involved in accommodation:**

1. Cornea and lens. 2.
2. The lens and ciliary muscle.
3. The sclera and cornea.
4. Ciliary muscle and cornea.

**110.Myopia is corrected with optical glasses:**

1. Spherical negative lenses.
2. Spherical positive lenses.
3. Cylindrical negative.
4. Cylindrical positive.

**111. Hyperopia is corrected with optical glasses:**

1. Spherical negative.
2. Spherical positive lenses.
3. Cylindrical negative.
4. Cylindrical positive.

**112.Highest refractive power is in:**

1. the crystalline lens.
2. Moisture of anterior chamber.
3. The vitreous body.
4. Cornea.

**113.Accommodation is understood to be:**

1. The ability of the eye to see well at a close distance.
2. The ability of the eye to see well at any distance.
3. The ability of the eye to see well at a distance.

**114. In the treatment of external and internal barley, use:**

1. anticoagulants.
2. Enzyme preparations.
3. antibacterial drops and ointments.
4. Antiviral drops and ointments.

**115. Injection of the eyeball in keratitis may be:**

1. Pericorneal.
2. Conjunctival.
3. Congestion.
4. Mixed.

**116. Symptom characteristic of anterior uveitis:**

1. Precipitates.
2. Ptosis.
3. Congestive injection of the eyeball.
4. Subluxation of the lens.
5. Hypopyon.

**117. A clouding of the cornea that is not visible to the eye is called:**

1. Leucoma.
2. Nubecula.
3. Macula.

**118. In optic atrophy, the colour of the optic disc is:**

1. Becomes red.
2. Becomes white.
- 3 Characterised by alternating red and white areas. 4.
4. Does not change.

**119. Immediate first-aid measure in acute iridocyclitis is instillation:**

1. atropine.
2. Pilocarpine.
3. Dicaine (inocaine).
4. Antibiotic solution.

**120. The alopecia of the eyelashes due to chronic blepharitis is called:**

1. Polyosis.
2. epicanthus.
3. trichiasis.
4. Madarosis.

**121. In the presence of a senile arch in the cornea:**

1. Resorption therapy is recommended.
2. Corneal transplantation is indicated.
3. no treatment is indicated.
4. Corticosteroid instillation is indicated.

**122. Ophthalmoscopic symptom of acute circulatory disturbance in the central retinal artery:**

1. "Corkscrew".
2. "Cherry pit".
3. "Copper wire".

**123.The main aqueous outflow pathway is through:**

1. The vasculature.
2. The angle of the anterior chamber.
3. The central vein of the retina.
4. Suprachoroidal space.
4. "Silver wire".

**124.Pain irradiating to the corresponding half of the head, nausea, vomiting are characteristic of:**

1. Acute iridocyclitis.
2. acute attack of closed-angle glaucoma.
3. Keratouveitis.
4. acute conjunctivitis.

**125.Pupil in an acute attack of closed angle glaucoma:**

1. Narrowing.
2. Dilates.
3. does not change.

**126.An acute attack of closed angle glaucoma is characterized by:**

1. Superficial injection, shallow anterior chamber, swelling of corneal epithelium, miosis.
2. Deep injection, medium depth of anterior chamber, precipitates on cornea, festooned pupil.
3. Corneal epithelial edema, medium anterior chamber depth, normal pupil diameter.
4. Congestive injection, corneal epithelial edema, shallow anterior chamber, mydriasis.

