Ministry of Health of Ukraine
O.O. Bogomolets National Medical University

METHODOLOGICAL RECOMMENDATIONS
to practical classes for students

Academic discipline: Pediatrics with children's infectious diseases (mandatory component 25)
Field of knowledge: 22 "Health care"
Specialty: 222 "Medicine"
Department of Pediatrics No 2

APPROVED at the meeting of the Department of Pediatrics No. 2 from August , 2023, protocol №1

Reviewed and approved by: Center for Pediatric Disciplines
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Lesson topic: **Diseases of the thyroid gland in children.**

Competencies:
- to collect complaints, anamnesis of life and diseases, evaluate the psychomotor, physical and sexual development of the patient, the state of organs and systems of the body;
- distinguish and identify leading clinical symptoms and syndromes (anemic, jaundice, constipation, child growth retardation, edematous syndrome);
- palpate the thyroid gland, measure blood pressure and evaluate the results;
- prescribe additional examination methods for differential diagnosis of diseases;
- interpret the results of laboratory studies (level of thyroid hormones, TSH, antibodies to thyroid tissues, iodine content in urine) and instrumental imaging of the thyroid gland (thyroid sonography, scintigraphy, biopsy, etc.);
- establish a final clinical diagnosis by making a reasoned decision and analyzing the received subjective and objective data of clinical, additional examination, differential diagnosis;
- prescribe treatment, regime of work, rest and nutrition on the basis of the final clinical diagnosis for the most common diseases of the thyroid gland in children (congenital hypothyroidism, autoimmune thyroiditis, Graves' disease, endemic goiter, thyroid cancer), observing the relevant ethical and legal norms, by adopting a well-founded solutions based on existing algorithms and standard schemes;
- diagnose thyrotoxic crisis and provide emergency medical care;
- to clearly and unambiguously convey one's own knowledge, conclusions and arguments on health care problems and related issues to specialists and non-specialists;
- demonstrate mastery of the moral and deontological principles of a medical specialist and the principles of professional subordination in pediatrics.

Equipment: a child's mannequin; device for measuring blood pressure; stethoscope, set for intravenous administration of drugs (peripheral intravenous catheter, tripod with system for intravenous infusion, disposable syringe for injections), disposable gloves, antiseptic for hand treatment.

Lesson plan and organizational structure

The name of the stage	Description of the stage	Levels of assimilation	Time
Preparatory	*Organizational issues* Learning motivation: Every eighth inhabitant of the planet is prone to thyroid disorders. In Ukraine, and in the world, diseases of the thyroid gland (thyroid gland) occupy a significant share in the structure of the general morbidity of the children's population. The growth of this pathology, to a large extent, is associated with an unfavorable	Introductory	25 min

	environment, iodine deficiency. Thyroid diseases account for almost half of all endocrinopathies. Timely diagnosis and adequate correction of thyroid dysfunctions prevent severe consequences of impaired growth and development of children. *Control of the initial level of knowledge (tes control and oral survey):* 1. Daily need for iodine (µg/day) for children 7-10 years old is: A.50 B. 80. **C. 120**. D. 150. D. 200. 2. What is characteristic of congenital hypothyroidism in the neonatal period: A. Premature pregnancy; low birth weight B. TSH level < 20 mIU/l C. The child is restless, often cries, high-pitched voice when crying. D. **Dry icteric skin, edema, large tongue.** E. Body temperature is elevated; tachycardia, skin with high humidity; muscl hypertension. 3. Diffuse toxic goiter is characterized by: **A. The thyroid gland is enlarged, emotional lability, tachycardia.** B. Tremor, exophthalmos, periodic pains i the heart, dry cold skin. C. The thyroid gland is enlarged, dense, tuberous; bradycardia, emotional retardation. D. Weight loss, growth retardation, drowsiness, enlargement of the thyroid gland. E. Delay in physical and mental development; edema, constipation, voice rough, low.	Reproductive	

Basic	4. Screening examination of children in endemic areas: A. The level of T3 and T4 in the blood B. Sonography of the thyroid gland. C. The level of antibodies to the tissues of the thyroid gland in the blood. D. **Level of iodine in urine.** E. The level of thyroglobulin in the blood. 5. Primary examination in the diagnosis of thyroid cancer: A. Ultrasound examination of the thyroid gland. B. Radioisotope scanning. C. Computer and magnetic resonance imaging. D. Determination of thyroglobulin level in blood serum. E. **Fine-needle aspiration puncture biopsy of the node followed by punctate examination** *Performance of practical tasks:* - demonstration of a thematic patient in the department of endocrinology (somatic department); - study of disease history and life history; - evaluation of the results of laboratory and instrumental examination methods; - on the basis of anamnesis, examination data and the results of laboratory and instrumental studies, establishing a preliminary clinical diagnosis; - determination of factors and pathogenetic mechanisms of disease development; - appointment of treatment (emergency measures, medical treatment, peculiarities of regimen and diet); - determination of disease prevention measures; - familiarization with the operation of the equipment (ultrasound diagnostic apparatus);	Introductory Introductory Reconstructive Creative Reproductive Creative Creative Introductory Reconstructive	1 hour 45 min

