

MINISTRY OF HEALTH OF THE REPUBLIC OF BELARUS
EDUCATIONAL INSTITUTION
BELARUSIAN STATE MEDICAL UNIVERSITY

Контрольный
экземпляр

APPROVED



by First Vice-Rector, Professor

I.N.Moroz

12.08. 2023

Reg. # UD- L.16/2324 /edu. sub.

ENDOCRINOLOGY

Curriculum of educational institution in the educational discipline for the
specialty 1-79 01 01 «General Medicine»

Sub-Residency «General Clinical Practice»

Minsk 2023

Curriculum is based on the educational program of educational institution in the educational discipline «Endocrinology» for the Sub-Residency «General Clinical Practice (for foreign citizens)», approved 11.08.2023, registration # УД-Л.16/2324УЧ.суб.

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RECOMMENDED FOR APPROVAL:

by the Department of Endocrinology of the Educational Institution «Belarusian State Medical University»
(protocol # 15 of 21.06.2023);

by the Scientific and Methodological Council of the Educational Institution «Belarusian State Medical University»
(protocol # 7 of 10.08.2023)

EXPLANATORY NOTE

«Endocrinology» is the educational discipline containing systematized scientific knowledge about etiology, pathogenesis, clinical picture, methods of diagnosis, treatment and prevention of diseases of the endocrine system, emergency medical aid to patients with endocrine diseases.

The aim of teaching the educational discipline «Endocrinology» for the sub-residency «General Clinical Practice» (for foreign citizens) is to form students' academic, social, personal and professional competences for the provision of medical care to patients with diseases of the endocrine system, with the application of timely screening principles for the identification of risk groups and methods of diagnosis of endocrine diseases.

The tasks of teaching the educational discipline consist of formation of scientific knowledge on etiology and pathogenesis of the main socially significant diseases of the endocrine system, the clinical manifestations of diseases of the endocrine system with a typical course of action, and the emergency conditions in endocrinology and the skills and abilities required for:

examinations of patients of different ages with diseases of the endocrine system;

interpretation of the results of laboratory and instrumental research methods;

diagnostics, treatment of diseases of the endocrine system

prevention of diseases of the endocrine system;

providing emergency care in critical conditions due to impaired function of internal secretion, as well as indications for prescribing antibiotic therapy in these acute conditions;

clinical examination, medical rehabilitation of patients with diseases of the endocrine system.

Teaching and successful learning of the educational discipline «Endocrinology» for the sub-residency «General Clinical Practice» is carried out on the basis of knowledge and skills acquired by students in the sections of the following academic disciplines:

Normal anatomy. The structure of the organs of the endocrine system.

Pathological anatomy. The relationship of the organs of the endocrine system with the surrounding organs and tissues.

Normal physiology. Regulation of the function of the glands of the endocrine system in normal and pathological conditions.

Pathological physiology. Mechanisms of violations of the regulation of the function of the glands of the endocrine system.

Biological chemistry. Influence of hormones on the metabolism of carbohydrates, fats and proteins, the structure of hormones.

Histology, cytology, embryology. Morphology of the endocrine glands in the norm and in the development of pathology.

Propaedeutics of internal diseases. Examination and examination of the patient.

Propaedeutics of childhood diseases. Semiotics and syndromes of major lesions of organs and systems in children. Methods of examination of a healthy and sick child of different ages.

Internal diseases. Characteristics of diseases similar in clinical manifestations to diseases of the endocrine system.

Pediatrics. Characteristics of diseases of the endocrine system that occur in childhood and are associated with the peculiarities of the development of the child's body. Characteristics of diseases similar in clinical manifestations to diseases of the endocrine system.

Pharmacology. Hormonal, antihormonal and other drugs used in the treatment of diseases of the endocrine system.

Radiation diagnostics and radiation therapy. Methods of visualization of endocrine glands.

Surgical diseases. Indications and contraindications for surgical treatment of diseases of the endocrine and neuroendocrine system.