**127.Tear-producing organs include:**

- 1.Lacrimal gland and supplementary lacrimal glands
- 2.lacrimal points
- 3.lacrimal ducts
- 4.nasolacrimal duct

**128.The nasolacrimal duct opens at:**

- 1.lower nasal passage
- 2.middle nasal passage
- 3.superior nasal passage
- 4.to the maxillary sinus
- 5.principal sinus

**129.The cornea membrane consists of: Answer options**

- 1.two layers
- 2.three layers
- 3.four layers
- 4.five layers
- 5.six layers

**130. The layers of the cornea are arranged: Answer options**

- 1.parallel to corneal surface
- 2.chaotically
- 3.concentrically
- 4.obliquely

**131. The cornea is nourished by: Answer options**

- 1.marginal loop-shaped vascular network
- 2.central retinal artery
- 3.lacrimal artery
- 4.anterior ciliary arteries
- 5.supraclavicular artery

**132. The functional centre of the retina is: Answer options**

- 1.optic nerve disc
- 2.central fossa
- 3.dentate zone
- 4.vascular bundle
- 5.juxtapapillary zone

**133.Motor apparatus of the eye consists of .... muscles: Answer options**

- 1.four
- 2.five
- 3.six
- 4.eight
- 5.ten

**134.In the differential diagnosis of acute glaucoma attack and acute iridocyclitis with hypertension are important:**

- 1.complaints
- 2.nature of anterior chamber
3. pupil

**135.Primary open angle glaucoma is most dangerous due to: Answer options**

- 1.its frequency
- 2.sudden onset
- 3.asymptomatic course
- 4.loss of visual acuity
- 5.decrease in dark adaptation

**136.what is common in the course of priry open-angle and closed-angle glaucoma: Answer options**

- 1.myopic refraction
- 2.pupil constriction
- 3.development of glaucomatous optic atrophy
- 4.increase in pigmentation of the anterior chamber angle
- 5.bulging of anterior iris root part

**137.The stage of primary glaucoma is assessed according to: Answer options**

- 1.visual acuity
- 2.level of intraocular pressure
- 3.area of glaucomatous optic disc excavation
- 4.visual field condition
- 5.range of daily variation of IOP

**138.Upper limit of true intraocular pressure:**

1. 19 mmHg.
2. 21 mmHg.
3. 25 mmHg.
4. 17 mm Hg.
5. 15 mmHg.

**139.Eyelid changes in inflammatory oedema include:**

- 1.hyperemia of the eyelid skin
- 2.increase in skin temperature
3. painfulness on palpation
- 4.crepitation
- 5.eyelid haematoma

**140.Scaly blepharitis is characterized by:**

- 1.Excruciating itching in the eyelids
- 2.trichiasis
- 3.the roots of the eyelashes are covered with dry scales
- 4.meibomeitis
- 5.eyelid edema

**141. In case of ulcerative blepharitis, eyelid changes are: Answer choices**

- 1.bleeding ulcers with purulent fur
- 2.eyelid eversion
- 3.eversion of the eyelid
- 4.vesicular eruptions
- 5.eyelid haematoma

**142.The combination of signs - photophobia, lacrimation, blepharospasm, pain in the eye - is characteristic for:**

- 1.cataract
- 2.keratitis
3. retinal detachment
- 4.optic nerve atrophy
- 5.central retinal vein thrombosis

**143.Growth of the crystalline lens comes to an end: Answer options**

1. by the age of 2 years
2. by 5 years
3. by 18 years

4. by the age of 23 years
5. does not end

**144.Mechanism of presbyopia development is explained by**

1. decreasing elasticity of the lens
- 2.ability to accomodate becomes less
- 3.tone of the ciliary muscles deteriorates
- 4.the integrity of the zinnar ligaments is impaired
- 5.disturbance of trophism of the planar part of ciliary body

**145.Incorrect projection of light in a patient with cataract indicates:**

- 1.the presence of a mature cataract in the patient
- 2.presence of immature cataract
- 3.pathology of retina and optic nerve
- 4.corneal pathology
- 5.destruction of vitreous body

**146.Optic neuritis refers to a disease:**

- 1.chronic
- 2.subacute
- 3.latent
- 4.acute
- 5.having wave-like course

**147.Pain syndrome is seen in the following forms of optic neuritis**

- 1.retrobulbar
- 2.intrabulbar
- 3.demyelinating optic nerve processes

**148.Treatment of retrobulbar neuritis in the acute period of disease includes:**

**Answer options**

- 1.vascular therapy
- 2.anti-inflammatory therapy
- 3.surgical measures
- 4.laser therapy
- 5.laser stimulation

