INTERNATIONAL HIGHER SCHOOL OF MEDICINE
Department of Introduction to internal medicine & family medicine

SYLLABUS

Endocrine system

2026-2027 academic year
for students of medical faculty
3 course 5 semester groups – according to timetable
4 credits (120 h, including auditoria 70 h, independent work – 50 h)
The final assessment for a course is the exam.

Lecture	
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The Syllabus is considered
at the meeting of the department of Introduction to internal medicine & family medicine
Protocol № 1 dated 27.08. 2026

Head of the department Kamchybekova A.A. 

Course Objective:

Based on comprehensive understanding of mechanisms of the common endocrine system disorders, to learn main symptoms and pathological syndromes, physical examination techniques as well as laboratory and instrumental methods of diagnostics of endocrine system disorders in adults and children.

After study of the discipline the student must have:

Knowledge:

- Causes of pathological abnormalities of the endocrine system, the results of physical, clinical and laboratory, functional and instrumental methods of examining a patient with the most common diseases of the endocrine glands
- Pathophysiological mechanisms of development of symptoms and syndromes in the most common diseases and substantiate pathogenetically justified diagnostic methods in various age groups of patients with the most common diseases of the endocrine system;
- Patterns of functioning of individual organs and systems, mechanisms of development of the main symptoms and syndromes, as well as methods for their identification;
- The essence of methods for clinical, laboratory and functional examination of adults and children with the most common diseases of the endocrine system;
- the essence of normal biochemical processes at the level of organs, systems and the body as a whole, as well as standards for the results of biochemical and clinical studies in diseases of the endocrine system.

Skill:

- Collect necessary information, describe all sections of the "student's" medical history carefully and competently.
- Analyze and synthesize information about identified pathological symptoms and syndromes affecting the endocrine glands and prescribe an adequate examination for the purpose of reliable diagnosis of diseases;
- Identify the main symptoms using physical examination methods and group them into syndromes based on knowledge of the anatomical and physiological characteristics and patterns of functioning of the endocrine system;
- Analyze the results of clinical, laboratory and functional examination of the body of adults and children in order to diagnose major diseases of the endocrine system;
- Recognize and interpret the results of biochemical and clinical studies, identifies logical relationships between changes in biochemical parameters and the clinical state of the body

Attitude:

- Demonstrate practical skills in collecting patient complaints, his medical history, conducting a physical examination in accordance with the medical history chart at the patient's bedside;
- Skills in the practical use of methods aimed at identifying the main pathological symptoms and syndromes for the purpose of reliable diagnosis of diseases of the endocrine system;
- Skills in physical examination of patients with diseases of the endocrine system, aimed at identifying the main pathological symptoms and syndromes for the purpose of their reliable diagnosis;
- Skills in conducting basic clinical, laboratory and functional examinations of adults and children with diseases of the endocrine system.
- Skills in making a preliminary diagnosis based on the results of biochemical and clinical studies for endocrine pathology.

- **Pre-requisites.**
  - Normal anatomy of endocrine system
  - Normal physiology of endocrine glands
  - Biochemistry of hormones
  - Basic pharmacology
  - Introduction to internal medicine (3 semester)

- **Post-requisites.**
  - Internal medicine (endocrinology)
  - Polyclinic therapy
  - Family medicine
  - Pediatrics

THEMATIC PLAN OF LECTURES

№	Name	Topic	Hours	Subject/ department	Date

1.	**Unit 1.** Disorders of the pituitary, thyroid and parathyroid glands	L1: Topographic anatomy and hormones of the pituitary, thyroid and parathyroid glands.	2	Anatomy	According to the timetable
		L2: Pathophysiology of endocrine disorders. Disorders of hypothalamo-hypophysal regulation of endocrine glands.	2	Pathology	According to the timetable
		L3: Clinical approaches to the diagnosis of short stature in children.	2	Pediatrics	According to the timetable
		L4: Clinical approaches to the diagnosis of thyroid diseases in children.	2	Pediatrics	According to the timetable
		L5: Hyperthyroidism and hypothyroidism syndrome	2	Proped therapy	According to the timetable
		L6: Radiation diagnostics of the endocrine system.	2	Radiology	According to the timetable
2.	**Unit 2.** Disorders of carbohydrate metabolism	L7: Topographic anatomy and hormones of the pancreas	2	Anatomy	According to the timetable
		L8: Hyperglycemia and hypoglycemia syndrome	2	Proped therapy	According to the timetable
3.	**Unit 3.** Adrenal glands and gonads disorders	L9: Syndrome of hyper- and hypocortisolism.	2	Proped therapy	According to the timetable
		L10: Puberty. Clinical Approaches to Pubertal Disorders.	2	Pediatrics	According to the timetable
	Total		**20**		

