

**MINISTRY OF SCIENCE AND HIGHER EDUCATION
RUSSIAN FEDERATION**

**FEDERAL STATE AUTONOMOUS EDUCATIONAL INSTITUTION OF
HIGHER EDUCATION
NORTH-CAUCASUS FEDERAL UNIVERSITY**

Methodological Guidelines
for Students on arranging and performing independent work
in the Discipline of "OPHTHALMOLOGY"
for Students majoring (Specialty) in 31.05.01 General Medicine

INTRODUCTION

The purpose of the discipline is to acquire theoretical knowledge, skills, and practical skills necessary for a general practitioner to provide ophthalmological care to patients with eye pathology.

The objectives are:

- To study the anatomical and physiological features and functions of various parts of the visual analyzer and the protective apparatus of the eye in adults and children; to form an understanding of the importance and anatomical and physiological features of the visual organ.
- Teach students the basic methods of examination (external examination, side illumination, transmitted light), introduce the methods of biomicroscopy, reverse and direct ophthalmoscopy and other modern methods of examination of patients, both in adults and children, teach to diagnose and treat the most common, accessible to doctors - non-specialists diseases. Master the technique of determining central and peripheral vision, twilight and color vision in adults and children, briefly introduce the principles of professional selection.
- Study the types of clinical refraction, teach you to determine refraction by the subjective method, accommodation and its changes with age, formulate the basic concepts of astigmatism, teach you to select and prescribe simple glasses for near and far. Introduce the concepts: binocular vision, friendly and paralytic strabismus.
- To introduce students to common diseases of the eyelids, lacrimal organs and conjunctiva, teach them to diagnose and treat the most common them.
- To introduce the clinic of some forms of keratitis, anterior and posterior uveitis in adults and children and their treatment, including surgical methods.
- To introduce the indications for the surgical treatment of cataracts, the principles surgery, correction of aphakia with glasses, contact and intraocular lenses.
- To study the clinical picture of damage to the organ of vision, to teach to determine urgency of referral to an ophthalmologist, to provide first aid for penetrating wounds, for burns of the eyes. Help to master the technique of extraction of superficial foreign bodies from the conjunctiva and cornea, to acquaint with the basic methods of treatment and prevention of damage to the organ of vision.
- To teach students to provide emergency care for acute attacks of glaucoma, to introduce methods of early diagnosis of glaucoma and methods of treatment.
- To introduce methods of diagnosis and treatment of inflammatory diseases, as well as primary and secondary tumors of the orbit, developing from the upper wall maxillary sinus, from the cells of the ethmoid labyrinth, the main sinus, from the nasopharynx and the bottom of the oral cavity, metastatic tumors. Pay attention to the diagnosis of tumors of the eyelids and of the eyeball, on the possibility of their growth into the orbit. To acquaint with methods fluorescent angiography for the diagnosis of tumors of the eyeball.

Methodological Recommendations for Studying Theoretical Material

When performing the independent study of theoretical material, the student must follow the rules as set below. The working curriculum of the respective academic discipline shall be recommended to be used as the basis for such activity. According to the schedule of classroom lessons and independent work, a different number of hours is to be allocated for studying individual topics. A significant portion of the student's independent work should be allocated to mastering the material on the covered topic, writing a summary (notes) on the specified theoretical blocks, and searching for additional literature based on the NCFU library and via the Internet system. The lecture material shall not cover all theoretical material; the greater part of it must be mastered through independent work. Given the above, working with the recommended literature is mandatory. Special attention must be paid to the content of the main provisions and conclusions, the explanation of phenomena and facts, and the understanding of the practical application of the theoretical issues under consideration. In the process of this work, the student should strive to understand and memorize the main provisions of the material being considered, the examples illustrating it, as well as to understand the illustrative material. Preparation should be completed by drawing up a plan (summary/notes) on the material (issue) being studied. This allows for the creation of a concentrated, concise representation of the issues being studied. First, studying the recommended literature is to be done. Special attention must be paid to the content of the main provisions and conclusions, the explanation of phenomena and facts, and the understanding of the practical application of the theoretical issues under consideration.