**149.In optic neuritis the disc colour:**

1. does not change
2. hyperemic
3. pale
- 4.waxy
- 5.gray

**150.There are the following types of clinical refraction in the eye: Answer choices**

- 1.permanent and non-permanent

2. dysbinocular and anisometropic
3. corneal and crystalline
4. static and dynamic

**151. Myopia of a mild degree corresponds to the following refraction values expressed in diopters:**

1. from 0.5 to 3.0 dpts
2. between 0.5 and 4.0D
3. between 0.5 to 5.0D
4. 0.5 to 5.5D

**152. the following refractive powers in dioptries correspond to the medium myopia**

1. 2.0 to 3.0D
- 2 .5 to 5.0D
- 3 .2.75 to 5.5Dpts
- 4.3 3 to 6.0 Dpts
- 5 .5 to 7.5D

**153. the following refraction values in dioptries correspond to high myopia**

- 1.5 to 5.5 dpts
2. 2.0 to 6.0D
- 3.0 to 6.5D and more
- 4.3.0 to 6.0D

**154. The basic function of the visual analyzer, without which all other visual functions cannot develop, is**

1. peripheral vision
2. monocular visual acuity
3. colour perception
- light perception
5. binocular vision

**155. Which anatomical structure of the eyeball has the greatest number of sensory nerve fibers:**

1. conjunctiva
2. cornea
3. sclera
4. retina
5. chorioidea

**156. Patient with ocular pain, decreased vision, precipitates on endothelium cornea, miosis and pericorneal injection - diagnosis:**

1. acute conjunctivitis
2. acute iridocyclitis
3. acute onset of glaucoma
4. lacrimal sac phlegmon
6. acute episcleritis

**157. Which symptoms are characteristic of central retinal artery occlusion:**

1. gradual decrease in visual acuity in the type of blurring
2. sharp decrease in visual acuity
3. Symptom of "cherry pit" in the macula against the background of milky-white retina
4. glaucomatous exccavation of the fundus
5. "squashed tomato" symptom

**158. Maximum cone density in the area:**

1. in the periphery of the retina
2. in the macula
3. in the area of the OND
4. distributed evenly over entire retina
- 5.in region of dentate line

**159.Inner turning of eyelid margin is called**

1. lagophthalmus
2. blepharospasm
3. ectropion
- 4.entropion
- 5.ptosis

**160.Functions of the Choroidea:**

1. trophic (in relation to the retina)
2. refractive
3. light perception
4. thermal
5. accommodative

**161.Accommodation is:**

1. the static refraction of the eyeball
- 2 corneal refractive power
- 3 anterior-posterior axis of the eye
- 4 the ability to see clearly objects at different distances from the eye
- different distances
- 5 ability to distinguish light of different intensities.

**Assessment criteria (assessment tool — Test)**

| Grade          | Assessment criteria                        |
|----------------|--|
| outstanding    | 95-100% correct answers are given          |
| excellent      | 90-95% correct answers are given           |
| very good      | 85-89% correct answers are given           |
| good           | 80-84% correct answers are given           |
| satisfactory   | 70-79% correct answers are given           |
| unsatisfactory | less than 70% of correct answers are given |
| poor           | less than 50% of correct answers are given |



### **5.1.6 Model assignments (assessment tool - Report-presentation) to assess the development of the competency IIK-5:**

