

**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 "ENDOCRINOLOGY"
for Students majoring (Specialty) in 31.05.01 General Medicine

INTRODUCTION

The purpose of studying the discipline "Endocrinology" is to master knowledge about the neuroendocrine mechanisms of regulation of body functions and behavior, the formation of modern ideas about the participation of neuropeptides, hormones and hormone-like substances in interneuronal interactions, in the formation of short- and long-term memory, emotional state, which are integral components of adaptive behavior, the involvement of the neuroendocrine system in the regulation of stress reactions, etiology and pathogenesis of endocrine diseases, features of the course, complications and outcomes of diseases, international classification of diseases; mastering the ability to substantiate the need and scope of laboratory and instrumental examination of the patient, methods for determining hormone levels in biological fluids, skills for collecting complaints, anamnesis of the patient's life and illness; skills for establishing a diagnosis taking into account the current international statistical classification of diseases and problems, related to health; an algorithm for performing basic diagnostic and therapeutic measures in the treatment of endocrine diseases.

The desire to study the neuroendocrine substrate of mental functions is necessary not only to understand the nature of man, but also because in the future it will give the possibility of correcting defects of behavioral reactions or restoring functions, lost as a result of the disease by psycho- and pharmacocorrection.

The main objectives of studying the discipline are:

- Mastering this discipline to the required extent.
- Consider the sex and age-related features of the endocrine system, including perinatal development (organogenesis); the anatomical and topographical relationships between the neuroendocrine and central nervous systems, and the interdependence of nervous and neuroendocrine regulation of body functions.
- To show the relationship between the body as a whole and the neuroendocrine system in particular, and the changing environmental conditions.
- To master the algorithm for performing basic diagnostic and treatment measures in the treatment of endocrine and related diseases; the skills of conducting scientific research, preparing presentation and information-analytical materials, and articles.
- In the process of teaching, to instill ethical standards of behavior in the "anatomical theater", to treat the organs of the human body and the corpse with respect and care. To instill high moral standards of behavior in the dissection halls of a medical university.

As a result of studying the discipline, a student should know:

- Legislation of the Russian Federation in the field of health care, regulatory legal acts, and other documents that determine the activities of medical organizations and medical workers.
- General principles of organization of medical care for the population.
- Principles of organizing sanitary and anti-epidemic (preventive) measures to prevent the occurrence and spread of infectious diseases.
- Regulations on medical care, clinical guidelines (treatment protocols) on medical care, and standards of medical care.
- Methods of laboratory and instrumental research for assessing the state of health, medical indications for conducting research, and rules for interpreting their results.
- Etiology, pathogenesis and pathomorphology, clinical picture, differential diagnosis, features of the course, complications and outcomes of diseases of internal organs.
- Methods of collecting complaints, medical history, and patient's condition.
- The method of a complete physical examination of a patient (examination, palpation, percussion, auscultation).
- International Classification of Diseases.
- Methods of diagnosing, treating, and preventing diseases in patients of different age groups;
- Indications and contraindications for surgical intervention in polyclinics and hospitals;
- Types and methods of stopping bleeding, causes and diagnostic methods;

- Indications for hospitalization of patients in a hospital department (preparation of a patient for hospitalization);
- Monitoring of medical treatment.
- Algorithms for conducting scientific and practical research in the field of biology.

Must be able to:

- Collect complaints, life history, and medical history of the patient and analyze the information obtained.
- Conduct a complete physical examination of the patient (examination, palpation, percussion, auscultation) and interpret its results.
- To justify the necessity and scope of a patient's laboratory examination.
- To justify the necessity and scope of a patient's instrumental examination.
- To justify the need to refer a patient to a specialist doctor for consultation.
- Analyze the patient's examination results and, if necessary, justify and plan the scope of additional examinations.
- Interpret the results of collecting information about a patient's disease.
- Interpret the data obtained during a patient's laboratory examination.
- Interpret the data obtained during a patient's instrumental examination.
- Interpret the data obtained during consultations with specialist doctors.
- Perform early diagnostics of internal organ diseases.
- To carry out differential diagnostics of diseases of internal organs from other diseases.
- Determine the sequence of volume, content, and sequence of diagnostic measures.
- To determine medical indications for providing emergency medical care, including specialized medical care.
- Use medical devices in accordance with the current procedures for providing medical care, clinical recommendations (treatment protocols), and medical care standards.
- Use the acquired knowledge to determine the optimal treatment tactics for patients.
- Work with scientific and reference literature, electronic scientific databases (platforms) on biological sciences.

