FACULTY MEDICINE N2

STUDY PROGRAM 0912.1 MEDICINE

CHAIR OF ENDOCRINOLOGY

APPROVED
at the meeting of the Commission for Quality Assurance and Evaluation of the Curriculum in Medicine/Pharmacy/ Dentistry
Minutes No. 6 of 20.05.24
Chairman, MD, PhD., professor
Pădure Andrei _____

APPROVED
at the Council meeting of the Faculty of Medicine nr. 2
Minutes No. 6 of 18.06.24
Dean of Faculty Medicine nr. 2
MD, PhD, associate professor
Beţiu Mircea _____

APPROVED
approved at the meeting of the chair Endocrinology
Minutes No.13 of 20.05.2024
Head of chair Endocrinology
MD, associate professor
Vudu Lorina L. Vudu

SYLLABUS

DISCIPLINE **ENDOCRINOLOGY. DIABETOLOGY**

Integrated studies

Tipe of course: **Compulsory**

Curriculum elaborat de colectivul de autori:

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I. INTRODUCTION

- General presentation of the discipline: place and role of the discipline in the formation of the specific competences of the professional / specialty training program

The discipline of Endocrinology is one of the compulsory disciplines in the academic training of beneficiaries, regardless of the specialty they will choose later. Endocrinology is fertile ground for integrating and implementing the fundamental knowledge (anatomy, human physiology, microbiology, pathophysiology, etc.) in clinical practice, and interrelationship with other medical disciplines (neurology, psychiatry, cardiology, gastroenterology, gynecology et c.).

Within this discipline, along with the study of etiology, pathogenesis, clinical manifestations, evolution, treatment and prophylaxis of endocrine diseases, the future specialist acquires practical skills of investigating the patient and appreciating the results obtained.

Endocrinology has a special role to play in forming the basics of clinical judgment, which will ensure proper diagnosis, appropriate treatment, and resolution of emergency situations in endocrine disease.

- Mission of the curriculum (aim) in professional training

Strengthen the fundamental knowledge related to endocrine gland pathology and their implementation in practice; knowledge of evolution, diagnosis, appropriate treatment and prophylaxis of endocrine diseases, development of clinical judgment and medical synthesis - defining elements in the training of any physician.

- Language (s) of the discipline: English;
- Beneficiaries: students of the IV year, faculty of Medicine no. 2.

II. MANAGEMENT OF THE DISCIPLINE

Code of discipline		**S.08.0.066**	
Name of the discipline		**Endocrinology. Diabetology.**	
Person(s) in charge of the discipline		**Vudu Lorina, MD, associate professor**	
Year	**IV**	Semester/Semesters	**VIII**
Total number of hours, including:			**120**

Lectures	24	Practical/laboratory hours	24
Seminars	24	Self-training	48
Form of assessment	E	Number of credits	4

III. TRAINING AIMS WITHIN THE DISCIPLINE

At the end of the discipline study the student will be able to:

- **at the level of knowledge and understanding:**

✓ to recognize endocrine disorders in patients;
✓ to know and use appropriately the specific notions of the specialty of Endocrinology;
✓ to know the particularities of the onset and evolution of the various diseases of the endocrine system;
✓ to understand the methodology and particularities of examining patients with various endocrine disorders;
✓ indications and how to transfer patients to specialized services;
✓ to know the frequency, etiology and pathogenesis of endocrine diseases;
✓ to know the current (urgent and scheduled) investigation methods of endocrine pathologies;
✓ to know the contemporary methods of treatment of endocrine diseases;
✓ to know the methods of prophylaxis of chronic and acute pathologies of organs of the endocrine system.

- **at the application level:**

✓ application of theoretical knowledge in the practice of professional and social activity;
✓ collecting and accurately estimating anamnesis data;
✓ correct examination of patients with various endocrine disorders;
✓ establishing the preventive diagnosis;
✓ applying the investigation methods necessary to confirm the diagnosis;
✓ appreciation of the results of paraclinical and instrumental investigations;
✓ the assessment of the severity of the general condition of the patient;
✓ providing urgent help in critical situations;
✓ completing and editing of medical documents;
✓ development of scientific research projects in the field of endocrinology.

- **at the integration level:**

✓ appreciation of the importance of pathology of the endocrine system in the context of general medicine and integration with related medical disciplines;
✓ assessing the progress of physiological processes, etiology and pathophysiology of pathological processes in an adult;
✓ further development of clinical judgment, based on the principles of clinical diagnosis, differential diagnosis of different nozological forms and individualized treatment;
✓ creative approach to endocrine problems;
✓ deduction of the interrelationship between endocrinology and other medical disciplines (internal medicine, phthisiology, oncology, clinical pharmacology, etc.);
✓ the ability to objectively evaluate and self-assess knowledge in the field;
✓ enhancing knowledge and gaining experience in diagnosis, differential diagnosis and treatment in endocrinology;
✓ the ability to acquire new achievements in endocrinology.
✓ to assess the importance of endocrine diseases in the context of Medicine.

IV. PROVISIONAL TERMS AND CONDITIONS

The fourth year student who starts studying the Endocrinology discipline requires the following:

- ✓ knowledge of the language of instruction;
- ✓ different use of semiotic elements (scientific language, graphical and computerized language)
- ✓ deep knowledge of preclinical and clinical disciplines previously studied (medical semiology, internal medicine, pathology and histology anatomy, normal and pathological physiology, biochemistry, pharmacology, surgery, radiology and medical imaging, cardiology, neurology, nephrology, etc.)
- ✓ digital skills (using the Internet, document processing, presentations);
- ✓ ability to communicate and teamwork;
- ✓ qualities - tolerance, compassion, autonomy.