Neurology and neurosurgery. Neurological symptoms of endocrine diseases; indications and contraindications for surgical treatment of diseases of the neuroendocrine system.

Obstetrics and gynecology. The main clinical manifestations, diagnosis and treatment of gonadal dysfunction in women with endocrine diseases.

Ophthalmology. Diagnosis of eye lesions (diabetic retinopathy, cataract, endocrine ophthalmopathy), ophthalmic symptoms of pituitary adenoma.

As a result of studying the educational discipline «Endocrinology» for the sub-residency «General Clinical Practice» student should

know:

etiology and observed pathogenesis of the most common diseases of the endocrine system;

basic principles of treatment of endocrine diseases;

occurring serious prevention, secondary and serious prevention of the most common endocrine diseases;

diagnosis of emergency conditions in diabetes mellitus, hypothyroidism, thyrotoxicosis, adrenal insufficiency and other endocrine diseases;

features of diagnostics and treatment of patients with combined endocrine and other somatic diseases;

principles of epidemiological safety in the providing of medical care;

rules of medical ethics and deontology;

be able to:

find out the main complaints of the patient, determine their pathogenetic significance;

determine the main syndromes and make a preliminary diagnosis based on the study of the life history and present disease, the results of an objective examination of the patient;

draw up a reasonable program for examining the patient and formulate a diagnosis based on the obtained clinical and laboratory-instrumental data;

determine and prescribe tests of the first and subsequent levels for hormonal testing and interpret the results;

interpret the results of laboratory research methods: glycemic profile and glucose tolerance test, general blood and urine tests, biochemical blood test, coagulogram, hormonal testing results;

evaluate the results of the cytogram of the thyroid gland;

evaluate the results of ultrasonographic examination of the thyroid gland and neck organs, radiographic examination of the pituitary gland, adrenal glands, pancreas, skeleton, scintigraphic examinations of magnetic resonance examinations of the pituitary gland, adrenal glands;

provide emergency medical care in case of emergency conditions of endocrine genesis;

develop specific measures for secondary and tertiary prevention of diseases of the endocrine system.

master:

rules for examining a patient in order to identify disorders of carbohydrate metabolism;

the basic principles of a preventive examination of a patient in order to identify a hidden violation of carbohydrate metabolism (glucose tolerance test);

skills in prescribing antihyperglycemic therapy in the treatment of patients with diabetes mellitus, depending on the type of diabetes mellitus;

ways of providing emergency medical care in case of emergency hyperglycemic and hypoglycemic conditions in patients with diabetes mellitus;

physical methods of examination of the patient in order to detect diseases of the thyroid gland (perform palpation of the thyroid gland and peripheral lymph nodes of the neck);

skills in prescribing the necessary laboratory and instrumental methods of investigation in case of suspected thyroid disease;

skills of interpretation of hormonal, sonographic and scintigraphic methods of examination of the thyroid gland;

methods of providing emergency medical care for thyrotoxic crisis, hypothyroid coma, hypo- and hypercalcemic crises;

physical methods of examination of patients in order to identify hormonally active formations of the adrenal glands and diseases accompanied by a decrease in the function of the adrenal glands;

the basic rules for prescribing the necessary laboratory and instrumental methods of research in case of suspected diseases of the adrenal glands;

skills of interpreting hormonal, sonographic and computed tomography methods for studying diseases of the adrenal glands;

methods of providing emergency medical care in Addisonian crisis;

physical methods of examination of a patient with obesity.

Total number of hours for the discipline study is 56 academic hours.

Classroom hours according to the types of studies: practical classes - 35 hours; student independent work (self-study) - 21 hours.

Intermediate assessment is carried out according to the syllabus of the specialty in the form of a credit (12 semester).

The form of education is full-time.

