

Ministry of Health of the Republic of Belarus
Education Institution
"Gomel State Medical University"

Department of Pediatrics with the course of the Faculty of Advanced Training and Retraining

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METHODOLOGICAL GUIDELINES

for a practical exercise
by a teacher with students
6th year of the Faculty of foreign students,
trainees in speciality 1-790101 in the discipline of pediatrics

**Topic: Chronic nutritional disorders. Protein-energy deficiency.
Malabsorption syndrome. Helminthiasis.**

Time: 7 hours

Approved at the meeting of the Department of Pediatrics with the Course of the Faculty of Advanced Training and Retraining
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LEARNING AND EDUCATIONAL GOALS, OBJECTIVES, MOTIVATION FOR MASTERING THE TOPIC

Educational objective:

- Formation of students' basic professional competence in the study of the discipline of Pediatrics

- The formation of students' scientific knowledge about diseases in children and prospects of their use in professional practice; abilities and skills necessary to work with patients of different ages, knowledge of the clinical manifestations of diseases, treatment and diagnostic measures, the basics of rehabilitation and prevention.

Educational objective:

- Fostering in students a sense of professional responsibility of a future medical worker;

- Formation of professionally important and socio-psychological qualities of the doctor personality in the system of doctor-nurse-patient relations;

- formation of students' responsible attitude to their future professional activity.

- Formation of academic and work discipline, discussion of disciplinary issues (attendance of lectures and practical classes, unexcused absences, tardiness, debts on missed classes).

Objectives:

As a result of the study session, the student should

know:

- peculiarities of metabolism in young children;
- rates of weight and body length gain in children of the first year of life;
- biological significance of the main ingredients of food (proteins, fats, carbohydrates);

- biological significance and mechanism of action of main water- and fat-soluble vitamins;

- classification of chronic nutritional disorders;

- clinical signs of hypotrophy;

- etiopathogenesis of hypotrophy;

- stages of diagnosis of hypotrophy, obesity;

- clinical manifestations of fermentopathies;

- The principles of clinical examination of children with chronic eating disorders.

- The main clinical manifestations of disaccharidase deficiency, celiac disease, cystic fibrosis;

- anatomico-physiological features of the skin, subcutaneous fat, lymph nodes, musculoskeletal system;

- etiology, pathogenesis, classification, clinical manifestations and stages of diagnosis of rickets;

- regulation of phosphorus-calcium metabolism;

- levels of calcium, phosphorus, alkaline phosphatase in blood serum;

- basic principles of rickets treatment, therapeutic and prophylactic doses of vitamin D;
- etiology, pathogenesis, stages of diagnosis and treatment of hypervitaminosis D;
- pathogenesis, clinical manifestations and emergency care for spasmodic seizures;
- Concepts of "constitution" and "abnormalities of constitution";
- Aetiology, pathogenesis, clinical manifestations and principles of management of children with constitutional abnormalities.
- Modern concepts of the epidemiology of parasitic diseases of the digestive tract;
- modern concepts in the development cycle of helminths and giardia;
- clinical manifestations of parasitic diseases of the digestive tract in children;
- the necessary amount of instrumental and laboratory research for the diagnosis of parasitic diseases of the digestive tract.

be able to:

- assess the clinical manifestations and determine the degree of hypotrophy by body weight deficit; obesity;
- make a differential diagnosis of enzymopathies;
- carry out correction of nutrition in hypotrophy; obesity;
- make a menu layout for children with paratrophy;
- collect a history of the child's life and illness, paying special attention to the signs characteristic of malabsorption syndrome;
- objectively assess the state of the gastrointestinal tract and identify the main pathological syndromes: dystrophy, the formation of iron deficiency, calcium, vitamins, trace elements (copper, zinc);
- determine the degree of hypotrophy by body weight deficit;
- make and substantiate a plan of examination in the syndrome of impaired intestinal absorption (laboratory, instrumental methods);
- determine the group of diseases for differential diagnosis;
- prescribe drug therapy for chronic eating disorders; malabsorption syndrome; helminthiasis.
- conduct examination of skin, subcutaneous fat, lymph nodes, bone and muscle systems;
- determine the size of the fontanelle in infants;
- correctly formulate a clinical diagnosis of rickets;
- calculate vitamin D for therapeutic and prophylactic purposes;
- prescribe nutrition to a sick child;
- provide emergency care for spasmodic seizures;
- by thoroughly collecting anamnesis, selecting information from the medical history to establish the connection of the identified changes with the occurrence of constitutional abnormality;
- outline a plan of examination of a child with a constitutional anomaly;
- interpret the results of the examination, establish their natural correlation.

know:

- methods of objective (palpation, percussion, auscultation) and additional (measuring, laboratory, instrumental, histological, immunological, etc.) examination
- skills of communication with patients of different ages and their parents, medical personnel.

Motivation for mastering the topic:

- Obtained knowledge and skills during the study of the discipline of pediatrics allows to motivate students to improve theoretical and practical knowledge for the implementation of early diagnosis, treatment and complex rehabilitation measures for children with diseases on this topic, tactics for emergency care.

MATERIAL EQUIPMENT

Tables on the theme of the lesson, medical charts of hospital patients, a set of hemograms, hemostasiograms, biochemical blood tests, urinalysis, the conclusion of ultrasound of the abdominal cavity, kidneys; scales, stadiometer, tape measure, tonometer; a bank of tasks for independent work; a selection of case studies of patients in the hospital departments.

CONTROL QUESTIONS FROM RELATED DISCIPLINES

1. "Human Anatomy:
 - Anatomico-physiological features of the digestive organs in children.
2. "Pharmacology":
 - Pharmacokinetics and pharmacodynamics of drugs used to treat children with chronic eating disorders.
3. "Biological Chemistry."
 - Stages of breakdown of major food ingredients in the digestive tract.
 - Peculiarities of metabolism in young children.
 - Physiological significance of proteins, fats, carbohydrates.
 - Biological role of major water soluble and fat soluble vitamins.
4. "Normal Physiology."
 - Rules of anthropometric studies.
5. "Pharmacology."
 - Rules for writing prescriptions for drugs of different forms of release.
6. "Emergency conditions:
 - Management of seizure syndrome.

CONTROL QUESTIONS ON THE TOPIC OF THE CLASS

- 1 Chronic eating disorders in children. Etiopathogenesis. Classification. Clinic. Diagnostics. Treatment.
2. Protein-energy insufficiency. Etiopathogenesis. Classification. Clinic. Diagnostics. Treatment.
3. Obesity. Etiopathogenesis. Classification. Clinic. Diagnostics. Treatment.
4. Differential diagnosis of malabsorption syndrome (disaccharidase deficiency, cystic fibrosis, celiac disease).
5. Treatment tactics for children with malabsorption syndrome.

6. Differential diagnosis of helminth infections in children (nematodeosis, tenidosis, trematodeosis). Treatment.

PROCESS OF THE STUDY

Theoretical Part

The problem of chronic nutritional disorders (dystrophies) in young children has not lost its significance to date. In modern conditions there is an increase in the frequency of chronic nutritional disorders: anemia, hypotrophy, rickets, polyhypovitaminosis. Disorders of nutrient absorption by tissues in dystrophies lead to the formation of profound metabolic disorders at the cell level, which delays repair processes in organs and tissues, contributes to the formation of chronic diseases of the gastrointestinal tract. The reasons for the formation of dystrophy can be various states of maldigestion and malabsorption, which require an individual approach to the prescription of diet and specific therapy. Modern studies have proved a significant increase in the proportion of persons with manifestations of polyhypovitaminosis, including in young children, especially in conditions of environmental disadvantage and prolonged exposure to small doses of radiation.