During this work, the student should strive to understand and memorize the main provisions of the material being considered, the examples illustrating it, as well as to understand the illustrative material. Preparation should be completed by drawing up a plan (summary/notes) on the material (issue) being studied. This allows for the creation of a concentrated, concise representation of the issues being studied. If necessary, one should seek (advice) consultation from the instructor. When going to a consultation, it is necessary to thoroughly think through the questions that require clarification. Keeping records contributes to turning reading into an active process, mobilizing motor memory along with visual memory. The following should be born in mind: a student who systematically keeps records creates their own individual stock of auxiliary materials for a quick review of what has been read and for the mobilization of accumulated knowledge. Records are especially important and useful when they reflect the thoughts that arose during independent work.

It is important to develop the students' capacity to compare sources and to think through the material being studied.

Improving note-taking skills among students is of great importance.

The instructor may recommend the following main forms of recording to students: a plan (simple and detailed), excerpts, and theses (abstracts).

The results of note-taking can be presented in various forms.

- A plan is an outline of the read material, a brief (or detailed) list of questions reflecting the structure and sequence of the material.
- A detailed plan fully replaces a summary.
- A summary (notes) is a systematized, logical presentation of the source material. Four types of summaries are distinguished:
 - Outline-summary (Plan-notes) – this is an expanded, detailed plan in which sufficiently detailed records are provided for those points of the plan that need explanation.
 - Textual summary – this is the reproduction of the most important provisions and facts of the source.
 - Free summary – these are clearly and briefly formulated (stated) main provisions resulting from a deep understanding of the material. It may contain excerpts, quotations, and theses; part of the material may be represented by a plan.

- Theme-based summary – this is compiled on the basis of studying a number of sources and gives a more or less exhaustive answer according to a certain scheme (issue).

Methodological Guidelines for the Preparation for Practical Activities

When preparing for practical activities, the recommendation implies studying the control questions for the given lesson and the theoretical material from one's own notes.

The main form of work during the lessons is an interview (discussion). Each student must be ready to speak on all issues raised in the plan and demonstrate maximum activity during their consideration.

The speech must be constructed freely, convincingly, and with arguments. The instructor ensures that the speech is not reduced to a reproductive level (simple reproduction of the text); simple reading of the summary is also not allowed.

It is necessary for the speaker to show their own attitude towards what they are talking about, express their personal opinion and understanding, substantiate it, and be able to draw the correct conclusions from what has been said. In doing so, the student may refer to the entries in the summary, directly to the primary sources, use knowledge of previously studied disciplines, etc. In addition, to obtain a grade at an advanced level, students solve situational tasks based on the results of the mastered topics.

During the execution of practical works, a defense of practical skills is provided, the full list of which is specified in the fund of assessment tools.

Methodological Recommendations for the Preparation of Presentations and Reports

The report must contain elements of novelty; along with the fundamental aspect, an analysis of the current state of the problem under study must be carried out, as well as inclusion in regional issues. The report must include an introduction, a theoretical part, a conclusion, a list of literature, and a presentation that reveals the essence of the topic in graphs, pictures, diagrams, and formulas.

The report is recommended to be submitted on 1 printed sheet. The text of the work must be printed with 1.5 line spacing on one side of a standard sheet (A4) of white paper.

The text and other printed elements of the work must be black, and the contours of letters and signs must be clear, without halos and shading. The font must be Times New Roman, size 14. The titles of chapters and paragraphs are highlighted in bold. The sheet with text must have margins: left – 30 mm, right – 10 mm, top – 20 mm, bottom – 20 mm.

Page numbering of the text is done in the lower right corner of the sheet. It is necessary to number pages starting from the page where the Introduction is printed, on which the number 3 is placed. After that, all pages, including appendices, are numbered.

A space equal to two intervals is placed between the title of the chapter and the title of the paragraph of this chapter, and the title of the paragraph must not be separated from the text of this paragraph by a space. The titles of paragraphs shall be separated from the text of the previous paragraph by a space equal to two intervals. Each chapter, as well as the introduction, conclusions, appendices, and the list of used literature, begin on a new page. The word Chapter is not to be written. Chapters have ordinal numbers within the entire work, designated by Arabic numerals (for example: 1, 2, 3), followed by a period.

The word **PARAGRAPH** or the paragraph symbol (§) is not placed in the title. Paragraphs have ordinal numbers within the chapters, designated by Arabic numerals (for example: 1.1. and 1.2.).

Headings of chapters and paragraphs in the text must be centered; a period shall not be placed at the end of the title of the chapter and paragraph. It is not allowed to hyphenate (transfer) a part of a word in a heading. 4.5. The numbering of tables and figures can be running (continuous) or relate to the number of the chapter and paragraph. For example, if a table or a figure is included in the text of the first paragraph of the second chapter, the numbering is as follows: Table 2.1.1., Fig. 2.1.1.