THEMATIC PLAN OF PRACTICAL CLASSES

№	Name of unit	Topic of practice classes	Hours	Subject/ department	Date
1.	**Unit 1.** Disorders of the pituitary, thyroid and parathyroid glands	PC 1: Topographic anatomy and hormones of the pituitary, thyroid and parathyroid glands.	2	Anatomy	According to the timetable
		PC 2: Pathophysiology of pituitary gland. Common etiology and pathogenesis of hypo- and hyperfunction of thyroid gland.	2	Pathology	According to the timetable
		PC 3: Clinical presentation and diagnosis of growth disorders in children.	4	Pediatrics	According to the timetable
		PC 4: Clinical presentation and diagnosis of pituitary and thyroid gland disorders in children.	4	Pediatrics	According to the timetable
		PC 5: Hyperthyroidism and hypothyroidism syndrome	2	Proped therapy	According to the timetable
		PC 6: Syndrome of hyperparathyroidism and hypoparathyroidism	2	Proped therapy	According to the timetable
		PC 7: Radiation diagnostics of the endocrine system: pituitary, thyroid and parathyroid glands	2	Radiology	According to the timetable
		PC 8: Unit 1 submission	4	Proped therapy	According to the timetable

		Total Unit 1	**22**		
2.	**Unit 2.** Disorders of carbohydrate metabolism	PC 9: Topographic anatomy and hormones of the pancreas	2	Anatomy	According to the timetable
		PC 10: Hyperglycemia and hypoglycemia syndrome	2	Proped therapy	According to the timetable
		PC 11: Acute hyperglycemia and hypoglycemia syndrome	2	Proped therapy	According to the timetable
		PC 12: Metabolic syndrome	2	Proped therapy	According to the timetable
		PC 13: Unit 2 submission.	4	Proped therapy	According to the timetable
		Total Unit 2	**8**		
3.	**Unit 3.** Adrenal glands and gonads disorders	PC 14: Topographic anatomy and hormones of adrenal glands	2	Anatomy	According to the timetable
		PC 15: Common etiology and pathogenesis of hypo- and hyperfunction of adrenal gland.	2	Pathology	According to the timetable
		PC 16: Syndrome of hyper- and hypocortisolism	2	Proped therapy	According to the timetable
		PC 17: Clinical manifestations and diagnosis of sexual development disorders in children and adolescents	4	Pediatrics	According to the timetable
		PC 18: Radiation diagnostics of thymus, adrenal glands and pancreas	2	Radiology	
		PC 19: Unit 3 submission.	4	Proped therapy	According to the timetable
		Total Unit 3	**16**		
	Total		**42**		

THEMATIC PLAN OF INDEPENDENT WORK OF STUDENTS

№	Unit	Name of task	Hours	Discipline
1.	Disorders of the pituitary gland, thyroid and parathyroid glands.	• To make a table of goiter classification , WHO • To make a table of normal values functional parameters of thyroid gland • To make a table of hypothyroidism syndrome . To make a table of thyrotoxicosis	16	Propedtherapy
2.	Disturbance of carbohydrate metabolism.	• To make a table on glucose values for glucose metabolism disorders • To make a table for hypoglycemia syndrome. • To make a table of hyperglycemia syndrome . • Pancreas hormones, secretion,function in cheme.	18	Propedtherapy

		Fill the BMI table		
3.	Adrenal glands and gonads disorders .	• To make a table of adrenal hormones, secretion, function in scheme • To make a table of the syndrome of hyperfunction of adrenal gland table To make a table of hypocorticism syndrome table	16	Propedtherapy
	Total		**50**	

Recommended reading for the discipline:

Basic:

Topographic anatomy:

1. B.D.Chaurasia. Human Anatomy Vol. 1, 48th edition, 2020.
2. NETTER'S CLINICAL ANATOMY, FOURTH EDITION, Carlos A.G. Machado, MD John A. Craig, MD, 2019.
3. Ross & Wilson Anatomy and Physiology in Health and Illness, 13th Edition 2018.

