**Methodical instruction to lesson №1.**

**Topic:** Human nutrition as a science.

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** Everyone needs air, water, and food. Food provides energy without which life is impossible. Health and well-being depend on the completeness of nutrition. Healthy and varied food can prevent the development of many diseases. And the successful treatment of existing diseases is also inconceivable without useful products for the body. In addition, delicious food is one of life's greatest pleasures

**Goal.** • To study the impact of nutrition on the vital functions of the human body.

• Study of energy components of food (proteins, fats, and carbohydrates).

• Study of the effects of food anti-food substances on human health.

• Study of the impact of biologically active and ballast substances on human health.

**Specific goals**

**The student must know:**

1. What is food, nutrients, and other substances they contain, their action, interaction, and balance in a healthy or sick person (nutrition),

2. Dietary requirements for maintaining the health and development of the body,

3. Processes of consumption, digestion, absorption, transport, utilization, and excretion of food substances.

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Materials which might be helpful.**

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №2 .**

**Topic:** Basic requirements for the organization of nutrition of a sick child. Characteristics of therapeutic diets.

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** In the treatment of a sick child, one of the most important places is occupied by the relevant disease and individual nutritional needs. Adequate physiological capabilities of therapeutic nutrition helps to restore the functional state of organs and systems, creates conditions for further recovery of the child.

**Goal.** To study the basic requirements to the organization of food of the sick child, to study characteristics of medical diets, to be able to appoint the diet corresponding to the child's disease.

**Specific goals**

**The student must know:**

1. Basic requirements for the organization of nutrition of a sick child
2. The role of diet therapy in the treatment of diseases of organs and systems of the child
3. The role of diet therapy in the treatment of diseases of the gastrointestinal tract
4. The role of diet therapy in the treatment of enzymopathies
5. Influence on features of diet therapy of age, features of diseases
6. Features of medical diets, its characteristics, indications for its purpose

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Materials which might be helpful.**

**FEEDING A SICK CHILD**

**MAIN REQUIREMENTS FOR FEEDING A SICK CHILD**

Proper nutrition of a sick child is one of the major links in the common set of therapeutic measures. Therapeutic nutrition which based on pathogenesis of disease, age of the child and child-development features, also has properties to normalize disturbed metabolic processes in the body, compensate for necessary energy expenditure by supplying appropriate nutrients, boost the immunity, eliminate the pathological process and restores the health.

However, in different diseases, the role of therapeutic nutrition is ambivalent. In some cases, therapeutic nutrition is the only way of treatment, without which no other therapy will give the desired result. This group of diseases includes congenital metabolic disorder and enzyme systems, such as enzymopathy. In such cases only a special diet can prevent the development of profound mental retardation, disability of the child or prevent fatal outcome.

In other cases, therapeutic nutrition is one of the main methods of treatment, and without it other therapeutic measures are ineffective. This group of diseases includes allergies, and primarily, food allergies, as well as obesity, diabetes, chronicgastrointestinal*,* liver*,* kidneysdiseases, and others.

Finally, the therapeutic nutrition, in a number of pathological conditions, in cases when it not a decisive factor in the treatment of the disease, mainly helps to determine the overall course of metabolism, contributes to increase protective reactions, thus ensuring the effectiveness of therapy. The last group of diseases includes cardiovascular system pathology, respiratory system and musculoskeletal system.

Dietetic therapy is one of the main pathogenetic approaches to treating all diseases.

In the pediatric practice, therapeutic nutrition should, first of all, meet the child's needs for basic nutrients and energy, and the therapeutic effect of the diet is determined by qualitative changes in the diet due to the special selection of products and the nature of their culinary processing.

It should always keep in mind that long-term deficiency in the main food ingredients and one-way nutrition has an extremely negative effect on the health of the child, especially at an early age, which is characterized by intense metabolic and energy processes, and they ensure its normal growth and development.

When drawing up therapeutic diets for sick children, the following factors should be taken into account: the age and level of physical development of the child, the nature of the disease, its pathogenesis, features of metabolic disorders, the form and stage of the disease, the existence of complications and comorbidities. In the children's in-patient department, something or other therapeutic nutrition is indicated by a diet number, that corresponds to the accepted numbering of diets in the dietetics of adults.

Each therapeutic diet has its own characteristics and includes indications for prescription, the purpose, general characteristics due to its energy value, chemical composition, a set of products, methods of culinary processing, and diet.