V. THEMES AND ESTIMATE ALLOCATION OF HOURS

Lectures, practical hours/ laboratory hours/seminars and self-training

No. d/o	THEME	Number of hours		
		Lectures	Practical hours	Self-training
1.	General organization of the endocrine system (endocrine glands, hormones, regulation). The endocrine hypothalamus. Tumors of the adenohypophysis: classification, epidemiology, clinical picture. Pituitary tumors. Acromegaly. Gigantism. Hyperprolactinemia.	2	2/2	4
2.	Pituitary insufficiency of the adult. Pituitary insufficiency of the child. Diabetes insipidus. Inadequate ADH secretion syndrome.	2	2/2	4
3.	Thyroid gland disorders. Iodine deficiency diseases: epidemiological criteria, pathophysiology, clinical forms: endemic goiter and endemic cretinism. Thyrotoxicosis. Graves Basedow disease, multinodular toxic goiter. Thyrotoxic adenoma.	2	2/2	4
4.	Hypothyroidism. Thyroiditis. Thyroid cancers. Diseases caused by iodine deficiency: endemic goiter and endemic cretinism.	2	2/2	4
5.	Endocrine control of phospho-calcic metabolism. Hypoparathyroidism. Acute tetanus. Hyperparathyroidism.	2	2/2	4
6.	The endocrine pancreas - structure, hormones. Diabetes mellitus: classification, diagnostic criteria. Etiopathogenesis, the clinical picture of Type 1 diabetes and Type 2 diabetes. Prediabetes. Gestational diabetes.	2	2/2	4
7.	Chronic and acute complications of diabetes: classification, pathogenetic mechanisms. Microvascular complications. Macrovascular complications. Diabetic neuropathy and diabetic foot. Acute complications: hyperglycemic conditions and hypoglycemia.	2	2/2	4

No. d/o	THEME	Number of hours		
		Lectures	Practical hours	Self-training
8.	Treatment of type 1 diabetes. Principles of nutrition in type 1 diabetes. Physical exercise in type 1 diabetes. Drug treatment of type 1 diabetes. Modern medical devices. Insulin preparations.	2	2/2	4
9.	Treatment of type 2 diabetes. Principles of diet therapy in DM 2. Physical exercise in DM 2. Oral antidiabetic drugs.	2	2/2	4
10.	The adrenal cortex. Adrenal medulla. Cushing's Disease and Syndrome. Primary hyperaldosteronism. Chronic adrenal insufficiency. Adissonian crisis. Congenital adrenal hyperplasia. Feocromocytoma.	2	2/2	4
11.	Gonads disorders. Female hypogonadism. Male hypogonadism. Hermaphroditism.	2	2/2	4
12.	Obesity.	2	2/2	4
Total				

VI. PRACTICAL TOOLS PURCHASED AT THE END OF THE COURSE

Mandatory essential practical tools are:

- Interpretation of hormonal results (STH, TSH, ACTH, LH, FSH, Prolactin, T3, T4, Cortisol, PTH, ADH, Testosterone, Estradiol, Progesterone)
- Dynamic function tests used in patients with pituitary dwarfism
- Water deprivation test
- Oral glucose tolerance test in patients with acromegaly (growth hormone suppression test)
- Palpation of the thyroid gland
- Eye signs evaluation in thyroid eye disease
- Thyroid gland scintigraphy results interpretation
- Testing for Chwosteck sign and Trousseau sign
- Dexamethasone suppression test with low and high dose
- ACTH stimulation test
- Oral glucose tolerance test (OGTT): procedure and interpretation of the results
- Assessment of blood glucose using a glucometer
- Assessment of body mass index (BMI)
- Appreciation of the ideal body weight
- Calculation of caloric need
- Assessment of bread unit (BU)
- Glycemic index (GI)
- Insulin administration technique
- Application of 500 rule and 1800 rule in determining the daily insulin dose
- Application of 15 rule in hypoglycemia treatment
- Diabetic Foot Assessment (foot sensitivity examination, peripheral pulsation determination)

Note: The essential practical tools characteristic of the discipline, obligatory to be acquired by each student during the module, will be listed. These will serve as a basis for the stage of evaluating practical skills and will constitute their portfolio per study program.

VII. OBJECTIVES AND CONTENT UNITS

Objectives	Content units
Theme 1. Hormones structure and classification. Endocrine, paracrine and autocrine regulation. General organization of the endocrine system (endocrine glands, hormones, hormone receptors). The hypothalamus: structure. Hypothalamic, adenohypophyseal hormones: structure, actions, regulation, practical use; exploration of the endocrine axes. Tumors of the adenohypophysis: classification, epidemiology, clinical picture. Pituitary tumor syndrome. Pituitary tumor exploration algorithm. Treatment of pituitary tumors. Acromegaly: etiopathogenesis, clinical picture; exploration algorithm, treatment. Gigantism. Hyperprolactinemia: etiopathogenesis, clinical picture, treatment.	
• **Have thorough knowledge of the previous objects** *(anatomy, physiology, histology, pathophysiology etc.)*	1. Hormones structure and classification. 2. Endocrine, paracrine and autocrine regulation. 3. General organization of the endocrine system (endocrine glands, hormones, hormonal receptors). 4. Hypothalamus: structure. Hypothalamic hormones: structure, actions. 5. Adenohypophyseal hormones: structure, actions, regulation
• **To define**	1. The notions of acromegaly and gigantism. Notions of pituitary tumors, prolactinoma.
• **To possess theoretical knowledge about**	1. Etiology, pathogenesis and clinical manifestations of acromegaly, gigantism, hyperprrolactinemia.
• **Apply practical and theoretical skills**	1. In the patient's clinical examination 2. Carrying out functional tests in diagnosis of acromegaly, gigantism, the insulin, arginine, metoclopramid test. 3. Interpretation of the results of functional tests and imaging investigations 4. Develop a treatment plan for the patients concerned
• **To integrate knowledge**	1. In terms of differentiating pathologies from other disciplines such as neurosurgery, psychiatry, internal medicine.
Theme (chapter) 2. Pituitary insufficiency of the adult: etiopathogenesis, clinical and biological diagnosis, complications, treatment. Clinical and biological diagnosis of growth disorders. Pituitary insufficiency child ethiopathogenesis, clinical symptoms, level of	