Pathophysiology:

1. Robbins "Basic Pathology" 10th edition, 2018.
2. Harsh Mohan «Textbook of Pathology» 8th edition, 2019.
3. Kumar Abbas «Essential Pathology» 2021.

Propedtherapy:

1. Bickley L.S. Szilagyi P.G. Bates` quide to physical examination and history taking, 8th ed., 2017.
2. Harrison's principles of Internal Medicine, 2023.
3. Ralston S.H. Davidson's Principles and Practice of Medicine, 23th ed., 2018.
4. Anthony W. Alfrey. Goljan rapid review pathology, 2023.

Pediatrics:

1. O.P. Ghai. Essential Pediatrics- 8th Edition 2015.
2. Nelson. Essentials of Pediatrics / Richard E. Berhman, Robert M. Kliegman – 20th ed.2015.

Radiology:

1. Mayur Arun Kulkarni, Saurabh S Patil, Amit M Shetty. Conceptual Review of Radiology. Nothing beyond for PGMEE, 2018.
2. E. Scott Pretorius, Jeffrey A. Solomon. Radiology Secrets Plus (3d edition), 2011.

Additional:

1. Frank H. Netter. MD- Atlas of human anatomy, 2019.
2. Jerry L. Prince, Jonathan M. Links. Medical Imaging Signals and Systems. 2nd edition, 2015.
3. John Barone MD, Manuel A. Castro, MD, AAHIVS «Preclinical Pathology review» 2023.

Grading policy and procedures for all types of work:

For the period of studying the discipline, the student gains points for the relevant parameters (per unit):

- current score - 20 points
- independent work - 20 points
- unit / module - 20 points
- the overall score - 60 (20+20+20)

For violations of t**he conduct policy**, the overall discipline score will be reduced by a maximum of 10 points.
For violations of **the academic ethics policy**, the overall score in the discipline is reduced by a maximum of 10 points.

Grading system for student's achievements

Grading criteria per discipline

Maximum score	Intervals			
	«unsatisfactory»	«satisfactory»	«good»	«excellent»
Current control - 40	0-23	24-30	31-35	36-40
Interval description	The student refuses to answer or when trying to answer demonstrates a complete lack of knowledge of the material. No clinical task has been solved, no practical task has been completed.	The student knows the educational material partially. Incorrectly performs or disrupts the sequence of clinical examination of the patient. Can apply his knowledge only in a typical familiar situation, and experiences difficulty when changing the question. There are also difficulties in using special skills. Can only solve typical clinical problems and has poor communication skills.	The student knows program material fluently in a familiar situation and makes two or three mistakes when answering. The student confidently answers additional questions. Able to apply knowledge and relevant clinical skills to a range of routine tasks. There are minor errors in the preparation of the medical history or situational task. Good confidence in communication skills and ability to conduct effective dialogue.	The student is fluent in educational material of varying complexity and uses information from other disciplines. The student demonstrates the ability to think and perform practical work independently. All tasks of the practical part were completed at a high level, clinical thinking and a non-standard approach to problem solving were demonstrated. He is fluent in communication skills.
Independent work - 20	0-11	12-14	15-17	18-20
	As above	As above	As above	As above
	The following are additionally considered – logic of reasoning; – original approach to the solution.			
Interval description	student does not possess the listed skills.	Student demonstrates knowledge and understanding of most of the assignment. The student knows the categorical apparatus, can give calculation formulas, and calculate the task.	Student completes the task with minor errors. The student masters the categorical apparatus, can classify the factors of a phenomenon, solve the problem and analyze the results obtained.	Student completed the task completely. The student knows the categorical apparatus, can classify the factors of a phenomenon, solve the problem and analyze the results obtained, explain the reasons for deviations from the desired result, defend his point of view, citing facts.
Control work (module) - 40	0-23	24-30	31-35	36-40
Interval description	Number of correct answers to MCQs –49% or less	Number of correct answers to MCQs –50-75 %	Number of correct answers to MCQs – 76-89%	Number of correct answers to MCQs – 90% and above