#### Topics of reports-presentations

1. optical system of the eye.
2. Amblyopia. classification, diagnosis, treatment.
3. Optical glasses for correction of refractive anomalies.
4. Functional methods of research of the organ of vision.
5. Detection of simulation, aggravation, dissimulation.
6. Radiation diagnostic methods in ophthalmology (radiological studies, scanning laser ophthalmoscopy, optical coherence tomography of the retina and optic nerve, computer and magnetic resonance tomography of the orbit).
7. Diseases of the eyelids.
8. Congenital pathology of the organ of vision.
9. Blepharitis of newborns and adults. Prevention and treatment.
10. Adenovirus conjunctivitis and its treatment.
11. Tear flow, its causes and methods of treatment.
12. Clinic and treatment of herpetic simple keratitis.
13. Creeping ulcer of the cornea: clinic, treatment.
14. Outcomes of cornea diseases. Corneal transplantation.
15. Surgical and laser treatment of glaucoma.
16. Secondary glaucoma
17. Sympathetic inflammation and sympathetic irritation.
18. Intraocular tumours.
19. Peripheral retinal dystrophies.
20. Basic methods of intraocular pressure measurement (Bowman tonometry, Maklakov tonometry, pneumotonometry).
21. Drugs and techniques of their administration in ophthalmology

22.Perimetry, types, indications. Changes in visual fields. Classification

23. Dry eye syndrome. Computer syndrome. Drugs: Regenerants and reparants, "Artificial tears". Indications, contraindications for use, complications of therapy with these drugs

24.Endocrine ophthalmopathy.

25.Radiological diagnostics of penetrating eye injuries.

26.Modern surgical methods of cataract treatment.

27.Secondary cataract. Diagnostics, treatment.

28.Fluorescent angiography. Methods, indications, contraindications.

29. Refractive surgery. Principles of planning and selection of the method of surgical correction of refractive anomalies.

### Assessment criteria (assessment tool — Report-presentation)

| Grade | Assessment criteria   |
|-------|---|
| pass  | the content of the report corresponds to the declared topic and fully discloses it; the topic is fully disclosed; a reasonable amount of information is presented; the presentation is accessible; the presentation fully complies with the established requirements, contains a sufficient number of slides corresponding to the topic, the illustrations are of good quality, with a clear image, the text is easy to read; the speaker is fluent in the content, clearly and competently presents the material, freely and correctly responds to questions and comments from the audience, accurately fits within the framework of the report. |
| fail  | the content of the report only partially corresponds to the declared topic, only a small part of the topic is disclosed; information search is superficial; the presentation of the material lacks logic, accessibility, illustrations are absent, in insufficient quantity or do not correspond to the topic, the presentation does not correspond to the established requirements, the speaker's performance only partially corresponds to the criteria, there were no answers to questions, or they did not correspond to the questions posed  |

### 5.2. Description of scales for assessing learning outcomes in the discipline during interim certification

#### Шкала оценивания сформированности компетенций

|  |            |                     |                   |        |              |         |             |
|--|------------|---------------------|-------------------|--------|--------------|---------|-------------|
| Уровень сформированности компетенций (индикатора достижения) | плохо      | неудовлетворительно | удовлетворительно | хорошо | очень хорошо | отлично | превосходно |
|  | не зачтено |                     | зачтено           |        |              |         |             |

| компет        |   |  |  |   |   |   |  |
|---------------|---|--|--|---|---|---|--|
| <u>Знания</u> | Отсутствие знаний теоретического материала. Невозможность оценить полноту знаний вследствие отказа обучающегося от ответа | Уровень знаний ниже минимальных требований. Имели место грубые ошибки                          | Минимально допустимый уровень знаний. Допущено много негрубых ошибок   | Уровень знаний в объеме, соответствующем программе подготовки. Допущено несколько негрубых ошибок   | Уровень знаний в объеме, соответствующем программе подготовки. Допущено несколько несущественных ошибок                               | Уровень знаний в объеме, соответствующем программе подготовки. Ошибок нет.  | Уровень знаний в объеме, превышающем программу подготовки.   |
| <u>Умения</u> | Отсутствие минимальных умений. Невозможность оценить наличие умений вследствие отказа обучающегося от ответа              | При решении стандартных задач не продемонстрированы основные умения. Имели место грубые ошибки | Продemonстрированы основные умения. Решены типовые задачи с негрубыми ошибками. Выполнены все задания, но не в полном объеме | Продemonстрированы все основные умения. Решены все основные задачи с негрубыми ошибками. Выполнены все задания в полном объеме, но некоторые с недочетами | Продemonстрированы все основные умения. Решены все основные задачи. Выполнены все задания в полном объеме, но некоторые с недочетами. | Продemonстрированы все основные умения. Решены все основные задачи с отдельными и несущественными недочетами, выполнены все задания в полном объеме | Продemonстрированы все основные умения. Решены все основные задачи. Выполнены все задания, в полном объеме без недочетов |
| <u>Навыки</u> | Отсутствие базовых навыков. Невозможность оценить наличие навыков вследствие отказа обучающегося от ответа                | При решении стандартных задач не продемонстрированы базовые навыки. Имели место грубые ошибки  | Имеется минимальный набор навыков для решения стандартных задач с некоторыми недочетами                                      | Продemonстрированы базовые навыки при решении стандартных задач с некоторыми недочетами   | Продemonстрированы базовые навыки при решении стандартных задач без ошибок и недочетов  | Продemonстрированы навыки при решении нестандартных задач без ошибок и недочетов  | Продemonстрирован творческий подход к решению нестандартных задач  |