Objectives	Content units
exploration, treatment. Diabetes insipidus: etiology, pathophysiology, exploration algorithm, therapy. Inadequate ADH secretion syndrome	
• **Have thoroughknowledge of the previous objects** *(anatomy, physiology, histology, pathophysiology etc.)*	1. Pituitary gland: structure. 2. Adenohypophyseal hormones in basophilic cells: structure, actions, regulation.
• **To define**	1. The notions of diabetes insipidus and s syndrome of inadequate secretion of ADH. The notion of pituitary dwarfism. 2. Getting it to the pituitary insufficiency in adults
• **To possess theoretical knowledge about**	1. Etiology, pathogenesis and clinical manifestations of diabetes insipidus and inadequate ADH secretion syndrome. 2. Etiology, pathogenesis and clinical manifestations of adult and child adenohypophyseal insufficiency. 3. Exploration of the endocrine axes.
• **Apply practical and theoretical skills**	1. In the patient's clinical examination 2. In performing functional diagnostic tests for diabetes 3. tasteless and inadequate ADH secretion syndrome 4. Interpretation of water restriction test results, test with vasopressin. 5. Develop a treatment plan for the patients concerned
• **To integrate knowledge**	1. In terms of differentiating pathologies from other disciplines such as pediatrics, neurosurgery, psychiatry, nephrology, gynecology.
Theme (chapter) 3. Iodinated thyroid hormones: biosynthesis, actions, regulation. Exploration of the hypothalamic-pituitary-thyroid axis. Thyrotoxicosis: classification, etiopathogenesis, pathophysiology, exploration algorithm. Graves-Basedow disease, toxic multinodular goiter, thyrotoxic adenoma: clinical manifestations, diagnosis, treatment.	
• **To have thorough knowledge of previous objects** *(anatomy, physiology, histology, pathophysiology)*	1. Iodinated thyroid hormones: biosynthesis, actions, regulation. 2. Exploration of the hypothalamic-pituitary-thyroid axis.
• **To define**	1. The notions of diseases caused by iodine deficiency 2. The notion of thyrotoxicosis 3. Notion of toxic diffuse goiter (Graves – Basedow disease)

Objectives	Content units
exploration, treatment. Diabetes insipidus: etiology, pathophysiology, exploration algorithm, *therapy. Inadequate ADH secretion syndrome*	
• **Have thoroughknowledge of the previous objects** *(anatomy, physiology, histology, pathophysiology etc.)*	1. Pituitary gland: structure. 2. Adenohypophyseal hormones in basophilic cells: structure, actions, regulation.
• **To define**	1. The notions of diabetes insipidus and s syndrome of inadequate secretion of ADH. The notion of pituitary dwarfism. 2. Getting it to the pituitary insufficiency in adults
• **To possess theoretical knowledge about**	1. Etiology, pathogenesis and clinical manifestations of diabetes insipidus and inadequate ADH secretion syndrome. 2. Etiology, pathogenesis and clinical manifestations of adult and child adenohypophyseal insufficiency. 3. Exploration of the endocrine axes.
• **Apply practical and theoretical skills**	1. In the patient's clinical examination 2. In performing functional diagnostic tests for diabetes 3. tasteless and inadequate ADH secretion syndrome 4. Interpretation of water restriction test results, test with vasopressin. 5. Develop a treatment plan for the patients concerned
• **To integrate knowledge**	1. In terms of differentiating pathologies from other disciplines such as pediatrics, neurosurgery, psychiatry, nephrology, gynecology.
Theme (chapter) 3. Iodinated thyroid hormones: biosynthesis, actions, regulation. Exploration of the hypothalamic-pituitary-thyroid axis. Thyrotoxicosis: classification, etiopathogenesis, pathophysiology, exploration algorithm. Graves-Basedow disease, toxic multinodular goiter, thyrotoxic adenoma: clinical manifestations, diagnosis, treatment.	
• **To have thorough knowledge of previous objects** *(anatomy, physiology, histology, pathophysiology)*	1. Iodinated thyroid hormones: biosynthesis, actions, regulation. 2. Exploration of the hypothalamic-pituitary-thyroid axis.
• **To define**	1. The notions of diseases caused by iodine deficiency 2. The notion of thyrotoxicosis 3. Notion of toxic diffuse goiter (Graves – Basedow disease)