**The diet of a sick child**

Adherence to a proper diet is a very important factor in the treatment of sick children, especially young children.

With any pathology, a regular intake of food is necessary, which determines the normal functioning of the digestive system, sufficient production of digestive juices and ferments, optimal provision of the body's metabolic energy costs, which are often increased due to the disease.

For infants, as a rule, it is necessary to maintain the habitual rhythm of diet, established for the disease. During breast-feeding, the child can be on a free feeding schedule and fed on demand, if there are no special indications for metered nutrition. For children who have supplemental feeding, it is supposed to switch to an hourly feeding schedule. Feeding must be 5 or 6 times a day.

For children older than 1 year, the diet is most often established with food intake 4-5 times a day. At the same time, the frequency of food intake is largely determined by the nature of the pathological process, the severity and stage of the disease. In the acute period of the disease, especially in acute enteric infections, vomiting, dyspeptic symptoms, febrile states, the development of toxicosis, an individual diet is established, in which the frequency of meals can reach 8-10 times a day.

The diet provides not only for determining the frequency of meals and determining the hours of feeding but also the rational distribution of daily calories between meals. With the usual general diet in children’s in-patient department, the following distribution of daily caloric intake is adopted:

- breakfast - 25%,

- lunch - 35%,

- afternoon luncheon - 10%,

- dinner - 25%,

- before bedtime - 5%.

Intervals between food intakes should not exceed 4 hours. The deviation from the set time should be no more than 15-30 minutes. This has both physiological and psychological significance because while maintaining constant intervals between feedings, the child regularly develops a feeling of hunger, accompanied by increased secretion of digestive juices, and a certain interest in food intake appears.

At the same time, the hours and the number of feedings of sick children largely depend on the child's condition, the prescribed diet, and the existence of complications. The question of the necessary diet is decided strictly individually with the development of toxicosis, nausea, vomiting.

**CHARACTERISTICS OF THERAPEUTIC DIETS**

**BASIC DIET -** Most children during in-patient treatment need a complete diet that satisfies the physiological needs of the child in energy and essential nutrients-proteins, fats, carbohydrates, vitamins, minerals, and meets the requirements of a balanced diet. Children can receive such a diet either from the moment of admission to the hospital or after a certain period of dietetic nutrition, in the phase of convalescence.

Indications for diet №15: it's a general diet for children from 1 year to 14 years for various diseases from the moment of admission to the in-patient hospital, when there is not sufficient need for therapeutic nutrition, as well as at the stage of recovery at the end of the diet.

Special Purpose: ensuring the age-related physiological needs of the child in main nutritional ingredients and energy.

General characteristics: diet is complete, physiological; represented by a wide assortment of dishes from various meat, fish, dairy products, cereals, vegetables and fruits, bakery products. Replacement of missing products in the menu is carried out only with products of equivalent chemical composition according to the product replacement table.

Culinary processing of products: conventional, age-appropriate.

Diet: food intake 4-5 times a day.

**Diet for patience with gastroduodenal diseases.**

*Indications*: 1) gastroduodenal ulcer in the recovery period after an acute exacerbation and in cases of a mild exacerbation; 2) a mild exacerbation of chronic gastritis with preserved or increased secretion; acute gastritis during the recovery period;

*Special Purpose*: providing the physiological needs of the body with high-grade proteins and vitamins, promoting the repair of the gastrointestinal mucosa, healing ulcers, and erosions. Reducing the negative impact of the acid-peptic factor on the mucous membrane of the gastro-duodenal zone by excluding strong secretagogues of gastric acid, mechanical sparing and fractional diet.

*Purpose of the appointment*: contributing the healing of ulcers, erosions. Reducing the inflammatory process of the mucous membrane of the upper part of the digestive tract by normalizing the repair processes of the mucous membrane. Reducing the excitation of the receptor apparatus and the mucous membrane of the stomach and duodenum. Regulation of the secretory and motor functions of the stomach. Full providing of the physiological requirements of the body for nutrient materials.

*General characteristics:* a diet with a physiological maintenance of proteins, fats, carbohydrates and a moderate restriction of sodium chloride. Restriction of chemical and mechanical provocatives of the mucous membrane, the receptor apparatus of the upper part of the digestive tract, stimulants of gastric secretion, substances that linger in the stomach for a long time.

*Culinary processing*: dishes are mainly in pureed form, boiled in water or steamed. Very hot and cold dishes are excluded. The removal of nitrogenous extractive substances is provided.