The last digit means the ordinal number of the table (or figure) in this paragraph.
The table is to be placed as the next page after the first mention of it in the text.

Recommended literature.

Main literature:

1. Dunaeva, V. F. Ophthalmology : textbook / V. F. Dunaeva. - Minsk :Republican Institute of Professional Education (RIPO), 2020. - 92 c. - ISBN 978- 985-7234-63-9. - Text : electronic // Digital educational resource IPR SMART : [website]. - URL: <https://www.iprbookshop.ru/100369.html>
2. Perederiy, V. A. Eye Diseases. Complete Reference Book / V. A. Perederiy. - Saratov : Scientific Book, 2019. - 701 c. - ISBN 978-5-9758-1850-8. - Text : electronic // Digital IPR SMART educational resource: [website]. - URL: <https://www.iprbookshop.ru/80192.html>

Additional literature:

1. Anatomy, physiology and pathology of the organs of hearing, vision and speech: educational and methodological manual / compilers I. A. Popova. - Komsomolsk-on-Amur, Saratov: Amur State University of Humanities and Pedagogy, IPR Media, 2019. - 63 c. -ISBN 978-5-4497-0087-2. - Text : electronic // Digital educational resource IPR SMART : [website]. - URL: <https://www.iprbookshop.ru/86189.html>
2. Birich, T. A. Ophthalmology : textbook / T. A. Birich, L. N. Marchenko, A. Yu. Chekina. - Minsk : Vysheyshaya shkola, 2007. - 556 c. - ISBN 978-985-06-1298-4. - Text : electronic // Digital educational resource IPR SMART : [website]. - URL: <https://www.iprbookshop.ru/24072.html>
3. Clinical Anatomy of the Eye : Textbook / A. E. Aprelev, I. V. Astafyev, M. A. Nikonenko [et al.]. - Orenburg : Orenburg State Medical Academy, 2013. - 113 p. - Text : electronic // Digital educational resource IPR SMART : [website]. - URL: <https://www.iprbookshop.ru/51452.html>
4. Fields of vision : textbook / A. A. Aprelev, M. A. Nikonenko, I. V. Astafyev [et al.]. - Orenburg : Orenburg State Medical Academy, 2014. - 88 c. - Text : electronic // Digital educational resource IPR SMART : [website]. - URL: <https://www.iprbookshop.ru/51480.html>

Internet resources:

1. <http://rudocor.net/> - Medical portal
2. <http://www.e-reading.club/> - Great online library
3. <https://dic.academic.ru/> - Dictionaries and encyclopedias
4. <https://roszdravnadzor.gov.ru/> - Federal Service for Supervision of Healthcare
5. <https://www.rmj.ru/> - Russian Medical Journal

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Topic 1. Anatomy of the visual organ.

Control questions:

1. **Eyelids.** Anatomy and functions of the eyelids.
2. **Tear organs.** The tear-producing apparatus. The tear-conducting pathways. Beginning active functioning of the lacrimal gland.
3. **Conjunctiva.** Anatomy, functions of the conjunctiva. Three parts of the conjunctiva. Properties of the normal conjunctiva.
4. **Ocular motility apparatus.** Topographic anatomy. Innervation. Functions oculomotor muscles.
5. ***Eyeball.**The vascular membrane:* Divisions of the vascular membrane, two systems blood supply to the vascular membrane, anastomoses between them. The value of the split blood supply in the occurrence and spread of inflammatory diseases.
6. Topographic anatomy, intraocular fluid, its chemical composition, structure the angle of the anterior chamber and its characterization as the main route of intraocular outflow fluids.
7. *Retina.* Structure and functions of the retina. Two systems of nutrition of the retina. Interaction of the retina and choroid in the visual act.
8. **Visual path** Topographic anatomy of the sections of the optic nerve (intraocular, orbital, intracanal, intracranial), chiasm, visual tract, subcortical visual centers.
9. **Vessels and nerves of the eye** and its accessory apparatus. Innervation of the eye's membranes and its accessory apparatus.
10. **Orbit.** Structure, contents, topographic anatomy, functions, significance of anatomical proximity to the ENT organs, oral cavity, and cranial cavity.
11. Age-related anatomy. Age-related features of the anatomy of the visual organ. Clinical significance.