THEMATIC PLAN

Section (topic) name	Number of class hours
	practical
1. Diabetes	14
1.1. Classification and diagnosis of diabetes mellitus. Obesity	7
1.2. Principles of evidence-based treatment of diabetes. Emergency conditions in diabetes	7
2. Diseases of the thyroid gland and parathyroid glands. Emergency conditions in diseases of the thyroid and parathyroid glands	7
3. Diseases of the adrenal glands and the hypothalamic-pituitary system. Emergency conditions in diseases of the adrenal glands	7
4. Endocrine aspects of reproductive health in different age periods	7
Total hours	35

CONTENT OF THE EDUCATIONAL MATERIAL

1. Diabetes

1.1. Classification and diagnosis of diabetes mellitus. Obesity

World Health Organization (WHO) classification of diabetes mellitus (2019). Modern algorithm for diagnosing disorders of carbohydrate metabolism. Differential diagnosis of diabetes mellitus types 1 and 2, features of clinical manifestations. Features of the diagnosis of diabetes mellitus in childhood.

Gestational diabetes mellitus: diagnostic criteria, principles of treatment and management of pregnancy.

Chronic complications of diabetes mellitus: diabetic neuropathy and diabetic foot syndrome, diabetic nephropathy, retinopathy (classification, diagnosis, treatment).

Obesity: definition, classification, modern methods of diagnosis and treatment. Features of diagnosis and treatment of obesity in children.

Place of bariatric surgery in the treatment of obesity and type 2 diabetes.

Examination of patients with diabetes mellitus and other somatic diseases: collection of complaints and anamnesis of the disease; objective examination; drawing up a plan for laboratory and instrumental examination (determination of various types of sensitivity, determination of pulsation on a.dorsalis pedis); interpretation of the results of laboratory and instrumental methods of examination; formulation of the diagnosis; drawing up a treatment plan; appointment and

correction of measures for the medical rehabilitation of patients, taking into account the results of the research; preparation of medical documentation.

1.2. Principles of evidence-based treatment of diabetes. Emergency conditions in diabetes

A modern algorithm for managing patients with type 2 diabetes mellitus. Lifestyle modification as a component of type 2 diabetes therapy. Current possibilities of drug therapy for type 2 diabetes mellitus and obesity (metformin, sulfonylurea derivatives, sodium glucose cotransporter 2 inhibitors, incretin mimetics, dipeptyl peptidase-4 inhibitors, insulin and insulin analogues, daily monitoring of glycemia). Complex therapy (multifactorial correction) of type 2 diabetes mellitus, aimed at preventing cardiac mortality.

Insulin therapy in type 1 diabetes mellitus: types of insulins and principles for calculating the daily dose, insulin therapy regimens, complications of insulin therapy. insulin pumps.

Principles of management of patients with somatic diseases in diabetes mellitus. The choice of antihyperglycemic drug depending on comorbid pathology.

Monitoring of diabetes mellitus in the outpatient setting and self-monitoring at home.

Secondary and tertiary prevention of diabetes mellitus.

Hyperglycemic coma: ketoacidotic, hyperosmolar, hyperlactacidemic - differences in pathogenesis, clinical manifestations, principles of treatment. Stages of medical care.

Hypoglycemic coma: etiopathogenesis, clinical manifestations, diagnosis, principles of emergency care at various stages. Prevention of emergency conditions in diabetes mellitus.

Examination of patients with diabetes mellitus and hypo-, hyperglycemic coma: collection of complaints and anamnesis of the disease; objective examination; drawing up a plan for laboratory and instrumental examination; interpretation of the results of laboratory and instrumental methods of examination; formulation of the diagnosis; drawing up a treatment plan with the calculation of insulin dosing at the beginning of insulin therapy, diet; carrying out preventive measures, prescribing and correcting measures for the medical rehabilitation of patients, taking into account the results of research; preparation of medical documentation.

2. Diseases of the thyroid gland and parathyroid glands. Emergency conditions in diseases of the thyroid and parathyroid glands

Nodular pathology of the thyroid gland: clinical forms and manifestations. Principles of differential diagnostic search in the presence of nodular goiter: examination sequence; TI-RADS stratification system for signs of malignancy of thyroid nodules; indications and contraindications for fine-needle puncture biopsy. Principles of monitoring and treatment of nodular pathology of the thyroid gland depending on the nosological form of goiter. Indications and contraindications for surgical treatment of nodular goiter.