Exam 40 points.
The exam is carried out in 2 stages:
Stage 1 - clinical skills exam – 40

Stage 2 - theoretical knowledge exam – 60

Grand total score for the discipline (average score for units 100 + exam score 100):2 = 100 points
Grand total score for the discipline is signed into the record book.

Conduct Policy: (lateness, absence, behavior in the auditorium, late submission of work).

- Punctuality and completion of tasks.
- Mandatory attendance of classes.
- Attending class in a clean medical uniform.
- Eliminating conversations on a cell phone in the classroom.
- Active participation in the learning process.
- Doing homework on time.
- Academic detention at the time specified by the teacher.

For violations of the Conduct Policy, the total points for discipline might be reduced to 1-10 points.

Academic Ethics Policy.

- Be tolerant, respect the opinions of others.
- Formulate objections in the correct form.
- Constructively support feedback in all classes.
- Plagiarism and other forms of dishonest work are unacceptable. Plagiarism includes the following: the absence of references when using printed and electronic materials, quotes, thoughts and works of other authors or students.
- Prompting and cheating during tests, exams, classes is unacceptable as well as passing an exam for another student, unauthorized copying of materials.

For violations of the Academic Ethics Policy, the total points for the discipline may be reduced to 1-10 points.

Guidelines for lessons of the discipline:

Unit I.

Key questions covered in lesson 1: Topography of the endocrine system. Topographic anatomy and hormones of the pituitary, thyroid and parathyroid glands.

1. The structure of endocrine system.
2. Classification of endocrine glands.
3. Characteristic for the organs of the endocrine system.
4. The thyroid gland, structure, functions, topography.
5. Blood supply of thyroid gland and parathyroid glands.
6. The parathyroid gland, structure, functions, hormones.

Recommended reading for this discipline:

[1] Davi Ellen Chabner- The language of medicine. M. 2017.828-880 p.
[2] B.D.Chaurasia . Human Anatomy. Volume 1. New Delhi. 2009.V-2. 225-248 p., V-1. 229-240 p.
[3] Lecture materials.

Unit I. Key questions covered in lesson 2: Pathophysiology of pituitary gland. Common etiology and pathogenesis of hypo- and hyperfunction of thyroid gland.

1. Etiology and pathogenesis of hypo- and hyperfunction of pituitary gland.
2. Syndrome of hypofunction and hyperfunction of endocrine glands.Types: primary, secondary, tertiary.
3. Etiology and pathogenesis of development pituitary nanism, gigantism, acromegaly.
4. Pathophysiological characteristic of partial and total hypophysal failure in children and adults.
5. Etiology and pathogenesis of hypofunction of thyroid gland. Typical disorders in myxedema and cretinism.
6. Etiology and pathogenesis of thyroid gland hyperfunction. Grave's disease.
7. Etiology and pathogenesis of endemic goiter. Role of iodine deficiency in thyroid gland pathology.

Recommended reading for this discipline:

[1] Kumar V., Abbas A.K., Aster J.A. Robbins and Cotran Pathologic Basis of Disease. 2015.
[2] **Copstead Banasick. Pathophysiology.2013**
[3] Calor Mattson Porth. Essentials of pathophysiology.2019

Unit 1. Key questions covered in lesson 3: Assessment of children's growth and development. Endocrine growth disorder in children.

1. Definition of Acromegaly, Gigantism, Dwarfism?
2. What is the primary function of Growth Hormone (GH) in the human body?
3. What are the key factors and measurements involved in assessing a child's growth and development?