### Scale of assessment for interim certification

| Grade |                    | Assessment criteria   |
|-------|--------------------|---|
| pass  | <b>outstanding</b> | All the competencies (parts of competencies) to be developed within the discipline have been developed at a level no lower than "outstanding", the knowledge and skills for the relevant competencies have been demonstrated at a level higher than the one set out in the programme. |
|       | <b>excellent</b>   | All the competencies (parts of competencies) to be developed within the discipline have been developed at a level no lower than "excellent",  |
|       | <b>very good</b>   | All the competencies (parts of competencies) to be developed within the discipline have been developed at a level no lower than "very good",  |
|       | <b>good</b>        | All the competencies (parts of competencies) to be developed within the discipline have been developed at a level no lower than "good",   |

|             |                       |   |
|-------------|-----------------------|---|
|             | <b>satisfactory</b>   | All the competencies (parts of competencies) to be developed within the discipline have been developed at a level no lower than "satisfactory", with at least one competency developed at the "satisfactory" level. |
| <b>fail</b> | <b>unsatisfactory</b> | At least one competency has been developed at the "unsatisfactory" level.   |
|             | <b>poor</b>           | At least one competency has been developed at the "poor" level.   |

### 5.3 Model control assignments or other materials required to assess learning outcomes during the interim certification with the criteria for their assessment:

#### 5.3.1 Model assignments (assessment tool - Control questions) to assess the development of the competency ОПК-5

Questions for the exam.

1. The orbit: anatomy, methods of examination. Phlegmon orbits\*.
2. Anatomy of the lacrimal system. \*
3. External ocular muscles, their innervation and functions.\*
4. Eyelids: anatomy, innervation, functions and blood supply.\*
5. Conjunctiva: anatomy and functions.\*
6. Contents of the eyeball.\*\*
7. Lens: anatomy and functions.\*
8. Vitreous body: anatomy, functions\*.
9. Blood supply of the eye.
10. Cornea: anatomy and functions.\*
11. Sclera and limbus: anatomy and functions.\*
12. Iris: anatomy and functions.\*
13. Choroid: anatomy and functions.\*
14. Ciliary body: anatomy and functions.\*\*
15. Retina: anatomy and functions.\*
16. Optic nerve, optic tract.\*
17. The structure of the visual analyzer.\*\*
18. Eye's hydrodynamics (intraocular fluid motion). The angle of the anterior chamber.\*
19. Physical and clinical refraction. Unit of measurement.\*
20. Types of clinical refraction of eye.\*
21. Myopia and its correction.\*
22. Hyperopia and its correction\*.
23. Astigmatism: types and correction.\*
24. Accommodation of the eye.\*
25. Absolute accommodation.\*
26. Relative accommodation.
27. Presbyopia. Correction and correction features depending on refractive errors.\*\*
28. Methods of correcting refractive errors.\*
29. Types of corrective lenses.\*
30. Refractive errors: classification, correction.\*
31. Afakia and its correction.\*
32. Visual acuity, methods of examination.\*
33. Color vision: examination, degrees of color vision deficiency.\*
34. Visual fields, methods of examination.\*
35. Ophthalmoscopy.\*
36. Gonioscopy.\* Skiascopy.
38. Intraocular pressure measurement.\*