Must own:

- Skills in collecting complaints, patient's life and medical history.
- Skills in conducting a full physical examination of the patient (examination, palpation, percussion, auscultation).
- Skills in formulating a preliminary diagnosis and drawing up a plan for laboratory and instrumental examinations of the patient.
- The skills of referring a patient for a laboratory examination if there are medical indications.
- The skills of referring a patient for an instrumental examination if there are medical indications.
- The skills of referring a patient for a consultation with specialist doctors if there are medical indications.
- Skills of referring a patient for specialized medical care in inpatient or day hospital conditions in the presence of medical indications.
- ☐ Skills of conducting differential diagnostics with other diseases/conditions, including urgent
- ☐ Skills of establishing a diagnosis taking into account the current international statistical classification of diseases and health-related problems..
- ☐ Algorithm of performing basic diagnostic and treatment measures in the treatment of various diseases.
- ☐ Skills in conducting scientific research, preparing presentation and information and analytical materials, articles.
- ☐ Experience in participating in scientific conferences.

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 References:

1. Bulatova O.V., Physiology of Regulatory Systems: Textbook, Part 1: Endocrinology, KGU, 2016 – 162 pp. http://biblioclub.ru/index.php?page=book_red&id=481493&sr=1
2. Drozdov A.A., Endocrinology: Textbook, ed. A.A. Drozdov and M.V. Drozdova. 2nd ed. Saratov: Nauchnaya kniga, 2019.159 pp. ISBN 978-5-9758-1825-6. Text available electronically via the IPR BOOKS electronic library system: <http://www.iprbookshop.ru/80995.html>
3. Complete Handbook of Endocrinology / G. I. Dyadya, G. Yu. Lazareva, M. A. Krasnova [et al.]. – Saratov: Nauchnaya kniga, 2019. – 892 pp. – ISBN 978-5-9758-1865-2. – Text: electronic version // Electronic Library System IPR BOOKS: [website]. – URL: <http://www.iprbookshop.ru/80178.html>

Additional literature:

1. Ya.V., Shlyakhto E.V., Babenko A.Yu. Endocrinology. St. Petersburg 2011. – 424 pp. http://biblioclub.ru/index.php?page=book_red&id=105781&sr=1
2. Koryagin, A.S. Fundamentals of Endocrinology: Teaching and Methodological Manual. Ed. A.S. Koryagin, E.A. Gracheva. Nizhny Novgorod: N.N.G.U. named after N.I. Lobachevsky, 2016. – 109 pp. Text: electronic version // Lan: Electronic Library System. URL: <https://e.lanbook.com/book/152932>
3. Malysenko, O.S. Clinical Tasks in Gastroenterology, Endocrinology, and Hematology: A Textbook / O. S. Malysenko, T. V. Protasova, T. A. Raskina. – Kemerovo: Kemerovo State Medical Academy, 2011. – 140 pp. – ISBN 2227-8397. – Text: electronic version // Electronic Library System IPR BOOKS: [website]. URL: <http://www.iprbookshop.ru/6052.html>.
4. Marshalko, O. V. Therapy. Part 3: Gastroenterology, Nephrology, Hematology, Endocrinology, Joint Diseases. Allergies: A Textbook / O. V. Marshalko, A. I. Karpovich. – Minsk: Republican Institute of Professional Education (RIPO), 2016. – 344 pp. – ISBN 978-985-503-637-2. – Text: electronic version // Electronic Library System IPR BOOKS: [website]. – URL: <http://www.iprbookshop.ru/67747.html>
5. Mohort, T. V. Clinical Endocrinology: A Textbook / T. V. Mohort, Z. V. Zabarovskaya, A. P. Shepelkevich. – Minsk: Higher School Press, 2013. – 415 pp. – ISBN 978-985-06-2305-8. – Text: electronic format // Lan: Electronic Library System. – URL: <https://e.lanbook.com/book/65456>.
6. Skvortsov, V. V. Clinical Endocrinology: A Short Course / V. V. Skvortsov; A. V. Tumarenko. – St. Petersburg: SpetsLit, 2015. – 194 pp. – ISBN 978-5-299-00621-6.
7. Okorkov, A. N. Emergency Endocrinology / A. N. Okorkov. – 2nd ed. – Moscow: Medical Literature, 2018. – 188 pp. – ISBN 978-5-89677-196-8. – Text: electronic // Electronic Library System IPR BOOKS: [website]. – URL: <http://www.iprbookshop.ru/75514.html>

Online resources:

1. <http://rudocctor.net> / – Medical portal;
2. <http://www.e-reading.club> / – Comprehensive online library;
3. <http://www.pubmed.com> / – Database of full-text medical articles;
4. <http://www.spravocnikpolekarstvam.ru> / – Free online pharmacological reference guide;
5. <https://dic.academic.ru> / – Dictionaries and encyclopedias;
6. <https://www.rmj.ru> / – Russian medical journal.

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- ☐ Skills in conducting scientific research, preparing presentation and information and analytical materials, articles.
- ☐ Experience in participating in scientific conferences.