Objectives	Content units
	4. The notion of thyrotoxic adenoma and toxic multinodular goiter
• **To possess theoretical knowledge about**	1. Exploration of the hypothalamic-pituitary-thyroid axis - contemporary diagnostic methods (hormonal dosing, USG thyroid gland, scintigraphy and thin needle biopsy). 2. Etiology, pathogenesis and clinical manifestations of thyroid pathologies: diseases caused by iodine deficiency and pathologies manifested by thyrotoxicosis (Graves Basedow disease, toxic multinodular goiter, thyrotoxic adenoma)
• **Apply practical and theoretical skills**	1. In palpating the thyroid gland and interpreting their changes 2. Interpretation of the results of hormonal dosing and contemporary imaging investigations used for the diagnosis of thyroid pathologies with thyrotoxicosis 3. Develop a treatment plan for the patients concerned
• **To integrate knowledge**	1. In the aspect of differential diagnosis with other pathologies from other disciplines such as cardiology, neurology, psychiatry.
Theme (chapter) 4. Hypothyroidism: etiopathogenesis, pathophysiology, clinical manifestations, treatment.Thyroiditis: etiopathogenesis, clinical manifestations, exploration and therapy. Nodular goiter: epidemiology, anatomical-clinical forms, diagnostic algorithm, therapeutic orientation. Thyroid cancers: anatomical-clinical forms, diagnosis, follow-up of evolution. Diseases caused by iodine deficiency: pathophysiology, clinical forms: endemic goiter and endemic cretinism.	
• **To have thorough knowledge of previous objects** *(anatomy, physiology, histology, pathophysiology)*	1. Effects of iodinated thyroid hormones. 2. Regulation of thyroid function.
• **To define**	1. Notion of hypothyroidism 2. The notion of thyroiditis and their classification 3. Notions of nodular goiter and thyroid cancer
• **To possess theoretical knowledge about**	1. Etiology, pathogenesis and clinical manifestations of thyroid pathologies manifested by hypothyroidism. 2. Contemporary methods of diagnosis and treatment
• **Apply practical and theoretical skills**	1. In palpating the thyroid gland and interpreting their changes.

Objectives	Content units
	2. Interpretation of the results of hormonal dosing and imaging investigations in hypothyroidism, thyroiditis, nodular goiter and thyroid cancer. 3. Develop a treatment plan for the patients concerned.
Topic (chapter) 5. Endocrine control of phospho-calcic metabolism. Hypoparathyroidism: etiopathogenesis, clinical manifestations, biological exploration, therapy. Acute tetanus. Hyperparathyroidism: etiopathogenesis, clinical forms, clinical manifestations, biological exploration and therapy.	
• **Have thorough knowledge of the previous objects** *(anatomy, physiology, histology, pathophysiology etc.)*	1. Anatomy and structure of parathyroid glands 2. Hormones that influence phosphocalcic metabolism - parathormone and calcitonin - structure, synthesis, biological effects 3. Calcium homeostasis regulation mechanisms in the body
• **To define**	1. The notions of hypoparathyroidism and its classification 2. The notion of hyperparathyroidism and its classification
• **To possess theoretical knowledge about**	1. Etiology, pathogenesis and clinical manifestations of hypothyroidism and hyperparathyroidism. 2. Contemporary methods of diagnosis and treatment in parathyroid diseases
• **Apply practical and theoretical skills**	1. When examining the patient with suspected parathyroid pathologies 2. In interpreting the results of hormonal dosing and imaging investigations in hypoparathyroidism and hyperparathyroidism. 3. Develop a treatment plan for the patients concerned
• **Integrate knowledge**	1. In terms of differential diagnosis with other pathologies, in other disciplines such as oncology, traumatology, nephrology, neurology.
Theme (chapter) 6. The endocrine pancreas - structure, hormones. Diabetes mellitus: definition, classification, diagnostic criteria. Etiopathogenesis, the clinical picture of Type 1 diabetes and Type 2 diabetes. The pathophysiology of metabolic disorders in diabetes. Prediabetes. Oral glucose tolerance test. Gestational diabetes.	
• **Have thorough knowledge of the previous objects** *(anatomy, physiology, histology, pathophysiology etc.)*	1. The structure of the pancreas. The role of endocrine pancreas 2. Hormone secretion by the pancreas - their biological effects.

Objectives	Content units
	3. Mechanisms and principles of regulating glucose homeostasis in the human body
• **To define**	1. The notions of diabetes and its international classification 2. The notion of prediabetes. 3. The notion of gestational diabetes.
• **To possess theoretical knowledge about**	1. Etiology, pathogenesis and clinical manifestations of diabetes mellitus. 2. Risk factors for diabetes 3. Diagnostic criteria for diabetes 4. Diagnostic criteria for gestational diabetes 5. Investigations needed to differentiate between different types of diabetes
• **Apply practical and theoretical skills**	1. In examining the patient with diabetes 2. In performing the glucose tolerance test (OGTT) 3. Interpretation of OGTT results and diagnosis of different categories of glucose metabolism disorder
• **Integrate knowledge**	1. In daily practice regarding the detection of risk factors and early screening of diabetes.
Theme (chapter) 7. Chronic and acute complications of diabetes: classification, pathogenetic mechanisms.Microvascular complications: retinopathy, nephropathy. Macrovascular complications - lower limb, coronary and cerebral vesselsangiopathy. Diabetic neuropathy and diabetic foot. Acute symptoms: Hyperglycaemic states and hypoglycemia in the diabetic patient: etiology, pathogenesis, clinical picture, laboratory diagnosis, treatment principles.	
• **Have thorough knowledge of the previous objects** *(anatomy, physiology, histology, pathophysiology etc.)*	1. The structure of the eye. 2. Kidney structure and functions. 3. Vessel structure. 4. Pathogenesis of the atherogenesis process. 5. Structure and classification of the peripheral nervous system.
• **To define**	1. The notions of chronic and acute complications and their classification
• **To possess theoretical knowledge about**	1. The pathogenic mechanisms of chronic micro and macrovascular complications 2. Clinical manifestations of chronic complications 3. Contemporary screening and diagnostic methods 4. Principles of treatment of chronic complications