39. Optical coherence tomography.\*
40. Malposition of the eyelids.\*\*
41. Conjunctivitis: term, classification, diagnosis, treatment.\*8
42. Bacterial conjunctivitis: diagnosis, treatment.\*
43. Differential diagnosis of sty and chalazion.\*
44. Disease of lacrimal sac.\*
45. Bacterial keratitis: diagnosis, treatment.\*
46. Herpetic keratitis: classification, diagnosis, treatment\*
47. Iridocyclitis: diagnosis, treatment.\*
48. Glaucoma: term, classification, diagnosis, treatment.\*
49. Open-angle glaucoma: classification, diagnosis, treatment.\*
50. Acute glaucoma: diagnosis, treatment.\*
51. Cataract: term, classification, diagnosis, treatment.\*
52. Vitreous hemorrhage (hemophthalmos): causes, treatment.\*
53. Retinal detachment.
54. Penetrating eye injury.
55. Blunt eye trauma.
56. Eye burns: classification, diagnosis, treatment.
57. Sympathetic ophthalmia.
58. Thrombosis of the central retinal vein. Occlusion of the central retinal artery.
59. Structure and functions of the oculomotor apparatus.
60. Strabismus: causes, classification, methods of determination and treatment.
61. Amblyopia: definition, classification, causes, methods of treatment.
62. Retinal detachment: classification, prevention, treatment.
63. Age-related macular degeneration: clinic, diagnosis, treatment, prevention.
64. Hypertensive retinopathy: causes, diagnosis, treatment and prevention.
65. Diabetic retinopathy: causes, diagnosis, treatment and prevention.
66. Intraocular tumors.

### **5.3.2 Model assignments (assessment tool - Control questions) to assess the development of the competency ПК-3**

1. Retinal photoreceptor - give definition?
2. describe the processes occurring in the retinal photoreceptors under the influence of light quantum radiation, ways of visual signal transmission.
3. What are the visual pigments of the outer segment of bacilli represented, how are they organised?
4. What form of isomers, out of the known five, provides the process of photoreception?
5. What varieties of eyelid droop do you know? Why does it occur?
6. What varieties of eyelid eversion do you know? Why does it occur?
7. List the possible complications of eyelid eversion?
7. Cardinal signs of conjunctivitis?
8. Cardinal signs of viral conjunctivitis?
9. What is the treatment of chronic dacryocystitis in adults?
10. List the possible complications of chronic dacryocystitis.
11. Describe the signs of phlegmon of the lacrimal sac.
12. Characterise pericorneal injection.
13. What does the colour of the corneal infiltrate depend on?
14. From where do vessels sprout into the cornea?
15. What factors are necessary for a corneal ulcer to occur?

### **5.3.3 Model assignments (assessment tool - Control questions) to assess the development of the competency ПК-4**

PC-4 (readiness to collect and analyse patient complaints, anamnesis data, examination results, laboratory, instrumental, pathological-anatomical and other examinations in order to recognise a

condition or establish the presence or presence of a disease

investigations in order to recognise a condition or establish the presence or absence of a disease, and to carry out differential diagnostics.\*\*

differential diagnosis).

1. blepharitis.

2. Posterior uveitis. Differential diagnostics of secondary chorioiditis and primary choriocapillaritis. choriocapillaritis.