Final	- practicing medical manipulations using a child dummy. *Control of the final level of training (situational tasks):* 1. Child 1 year, 3 months. The main complaint is the constipation. She was born from the first pregnancy, normal delivery. Body weight at birth - 4300 g, length - 52 cm. Prolonged jaundice, pastiness, late shedding of the umbilical cord remnant were noted in the maternity hospital. She started holding her head at 6 months, sitting at 1 year. Observed by a district pediatrician. It is treated with vitamins. The mother had a goiter of the 2nd stage, she was not examined and did not receive treatment. During the examination: the child is sluggish, inhibited; does not walk, does not speak; voice rough; no teeth; the skin is pale, with a yellowish tint, dry; the tongue is large; rhythmic heart sounds, bradycardia; stomach of increased size; liver +2 cm. The thyroid gland is not palpable. Blood analysis: Hb - 95 g/l, erythrocytes - 3.9 T/l, color indicator - 0.80, leukocytes - 8.0 G/l: p-1%, c-52%, e-3, l-38%, m-6%, ESR - 8 mm/h. Urine test: no specifics. Biochemical blood analysis: glucose – 4.5 mmol/l, sodium – 132 mmol/l, potassium – 5.0 mmol/l, total protein – 60.0 g/l, cholesterol – 6.8 mmol/l. 1. What is the most likely diagnosis for the child? 2. Evaluate the results of the conducted research. 3. What kind of research needed to be done in the maternity hospital and what tests are needed for diagnosis? 4. Treatment tactics? Answer standard: 1) Probable diagnosis – Congenital hypothyroidism (on the basis of history and characteristic clinical symptoms). 2) Laboratory data indicate anemia and hypercholesterolemia. 3) A necessary	Creative	30 min

	screening examination on the 3-5th day after birth is the level of TSH in capillary blood. To confirm the diagnosis, determine TSH, free T4 and T3, thyroid tissue antibodies, thyroid sonography. 4) In the treatment - Levothyroxine - the minimum dose that ensures a euthyroid state and normal levels of TSH and T3, T4. 2. A 15-year-old girl went to the clinic with complaints of irritability, tearfulness, frequent mood swings, sleep disturbances, and weight loss with increased appetite. Symptoms bother for 1 month. She received sedatives. Objectively: Height – 170 cm, body weight – 52 kg. Blood pressure - 130/60 mm Hg. Art. The condition is broken. Frequent, small tremors of the fingers of outstretched hands. High moisture skin. Sweating is diffuse. Glare of eyes, wide open eye slits. Lymph nodes are unremarkable. Vesicular respiration in the lungs. Heart sounds are sonorous, rhythmic, 120 bpm. Abdomen is soft, painless. Liver +0.5 cm. Thyroid gland of the 1st century, diffuse, soft, elastic, mobile, painless. 1. The most likely diagnosis? 2. Laboratory-instrumental diagnosis of the disease? 3. Tactics of the doctor? Answer standard: 1) Diffuse toxic goiter (Graves' disease). 2) Examination plan: TSH, T3, T4, thyroid peroxidase antibodies and TSH receptor antibodies, thyroglobulin, thyroid sonography. 3) Treatment plan: Thyrostatic drug (methimazole, mercazolil, thiamazole) in an initial dose of 0.5-0.7 mg/kg/day, followed by a dose reduction to a euthyroid state; the minimum dose is prescribed for 2 years; assessment of the level of TSH, T4 and T3 every 6 weeks until the TSH reaches the range of control values, and further assessment of the level of TSH every 3 months until the withdrawal of thyrostatic drugs.		

	General evaluation of the student's educational activity		

Recommended Books:

1. Nussey S, Whitehead S. Endocrinology: An Integrated Approach. Oxford: BIOS Scientific Publishers; 2001. Chapter 3, The thyroid gland.
2. Pediatrics : textbook / O. V. Tiazhka, T. V. Pochinok, A. M. Antoshkina [et al.]; edited by O. Tiazhka. – 3 rd edition, reprint. – Vinnytsia : Nova Knyha, 2018. – 544 pp. (pp.489–501) : il. ISBN 978-966-382-690-5
3.Nelson Textbook of Pediatrics, 21th Edition, 2019 by ROBERT M.KLIEGMAN, NATHAN J. BLUM, SAMIR S. SHAH, JOSEPH W. ST GEME III, ROBERT C. TASKER, KAREN M. WILSON, RICHARD E. BEHRMAN, P. 2912-2937.
4. National Institute for Health and Care Excellence (2019) Thyroid disease: assessment and management. NICE guideline [NG145]
5. https://www.childrens.com/specialties-services/conditions/thyroid