Objectives	Content units
	5. Causes and pathogenic mechanisms of acute complications 6. Clinical picture manifestations of acute hyperglycemic conditions and hypoglycaemia 7. The investigation algorithm and emergency therapeutic behavior in critical conditions in diabetes
• **Apply practical and theoretical skills**	1. Examining the diabetic patient with chronic complications 2. In examining the diabetic foot - vascular component (peripheral pulse appreciation) and neurological component (appreciation of different types of sensitivity) 3. Interpretation of various laboratory and instrumental investigations to correctly confirm the status of various chronic complications 4. In differentiating the various urgent conditions of diabetes 5. In providing emergency help to the diabetic patient 6. Develop a treatment plan for the patients concerned
• **Integrate knowledge**	1. In terms of differential diagnosis with other pathologies in other disciplines like nephrology, ophthalmology, surgery, cardiology, neurology.
Theme (chapter) 8. Treatment of diabetes mellitus Type 1: criteria of good control. Principles of diet in type 1 diabetes. Physical exercise in type 1 diabetes. Drug treatment of type 1 diabetes (therapeutic means, indications, side effects). Modern medical devices used in type 1 diabetes. Insulin preparations: classification, action curve, indications.	
• **To have thorough knowledge of previous objects** *(anatomy, physiology, histology, pathophysiology)*	1. Healthy eating. 2. Insulin preparations: classification, action curve.
• **Define it**	1. The notion of bread unit
• **Have theoretical knowledge about**	1. Criteria of good control of diabetes mellitus type 1. 2. Diet particularities in type 1 diabetes mellitus. 3. Physical exercise in type 1 diabetes. 4. Insulin preparations - action curve, indications, contraindications and treatment regimen 5. Modern medical devices used in type 1 diabetes.

Objectives	Content units
• **Apply practical and theoretical skills**	1. In assessing individual target values for diabetes type 1 patients 2. In calculating the caloric requirement of the diabetic patient and calculating the bread units 3. In administering insulins and selecting the optimal treatment regimen
Theme (chapter) 9. Treatment of type 2 diabetes: treatment principles, objectives. Principles of diet therapy in DM 2. Physical exercise in DM 2. Oral antidiabetic remedies: mechanism of action.	
• **To have thorough knowledge of previous objects** *(anatomy, physiology, histology, pathophysiology)*	1. Classification of oral hypoglycaemic drugs 2. Mechanism of action of oral hypoglycemic drugs
• **To define**	1. The notion of caloric need.
• **To possess theoretical knowledge about**	1. Targets for the treatment of type 2 diabetes. 2. Principles of healthy living. 3. Diet particularities in type 2 diabetes. 4. Non-insulin antidiabetic drugs - groups of drugs, mechanism of action, side effects and precautions
• **Apply practical and theoretical skills**	1. Selection of the treatment regimen for patients with type 2 diabetes mellitus with non-insulin remedies.
Theme (chapter) 10. The adrenal - structure, hormones - actions, regulation, therapeutic utility. Adrenal medulla: catecholamine actions. Exploring the adrenal gland. Cushing's Disease and Syndrome: etiopathogenesis, clinical manifestations, exploration, treatment. Primary hyperaldosteronism: etiopathogenesis, exploration algorithm, therapy. Chronic adrenal insufficiency: etiopathogenesis, clinical manifestations, diagnosis and therapy. Adissonian crisis: etiology, clinical manifestations, exploration plan, treatment. Congenital adrenal hyperplasia: etiopathogenic forms, clinical manifestations, exploration, treatment. Pheochromocytoma: clinical manifestations, biological and imaging assessment, treatment.	
• **Have thorough knowledge of the previous objects** *(anatomy, physiology, histology, pathophysiology etc.)*	1. Structure of the adrenal glands. 2. Adrenal cortex hormones - synthesis, regulation mechanism, biological effects 3. Adrenal medulla - catecholamine actions
• **To define**	1. The notions of Syndrome and Cushing's Disease 2. The notion of Addison's disease and congenital hyperplasia of adrenals 3. The notion of primary hyperaldosteronism and pheochromocytoma

Objectives	Content units
• **To possess theoretical knowledge about**	1. Etiology, pathogenesis and clinical manifestations of adrenal glandpathologies . 2. Contemporary methods of diagnosis and treatment of adrenal glanddisorders
• **Apply practical and theoretical skills**	1. In the clinical examination of patients with pathologies of adrenals 2. Performing functional tests (test with Dexamethasone, Synacthen, etc.) and interpretation of their results 3. Interpretation of results of hormonal measurements and imaging investigations in adrenal pathology. 4. Develop a treatment plan for the patients concerned
• **Integrate knowledge**	1. In terms of differential diagnosis with other pathologies in other disciplines such as psychiatry, gastrology, cardiology, neurology.
Theme (chapter) 11. Gonads - structure. Sex hormones: structure, regulatory action, therapeutic utility. Female hypogonadism - etiopathogenesis, classification, methods of investigation and treatment. Male hypogonadism - etiopathogenesis, classification, methods of investigation and treatment. Hermaphroditism.	
• **Have thorough knowledge of the previous objects** (*anatomy, physiology, histology, pathophysiology etc.)*	1. Structure of female and male sexual glands 2. Sex hormones - their secretion and biological effects 3. Principles of regulating sex hormone secretion
• **To define**	1. The notions of hypogonadism and its classification 2. The notion of gonadal dysgenesis 3. The notion of polycystic ovary syndrome 4. The notion of menopause and andropause
• **To possess theoretical knowledge about**	1. Etiology, pathogenesis and clinical manifestations of gonads diseases in males and females. 2. Contemporary methods of diagnosis and treatment
• **Apply practical and theoretical skills**	1. In the clinical examination of patients with male and female gonadal pathology 2. Interpretation of hormonal dosing results and imaging investigations in hypogonadism, gonadal dysgenesis, PCOS, menopause