*Die*t: 5-6 warm dishes per day . There are 2 diet options, with pureed and solid food. The variant with pureed food is prescribed for 3-4 weeks, and with solid food for 2-3 years.

**Diet in acute period of the disease**

*Indications:* 1) peptic ulcer of the stomach and duodenum during a period of acute exacerbation with severe symptoms of an irritated stomach (in the first 6-8 days of treatment); 2) a sharp exacerbation of chronic gastritis in the first days of treatment; 3) acute gastritis on the 2-4th day of treatment; other diseases in accordance with the intended purpose of the diet; 4) gastroduodenal bleeding after the disappearance of signs of profuse bleeding 5) chemical burns of the esophagus.

*Purpose of appointment:* Promoting the healing of ulcers and erosions, reducing the inflammatory process of the mucous membrane of the upper digestive tract by normalizing the processes of reparation of the mucous membrane and reducing irritation of the receptor apparatus of the stomach and duodenum, regulation of the secretory and motor functions of the stomach. Providing the physiological needs of the body in nutrients in conditions of strict bed rest. Reducing the excitability of the autonomic nervous system.

*General characteristics:* a diet with a physiological content of proteins and fats, restriction of carbohydrates and sodium chloride, a sharp restriction of chemical and mechanical irritants of the mucous membrane and receptor apparatus of the upper digestive tract and substances that linger in the stomach for a long time, stimulants of gastric secretion.

*Culinary processing:* food is prepared in pureed form, boiled in water or steamed, given in liquid or mushy form. Hot and cold dishes are excluded.

*Diet:* 6 times a day in small portions in a warm form.

**Diet**  **during the period of subsidence of the disease**

*Indications:* 1) gastric ulcer of the stomach and duodenal ulcer or chronic gastritis in the case of attenuation of acute exacerbation; 2) acute gastritis; 3) chronic gastritis, gastroduodenitis during the period of exacerbation; 4) gastroesophageal reflux; 5) condition after abdominal surgery and tonsillectomy.

*Purpose of appointment:* promoting the healing of ulcers, erosions, reducing the inflammatory process of the mucous membrane of the upper digestive tract by normalizing the repair processes of the mucous membrane, reducing the irritation of the receptor apparatus and the mucous membrane of the stomach and duodenum, regulation of secretory and motor functions of the stomach. Providing the physiological needs of the body in nutrients in a semi-bed regime.

*General characteristics:* a diet with physiological content of proteins, fats, restriction

carbohydrates and sodium chloride, severe restriction of chemical and mechanical irritants of the mucous membrane and the receptor apparatus of the upper digestive tract, stimulants of gastric secretion, substances that linger in the stomach for a long time.

*Culinary processing:* all dishes are prepared in pureed form, boiled in water or steamed. The food is liquid, mushy.

*Diet*: 5-6 times a day in a warm form.

**Diet for patient** with secretory insufficiency

*Indications:* Chronic gastritis with secretory insufficiency in case of mild exacerbation and in the recovery stage after exacerbation;

*Purpose of appointment:* provide adequate nutrition. Moderately stimulate the secretory function of the digestive system, normalize the motor function of the digestive tract.

*General characteristics:* physiologically complete diet with moderate restriction of mechanical stimuli and moderate stimulation of the secretion of the digestive secretions. It is prescribed on average for 1-2 years.

*Culinary processing:* dishes of various degrees of grinding and heat treatment are allowed - boiled, stewed, baked, fried without the formation of a coarse crust (do not bread in breadcrumbs or flour). Products and dishes that linger in the stomach for a long time, which are difficult to digest, products that irritate the mucous membrane of the digestive tract, very hot and cold dishes are excluded.

*Diet:* 4-6 times a day in small portions, temperature is from 20 to 60 C.

**Diet for patient** with constipation

*Indications:* chronic bowel disease with constipation in the presence of a mild damping exacerbation and remission.

*Purpose of appointment:* normalization of the motor and evacuation functions of the bowel and the associated metabolic disorders in the body.

*General characteristics:* a physiologically complete diet with the inclusion of foods and dishes that enhance motor function and bowel emptying (vegetables, fresh and dried fruits, bakery products, cereals, dairy drinks, etc.). Exclusion of foods and dishes that increase fermentation and putrefaction in the bowel and adversely affect other digestive organs (products rich in essential oils, cholesterol, fried foods, etc.), strong stimulants of bile secretion, gastric and pancreatic secretion.

