BOHOMOLETS NATIONAL MEDICAL UNIVERSITY

GUIDELINES
for practical classes
for students

Educational discipline: «Pediatric gastroenterology, pulmonology and nephrology»

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 on August 26, 2024, protocol No. 1

Considered and approved by: Cyclic methodological commission for pediatric disciplines

dated August 29, 2024, protocol No 1

Subject of the lesson:

" Cystic fibrosis and undernutrition "

Competencies:

Ability to collect medical information about the child and analyze data (complaints, life history, medical history)

The ability to distinguish and identify leading clinical symptoms and syndromes in cystic fibrosis and protein-energy deficiency in children.

Ability to determine the necessary list of laboratory and instrumental studies for cystic fibrosis and protein-energy deficiency in children and evaluation of their results.

The ability to determine the necessary list of laboratory and instrumental studies for the diagnosis of cystic fibrosis and protein-energy deficiency in children and to evaluate their results.

The ability to establish a preliminary and clinical diagnosis of cystic fibrosis and protein-energy deficiency in children.

Ability to determine the principles and nature of treatment for cystic fibrosis and protein-energy deficiency in children and prevention of these diseases.

Ability to diagnose emergency conditions.

Ability to determine tactics and provide emergency medical care.

Ability to abstract thinking, analysis.

The ability to master and process modern knowledge.

Understanding the peculiarities of working with children of different ages.

The ability to make decisions when studying the discipline "Fundamentals of pediatric gastroenterology, pulmonology and nephrology"

The purpose of practical class

Formation of students' professional competencies for achieving program learning outcomes by controlling the initial level of knowledge in the process of discussing theoretical issues and testing, performing practical tasks and conducting control of the final level of training in solving situational problems on diagnosis, treatment and prevention of cystic fibrosis and undernutrition

Equipment: PC with appropriate information support, reference materials, methodological recommendations, extracts from medical histories, a set of laboratory test results, manikin.

Lesson plan and organizational structure

Stage name	Description of the stage	Levels of assimilation	Timing

| Prepa-ratory | - Organizational issues
- Learning motivation:

Cystic fibrosis is the most common hereditary orphan disease with an autosomal recessive type of inheritance, a universal multisystemic exocrinopathy. The main manifestations of CF are: a chronic obstructive process in the respiratory tract, which is accompanied by recurrent bacterial infection; violation of the digestive system with insufficiency of the exocrine function of the pancreas; by increasing the content of electrolytes in sweat fluid; obstructive azoospermia in men caused by congenital bilateral agenesis of the vas deferens. Undernutrition is an imbalance between the intake and need for nutrients, which leads to a cumulative deficiency of energy, protein or trace elements, which can negatively affect the growth and development of the child (definition adopted by the Academy of Nutritionists and nutritionists, the American Academy of Pediatrics, the American Society for Parenteral and Enteral Nutrition (ASPEN)). Undernutrition manifests as a complex violation of homeostasis in the form of changes in basic metabolic processes, water-electrolyte imbalance, body structure changes, nervous regulation disorders, endocrine imbalance, suppression of the immune system, dysfunction of the gastrointestinal tract and other body systems.
Control of the initial level of knowledge - test control and oral survey.
Examples of test tasks:
1. Which study most informatively reflects the functional state of the body when the food load increases during undernutrition diet therapy:
A. General blood analysis
B. General analysis of urine
C. Co-program
D. Determination of the protein spectrum of blood
E. Determination of total nitrogen and blood urea
2. Speed of body weight gain (children younger than 2 years old) with chronic undernutrition I stage: | Introductory

Reproductive | 15 min |

	A. < 75% of the expected increase B. < 50% of the expected increase C. < 25% of the expected increase D. < 90% of the expected increase E. < 95% of the expected increase **3. The period of establishing tolerance to food in mild undernutrition is:** A. 12 hours B. 1 day C. 1-2 days D. 2-4 days E. 3-5 days **4. What diet should be chosen in the first phase of diet therapy for severe undernutrition:** A. 6 times every 3.5 hours with a night break B. 7 times in 3 hours with a night break C. 8 times every 3 hours without a night break D. 10 times every 2 - 2.5 hours without a night break E. Continuous enteral tube feeding **5. A 4-month-old child was diagnosed with undernutrition of moderate severity. What range on the body mass-length graph do the anthropometric parameters of this child correspond to?** A. From -1 to -1.9 SD B. From -2 to -2.9 SD C. From -3 and below SD D. From 0 to -1 SD E. From -1 to -3 SD		
Main	Formation of professional competences: - demonstration of a thematic patient or review of extracts from medical histories of patients with cystic fibrosis and undernutrition - evaluation of the results of laboratory studies; - on the basis of anamnesis, data of a clinical examination and the results of laboratory studies, the establishment of a preliminary clinical diagnosis - determining of factors and pathogenetic mechanisms of disease development; - appointment of treatment and management of the disease;	Introductive Reproductive Creative Reproductive Creative Reproductive Creative	100 min

