Ministry of Public Health of Ukraine
National O.O. Bohomolets Medical University

METHODICAL GUIDE
to practical classes for students

Educational discipline	Propaedeutics of Pediatrics including nursing practice, basic medical skills in the pediatric department
Training direction	22 " Public Health "**,** II (master's) educational and qualification level
Specialty	222 «Medicine»
Department	Paediatrics # 2
Thematic module 2	Anatomical and physiological features of organs and systems in children, clinical examination methods. Semiotics of damage syndromes of each of the systems and the most common diseases.
Topic:	Anatomical and physiological features, examination methods, semiotics of diseases of the endocrine system in children.
Course	3

Approved on methodic meeting of department of pediatrics №2 from «28» august 2023., protocol №1

Considered and approved: CMC on pediatric disciplines from «28» august 2023., protocol №1

1. Goal: the student acquires knowledge about:
• anatomical and physiological features of the endocrine system in children depending on age and their clinical significance;
• semiotics of the main disorders of the endocrine system in children, leading pathological symptoms and syndromes with the most common endocrine diseases taking into account age features.
the student's acquisition of skills regarding:
• collection of anamnesis from a sick child (and/or his parents/guardians) with pathology of the endocrine system;
• objective examination of children with endocrine pathology;
• determining the "bone age" of the child;
• assessment of the child's sexual development according to age;

2. Competencies:
• collecting complaints, medical history and life of a child or his parents with diseases of the endocrine system;
• clinical examination of children with diseases of the endocrine system (examination, palpation, percussion, auscultation);
• drawing up a scheme for laboratory-instrumental examination of children with endocrine pathology;
• interpretation of the obtained data of clinical, laboratory-instrumental examination of children with endocrine pathology;
• definition of the main clinical symptoms and syndromes in children with diseases of the endocrine system.

3. **Plan and organizational structure of the lesson**

The name of the stage	**Description of the stage**	**Levels of assimilatio***
Preparatory stage	Organizational measures Setting educational goals, student motivation	*
The main stage	Test control on the subject of the lesson, checking and announcing the results. - theoretical survey; - demonstration of practical skills, clarification of the most important points regarding the collection of anamnesis and conducting an objective examination of a child with pathology of the endocrine system (palpation of the thyroid gland, "bone age", assessment of sexual development);	** *, **, *** **, ***

*

	- students' work on acquiring skills of clinical examination of children with pathology of the endocrine system. Solving tasks according to the subject of the lesson.	
Final	Analysis and assessment of student work results. Announcement of the topic of the next lesson, an indicative map for independent work with literature.	*
	Together 2,5 academic hours	

Introductory, **reproducible, *** reconstructive, **** creative learning levels.

4. Content of educational material

4.1. A list of the main terms, parameters, and characteristics that the student should learn when preparing for the class:

Terms:	***Definition:***
Goiter	An increase in the volume of the thyroid gland.
Nodular goiter	Focal or multifocal changes in thyroid tissue.
Basic metabolism	This is the minimum amount of energy needed to maintain the life of an organism in a state of complete rest; it is established in a child who is not sleeping and is in a state of complete muscular and emotional rest at a comfortable temperature - 18-20℃, in the morning, on an empty stomach.
Diffuse toxic goiter	A disease characterized by hyperfunction of the thyroid gland, its hyperplasia and hypertrophy.
Hypothyroidism	A clinical symptom complex caused by a persistent deficiency of thyroid hormones in the body or a decrease in the biological effect of hormones at the tissue level.
Hyperthyroidism	A complex of clinical and metabolic changes caused by the effect on the body of an increased amount of thyroid hormones.
Euthyroidism	The function of the thyroid gland is normal.
Congenital hypothyroidism	Congenital disease of the thyroid gland in children, caused by insufficient action of thyroid hormones, which occurs in utero under the influence of endogenous and exogenous factors.
Iodine deficiency state	Pathological condition caused by reduced use of iodine.
Autoimmune thyroiditis (Hashimoto's goiter)	A chronic autoimmune disease characterized by lymphoid infiltration with slow gradual damage to the tissue of the thyroid gland and the development of hypothyroidism.