4. What are the typical signs and symptoms of an endocrine growth disorder in children?
5. What is the most common cause of short stature in children, and how is it diagnosed?
6. Explain the term "precocious puberty" and its impact on a child's growth.

Recommended reading for this discipline:
[1] O.P. Ghai. Essential Pediatrics- 8th Edition 2015.
[2] Nelson. Essentials of Pediatrics / Richard E. Berhman, Robert M. Kliegman – 20th ed.2015

Key questions covered in lesson 4: Syndrome of hyperthyroidism and hypothyroidism in children.

1. What is hyperthyroidism, and how does it differ from hypothyroidism?
2. What are the common causes of hyperthyroidism in children, and how do they differ from those in adults?
3. What are the clinical manifestations and symptoms of hyperthyroidism in children?
4. What is the significance of measuring thyroid function tests, including TSH, free T4, and free T3, in diagnosing hyperthyroidism in children?
5. What are the clinical signs and symptoms of hypothyroidism in pediatric patients?
6. How is hypothyroidism diagnosed in children, and what are the key laboratory tests used?

Recommended reading for this discipline:
[1] O.P. Ghai. Essential Pediatrics- 8th Edition 2015.
[2] Nelson. Essentials of Pediatrics / Richard E. Berhman, Robert M. Kliegman – 20th ed.2015

Unit 1. Key questions covered in lesson 5: Hyperthyroidism and hypothyroidism syndrome.

1. Common features of hyperthyroidism, classification
2. Grave's disease: clinical features, physical examination, laboratory and instrumental diagnostics.
3. Common features of hypothyroidism, classification, physical examination, laboratory and instrumental diagnostics
4. Goiter: types, physical examination, diagnostics

Recommended reading for this discipline:
[1] Braunwald E. Harrison's principles of Internal Medicine.Vol.2, 2005.
[2] Ralston S.H. Davidson's Principles and Practice of Medicine, 23th ed., 2018

Unit 1. Key questions covered in lesson 6: Syndrome of hyperparathyroidism and hypoparathyroidism.

1. Hyperparathyroidism: causes, classification, clinical features, physical examination, laboratory and instrumental diagnostics.
2. Hypoparathyroidism: causes, classification, clinical features, physical examination, laboratory and instrumental diagnostics.

Recommended reading for this discipline:
[1] Braunwald E. Harrison's principles of Internal Medicine.Vol.2, 2005.
[2] Ralston S.H. Davidson's Principles and Practice of Medicine, 23th ed., 2018

Unit 1. Key questions covered in lesson 7: Radiation diagnostics of the pituitary, thyroid and parathyroid glands

1. Normal lateral craniogram and its significance in assessing the condition of the pituitary gland.
2. Pituitary adenomas, pituitary pathology syndromes.
3. Pathology of the pituitary gland: Acromegaly. Prolactinoma. Cushing's syndrome. Apoplexy of the pituitary gland.
4. Normal ultrasound anatomy of the thyroid gland. Comparison of morphological, functional and visual components in an ultrasound image.
5. Ultrasound-Topographic relationship of displayed structures. Markers for gland detection on transverse and longitudinal sonograms. The muscles surrounding the thyroid gland in transverse and longitudinal ultrasound sections. Iodine metabolism: inside and outside the organ. Thyroid hormones and their biological effects.
6. Gamma scintigraphy of the thyroid gland. Preparing the patient for the study. Scintigraphic norm in dynamics. Possibilities and limitations of scintigraphic technology.
7. Radiological syndromes of thyroid disease:
   A. Radiological syndrome of hyperfunction of the thyroid gland. Nodular and diffuse form.
   B. Radiological syndrome of hypothyroidism. Hypothyroidism primary, secondary, tertiary and iodine deficiency.
   C. Radiological syndrome of benign thyroid tumor.
   D. Radiological syndrome of malignant tumor of the thyroid gland

8. Thyroid cancer Fine-needle aspiration biopsy in differentiating the malignancy of the pathological process

Recommended reading for this discipline:
[1] Atlas of thyroid ultrasonography. Springer 2017. Editors Milan Halenks & Zdenek Frysak
[2] Clinical Sonography. A practical guide 5th edition © 2016 Wolter Kluwer Roger Sanders. Barbara Hall Terracciano: Chapter 31
[3] Review of Radiology 7th Edition 2016. Sumer K. Sethi peepee Publishers & distributors (P)LTD