The polyetiology of nutritional disorders and the complex pathogenetic mechanisms of their development often create difficulties in the diagnosis and treatment of these conditions. In this connection, it is important for pediatricians to study the etiology, pathogenesis, clinical manifestations and individual complex treatment of chronic eating disorders.

Metabolic diseases in young children have not lost their importance up to the present time. Disorders of nutrient uptake by body tissues in dystrophies lead to deep metabolic disorders at cell level, which delay reparation processes in organs and tissues, contribute to formation of chronic diseases of gastrointestinal tract. The reasons for the formation of hypotrophy can be conditions of maldigestion and malabsorption, which require an individual approach to the prescription of diet and specific therapy. The polyetiology of nutritional disorders, the complex pathogenetic mechanisms of their development often create difficulties in the diagnosis and treatment of hypotrophy.

Rakhitis - a general disease of the growing body, with impaired metabolism (mainly calcium and phosphorus) and a significant disorder of bone formation and disturbed functions of all major organs and systems. This dictates the need for every physician to know this disease.

Helminth infections are ubiquitous diseases. Enterobiasis is on the first place according to the frequency of detection. Poor sanitary and hygienic conditions, and non-observance of personal hygiene rules contribute to the spread of helminths and related diseases.

Practical part

Students are instructed, attention is drawn to the rules of the internal order, the peculiarities of work in the departments on the topic of class. The selection of patients is carried out in accordance with the theme of the lesson. During practical work, the student must carry out:

- collection of complaints and anamnesis of the disease,
- clinical examination of the child,
- Making a preliminary diagnosis and drawing up a plan of examination,
- interpretation of the results of laboratory and instrumental methods of investigation,
- Formulation of the final clinical diagnosis,
- Formulation of a treatment and rehabilitation plan,
- Writing prescriptions for medications.

Control of assimilation of the topic

1. Demonstration of thematic patients with analysis of clinical cases in accordance with the scheme of examination of the patient:

Complaints: clarify in a patient with chronic pathology (or parents) the presence of complaints at the time of the examination.

When collecting the anamnesis of life, specify how pregnancy and childbirth occurred, the nature of feeding in the first year of life, features of child development in the first year of life, features of child nutrition after one year, lifestyle, the possible influence of environmental factors on the body. Pay attention to family genetic diseases (it is advisable to draw a family tree). Find out about past diseases, taking into account the peculiarities of their course and the therapy undertaken.

When collecting the anamnesis of the disease, pay attention to predisposing factors, the time of the first clinical manifestations of the disease, the nature of the course of the disease, treatment in the hospital and outpatient clinic, the effectiveness of the therapy.

When examining to assess the general condition and well-being of the child: skin color, palpation of lymph nodes, examination of the pharynx, percussion and auscultation of the lungs and heart, palpation of the abdomen, specify the nature of physiological excretions.

Evaluate the additional methods of investigation: laboratory and instrumental, depending on the pathology.

Evaluate the child's condition at the time of the examination, the need for contradictory treatment in this period, the possibility of recuperation in the sanatorium conditions.[9]

1. Solution of situational tasks

Task 1.

Examine a patient with hypotrophy. To do this:

- (a) Analyze the anamnesis, establish the connection of the identified data with the possibility of hypotrophy;
- (b) Establish the severity of the child's condition;
- (c) With which diseases it is necessary to make a differential diagnosis, highlight the main diagnostic criteria.

Justify your choice.

Task 2.

Examine the newly admitted child. To do this:

- (a) Gather the anamnesis, pay special attention to the connection of this disease with the previous ones, the nature of complaints, heredity;
- b) Carry out an objective examination of the patient, establish the leading clinical syndrome;
- c) Formulate a preliminary diagnosis based on the history and objective data;
- d) Make a plan of examination and treatment, justify your prescriptions.

Task 3.

Analyze the medical history of an inpatient patient.