Acute and subacute thyroiditis: definition, etiology, pathogenesis, clinical presentation, diagnosis, differential diagnosis, principles of treatment.

Hypothyroidism syndrome: classification, epidemiology, etiology, pathogenesis, main clinical symptoms. differential diagnosis, examination algorithm and principles of treatment.

Subclinical hypothyroidism: the concept and criteria for verification, the impact on the risk of developing somatic pathology and the rationale for the expediency of treatment depending on the age of disease manifestation.

Hypothyroid coma: etiology, pathogenesis, clinical presentation, diagnosis, treatment.

Thyrotoxicosis syndrome: causes, clinical manifestations and differential diagnosis, examination algorithm and principles of treatment with thyrostatic therapy. Methods of radical treatment: indications and contraindications.

Subclinical hyperthyroidism: the concept and criteria for verification, the impact on the risk of developing somatic pathology and the rationale for the expediency of treatment depending on the age of disease manifestation.

Thyrotoxic crisis: etiology and pathogenesis, clinical manifestations, diagnosis, emergency medical care at various stages. Prevention of thyrotoxic crisis.

Primary and secondary hyperparathyroidism: etiology and pathogenesis, features of clinical manifestations, diagnosis, differential diagnosis, principles of treatment. Hyperparathyroid crisis: etiology, pathogenesis, clinical manifestations, diagnosis, treatment.

Hypoparathyroidism: etiology, pathogenesis, clinical picture, diagnosis, differential diagnosis, principles of treatment. Hypocalcemic crisis: etiology and pathogenesis, clinical manifestations, diagnosis, emergency medical care, prevention.

Examination of patients with diseases of the thyroid and parathyroid glands; collection of complaints and anamnesis, physical examination (palpation of the thyroid gland, regional and peripheral lymph nodes), assessment of the severity of the condition, drawing up a plan for laboratory and instrumental examination; interpretation of the results of laboratory and instrumental methods of examination; making a diagnosis; differential diagnosis, determination of indications for surgical treatment; appointment and correction of measures for the medical rehabilitation of patients, taking into account the results of the research; preparation of medical documentation.

3. Diseases of the adrenal glands and the hypothalamic-pituitary system.

Emergency conditions in diseases of the adrenal glands

Syndromes of hypercortisolism and hypocortisolism: classification, etiology, pathogenesis, clinical picture, diagnosis, differential diagnosis, principles of treatment.

Differential diagnosis of primary and secondary hyperaldosteronism: etiology, pathogenesis, clinical picture, diagnosis, principles of treatment.

Hypersomatotropism syndrome: definition, epidemiology, etiology, pathogenesis, clinical picture (features depending on the age of manifestation of the disease), diagnostic and therapeutic tactics.

Arterial hypertension of endocrine origin. Features of its clinical manifestations in pheochromocytoma, hyperaldosteronism, hypersomatotropism.

Acute adrenal insufficiency and adrenal crisis: etiology and pathogenesis, clinical manifestations, diagnosis, emergency medical care at various stages. Principles of prevention of Addisonian crisis in chronic adrenal insufficiency.

Sympathoadrenal crisis: provoking factors, clinical manifestations, differential diagnosis, complications, treatment.

Examination of patients with diseases of the adrenal glands and the hypothalamic-pituitary system; collection of complaints and anamnesis of the disease; objective examination; drawing up a survey plan; interpretation of the results of laboratory and instrumental methods of examination; formulation of the diagnosis; carrying out preventive measures. drawing up a plan of conservative treatment; indications for surgical treatment; provision of emergency medical care; preparation of medical documentation.

4. Endocrine aspects of reproductive health in different age periods

Polycystic ovary syndrome: insulin resistance and other causes of the disease. Modern methods of diagnostics, differential diagnostics, non-drug and drug treatment in patients with this pathology.