Objectives	Content units
	3. Develop a treatment plan for the patients concerned
• **Integrate knowledge**	1. In the aspect of differential diagnosis with other pathologies in other disciplines such as gynecology, urology, genetics.
Theme (chapter) 12. Obesity. Classification, etiology, pathogenesis, clinical picture, complications, treatment: non-pharmacological, drugs, bariatric surgery.	
• **To have thorough knowledge of previous objects** *(anatomy, physiology, histology, pathophysiology)*	1. Calculating of diet ratio in a healthy person 2. Calculating the energy needs of a healthy person.
• **To define**	1. The notion of obesity. 2. The notion of metabolic syndrome.
• **To possess theoretical knowledge about**	1. Etiology and pathogenesis of obesity. 2. Healthy lifestyle. 3. Contemporary methods of diagnosis and treatment. 4. Indications for metabolic surgery.
• **Apply practical and theoretical skills**	1. In the clinical examination of obese patients. 2. Interpretation of the results of hormonal dosing and imaging investigations in obesity. 3. Develop a treatment plan of patients concerned. 4. Calculation of body mass index 5. Calculating the dietary needs in obesity. 6. Calculating the energy needs of the obese person.
• **To integrate knowledge**	1. In the aspect of cooperation with other specialists or disciplines - surgery.

VIII. PROFESSIONAL (SPECIFIC (SC)) AND TRANSVERSAL (TC) COMPETENCES AND STUDY FINALITIES

✓ **Professional (specific) (SC) competences**

✓ **PC1. The responsible execution of professional tasks with the application of the values and norms of professional ethics, as well as the provisions of the legislation in force.** Applies the legal and normative framework in practical activity. Respects the norms of ethics and deontology. It ensures compliance with ethical and deontological norms and is guided by the provisions of the code of medical ethics. Promotes collegial relationships with co-workers. Carries out free and independent activities according to the oath of the medical profession. Knows and respects the rights and technical rules regarding the sanitary-hygienic and anti-epidemic regime in various socio-medical situations according to the legislation in force. Knows and respects the provisions of the collective labor agreement, the

protection rules and the safety and health technique at the workplace. It ensures the compliance and correctness of the fulfillment of service obligations in the provision of care to the population in public, private and community medical and sanitary institutions. Incourages informed ethical decision making and respects the patient's decision. Responsible execution of professional tasks with the application of the values and norms of professional ethics, as well as the provisions of the legislation in force.

- ✓ **PC 2. Adequate knowledge of the sciences about the structure of the body, the physiological functions and the behavior of the human body in various**
- ✓ **physiological and pathological states, as well as the existing relationships between the state of health, the physical and the social environment.** Knows the structures, physiological functions of organs and organ systems in healthy subjects. Recognizes the physiological and pathological processes of the human being and the psychosocial responses of individuals in various states of health. Knows the relevant terminology for the important signs and symptoms that are derived from various pathophysiological conditions. Identifies pathophysiological processes and their expression, as well as risk factors that determine health and disease at different stages of the life cycle. Appreciates the relationship between the state of health, the physical and social environment of the human being. Knows the possible evolution and complications leading to the main pathological processes. Adequate knowledge of the sciences about the structure of the body, physiological functions and behavior of the human body in various physiological and pathological conditions, as well as the relationships between health, physical and social environment.
- ✓ **PC 3. Solving clinical situations by developing the diagnosis, treatment and rehabilitation plan in various pathological situations and selecting the appropriate therapeutic procedures for them, including the provision of emergency medical assistance.** Assesses patients' health status through rigorous history and clinical examination. Applies critical and systematic thinking skills to solve problems and make prompt decisions in various situations. Evaluates and identifies problems in advance, facilitating finding the best solution for situations created by risk, achieving objectives, improving results and ensuring the quality of the work carried out. Performs various practical maneuvers during the clinical examination, necessary to establish the diagnosis. Establishes the diagnosis of the most common conditions. Discusses options, advantages, disadvantages and risks of treatments with patients and is able to help patients make decisions about their treatment. Prescribes, reviews and monitors appropriate therapeutic interventions relevant to clinical practice, including therapeutic and prophylactic indications. Responds promptly, independently, in various situations to save life and improve quality of life. Applies first aid techniques in emergency situations. Performs resuscitation and first aid manipulations. Resolving clinical situations by developing a plan for diagnosis, treatment and rehabilitation in various pathological situations and selecting appropriate therapeutic procedures for them, including providing emergency medical care.
- ✓ **PC 4. Promoting a healthy lifestyle, applying preventive measures and self-care.** Applies Health promotion and prevention measures. Identifies opportunities for health maintenance and disease prevention. Identifies opportunities to promote lifestyle changes and other actions that will positively improve health

status. Performs health education actions in accordance with medical practice guidelines and protocols. He maintains his own health and is aware of his responsibility as a physician to promote a healthy, evidence-based approach to life. Talks with patients about factors that could influence their health. Participates and supports individuals or the community in Health promotion activities, screening programs and provides information about its risks and benefits. Performs prophylaxis activities at the individual level according to the provisions of the clinical protocols. Promotes and applies measures to promote own health and stress management at work. Systematically performs the medical examination to maintain your own health. Promoting a healthy lifestyle, applying prevention and self-care measures