Interview questions.

1. Definition of SD(diabetes mellitus): The etiological classification of SD.
2. Pathogenesis of type 2 diabetes mellitus. The role of obesity in the manifestation of type 2 diabetes mellitus.
3. Laboratory methods for diagnosing various types of carbohydrate metabolism disorders. Determination of glucose tolerance, its normal, impaired, and diabetic levels criteria.
4. The main differences between type 1 and type 2 diabetes in terms of etiology, pathogenesis, and clinical features.
5. Clinical features of type 1 and type 2 diabetes.
6. Concept of diabetic microangiopathy: pathogenesis, morphology, clinic.
7. Modern classification of diabetic retinopathy (WHO).
8. Classification of diabetic nephropathy.
9. Treatment of diabetic nephropathy.
10. Diabetic neuropathy, its variants.
11. Diabetic foot syndrome, its clinical variants.
12. Diabetic macroangiopathies, pathogenesis, the role of hyperinsulinemia in the development of macroangiopathy.
13. Basic principles of diet therapy for patients with diabetes. The concept of simple and complex carbohydrates.
14. Indications for the prescription of sulfanilurea (SM) drugs. Mechanism of action of SM drugs.
15. Indications and contraindications for the use of biguanides, and their mechanism of action.
16. Indications for the use of insulin in patients with type 1 and type 2 diabetes.
17. Understanding the basic principles of modern insulin therapy for patients with type 1 diabetes.
18. Exogenous insulin preparations that mimic basal and bolus insulinemia.
19. The concept of diabetic ketosis and moderately severe ketoacidosis.
20. The concept of decompensated diabetic ketoacidosis syndrome and its criteria.
21. Hypoglycemic coma, etiology, and pathogenesis.
22. Hyperosmolar coma, etiology, and pathogenesis.
23. Modern ideas about the etiology and pathogenesis of goiter and other iodine-deficiency diseases.
24. Classification of goiter (WHO, 1994)
25. Clinic of goiter. Spectrum of manifestations of IDD.
26. Laboratory and instrumental diagnostics of IDA: blood hormone levels (T3, T4, TSH), ultrasound characteristics, determination of thyroid volume, biochemical parameters (urine iodine excretion). Epidemiological criteria for assessing the severity of iodine deficiency.
27. Differential diagnosis of goiter.

28. Treatment and prevention of goiter and IDA.
29. Classification of hypothyroidism.
30. Clinical manifestations of hypothyroidism.
31. Laboratory and instrumental diagnostics of hypothyroidism: blood hormone levels (T3, T4, TSH), biochemical parameters (cholesterol, LDL), ECG, and reflexometry.
32. Treatment of hypothyroidism: characteristics of thyroid hormone preparations and principles of replacement therapy.
33. Etiology and pathogenesis of Graves' disease.
34. Clinical symptoms of hyperthyroidism and its complications.
35. Laboratory and instrumental diagnostics of thyrotoxicosis: blood hormone levels (T3, T4, TSH), cholesterol levels; radioisotope diagnostics, ultrasound.
36. Differential diagnosis of DT3 with other diseases that occur with thyrotoxicosis syndrome.
37. Treatment of Cushing's disease: medical, surgical, and radioiodine therapy.
38. Definition of Cushing's disease and syndrome.
39. Morphological variants of Cushing's disease and syndrome.
40. Etiology and pathogenesis of Cushing's disease.
41. Pathogenesis of Cushing's syndrome.
42. Clinic of true hypercortisolism, pathogenesis of individual symptoms.
43. Laboratory and instrumental diagnostics of true hypercortisolism.
44. Medical tactics and treatment of Cushing's disease.
45. Primary chronic adrenal insufficiency: etiology, pathogenesis, clinic.
46. Principles of replacement therapy for primary chronic adrenal insufficiency.

Recommended Literature

Main References:

4. Bulatova O.V., Physiology of Regulatory Systems: Textbook, Part 1: Endocrinology, KGU, 2016 – 162 pp. http://biblioclub.ru/index.php?page=book_red&id=481493&sr=1
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13. Skvortsov, V. V. Clinical Endocrinology: A Short Course / V. V. Skvortsov; A. V. Tumarenko. – St. Petersburg: SpetsLit, 2015. – 194 pp. – ISBN 978-5-299-00621-6.
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Online resources:

7. <http://rudocctor.net> / – Medical portal;
8. <http://www.e-reading.club> / – Comprehensive online library;
9. <http://www.pubmed.com> / – Database of full-text medical articles;
10. <http://www.spravocnikpolekarstvam.ru> / – Free online pharmacological reference guide;
11. <https://dic.academic.ru> / – Dictionaries and encyclopedias;
12. <https://www.rmj.ru> / – Russian medical journal.