Thyroid-stimulating immunoglobulins	Specific autoantibodies to thyrotropin receptors, which are formed when T-helpers sensitized to thyroid gland antigens interact with B-lymphocytes in the presence of provoking factors.
Neonatal screening for congenital hypothyroidism	The main goal of screening for congenital hypothyroidism is to identify all newborns with an elevated level of thyrotropin in the blood as early as possible.
Diabetes mellitus	A metabolic disease of various etiology, which is characterized by chronic hyperglycemia, which is a consequence of impaired secretion, action of insulin, or both of these factors.
Glycemia	Blood glucose level.
Hyperglycemia	Increased level of glucose in the blood.
Glucosuria	The presence of glucose in the urine.
Ketonemia	The level of ketone bodies in the blood.
Hyperketonemia	Increased level of ketone bodies in the blood.
Ketonuria	The presence of ketone bodies in the urine.
Ketone bodies	Acetone, acetoacetic, beta-oxybutyric acids are intermediate products of fat metabolism in the process of lipolysis.
Lipolysis	Fat breakdown.
Ketoacidosis	The shift of the acid-alkaline state towards acidosis is caused by an increase in the level of ketone bodies in the blood.
Oral glucose tolerance test	It is carried out in doubtful cases in the presence or absence of a characteristic clinic and fasting glycemia in capillary blood within 5.6-6.1 mmol/l.
Glycated hemoglobin (minor fraction – HbA1c)	Glycated proteins are proteins with glucose attached to them in a non-enzymatic way; are indicators of the state of carbohydrate metabolism for the last 3 months, taking into account the life expectancy of an erythrocyte. Hyperglycemia in diabetes contributes to an increase in the processes of non-enzymatic glycolysis of hemoglobin proteins.
Gluconeogenesis	Formation of glucose from carbohydrates - proteins and fats.
Glycogenolysis	Breakdown of glycogen into glucose.
Mauriac's syndrome	Complication of diabetes in children. It is characterized by growth retardation, excessive deposition of fat according to the cushingoid type, hepatomegaly; in puberty - delayed sexual development. Presence of diabetic angiopathy.
Nobekur's syndrome	Complication of diabetes in children. Delay in growth and sexual development, fatty infiltration of the liver in children with reduced body weight; the presence of diabetic angiopathy.
Diabetic rubeosis	Blush on the cheeks, cheekbones, browbones, chin, caused by paresis of skin capillaries during decompensation of diabetes, especially in ketosis.
Hypoglycemia	A condition caused by low blood sugar or a rapid decrease in its concentration.

Dwarfism (nanism)	Growth retardation syndrome – (-3) standard deviations (sigma) and > .
Subnanism	Growth retardation syndrome (-2)-(-3) standard deviations (sigma).
Short stature	Growth retardation syndrome; diagnosed with indicators from 3 to 25 percentiles (-1 to (-2) standard deviations).
Pituitary dwarfism	It develops as a result of a primary deficiency of growth hormone (both isolated and in combination with other tropic hormones), characterized by a proportional delay in the child's growth and development.
Android obesity (upper, abdominal)	It is characterized by the deposition of fat in the upper half of the body, on the stomach, on the face in the form of visceral fat.
Gynoid obesity (lower type, buttock-femoral)	It is characterized by the distribution of fat in the area of the buttocks and thighs.
Body mass index (BMI)	BMI=W : H2, where W is body weight (kg), H is height (m).
Genetic sex	The set of sex chromosomes XY and XX determines the genetic sex.
Karyotype	A set of sex chromosomes.

5. Theoretical questions that are considered in class.

1. What is the role of the pituitary gland in the child's body?
2. Hypothalamus and pituitary hormones, mechanism of action.
3. Thyroid hormones, their role in the child's body.
4. How is the function of the endocrine glands regulated?
5. What are the clinical and laboratory methods of examining the thyroid gland in children?
6. What are the main clinical signs of hyperthyroidism in children?
7. Describe the ocular symptoms of hyperthyroidism.
8. What are the clinical signs of congenital hypothyroidism in children?
9. Syndromes of growth disorders in children?
10. What are the clinical symptoms of pituitary growth retardation syndrome origin?
11. Adrenal hormones, mechanism of action.
12. Describe the clinical symptoms of chronic adrenal insufficiency.
13. What are the clinical manifestations of diabetes insipidus syndrome?
14. What is the endocrine function of the pancreas?
15. What are the typical clinical manifestations of diabetes in children?
16. What are the clinical manifestations of hypoglycemia syndrome in children?
17. What is the biological role of parathyroid hormone in the child's body?
18. Criteria for the sexual development of boys?
19. Criteria for the sexual development of girls?
20. What symptoms does the syndrome in children with prematurity in sexual development?

21. Clinical symptoms of hypogonadism in children.
22. Symptoms, which are typical for obesity with various genesis.

Recommended literature.

Basic:

Nelson textbook 21th Edition by Robert M. Kliegman, MD, Joseph St. Geme, Nathan J. Blum, Samair S. Shan, Robert C. Tasker, Karen M. Wilson, Richard E. Behrman Видавництво: Elsevier, 2019. P. 5146-5152, 5219, 5287, 5309, 5314, 5395-5400.

Additional:

1. Fundamentals of pediatrics according to Nelson. Karen J. Marcdante, Robert M. Kligman; translation of the 8th Eng. edition in 2 volumes. Scientific editors of the translation V.S. Berezenko, T.V. Rest Kyiv: VSV "Medicine", 2020.

2. Katilov O.V., Dmitriev D.V., Dmitrieva K.Yu., Makarov S.Yu. Clinical examination of a child. 2nd edition. Vinnytsia: Nova Kniga, 2019. 520 p.

3. Pediatrics: textbook. T.O. Kryuchko, O.Y. Abaturov, T.V. Kushnereva et al.ed. by T.O. Kryuchko, O.Y. Abaturov. Kyiv: AUS Medicine Publishing, 2016. 208 p. (p.39-49) ISBN 978-617-505-485-7.