*Culinary processing:* Food is cooked mostly uncrushed, boiled in water or steamed, baked. Vegetables and fruits are raw and boiled. The diet includes first dishes, sweet dishes and drinks.

*Diet:* 4-6 times a day, food temperature is from 20 to 60 C. In the morning, c old water with honey or fruit and vegetable juices are desirable. Supper may include kefir, compotes of fresh or dried fruit, fresh fruit, prunes.

When preparing the diets of children on the diet №3, it is possible to use sets of products and approximately menu of diets №2 or 4B, expanding the range of vegetables and fruit.*55*

**Diet for patient with chronic bowel diseases with severe diarrhea**

*Indications:* acute diseases and acute exacerbation of chronic bowel diseases with severe diarrhea.

*Purpose of appointment:* to provide nutrition in case of digestive disorders, to reduce inflammation, fermentation and putrefactive processes in the bowel, to promote the normalization of the functions of the bowel and other digestive organs.

*General characteristics:* a diet with normal protein content and low energy value due to fats and carbohydrates. Mechanical, chemical and thermal stimuli of the digestive tract are sharply limited. Foods and dishes that increase the secretion of digestive organs, fermentation and putrefaction in the intestine are excluded. Appointed for 1-3 days during the period of diarrhea.

*Culinary processing:* liquid, semi-liquid, pureed, boiled in water or steamed dishes. Very hot and cold dishes are excluded.

*Diet:* 5-6 times a day in small portions in a warm form.

**Diet for patient with acute intestinal diseases in case of mild exacerbation**

Indications: 1) acute intestinal diseases during the period of improvement; 2) chronic intestinal diseases after acute exacerbation or in case of mild exacerbation.

Purpose: to provide balanced nutrition in conditions of moderately impaired digestion, to reduce inflammation and normalize the functions of the intestine and other digestive organs.

General characteristics: a balanced diet in terms of energy and chemical composition with a small increase in protein content. Moderately limited mechanical and chemical irritants of the mucous membrane of the digestive tract. Products and dishes that increase putrefaction and fermentation in the intestines, as well as those products that dramatically stimulate the secretion of the stomach, pancreas, bile and irritate the liver, are excluded.

Cooking: dishes half-grated and chopped, boiled in water or steamed. Hot and cold dishes are excluded.

Eating: 6-7 times a day. The dish is served warm.

**Diet for patient with acute intestinal diseases in the recovery period**

Indications: 1) acute intestinal diseases in the recovery period as a transition to a balanced nutrition; 2) chronic intestinal diseases in the period of recovery after exacerbation and remission.

Purpose: to provide balanced nutrition in case of some insufficiency of intestinal functions, to promote the restoration of intestinal functions and the activity of other digestive organs.

General characteristics: physiologically complete diet with a small increase in protein content and moderate restriction of sodium chloride, mechanical and chemical irritants of the mucous membrane of the digestive tract. Products and dishes that increase putrefaction and fermentation in the intestine, its secretory and motor function, stimulate the secretion of the stomach, pancreas, bile and irritate the liver, are excluded.

Cooking: dishes are not chopped, but boiled in water or steamed, baked. The temperature of the food is normal.

Eating: 5-6 times a day. Dishes are served warm.

**Diet** **for patient with liver pathology**

Indications: 1) acute hepatitis and cholecystitis in the recovery stage; 2) chronic hepatitis without exacerbation; 3) cirrhosis of the liver without its insufficiency; 4) chronic cholecystitis or gallstone disease without exacerbation.

Purpose: chemical sparing of the liver with a balanced diet, to promote the normalization of liver function and biliary tract, to improve bile secretion.

General characteristics: physiologically normal content of proteins and carbohydrates with a slight restriction of fats (mostly refractory). Excludes products and dishes rich in nitrogenous extractives, purines, oxalic acid, cholesterol, essential oils and fat oxidation products formed in fried products. Increased content of lipotropic substances, fiber, pectins, vitamins, fluids. Appointed for an average of 1-3 years.

Cooking: boiled or steamed, baked, occasionally – stewed dishes. Only lean meat and high-fiber vegetables can be mashed; flour and vegetables are not sauteed. Very cold dishes and spices are excluded.

Eating: 5-6 times a day in small portions. Dishes are served warm.

**Diet** **for patient with liver pathology in acute period**

Indications: 1) acute hepatitis and cholecystitis; 2) exacerbation of chronic hepatitis, cholecystitis and gallstone disease; 3) cirrhosis of the liver with moderate insufficiency; 4) chronic hepatitis or cholecystitis in combination with ulcer, severe gastritis, enterocolitis with diarrhea.