- ✓ **PC 5. Interdisciplinary integration of the doctor's work in the team with the efficient use of all resources.** Communicates, interacts and works effectively collectively and with inter-professionalstaff, individuals, families and groups of people. Interacts effectively with other professionals involved in patient care, demonstrating respect for colleagues and other healthcare professionals. Develops positive collaborative relationships with team members involved in patient care as well as the ability to adapt to change. Provides appropriate and timely support for service users in navigating the health system, including services, access to care and available resources. Uses language skills, information technologies and communication skills efficiently. Interdisciplinary integration of the doctor's activity in a team with efficient use of all resources
- ✓ **PC 6. Conducting scientific research in the field of health and other branches of science.** Plans, organizes and executes scientific research in the field. Identifies sources of information, selects research materials and methods, performs experiments, statistical processing of research results, formulation of conclusions and proposals. Develops and supports speeches, presentations at scientific events by demonstrating personal attitude, coherence in exposition and scientific correctness; participates in discussions and debates at scientific events/ Carrying out scientific research in the field of health and other branches of science.

Transversal competences (TC)

- ✓ **TC1. Autonomy and responsibility in activity.** The application of rigorous and efficient work rules, the manifestation of a responsible attitude towards the performance of professional tasks with the application of the values and norms of professional ethics, as well as the provisions of the legislation in force. Promoting logical reasoning, practical applicability, evaluation and self-evaluation in decision-making.

✓ **Study finalities**

Upon completion of the course the student will be able to:

- to know the fundamental particularities of endocrine diseases and their bases in internal medicine;
- understand the principles of clinical and laboratory examination in patients with endocrine disorders ;
- to know the particularities of the diagnostic algorithm and the argumentation of an etiological treatment, pathogenetic, symptomatic treatment;
- to be able to perfect the clinical thinking to analyze and systematize the results of the clinical and paraclinical examination;

- to be able to evaluate the results of the endocrine patient's clinical examination , the argumentation of the presumptive diagnosis, the preparation and argumentation of the paraclinical investigation program, the differential diagnosis;
- be competent to use the knowledge and methodology of endocrine diseases in the ability to explain the nature of physiological or pathological processes;
- to be able to implement the knowledge gained in the research activity;
- to be competent to use critically and with confidence the scientific information obtained using the new information and communication technologies;
- to be competent to apply practical knowledge and skills to interpret the impact of various factors by deprophylaxis of endocrine pathologies (pathologies induced by iodine deficiency, type 2 diabetes, obesity, chronic complications of diabetes) ;
- to be able to use the knowledge gained in the process of study and integration with other disciplines by strengthening, enriching and implementing in clinical practice.

Note. Discipline finatities (are deduced from the professional competences and the formative valences of the informational content of the discipline).

IX. STUDENT'S SELF-TRAINING

No.	Expected product	Implementation strategies	Assessment criteria	Implementation terms
1.	Clinical observation file	Comprehensive examination of the patient and establishment of preventive diagnosis. Developing an investigation and treatment plan.	The ability to formulate the conclusions, the correctness of completing the observation and indication sheet	By the end of the module
2.	Presentation of clinical cases of rare diseases	Comprehensive examination of the patient and establishment of preventive diagnosis. Developing an investigation and treatment plan. Study of specialized literature regarding the clinical case	The ability to formulate the conclusions, the correctnessof the investigation plan and its argumentation. Degree of interest and elucidation of clinical case and literature data.	By the end of the module
3.	Preparing presentations, posters with various themes	Selection of the research theme, establishment of the plan and the deadline	The degree of dwelling into the essence of the subject, the way of argumentation and presentation with elements of creativity. Consistency of exposure and presentation	End of the module
4.	Preparing posters with materials used to	Selection of the theme, poster presentation	The elements of creativity, the simplicity of material exposure, the degree of information and receptivity of patients	End of the module

	train patients			

X. METHODOLOGICAL SUGGESTIONS FOR TEACHING-LEARNING-ASSESSMENT

XI. Teaching and learning methods used

The discipline of Endocrinology is a compulsory discipline and teaches according to the classical university standard: lectures, seminars and practical works and individual work. The theoretical course at lectures is held by the course holders.

The teaching of the Endocrinology discipline uses different methods and didactic methods, oriented towards the efficient acquisition and achievement of didactic objectives, such as: lecture, practical lesson, explanation, debate, problem, simulation of clinical situations, group and individual working methods, study bibliography.

Practical lessons are spent using widely diverse clinical and illustrative materials.

Depending on the time dynamics of the educational process, different types of courses are applied, such as: introductory, basic, problematic, applications, realizing the instructive (informative) - educative (formative) objective, which is based on such characteristics such as: mobility, diversification, specialization.

Practical lessons are expected to be held:

- at the bed of the patients, with the examination and discussion of the thematic patients, with the interpretation of the laboratory and paraclinical investigations, the estimation of the treatment schedule
- beneficiary involvement in presenting representative clinical cases with various endocrine diseases
- to spend practical lessons in an interactive way by addressing the didactic strategy focused on active and inertial learning: Beneficiary-centered, multidirectional communication, skills training skills, with the predominance of the formative component.