3. Early diagnosis of glaucoma: optical coherence tomography, threshold perimetry.

4. Contusion injury to the eye.

5. Retinoblastoma

### **5.3.4 Model assignments (assessment tool - Control questions) to assess the development of the competency ПК-5**

1. Name the features of the structure of the vascular tract of the eye.

2. How are diseases of the vascular tract of the eye subdivided according to the localisation of the process?

3. List the complications associated with the outcomes of uveitis.

4. What anamnestic data clarify the rheumatic etiology of uveitis?

5. How are uveitis subdivided according to the course of the process?

6. What common infectious diseases can cause cataracts?  
can cause cataracts?

7. What types of radiant energy can cause cataract development?

8. What diseases of the eyeball itself cause cataracts to develop?  
of cataracts?

9. Name the stages of senile cataract development?

10. What are the main complications of cataract in children?

11. Name the most common causes of optochiasmal arachnoiditis.

12. What consequences for vision may occur in case of untimely diagnosis of optochiasmal arachnoiditis?

13. In what terms after fracture of the skull base atrophy of the optic nerve occurs?

14. Name the division of glaucoma according to IOP level.

15. Characterise the initial stage of glaucoma.

16. Characterise the advanced stage of glaucoma.

17. Characterise the advanced stage of glaucoma.

18. Characterise the terminal stage of glaucoma.

19. Define secondary glaucoma, give its causes.

20. List the characteristic complaints of patients with open-angle and closed-angle primary glaucoma.

21. What can be indicated by a "spectacle symptom" occurring a day or more after a contusion?

22. What will happen to vision in the case of complete detachment of the optic disc after a severe contusion?

23. What does an irregular anterior chamber indicate in a contusion of the eye?

24. What kind of first aid would you give if a contusion resulted in a patient the maxilla, ocular wall, and skull base fracture at the same time?

25. What are the complaints of patients with closed fractures of the upper orbital wall?

26. Emergency treatment for bee or wasp stings.

27. What is the classification of eye burns?

### **Assessment criteria (assessment tool — Control questions)**

| Grade          | Assessment criteria  |
|----------------|--|
| outstanding    | perfectly High level of preparation, impeccable mastery of theoretical material, the student demonstrates a creative approach to solving non-standard situations. The student gave a full and detailed answer to all theoretical questions of the ticket, confirming the theoretical material with practical examples. The student actively worked at practical classes. 100% fulfilment of control examination tasks.   |
| excellent      | excellent High level of preparation with insignificant mistakes. The student has given a full and detailed answer to all theoretical questions of the ticket, confirms the theoretical material with practical examples. The student actively worked at practical classes. Fulfilment of control examination tasks at 90% and above.   |
| very good      | very good Good preparation. The student answers all theoretical questions of the ticket, but there are inaccuracies in definitions of concepts, processes, etc. The student worked actively in practical classes. Fulfilment of control exam tasks from 80 to 90%.   |
| good           | good Generally good preparation with notable errors or deficiencies. The student gives a complete answer to all theoretical questions of the ticket, but there are inaccuracies in the definitions of concepts, processes, etc. There are mistakes in answering additional and clarifying questions of the examiner. The student worked at practical classes. Execution of the control assessment Criteria for assessment of examination tasks from 70 to 80%. |
| satisfactory   | satisfactory Minimal sufficient level of preparation. The student shows a minimal level of theoretical knowledge, makes significant mistakes, but when answering leading questions, can correctly orientate himself/herself and give a correct answer in general terms. The student has attended practical classes. Fulfilment of control exam tasks from 50 to 70%.   |
| unsatisfactory | unsatisfactory The preparation is insufficient and requires additional study of the material. The student gives erroneous answers both to the theoretical questions of the ticket and to the leading and additional questions of the examiner. The student missed most of the practical classes. Fulfilment of control exam tasks up to 50%.   |
| poor           | bad The preparation is absolutely insufficient. The student does not answer the questions posed. The student was absent from most of the lectures and practical classes. Completion of control examinations is less than 20%.  |

## 6. Учебно-методическое и информационное обеспечение дисциплины (модуля)

Основная литература:

1. Ангел Анастасия Валерьевна. Основы клинической терминологии = The basics of clinical terminology : практикум / А. В. Ангел ; ННГУ им. Н. И. Лобачевского. - Нижний Новгород : Изд-во ННГУ, 2022. - 66 с. - Текст : электронный., <https://e-lib.unn.ru/MegaPro/UserEntry?Action=FindDocs&ids=795749&idb=0>.
2. Filippova E. O. Anatomy and physiology of the eye (with clinical correlation): a textbook / Filippova E. O., Gorbunova E. A., Krivosheina O. I. - Томск : СибГМУ, 2023. - 78 с. - Книга из коллекции

Дополнительная литература:

1. Краткий медицинский латино-английский и англо-латинский словарь : учебно-методическое пособие / А. Е. Хомутов, М. А. Шабалин, Н. А. Лобанова, М. В. Золотова ; ННГУ им. Н. И. Лобачевского. - Нижний Новгород : Изд-во ННГУ, 2019. - 61 с. - Текст : электронный., <https://e-lib.unn.ru/MegaPro/UserEntry?Action=FindDocs&ids=795243&idb=0>.
2. Gary H. Cassel. The Eye Book : A Complete Guide to Eye Disorders and Health. - Johns Hopkins University Press, 2021. - 1 online resource. - ISBN 9781421439990. - ISBN 9781421439983. - Текст : электронный., <https://e-lib.unn.ru/MegaPro/UserEntry?Action=FindDocs&ids=856310&idb=0>.

Программное обеспечение и Интернет-ресурсы (в соответствии с содержанием дисциплины):

Basic literature :

"Ophthalmology. Russian-English textbook"

Author : Паштаев Н.П. , Н.В. Корсакова, А.Н. Андреев, Д.Г. Арсютов; под ред. Н.П. Паштаева

Language: английский, русский

Year of Edition; 2022

"Kanski's Clinical Ophthalmology: A Systematic Approach"

Author John Salmon; Brad Bowling

Language English

Year 2019

"Ophtalmology" Second Edition

Author : Kasr Al-Ainy

Year : 2022

Additional literature:

"Cornea Atlas": Cornea Atlas E-Book

Jay H. Krachmer, David A Palay

Elsevier Health Sciences, year 2013 .

"Cornea"

A colour atlas and synopsis of clinical ophthalmology

Author Christopher Rapuano

Edition: 3

Wolters Kluwer Health Publisher, 2018

Cambridge International Dictionary of English. - Cambridge University Press, 2005. 13. Nema H.V.

«Textbook of ophthalmology» Jaypee Brothers. New Delhi, 2008

Англо-русский медицинский энциклопедический словарь.- Stedman's Medical Dictionary /Под ред. акад. РАМН А.Г. Чучалина. - М.: ГОЭТАР Медицина, 2005.

Atlas of ophthalmology / Al ward W.L.M., Long my R.A. 2013

<https://eye.hms.harvard.edu/curriculum>

<https://www.sciencedirect.com/journal/ophthalmology>

<https://www.booksofmedical.com/2023/06/kanskis-synopsis-of-clinical.html>

ЭБС «Лань». Access mode: <http://e.lanbook.com/>.



ЭБС «Znanium.com».

Access mode: [www.znanium.com](http://www.znanium.com).

## **7. Материально-техническое обеспечение дисциплины (модуля)**

Учебные аудитории для проведения учебных занятий, предусмотренных образовательной программой, оснащены мультимедийным оборудованием (проектор, экран), техническими средствами обучения, компьютерами, специализированным оборудованием: Classrooms for conducting training classes envisaged by the educational programme are equipped with multimedia equipment (projector, screen, technical equipment).

The rooms for independent work of students are equipped with computer equipment with the possibility to connect to the Internet and provided with access to electronic media.

Помещения для самостоятельной работы обучающихся оснащены компьютерной техникой с возможностью подключения к сети "Интернет" и обеспечены доступом в электронную информационно-образовательную среду.

Программа составлена в соответствии с требованиями ФГОС ВО по направлению подготовки/специальности 31.05.01 - General Medicine.

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