Purpose: chemical, mechanical and thermal sparing of all digestive organs, ensuring maximum rest of the liver. To contribute to the normalization of impaired liver and bile ducts.

General characteristics: the diet is limited to fats (mostly refractory), proteins and carbohydrates are within the physiological norm. Products and dishes rich in extractives, purines, oxalic acid, cholesterol, crude fiber and fried food are excluded. Increased content of lipotropic substances, vitamins, fluids. Prescribed for an average of 4-6 weeks.

Cooking: dishes are boiled or steamed, grated. Food is served warm, cold dishes are excluded.

Eating: 5-6 times a day in small portions, dishes are served warm.

When compiling the diets for ill children who are on the diet №5a, you can use sets of products and menu, which are recommended in the diet №5, using a more delicate cooking.

**Diet for patient with pancreas pathology**

Indications: acute and chronic pancreatitis in the acute phase.

Purpose: to normalize the function of the pancreas, to provide mechanical and chemical sparing of the stomach and intestines, to reduce the excitability of the gallbladder, to prevent fatty infiltration of the liver and pancreas.

General characteristics: diet with high protein content, reduction of fats and carbohydrates, in particular, sugar. Products and dishes rich in extractives, purines, oxalic acid, cholesterol, essential oils, crude fiber, fried food are excluded. Increased content of lipotropic substances and vitamins.

Cooking: dishes boiled or steamed, baked, mostly rated or chopped. Hot and very cold dishes are excluded.

Eating: 5-6 times a day in small portions, dishes are served warm.

When preparing diets for ill children who are on the diet №5p, you can use food of products and an approximate menu of the diet №5, excluding raw vegetables (cauliflower), concentrated fruit and vegetable juices, sweets.

**Diet for patient with kidney pathology**

Indications: acute and chronic glomerulonephritis in the active stage of the disease; initial (tubular) stage of chronic renal failure; hyperuria.

Purpose: reduction of the inflammatory process in the kidneys by limiting the protein load, preventing disease progression; reduction of hypertensive and edematous syndromes; reduction of hyperazotemia; correction of electrolyte disturbances and acid-base balance.

General characteristics: diet of high caloric value due to easily digestible carbohydrates and vegetable fats; salt-free, dairy-vegetable, potato-egg; protein of animal origin is limited by 30% of the age physiological norm due to the exclusion of meat, poultry, fish, cheese. Children with decreased appetite, anorexia (during the abolition of prednisolone) and individual intolerance of chicken eggs are temporarily allowed to replace it with cheese, boiled meat, fish (not more than 50 g per day).

Сaloric value and chemical composition: proteins 80 g (50-60% - animal), fats 90-100 g (25% -vegetables), carbohydrates 400-450 g (80-90 g of sugar), 2700-2900 kcal. Free liquid - 0.9-1.1 liters. Vitamins C, P and vitamins of group B are given in increased amounts.

Cooking: when cooking, chopping, grading, boiling to softness, quenching, mashing, frying, baking are allowed; dishes are prepared without salt.

Eating: fractional, 4-5 times a day; food temperature from 20 to 600C.

**Diet for patient with obesity**

Testimony: obesity of different etiology.

Purpose of setting: warning and removal of surplus deposit of fatty fabric is in an organism; decline of appetite; normalization of processes of exchange of matters, in the first turn – lipid.

General description: diminishing of power value of ration due to carbonhydratess, especially such, that mastered easily, and by a less measure — fats, foremost animal, in the case of normal or insignificantly enhanceable content to the albumen. Limitation of free liquid, sodium of chloride and products and foods which excite an appetite. Increase of content of food fibres. Duration of diet is individual depending on the rates of decline of b.w.

Culinary treatment: foods prepare boiled, stewed, baked. The wiped and chopped wares fried, are undesirable. The temperature of meal is ordinary.

Diet: 5-6 times on a day with a sufficient volume for feeling of saturation.

**Diet for patient with diabetes**

Testimony: saccharine diabetes

Purpose of setting: instrumental in normalization of carbohydrate exchange and warn violation fatty, water-salt and proteometabolism, to define tolerance to the carbonhydratess, what amount of carbonhydratess is mastered.