Congenital dysfunction of the adrenal cortex: definition, etiopathogenesis, clinical forms and their manifestations, diagnosis, differential diagnosis, principles of treatment.

Physiological and pathological causes of hyperprolactinemia. Modern methods of diagnosis and treatment of this pathology.

Hypogonadism in men and women: causes, clinical manifestations in different age periods, diagnosis, differential diagnosis, determination of expediency and principles of replacement therapy.

Causes of short stature, etiology, growth hormone deficiency (congenital, acquired), pathophysiology. The main symptoms characteristic of congenital growth hormone deficiency. Short stature diagnosis. Treatment of short stature, indications and contraindications for treatment with recombinant human growth hormone, prognosis.

Examination of patients with endocrine disorders of reproductive health: collection of complaints and anamnesis of the disease; objective examination; drawing up a survey plan; interpretation of the results of laboratory and instrumental methods of examination; formulation of the diagnosis; carrying out preventive measures. drawing up a plan of conservative treatment; indications for surgical treatment; provision of emergency medical care; preparation of medical documentation.

**EDUCATIONAL METHODOLOGICAL CARD OF EDUCATIONAL DISCIPLINE «ENDOCRINOLOGY» FOR THE
SUB-RESIDENCY «GENERAL CLINICAL PRACTICE»**

Section number, topics	Name of section, theme	Number of class hours		self-studies	Equipment	Literature	Form of knowledge control
		practical					
1.	Diabetes	14		6	1-8	1-8, 14-16	1-5, 7
1.1.	Classification and diagnosis of diabetes mellitus. Obesity	7		3	1-6	1-8, 14-16	1-5, 7
1.3.	Principles of evidence-based treatment of diabetes. Emergency conditions in diabetes	7		3	1-6	1-8, 14-16	1-5, 7
2.	Diseases of the thyroid gland and parathyroid glands. Emergency conditions in diseases of the thyroid and parathyroid glands	7		5	1-3, 6	1-5, 8-10, 16	1-5, 7
3.	Diseases of the adrenal glands and the hypothalamic-pituitary system. Emergency conditions in diseases of the adrenal glands	7		5	1-3, 6	1-5, 8, 11, 12, 16	1-5, 7
4.	Endocrine aspects of reproductive health in different age periods	7		5	1-3, 6	1-5, 8, 13, 15	1 - 7
	Total hours	35		21			

INFORMATION AND INSTRUCTIONAL UNIT

LITERATURE

Basic:

1. Williams textbook of endocrinology. Melmed S. [et al.]. Philadelphia : Elsevier, 2020. – 1777 p.
2. Harrison`s principles of internal medicine. Vol. 1 / ed. by D. L. Longo, D. L. Kasper, J. L. Jameson [et. al]. – New York [etc.] : McGrawHill Medical, 2018. – 1796 p.

Additional:

3. American Diabetes Association Standarts of Medical care in Diabetes : vol. 44 : Diabetes Care : suppl. 1,1. – 2021. – 232p.
4. Internal medicine: critical care : textbook / Babak, O. Ya. [и др.] ; ed. by. O.Ya. Babak, O. M. Bilovol. – Kyiv : AUS Medicine Publishing, 2018. – 368 p.

Normative regulatory acts:

5. Recommendations by the World Health Organization (WHO), the International Diabetes Federation (IDF), the American Association of Clinical Endocrinologists (AACE), the International Council for Control of Iodine Deficiency Disorders (ICCIDD) accepted in the countries of Europe, Asia and America.

CHARACTERISTICS OF THE USED TRAINING METHODS

When organizing the educational process, traditional methods of teaching the discipline are used: practical classes and elements of controlled independent work of students.

It is recommended to organize the educational process with the use of traditional and modern educational technologies (technologies of simulation training, methods of «standardized patient», various forms of communication, variable models of independent work, modular and rating systems of training, tests and other systems of competence assessment, etc.).

