FACULTY OF 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
Minutes No.___ of _____

Chairman, MD, PhD., professor

Suman Serghei _____

APPROVED
at the Council meeting of the Faculty of Medicine nr. 2
Minutes No.___ of _____

Dean of the Medicine nr. 2 Faculty, MD., PhD, associate professor

Bețiu Mircea _____

APPROVED
at the meeting of the chair Endocrinology
Minutes No. of .09.2021

Head of chair MD, associate professor
Vudu Lorina _____

SYLLABUS

DISCIPLINE **ENDOCRINOLOGY. DIABETOLOGY**

Integrated studies

Type of course: **Compulsory**

Curriculum developed by the team of authors:

Vudu Lorina, dr. of med., associate professor
Rizov Cristina, dr. of med. associate professor
Șeremet Aristia, university assistant
Vudu Stela, university assistant

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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 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 course: 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	**VII / 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	Seminars/ practical hours	Self-training
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.	2	2/2	4
2.	Pituitary insufficiency of the adult: etiopathogenesis, clinical and biological diagnosis, complications, treatment. Clinical and biological diagnosis of growth disorders. Pituitary insufficiency of the child: etiopathogenesis, clinical symptoms, exploration plan, treatment. Diabetes insipidus: etiology, pathophysiology, exploitation algorithm, therapy. Inadequate ADH secretion syndrome.	2	2/2	4
3.	Thyroid hormones: biosynthesis, actions, regulation. Exploration of the hypothalamic-pituitary-thyroid axis. Iodine deficiency diseases: epidemiological criteria, pathophysiology, clinical forms: endemic goiter and endemic cretinism. Thyrotoxicosis: classification, etiopathogenesis, pathophysiology, exploration algorithm. Graves Basedow disease, multinodular toxic goiter, thyrotoxic adenoma: clinical manifestations, diagnosis, treatment.	2	2/2	4
4.	Hypothyroidism: etiopathogenesis, classification, clinical manifestations, treatment. Thyroiditis: classification, etiopathogenesis, clinical manifestations, exploration and therapy. Thyroid cancers: anatomical-clinical forms, diagnosis, evolution. Diseases caused by iodine deficiency: pathophysiology, clinical forms: endemic goiter and endemic cretinism.	2	2/2	4
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.	2	2/2	4
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.	2	2/2	4
7.	Chronic and acute complications of diabetes: classification, pathogenetic mechanisms. Microvascular complications: retinopathy, nephropathy. Macrovascular complications - lower limb, coronary and cerebral vessels angiopathy. Diabetic neuropathy and diabetic foot. Acute complications: hyperglycemic conditions and hypoglycemia in the diabetic patient: etiology, pathogenesis, clinical picture, laboratory diagnosis, treatment principles.	2	2/2	4

8.	Treatment of type 1 diabetes: criteria for controled diabetes. Principles of nutrition 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.	2	2/2	4
9.	Treatment of type 2 diabetes: treatment principles, objectives. Principles of diet therapy in DM 2. Physical exercise in Diabetes mellitus type 2. Oral antidiabetic drugs: mechanism of action.	2	2/2	4
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. Feocromocytoma: clinical manifestations, biological and imaging assessment, treatment.	2	2/2	4
11.	Gonads - structure. Sex hormones: structure, actions, regulation, therapeutic utility. Female hypogonadism - etiopathogenesis, classification, methods of investigation and treatment. Male hypogonadism - etiopathogenesis, classification, methods of investigation and treatment. Hermaphroditism.	2	2/2	4
12.	Obesity. Classification, etiology, pathogenesis, clinical picture, complications, treatment: non-pharmacological, drug, bariatric surgery.	2	2/2	4
Total		24	24/24	48

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)

VII. REFERENCE OBJECTIVES OF 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.	
• **To define**	1. The notions of acromegaly and gigantism. Notions of pituitary tumors, prolactinoma.
• **To know**	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 6. Etiology, pathogenesis and clinical manifestations of acromegaly, gigantism, hyperprrolactinemia.
• **To demonstrate**	1. The role of etiological factors in the development of hypothalamo-pituitary disorders with hyperfunction
• **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, 6etoclopramide 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 exploration, treatment. Diabetes insipidus: etiology, pathophysiology, exploration algorithm, therapy. Inadequate ADH secretion syndrome	
• **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 know**	1. Pituitary gland: structure. 2. Adenohypophyseal hormones in basophilic cells: structure, actions, regulation. 3. Etiology, pathogenesis and clinical manifestations of diabetes insipidus and inadequate ADH secretion syndrome.