To do this:

- (a) Analyze the correctness of the preliminary and final clinical diagnosis;
- b) Evaluate the proposed therapy and make suggestions;
- c) Evaluate the scope of the proposed examination and make adjustments.

METHODOLOGICAL RECOMMENDATIONS FOR ORGANIZING AND PERFORMING THE CSR

Students use the time allotted for independent work for:

- working through the topics (issues) assigned for independent study;
- problem solving;
- carrying out research and creative assignments;
- preparing thematic reports, presentations;
- completing practical assignments;
- designing information and demonstration materials (stands, posters, charts, tables, newspapers, etc.);
- compilation of thematic selection of literary sources, Internet sources;
- duty in health care organizations;
- making a review of scientific literature on the issues of the class.
- preparation of lectures, talks with patients on the prevention of cardiovascular diseases and the formation of a healthy lifestyle;
- drawing up case studies on the topic of the class.

The main methods for organizing independent work:

- making a report;
- study of the topics and problems that are not covered in the classroom;
- preparation and participation in active forms of learning.

List of tasks of the SIW:

- study of clinical recommendations (examination and treatment protocols for children) with diseases of the digestive organs;
- drawing up situational problems on the topic of the class;
- write out prescriptions for major groups of drugs used in gastroenterology;
- Research work on the topic of the class

METHODOLOGICAL RECOMMENDATIONS ON THE ORGANIZATION AND IMPLEMENTATION OF THE SSR

The recommended forms of GSSS organization are:

1. preparation of essays on proposed topics;
2. solving situational problems on the topic of the class;
3. tests on the subject of the lesson.

List of SIW tasks:**1. Prepare an abstract on the proposed topic:**

- Congenital malformations of the gastrointestinal tract
- Intestinal dysbacteriosis
- Exudative enteropathy.
- Fructose intolerance.
- Features of the diet of children with food allergies.

2. Solution of situational tasks:**Task 1.**

Make an algorithm for recognizing the disease according to the proposed scheme.

Stages of diagnosis	Signs that are theoretically possible with this nosological form (work with the textbook)	Signs of illness, Your patient's signs of illness
Complaints Medical history Medical history Physical examination Laboratory examination Laboratory tests		

Task 2.

Draw up a treatment algorithm according to the scheme given.

Stages of treatment	Treatment for the condition	Treatment of this patient
Mode Diet Etiopathogenetic therapy Symptomatic therapy		

Task 3.

Determine the prognosis of the patient's disease. To do this:

- Determine the risk factors in this patient;
- Determine the general condition of the child;
- Prescribe an adequate treatment and justify it;
- Write a prescription for the prescribed medication.

Task 4.

Determine the prognosis of a child with impaired intestinal absorption syndrome. To do this:

- Analyze the child's life and medical history and the nature of the pathological process to assess the nature of malabsorption syndrome (primary, secondary).
- Evaluate the presence of clinical signs of deficit conditions in the patient and the degree of their severity;
- prescribe adequate treatment, justify it;

- d) write prescriptions for prescribed medications;
- e) make a plan of rehabilitation measures for this patient.

Task 5.

Determine the prognosis of the patient's disease. To do this:

- (a) Identify the risk factors in this patient;
- b) Determine the general condition of the child;
- (c) Prescribe an adequate treatment, justify it;
- (d) Write prescriptions for the prescribed medications.

Task 6.

Make up an algorithm for recognizing the disease according to the proposed scheme:

Stages of diagnosis	Signs that are theoretically possible with this nosological form (work with the textbook)	Signs of illness, Your patient's signs of illness
Complaints		
Medical history		
Medical history		
Physical examination		
Laboratory examination		
Laboratory tests		

Task 7.

Draw up a treatment algorithm according to the scheme given:

Stages of treatment	The treatment used for the disease (work with a textbook)	Treatment of this patient
Mode		
Diet		
Etiopathogenetic therapy		
Symptomatic therapy		

Task 8.