Practical lesson algorithm Endocrinology : duration - 4 academic hours (180 min) includes: discussion of the topic with the use of didactic and illustrative materials on computer (hormonal investigations and results of functional tests, radiological images or MRI), at the patient's bed with real clinical cases and based on the typical situational problems using results of laboratory and instrumental investigations ; answers to thematic questions by the teacher; independent work with patients assigned for curation; reporting the curated patients by the student ; evaluation of the practical skill acquisition regarding the topic, conclusions - 10 min.

XII. Applied (specific to the discipline) teaching strategies / technologies

Exposing, interactive lecture, problem-solving, brainstorming, group work, individual study, work with manual and scientific text, debate, clinical case solving, interactive listening.

- Try to understand the main key notions explained by the teacher, but do not focus on assessment methods, learn not to pass totals and to be admitted to the session, but to gain knowledge that you will then use in other disciplines.
- The course is designed to meet the students needs for training and professional development, so ask the teacher, so that each information is proved through examples, applications, theoretical and practical problems, this will provide an active way of

learning. Develop metacognition - an inner dialogue with yourself, it will help you build learning skills that will allow you to control your training.

- Use different nonverbal resources such as schemes, documents, experiences, devices, they support the formation of professional skills, create work tasks, the solution of which will have real consequences.
- Use different methods of engaging in active reading and resources, which encourages critical thinking to solve situations, and increase the student's systematization capacity.
- "Try to be a teacher", explain to colleague / colleagues the key moments of the subject studied, give own examples, explain the difficult moments, listen to their opinions. The ability to explain to colleagues the material will increase your ability to think and express yourself.

XIII. **Methods of assessment** (including the method of final mark calculation)

Current: : frontal and / or individual control via

- (a) testing of four basic chapters (hypothalamic-pituitary pathology, thyroid and parathyroid disorders, diabetes mellitus and obesity, and adrenal pathologies and gonads);
- (b) presentation of clinical case studies or posters in powerpoint fomat;
- (c) presentation of the curated patient's hospital sheet.

Final: Students who did not pass all 4 totalization works and the "individual work" section , as well as students who did not recover the absences from the practical lessons are not admitted to the exam for the Endocrinology discipline .

The Endocrinology Exam (Summarized Assessment) is a combined test-grid test ("Test Editor" version of the USMF "Nicolae Testemitanu") and the verbal test and the assessment of practical skills. The test-grid test consists of variants of 100 tests each in all subjects of the Endocrinology course, of which 40 tests are single answer, 60 multiple choice tests. The student has a total of 100 minutes to answer the test. The test is scored with grades from 0 to 10. For the oral exam the student has 30 minutes to prepare for the answer. The test is scored with grades from 0 to 10. The subjects of the practical skills are approved at the chair meeting and are brought to the attention of the students at least one month until the session.

The final grade will compile the average mark of 1) the average score (as a result of 4 totalization works + mark for "individual work") (0.3 share), 2) mark for practical skills (patioent observation sheet + practical skills assesment) (0.2 share), 3) test (0.2 share) and 4) oral examination exam (0.3 share).

Failure to attend the examination without good reason is recorded as "absent" and is equivalent to 0 (zero). The student is entitled to 2 repeated claims of the unsuccessful exam.

Assessment of knowledge is appreciated with grades from 10 to 1 without decimals, as follows:

- 10 or "excellent" (ECTS - A equivalent) will be awarded for fitting 91-100% of the material;
- 9 or "very good" (equivalent to ECTS - B) will be awarded for acquiring 81-90% of the material;
- 8 or "good" (equivalent to ECTS - C) will be awarded for acquiring 71-80% of the material;
- 6 and 7 or "satisfactory" (equivalent to ECTS - D) will be awarded for the acquisition of 61-65% and 66-70% of the material;
- 5 or "Poor" (equivalent to ECTS - E) will be awarded for acquiring 51-60 of the material;
- 3 and 4 (equivalent to ECTS - FX) will be awarded for 31-40% and 41-50% respectively;

• 1 and 2 or "unsatisfactory" (equivalent to ECTS - F) will be awarded for the acquisition of 0-30% of the material.

Method of mark rounding at different assessment stages

Intermediate marks scale (annual average, marks from the examination stages)	National Assessment System	ECTS Equivalent
1,00-3,00	**2**	**F**
3,01-4,99	**4**	**FX**
5,00	**5**	**E**
5,01-5,50	**5,5**	
5,51-6,0	**6**	
6,01-6,50	**6,5**	**D**
6,51-7,00	**7**	
7,01-7,50	**7,5**	**C**
7,51-8,00	**8**	
8,01-8,50	**8,5**	**B**
8,51-9,00	**9**	
9,01-9,50	**9,5**	**A**
9,51-10,0	**10**	

The average annual mark and the marks of all stages of final examination (computer assisted, test, oral) - are expressed in numbers according to the mark scale (according to the table), and the final mark obtained is expressed in number with two decimals, which is transferred to student's record-book.

Absence on examination without good reason is recorded as "absent" and is equivalent to 0 (zero). The student has the right to have two re-examinations in the failed exam.

XIV. RECOMMENDED LITERATURE:

A. Compulsory :

1. Endocrinology: course of lectures / Z. Anestiadi, V. Anestiadi. - Chisinau: Sinergie, 2003. 338 p.
2. Harrison's principles of internal medicine /18-th edition

B. Additional

1. Greenspan's basic & clinical endocrinology / International edition
2. Basic Medical Endocrinology, third edition. H. Maurice Goodman.