Practical training is conducted on the basis of endocrinological departments of health care organizations. In practical classes under the supervision of the teacher, students independently collect patient complaints and anamnesis of the disease, conduct physical examination, learn to draw up a plan of laboratory and instrumental examination, interpret the results of laboratory and instrumental research methods, make a diagnosis and a treatment plan, fill in medical documentation. Practical training is provided by the students' solution of situational problems, test tasks, by the development of skills of patient examination, diagnosis and differential diagnosis of diseases, carrying out medical manipulations with the use of electronic-mechanical, virtual and multi-component simulators, skills of communicative competence with the use of standardized (simulated) patient.

Self-study consists of the study of basic and additional literature, monographs and periodical literature, preparation of reports, essays, presentations and brief reports on the most pressing problems of emergency medical care for patients with endocrine diseases, development of topics (issues), submitted to independent study, preparation for credits.

Students learn about safe working conditions, international requirements and ethical standards during practical classes.

LIST OF TRAINING AIDS

1. Computer, pads, smartphone.
2. Multimedia presentations.
3. Glycaemia analysis execution using test systems.
4. Medical devices for determining the tactile, pain, temperature and vibration sensitivity of the lower extremities.
5. Laboratory and instrumental research methods.
6. Medical records of inpatients (outpatients), photo album, tables.

LIST OF AVAILABLE DIAGNOSTIC TOOLS

The assessment of the student's academic achievements is carried out using the fund of evaluation means and technologies of higher education institution. The fund of evaluation means of student's academic achievements includes:

typical tasks in various forms (oral, written, test, cases, simulation);
themes of reports;

medical records of inpatients (outpatients) and the results of additional examination methods (laboratory, functional, radiological).

The following forms are used for competences assessment:

Oral form:

1. Interview.
2. Evaluation based on a business game.

Written form:

3. Tests.
4. Reports.

Oral-written form:

5. Situation problems.
6. Credit.

Technical form:

7. Electronic tests.

LIST OF PRACTICAL SKILLS

1. Physical examination of patients with diseases of the endocrine system (determination of height, weight, calculation of body mass index, measurement and evaluation of waist circumference, compliance with age and sex).

2. Physical examination of the lower extremities of patients with diabetes mellitus (determination of various types of sensitivity, pulsations in the peripheral arteries).

3. Evaluation of the results of the rapid analysis of glycemia using test systems and continuous monitoring of glycemia to determine the tactics of treatment correction.

4. Calculation of the dose of insulin, taking into account the diet by the number of carbohydrate units and mastering the features of insulin administration with an insulin syringe and an insulin pen.

5. Determination of target values of glycemia in the management of a patient with diabetes.

6. Determination of indications for initiation of insulin therapy in type 2 diabetes mellitus.

7. Physical examination of patients with thyroid diseases, including its palpation, assessment of eye symptoms.

8. Determination of indications for fine-needle puncture biopsy and evaluation of the results obtained using the BETHESDA scale.

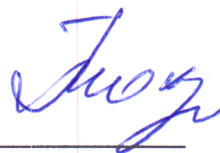
9. Physical examination of patients with hyperandrogenism - assessment of the hirsute number on the Ferriman-Galway scale and other signs of virilization.

10. Physical examination of male patients with hypogonadism and gynecomastia (palpation of the scrotum and mammary glands).

11. Providing emergency medical care for hyperglycemic and hypoglycemic precomatous and comatose conditions, hypo- and hypercalcemia, adrenal, thyrotoxic crisis, hypothyroid coma.

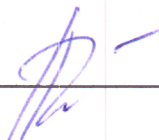
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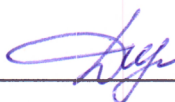
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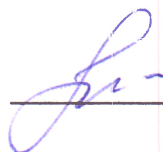
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Curriculum content, composition and accompanying documents comply with established requirements.

Dean of the Medical Faculty for
International Students of the
educational institution «Belarusian
State Medical University»

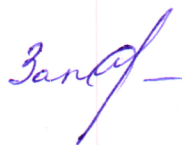
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