A 3-year-old child, born from the third pregnancy. (The first child died of pneumonia in infancy; the second one died of chronic diarrhea). Since the age of one year the child has had copious and frequent diluted stools, poor appetite, sometimes vomiting. In the period of newbornness he had pneumonia, then pneumonias recurred every year, with a severe course; cough was almost constant, often attack-like. Sputum was mucous, viscous, secreted with difficulty.

On admission to the hospital, there was a sharp retardation in physical development, chest deformity. Phalanges of fingers in the form of "drumsticks", fingernails - "watch glasses". In the lungs, "mosaic" percussion sound is determined. Breathing is rigid, dry and moist multi-caliber rales are heard on both sides. The

liver protrudes by 3 cm from under the rib arch; the spleen is not palpated. The stool is mushy, copious, and stinky.

Questions:

1. What is the preliminary diagnosis?
2. List what additional examinations are necessary to confirm the diagnosis.
3. On the basis of the data obtained, make a diagnosis:
 - (a) Blood tests: L - 88g/l; L - 18×10^9 g/l; e - 1%; p - 4%; s - 66%; l - 20%; m - 9%; SLE - 35 mm/hour.
 - b) Bronchoscopy revealed diffuse catarrhal purulent endobronchitis, abundant viscous, mucous sputum;
 - c) sweat analysis: sodium content over 80 mmol/l;
 - d) in fecal tests: absence of trypsin, large amount of neutral fat.
4. Which test results are especially important to confirm the diagnosis?

Task 9.

A 4.5-month-old boy, weight 4250, poor appetite, unstable stool. He was born with the weight of 3500 g and body length of 52 cm. From the first month he was fed on donor milk. Since the age of 2 months the child was on artificial feeding. The child had enterocolitis and purulent otitis media.

Examination: The child was lethargic. Face expression was mournful. The skin was pale, wrinkled, creased slowly. The mucous membranes are dry, bright. Subcutaneous fat layer is absent. Painful fontanelle is sunken. Breathing is shallow, arrhythmic. Heart tones are muffled. The pulse is weak. Bradycardia. The abdomen is swollen. The bowel loops are contoured.

Questions:

1. Formulate a diagnosis.
2. What is the cause of the poor appetite?
3. What is the evidence of a sunken fontanelle?
4. What is the pathogenesis of unsteady stools?
5. Your tactics.

Task 10

The baby is 7 months old. He is fed artificially, predominantly with cow's milk, drinks from 1000 ml to 1200-1300 ml of milk per day. Has some delay in motor development - badly sits, does not lean on his feet, has two teeth. The frontal tubercles, "Harrison's furrow", "rosaries" on the ribs, moderate kyphosis are pronounced. Abdomen was enlarged in size, liver protruded 2 cm from under the edge of the rib arch.

In early spring we took the child for a walk. After a walk, the child became restless, cried out and had a clonic-tonic seizure, the child was taken by ambulance to the emergency room of the hospital.

The seizure lasted for 15 minutes. The temperature was normal, the child's condition was satisfactory, but he was cranky. Body weight is 8 kg.

Task:

1. what disease can be thought of? Formulate a diagnosis. Justify it.

2. What additional information should be gathered from life history for differential diagnosis? With what diseases and conditions should the differential diagnosis be made? What tests are required to confirm the diagnosis?

3. Indicate the emergency treatment to be given. Principles of diet therapy and further treatment for this disease.

Task 11.

An 8-month-old child was admitted to a children's hospital for tonic-clonic convulsions.

The anamnesis shows that the child was born of young healthy parents, at term, in December. Weight at birth was 3850 g, length 50 cm. Apgar score was 7/8. The baby was applied to the breast on the second day. He was breast-fed till 1.5 months of age then fed artificially. Since the age of 3 months the child was diagnosed with rickets. Prescribed vitamin D treatment (vigantol, 5 drops a day). For the last month the child has been living with his grandmother in the country. Feeding mainly cow's milk, cooked porridge, cottage cheese. Spends most of the daylight hours outside. Grandmother gives vigantol 1 teaspoon x 3 times a day. Grandmother also gives the child 1 teaspoon of fish oil at each feeding. For the last 3 days the child has been noted to have anxiety, hyperexcitability, refusal to eat, vomiting 3 times, constipation, infrequent urination. The child lost weight sharply within the last week. Now his body weight - 8 kg.