Unit 1. Key questions covered in lesson 8: Unit 1 control.
1. The main clinical symptoms and signs of the pituitary hypofunction as well as GH deficiency in children.
2. Hyperthyroidism: classification, causes, pathogenesis, clinical features, physical examination, diagnostics.
3. Hypothyroidism: classification, causes, pathogenesis, clinical features, physical examination, diagnostics
4. Types, causes, pathogenesis, clinical features, physical examination findings, diagnostics of hyperparathyroidism.
5. Types, causes, pathogenesis, clinical features, physical examination findings, diagnostics of hypoparathyroidism

Recommended reading for this discipline:
[1] References listed above
[2] Lecture notes

Unit 2.
Key questions covered in lesson 9: Topographic anatomy and hormones of the pancreas.
1. Pancreas ,structure, topography and function.
2. Blood supply and innervation of pancreas.
3. Hormones of the pancreas.

Recommended reading for this discipline:
[1] Davi Ellen Chabner- The language of medicine. M. 2017.828-880 p.
[2] B.D.Chaurasia . Human Anatomy. Volume 1. New Delhi. 2009.V-2. 225-248 p., V-1. 229-240 p.
[3] Lecture materials.

Unit 2. Key questions covered in lesson 10: Hyperglycemia and hypoglycemia syndrome
1. Hyperglycemia: main causes, clinical features.
2. Diabetes mellitus: classification. Type 1 and type 2 DM. Risk factors of insulinresistancy.
3. Normal glycemic level. Diagnostic criteria for diabetes mellitus. Criteria for prediabetes.
4. Chronic complications of hyperglycemia.
5. Main causes of hypoglycemia. Clinical picture. Physical examination. Laboratory diagnostics.

Recommended reading for this discipline:
[1] Braunwald E. Harrison's principles of Internal Medicine.Vol.2, 2005.
[2] Ralston S.H. Davidson's Principles and Practice of Medicine, 23th ed., 2018.

Unit 2. Key questions covered in lesson 11: Acute hyperglycemia and acute hypoglycemia syndrome.
1. Ketoacidosis: causes,clinical picture. physical examination, laboratory diagnostics, first help
2. Acute hypoglycemia: causes,clinical picture. physical examination, laboratory diagnostics, first help

Recommended reading for this discipline:
[1] Braunwald E. Harrison's principles of Internal Medicine.Vol.2, 2005.
[2] Ralston S.H. Davidson's Principles and Practice of Medicine, 23th ed., 2018.

Unit 2. Key questions covered in lesson 12: Metabolic syndrome.
1. Metabolic syndrome: definition, clinical picture, diagnostic criteria.
2. Normal level of lipids

Recommended reading for this discipline:
[1] Braunwald E. Harrison's principles of Internal Medicine.Vol.2, 2005.
[2] Ralston S.H. Davidson's Principles and Practice of Medicine, 23th ed., 2018.

Unit 2. Key questions covered in lesson 13: Unit 2 control.
1. Hyperglycemia: causes, pathogenesis, clinical features, physical examination findings, diagnostics.
2. Diabetes mellitus: classification. Differences between diabetes mellitus type 1 and type 2.
3. Ketoacidosis: causes,clinical picture. physical examination, laboratory diagnostics, first help

4. Acute hypoglycemia: causes, pathogenesis, clinical picture. physical examination, laboratory diagnostics, first help

Recommended reading for this discipline:
[1] References listed above
[2] Lecture notes

Unit 3.
Key questions covered in lesson 14: Topographic anatomy and hormones of adrenal glands.
1. The adrenal glands, structure, topography and function.
2. Blood supply of the adrenal gland.
3. Hormones of adrenal glands

Recommended reading for this discipline:
[1] Davi Ellen Chabner- The language of medicine. M. 2017.828-880 p.
[2] B.D.Chaurasia . Human Anatomy. Volume 1. New Delhi. 2009.V-2. 225-248 p., V-1. 229-240 p.
[3] Lecture materials.