Objectives	Content units
	4. Etiology, pathogenesis and clinical manifestations of adult and child adenohypophyseal insufficiency. 5. Exploration of the endocrine axes.
• **To demonstrate**	1. The role of etiological factors in the development of hypothalamo-pituitary disorders with hypofunction
• **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) 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:	

Objectives	Content units
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. 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. 3. Mechanisms and principles of regulating glucose homeostasis in the human body

Objectives	Content units
• **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 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

Objectives	Content units
	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.
• **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

Objectives	Content units
• **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
• **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 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.

Objectives	Content units
	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 OUTCOMES

✓ Professional (specific) (SC) competences

- CP1. Strong knowledge, understanding and operation with theoretical knowledge and basic practical methods of endocrine diseases.
- CP 2. Knowledge, understanding and use of specific medical language;
- CP 3. Sound knowledge and practical application of the knowledge of etiology, pathogenesis, contemporary classification, clinical syndromes in order to ensure therapeutic compliance.
- CP 4. Explaining and interpreting the results of the clinical and paraclinical investigations
- CP 4. Possession of treatment principles and elucidation of causes and conditions that influence the evolution of endocrine diseases .
- CP 5. Solving situational problems and formulating conclusions.
- CP 6. Promoting a healthy lifestyle, applying preventive measures and self-care measures.

✓ Transversal competences (TC)

✓ TC1. Manifesting a responsible attitude towards the scientific and didactic field, to optimally and creatively exploit their own potential in specific situations, observing the principles and norms of professional ethics;
✓ TC2. Ensure effective deployment and effective engagement in team activities.
✓ TC3. Identifying opportunities for continuous training and efficient use of learning resources and techniques for their own development.
✓ TC4. Ability to social interaction, group work with different roles.
✓ TC5. Fitting in interdisciplinary projects, extracurricular activities.
✓ TC6. Developing different learning techniques to learn.

✓ 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.

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 train patients	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

X. METHODOLOGICAL SUGGESTIONS FOR TEACHING-LEARNING-ASSESSMENT

- ***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.

Case study method is a method of direct confrontation of participants with a real, authentic situation, taken as a typical example, representative of a set of problematic situations and events. Through this method, students are trained in finding solutions by presenting them real life situations and problems they may face, familiarizing them with a strategy for addressing them. The method involves presenting a specific "case" to the studied module and specific objectives; students examine the proposed case individually and discuss in groups the ways to solve the case.

The algorithm of the practical lesson / seminar in Endocrinology with 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 clichés or MRI), at the patient's bed on concrete clinical cases and based on typical situation problems with the results of laboratory and instrumental investigations; answers to thematic questions by the teacher; the independent work of students with patients assigned for cleaning; the ratio of patients cleaned by the student; estimating the practical mastery of the topic, conclusions.

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.

- ***Applied 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.

- ***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 format; or
- (c) presentation of the curated patient's hospital sheet.

Final evaluation

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 (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	ECTSEquivalent
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**
8,51-8,00	**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.

XI. 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 by J. Larry Jameson
3. Oxford Textbook of Endocrinology and Diabetes (2 edition) by John A.H. Wass, Paul M. Stewart, Stephanie A. Amiel, and Melanie J. Davies
4. Williams Textbook of Endocrinology by Shlomo Melmed; Ronald Koenig; Clifford Rosen; Richard Auchus; Allison Goldfine

B. Additional

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