Final	Control of the final level of preparation Clinical cases **Task 1.** The child is 5 months old, weighs 5,000 g, and is 62 cm tall. The mother complains of reduced appetite, insufficient weight gain, frequent vomiting, poor sleep, restlessness. When examined, the skin is pale, dry; thinned subcutaneous fat layer on the trunk and limbs, reduced turgor of soft tissues. The reaction of the environment is reduced. The defecation is unstable (diarrhea-constipation). Pronounced frontal humps, costal rosaries, "Harrison's" furrow. It is known from the anamnesis that the child was born at 32-33 weeks of pregnancy with a weight of 2500 g, 47 cm, was fed through a tube with breast milk with the addition of mixtures of fortifiers. She was discharged in satisfactory condition while breastfeeding. At home, the mother did not use mixtures - fortifiers, fed 4-5 times a day. 1. Preliminary diagnosis. Justify. 2. How should a child be fed? 3. What laboratory tests should be prescribed? 4. What instrumental research methods should be prescribed? 5. What concomitant conditions must be treated? **Answer standard** Undernutrition III degree, the ratio of mass to growth in the range of -2 to - 2.9 SD, the child has been sick for more than 3 months, therefore БЕН is chronic. Control feeding, rule out hypogalactia in the mother. If the mother has a shortage of breast milk, transfer the child to mixed feeding. Add highly adapted mixture. Increase the number of feedings 8 times; the daily amount of food is ½ of what is appropriate for this age during the period of finding out tolerance to food, another half of the daily amount is supplemented with balanced electrolyte solutions. The period of ascertaining food tolerance lasts up to 7 days. In the second week, the volume corresponds to the daily age requirement. Gradually reduce the number of feedings, increase caloric intake. The calculation of food for proteins and carbohydrates	Creative	20 min

is carried out on the proper weight, and fats on the actual weight. Clinical blood analysis, clinical urinalysis, biochemical blood analysis (total protein, fractions, electrolytes, 25OH D, serum iron, transferrin), general urinalysis, co-program. Ultrasound of the abdominal cavity. Ultrasound examination of the abdominal cavity, fibrogastroduodenoscopy. Prescribe treatment of rickets and iron-deficiency anemia after improving nutrition..

Task 2. The boy is 3 months old, born at 38-39 weeks of pregnancy with a body weight of 2300, length of 47 cm, is on natural feeding. The pregnancy occurred against the background of fetoplacental insufficiency, the mother suffers from rheumatoid arthritis. In the 1st month, the weight gain is 400g, in the 2nd - 450g, in the 3rd - 500g. Defecation are unstable. At the time of examination, the child's weight is 3650 g, height - 53 cm. 1. Assess the physical development of the child, in case of detected violations, what pathology can this indicate? 2. What are the reasons for this condition? 3. Principles of treatment.

Answer standard
ratio of mass to height -2SD to -3SD, which indicates the II century. (moderate) chronic undernutrition. 2. Pathology of pregnancy (placental insufficiency), chronic illness of the mother led to delayed intrauterine development and impaired maturation of the digestive and nervous systems. 3. Control and analysis of actual nutrition once every 7-10 days. Treatment and prevention of hypoglycemia. Prevention and treatment of hypothermia. Correction of electrolyte imbalance. Prevention of infection. Correction of micronutrient deficiency. Balanced diet therapy (on the 1st day of treatment, the daily amount of food corresponds to ½ of the age norm (75-80 kcal/kg/day; protein 1.5 g/kg/day), the number of feedings is 8, another half of the daily amount is supplemented by of balanced electrolyte solutions; 7 days. Control feedings, rule out

hypogalactia in the mother. If the mother has a shortage of breast milk, transfer the child to mixed feeding. Add a highly adapted mixture. Gradually reduce the number of feedings, increase caloric intake. Calculation of nutrition based on proteins and carbohydrates is carried out for the appropriate weight, and fats on the actual.

Task 3. The boy is 9 months old. From the first weeks of life, a constant cough, sputum does not flow well, decreased appetite, diarrhea bothers. Child from the second full-term pregnancy, weight - 3200 g, height - 52 cm at birth. It is known from the anamnesis that there was meconium ileus during the newborn period. Diarrhea was observed periodically. Tests for a group of intestinal infections are negative. On examination: cyanosis of the nasolabial triangle, dry, pale skin. Over the lungs - percussion shortening of the percussion sound in the lower parts of the chest, auscultation - a large number of wet and dry rales. Heart sounds are rhythmic, weakened. The abdomen is soft, the liver +3 cm protrudes from under the edge of the right costal arch. Excretions are liquid, oily. Diuresis corresponds to age. Weight - 7200 g, height - 66 cm. 1. Evaluate physical development by the method of standard deviations (weight for age, weight-to-length ratio). 2. What is the previous diagnosis? 3. What examinations must be prescribed to confirm the diagnosis?
Answer standard
Weight for age -1.1 SD-2.0SD, ratio of mass to length in the interval -1.1 to -2.0 SD, which corresponds to the 1st degree of chronic BEN. Cystic fibrosis (mixed form), CKD. Determination of the content of chlorides in a sweat sample (according to Gibson-Cook), co-program, determination of fecal pancreatic elastase-1 activity, genetic examination, X-ray/MRI/CT of chest organs

General assessment of educational activity

Recommended Books

1. Nelson Textbook of Pediatrics, 2-Volume set, 21-th edition. By Robert M. Kliegman, Bonita M.D. Stanton, Joseph St. Geme and Nina F Schor. – Philadelphia, PA : Elsevier Inc., 2020 - 4264 p. (pp. 2282-2297)
ISBN-10 : 032352950X ISBN-13 : 978-0323529501

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. 36-50) : il. ISBN 978-966-382-690-5

Questions for student self-preparation for practical classes

1. Etiology and pathogenesis of CF
2. Name the main clinical manifestations of CF depending on age
3. Criteria for diagnosis of CF
4. Diagnosis of exocrine pancreatic insufficiency
5. Make a plan for laboratory and instrumental examinations of a patient with suspected CF
6. Basic principles of treatment of CF patients
7. Prevention of CF
8. Name the main causes of undernutrition in young children.
9. Define the main clinical syndromes in undernutrition in young children.
10. Describe the clinical features of undernutrition of different degrees of severity
11. Determine the schemes of dietary therapy and drug therapy of undernutrition of various degrees of severity in young children.

Methodical guidelines have been created as.prof. Horobets N.I., as prof. Iemets O.V.