Unit 3. Key questions covered in lesson 15: Common etiology and pathogenesis of hypo- and hyperfunction of adrenal gland.
1. Pathophysiology of adrenal cortex.
2. Pathophysiology of primary and secondary hypercortisolism. Cushing's syndrome and Cushing's disease.
3. Etiology and pathogenesis of metabolic and functional disorders in glucocorticoids excess.
4. Etiology and pathogenesis of metabolic and hormonal disorders in mineralocorticoids excess.
5. Pathophysiology of adrenal medulla.
6. Etiology and pathogenesis of acute and chronic adrenal failure.
7. Pathophysiological characteristics of adrenal insufficiency.

Recommended reading for this discipline:
[1] Kumar V., Abbas A.K., Aster J.A. Robbins and Cotran Pathologic Basis of Disease. 2015.
[2] **Copstead Banasick. Pathophysiology.2013**
[3] Calor Mattson Porth. Essentials of pathophysiology.2019

Unit 3. Key questions covered in lesson 16: Syndrome of hyper- and hypocortisolism.
1. Hypertorticism syndrome: causes, types, clinical picture, physical examination, laboratory and instrumental diagnostics.
2. Main differences between ACTH-dependent forms and ACTH-independent forms of Cushin’s syndrome.
3. Adrenal insufficiency syndrome: cause, clinical picture, physical, laboratory, instrumental examination.

Recommended reading for this discipline:
[1] Braunwald E. Harrison's principles of Internal Medicine.Vol.2, 2005.
[2] Ralston S.H. Davidson's Principles and Practice of Medicine, 23th ed., 2018.

Unit 3. Key questions covered in lesson 17: Radiation diagnostics of thymus, adrenal glands and pancreas.
1. Adrenal glands, pancreas. MRI anatomy, ultrasound capabilities in assessing the tissue structures of these organs.
2. Diseases of the adrenal glands: Insulinoma. Conn's syndrome. Addison's disease. Pheochromocytoma.
3. Radiation symptoms of pancreatic pathology

Recommended reading for this discipline:
[1] E. Scott Pretorius, Jeffrey A. Solomon. Radiology Secrets Plus (3d edition), 2011.

Unit 3. Key questions covered in lesson 18: Unit 3 submission.
1. Cushing’s syndrome: types, causes, pathogenesis, clinical picture, physical examination, laboratory and instrumental diagnostics.
2. Adrenal insufficiency syndrome: causes, types, pathogenesis, clinical picture, physical, laboratory, instrumental examination.

Recommended reading for this discipline:
[1] References listed above
[2] Lecture notes

Methodological instructions for the implementation of independent work on the discipline

Methodological instructions for making an abstract:

1. To study the curriculum and the working curriculum.
2. Determine the place of the topic of this lecture in the structure of the discipline according to the thematic plan.
3. Find out all the issues that need to be studied.
4. To study material, which is in the syllabus, to clarify the amount of missing material on the basis of control questions, tasks for control work and questions submitted for the module (see the program discipline and the working curriculum).
5. Determine the literature in which there is the necessary educational material, and the sequence of its assimilation.
6. To process each educational material in the following way.
7. Read it in dynamics to understand the general essence.
8. Read the study material a second time, understanding each word and sentence
9. For the third time to identify the basic concepts, the essence of phenomena and processes, their structure and content, as well as the links between them.
10. Write it all down in a synopsis.
11. To establish a connection with the previous educational material.
12. Independently answer all control questions on this topic.

Methodological instructions for independent work:

1. Study the theoretical material well; master the method of applying knowledge in practice.
2. Be able to use the necessary equipment, materials, equipment for measurements.
3. To study the recommendations for specific laboratory or practical work, which are set out in textbooks and methodological developments.
4. Plan for laboratory or practical work.
5. Prepare the necessary material.
6. Perform tasks of laboratory or practical work.
7. Interpret the results and describe the identified phenomena.
8. Draw conclusions.
9. Draw up everything accordingly.