Objectively: pallor, marked dryness of skin, mucous membranes, hyperesthesia, tachycardia, muffled heart tones, seizure readiness.

General blood count: Hb - 110 g/l, R - $3.6 \times 10^{12}/l$, L - $7.6 \times 10^9/l$, p/l - 2%, s - 31%, e - 2%, l - 56%, m - 9%, sed rate - 6 mm/hour.

Biochemical blood test: total protein - 58 g/l, calcium - 2.9 mmol/l, potassium - 4.1 mmol/l, sodium - 139 mmol/l, phosphorus - 0.6 mmol/l.

Sulkowicz test +++

Assignment:

1. Make a presumptive diagnosis.
2. Prescribe food for this child.
3. prescribe treatment.

Task 12

The 3.5-month-old baby is being breastfed. Recently, the child has become restless, his sleep is restless, he shudders, and the back of his head is alopecia. Diagnose and prescribe an appropriate treatment (diet therapy, drug therapy).

3. test control

1. Clinical forms of cystic fibrosis include all of the following except:
 1. edematous;
 2. mixed intestinal-pulmonary;
 3. predominantly pulmonary;
 4. predominantly intestinal;
 5. meconial ileus.

2. A 9-month-old child has a history of persistent cough from 2 months of age and chronic diarrhea. Stools are greasy, stinky. On examination the child was pale, malnourished, with a body weight of 7 kg. Medium bubbly wet and dry rales were heard in the lungs. Which of the following additional data indicates cystic fibrosis?

1. increased concentration of electrolytes sodium and chlorine in sweat;
2. elevated blood glucose levels;
3. family pedigree with autosomal recessive inheritance of similar pathology;
4. history of meconial ileus.

3. malabsorption following the introduction of cereals is characteristic of:

1. celiac disease;
2. Gilbert's syndrome;
3. gastroesophageal reflux disease.

4. Which of the following diseases is necessarily accompanied by pancreatic involvement?

1. colitis;
2. cystic fibrosis;
3. esophagitis;
4. gaucher's disease;
5. scarlet fever.

5. Which disease accompanied by malabsorption syndrome is characterized by steatorrhea?

1. lactose intolerance;
2. celiac disease;
3. cystic fibrosis;
4. exudative enteropathy.

6. In which disease is a flat sugar curve observed after lactose loading?

1. intolerance to cow's milk protein;
2. lactose intolerance;
3. cystic fibrosis;
4. celiac disease.

7. Which disease accompanied by malabsorption syndrome is characterized by pseudonephrotic edema?

1. lactose intolerance;
2. sucrose intolerance;
3. exudative enteropathy;
4. intolerance of cow's milk protein.

8. Signs of intrauterine hypotrophy are all of the following except:

1. reduced nutrition;
2. profuse lanugo on the skin;
3. dystrophic changes in the skin.

9. The clinical symptoms of grade 3 hypotrophy are:

1. vomiting;
2. body weight deficit of more than 20%; 3.
3. anorexia;
4. normal character of stools.
10. Nutritional correction in paratrophy is indicated by:
 1. calculation of proteins per actual weight;
 2. calculation of carbohydrates per actual weight;
 3. calculation of fats per actual weight.

Answers:

1 - 1; 2 - 1; 3 - 1; 4 - 2; 5 - 3; 6 - 2; 7 - 3; 8 - 2; 9 - 2; 10 - 1

Forms of USRS performance control:

1. *checking and evaluating the abstract on the given topic;*
2. *checking and evaluating the correctness of solving situational tasks;*
3. *test control.*

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