TOPIC 3. PATHOLOGY OF THE EYESHELLS, TEARS, ORBITS

Control questions:

Inflammatory diseases of the eyelids.

1. Blepharitis. The role of endogenous and exogenous factors in the development. The clinic and course of blepharitis, complications, outcomes. Principles and duration of treatment. Demodex, diagnostics, treatment.
2. Stye. Etiology, clinic, treatment, complications, outcomes.
3. Eyelid abscess. Etiology, clinic, treatment, outcomes.
4. Chalazion. Causes, clinic, differential diagnosis with adenocarcinoma of the meibomian glands. Principles of treatment (corticosteroids, surgery). Contagious molluscum.

Allergic eyelid diseases.

5. Quincke's edema. Toxicoderma. Drug-induced eyelid dermatitis. Causes and features of occurrence. Clinic, course, frequency of relapses, principles of treatment.

TOPIC 4. PATHOLOGY OF THE CONJUNCTIVA OF THE EYE (CONJUNCTIVITIS)

Control questions:

1. Inflammation of the conjunctiva (conjunctivitis). Classification. The main symptom complex of conjunctivitis. Differential diagnosis. Methods of diagnosing conjunctivitis.
2. Microbial acute conjunctivitis. Acute conjunctivitis caused by staphylococci and streptococci. Clinic, course, complications, treatment, and prevention.
3. Epidemic conjunctivitis (Koch-Wicks). Features of the clinical course. Epidemiology, seasonality, and prevalence in hot climate regions. Treatment. Public and personal prevention.
4. Pneumococcal conjunctivitis. Clinic, course, features. Treatment and prevention.
5. Gonococcal conjunctivitis (newborns and adults). Ways of infection, features of the clinical course, complications. Methods of diagnosis. Treatment and prevention.
6. Diphtherial conjunctivitis. Ways of infection. General condition of the body. Clinic, course, complications. Methods of diagnostics. Emergency care. Treatment and prevention.
7. Viral conjunctivitis. Frequency in adults and children. The main types of pathogens (influenza virus, herpes, adenoviruses, etc.). Features of the course of viral conjunctivitis. Modern drugs used for the treatment of viral conjunctivitis.
8. Adenovirus conjunctivitis (epidemic keratoconjunctivitis). Epidemiology, contagiousness. Pharyngoconjunctival fever. Three forms of adenovirus conjunctivitis (catarrhal, follicular, film-like). Differential diagnosis with microbial conjunctivitis, trachoma. Methods of diagnosis. Principles of treatment and prevention.

Practical lesson No. 7

Diseases of the connective membrane (conjunctivitis). Issues of regional pathology

Control questions:

1. Allergic conjunctivitis. Causes, clinic, course, principles of treatment. The most common forms (spring conjunctivitis, drug-induced, swimming pool).
2. Chronic conjunctivitis. Etiological significance of exogenous and endogenous factors. Clinic, course, methods of treatment and prevention. Chronic conjunctivitis as an occupational disease.
3. Trachoma. The social significance of trachoma. The prevalence of trachoma in the world. The etiology and epidemiology of trachoma. The clinical course of trachoma in four stages. The complications of trachoma.

TOPIC 5. CORNEA AND SCLERA DISEASES.

1. Congenital corneal abnormalities. Micro- and macrocornea, keratoconus, and keratoglobus. Visual functions in case of developmental abnormalities. Surgical treatment. Possibilities of contact correction. Outcomes.
2. Corneal inflammations (keratitis). Classification of keratitis by etiology, severity, and localization of the process. Methods of diagnosis. Subjective and objective signs of keratitis. Principles of treatment. Outcomes.
3. Infectious bacterial keratitis: Superficial marginal keratitis. Complications of acute conjunctivitis. Factors contributing to the occurrence, clinic, course, treatment, outcomes, and prevention.
4. Corneal ulcer (creeping corneal ulcer). Etiology, clinic, stages, course, treatment, outcomes, complications. Physiotherapeutic methods of treatment (diathermocoagulation, cryotherapy, lasercoagulation).
5. Herpetic keratitis. The frequency of the disease. Properties of the causative agents of herpetic keratitis, ways of getting into the body; factors contributing to the activation of the herpes

virus in the body. General symptoms of herpetic keratitis. Modern classification of herpetic keratitis. Features of the clinic and course of primary and postprimary herpetic keratitis.

6. Superficial forms of herpetic keratitis: vesicular, tree-like. Metaherpetic keratitis.
7. Deep forms of herpetic keratitis (disc-shaped, metaherpetic, etc.).
8. Keratitis caused by the herpes zoster virus.
9. Methods of diagnosis of herpetic keratitis; clinical, laboratory –cytology of conjunctival scraping, the method of fluorescent antibodies - MFA, focal test with herpetic vaccine. Differential diagnosis. Treatment. Prevention.

TOPIC 6. DISEASES OF THE VASCULAR TRACT AND RETINA.

1. Pathology of the choroid. The frequency of vascular tract diseases among general eye pathology. The structure of vascular tract diseases (inflammatory, dystrophic processes, neoplasms, congenital abnormalities).
2. Vascular tract inflammation (uveitis). The most common causes of uveitis. Classification of uveitis by course, localization, clinical and morphological picture, etiology, immunology. The main morphological and functional features of anterior uveitis (iritis, iridocyclitis); posterior uveitis (choroiditis); panuveitis. Differential diagnosis of diseases of the choroid. Methods of general and local treatment of anterior and posterior uveitis, depending on the etiology and nature of the process. Outcomes. Prevention.
3. Tumors of the vascular tract. The most common benign and malignant tumors. Clinic. Diagnostics. Treatment. Forecast.
4. Dystrophic diseases of the iris and ciliary body. Frequency of the disease. Causes of the disease. Forms (chronic dysfunction of the ciliary body, Fuchs syndrome). Differential diagnosis with anterior uveitis. Clinic, course, principles of treatment.

TOPIC 7. DISEASES OF THE OCULAR MOTOR APPARATUS. DISPENSARY.

1. Strabismus. Types of strabismus. Angle of strabismus. Imaginary strabismus. Hidden strabismus. Obvious strabismus. Etiology. Classification. Pathogenesis.
2. Non-accommodative strabismus. Partial accommodative strabismus. Treatment.

TOPIC 8. DISEASES OF THE CRYSTAL.

1. Diseases of the crystal. Types and frequency of crystal pathology. Methods of diagnostics, modern principles of treatment. Share in the structure of low vision and blindness.
2. Abnormalities of crystal development. Congenital cataracts. Frequency and causes occurrence. Indications for surgical treatment depending on the magnitude of cataract, its localization, visual acuity, age of the child. Principles of operations. Prevention of macular underdevelopment and obstructive amblyopia, correction of aphakia. Features of correction of unilateral aphakia. Contact lenses. Intraocular lenses.
3. Age-related (senile) cataracts. Clinic. Stages of cataract development. Conservative treatment in the initial stages. Indications for surgery. Modern methods of cataract extraction. Phacoemulsification. Aphakia, signs and principles of its correction. Correction of unilateral aphakia.

TOPIC 9. GLAUCOMA. DISEASES OF THE OPTIC NERVE. TRAUMAS OF THE VISUAL ORGAN.

1. Glaucoma. Definitions of glaucoma. The social significance of glaucoma as one of the main causes of blindness. The frequency and prevalence of the disease. Types of glaucoma in adults and children. The fundamental difference between glaucoma in children and in adults.

2. Congenital glaucoma (buphthalm, hydrophthalm). Frequency, etiology, heredity. The earliest signs of the disease. Principles, terms and methods of surgical treatment of congenital glaucoma. Outcomes. Forecast.
3. Primary glaucomas. Modern views on the etiology. Factors predisposing to the development of glaucomas (impairment of central regulation of ophthalmotonus, change of diencephalic and hypothalamic area, state of regional blood circulation and filtering zone of the eye).

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6. Birich, T. A. Ophthalmology : textbook / T. A. Birich, L. N. Marchenko, A. Yu. Chekina. - Minsk : Vysheyshaya shkola, 2007. - 556 c. - ISBN 978-985-06-1298-4. - Text : electronic // Digital educational resource IPR SMART : [website]. - URL: <https://www.iprbookshop.ru/24072.html>
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Internet resources:

6. <http://rudocor.net/> - Medical portal
7. <http://www.e-reading.club/> - Great online library
8. <https://dic.academic.ru/> - Dictionaries and encyclopedias
9. <https://roszdravnadzor.gov.ru/> - Federal Service for Supervision of Healthcare
10. <https://www.rmj.ru/> - Russian Medical Journal