General description: diet with the mildly diminished power value due to легкозасвоюваних carbonhydratess and fats, foremost animal, at normal or insignificantly enhanceable content of albumen. Squirrel meet a physiology standard. Sugar and sweetnesses is eliminated. Mildly limited content of sodium of chloride, cholesterol, extract matters. Megascopic content of ліпотропних matters, vitamins, food fibres (cheese, unfat fish, морепродукти, green-stuffs, fruit, groats from whole grain, bread from the flour of rough grade). For sweet foods and drinks is ксиліт or Sorbitum, which take into account the power values of diet.

Culinary treatment: foods it is desirable boiled and baked, rarer — stewed and fried. The temperature of meal is ordinary.

Diet: 5-6 times on a day with the even distributing of carbonhydratess*.*

At drafting of rations of children, which are on a diet №9, it is possible to draw on the set of products and approximate menu of diet №8, except carbonhydratess, replacing them products, rich on food fibres.

**Diet** **for patient with cardio pathology**

Testimony: disease of the серцево-судинної system with insufficiency of circulation of blood, hypertensive illness of II-III of the stages, rheumatism (active phase), heterospecific поліартрит

Having a special purpose setting: proceeding in the broken circulation of blood; normalization of arteriotony, function of buds to the exchange of matters.

General description: a diet is with physiology content of all food matters and energy, decline of amount of culinary salt, free liquid. Content of salts to potassium is megascopic, magnesium, ліпотропних matters. Eliminate extract matters, refractory fats, products which cause flatulence. Terms of setting are individual depending on a dynamics diseases.

Culinary treatment: dishes boil, extinguish, prepare on a pair, без. A meal is given in the unwiped kind, but well boiled by soft or finely shredded.

Diet: a meal is given 5 times per a day, temperature of it -від 20 to 60 'С.

At drafting of rations of children which are on a diet № 10, it is possible to draw on the sets of products and exemplary menus of diet № 5, limiting culinary salt, including products, rich in potassium, magnesium, cellular shells, ліпотропними matters, vitamins.

**Diet for weakened patients** Testimony: tuberculosis, anaemias, exhaustions, is after infectious diseases.

Purpose of setting: increase of level of general feed and immunological reactivity of organism, резистентності in relation to chronic infections, stimulation of processes of assimilation and репарації, normalization of нутритивного status.

General description: a power value, megascopic content of albumens of animal origin, vitamins, mineral matters, is enhanceable (iron, calcium, phosphorus). Culinary treatment: various without limitations.

Diet: 5 times on a day. At drafting of rations of children which are on a diet № II, it is possible to draw on the set of products, exemplary menu and products which are recommended, and dishes of diet № 15, accordingly increasing the amount of high-protein products.

An increase of albuminous component of diet is on 15 % it can be attained by additional introduction of kefir (for 200 мл for every age-related group), cheese (30 gs for children in age 3—6 and for 35 gs for the children of more senior age) and meat (20 gs for children 3—6 years, 30 and 40 gs accordingly for children 7-10 and 11- 14 years).

**Diet for patient with acute infectious diseases.**

Testimony: sharp infectious diseases.

Purpose of setting: strengthening of leadingout of toxins from an organism sick, maintenance of general forces of organism increase of his resistance of infection, diminishing of intoxication, щадіння organs of digestion in the conditions of the having a fever state and ліжкового mode.

General description: a diet provides the physiology necessities of patient; limitation of fat, sharp, salt and heavy digestive dishes with high maintenance of vegetable cellulose; increase of amount of vitamins and mineral matters; increase of amount of free liquid.

Culinary treatment: it is cooked in the chopped and wiped kind, cook in water or on a pair. Foods which are hardness overcooked are eliminated. Give foods hot (not below 55-500 С) or cold (not below 120 С).

Diet: 5-6 times on a day by small portions.

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №3.**

**Topic:** Features of breastfeeding. Lactation. Quantitative and qualitative characteristics of breast milk. Breastfeeding technique. Advantages of breastfeeding. The technique of application to the breast. Basic rules for feeding.

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** Breastfeeding is the feeding of a young child exclusively with breast milk, both directly from the breast and expressed. Many factors can affect the beginning and duration of breastfeeding, namely: cultural traditions, education and desires of the mother, the attitude of family members and friends. As a health professional, you play an important role in counseling, educating, and supporting the nursing mother.

**Goal:**

1. characterization and analysis of the importance of a balanced diet;
2. rules of diet;
3. the impact of environmental factors on food quality.

**Specific goals**

**The student must know:**

1. make a diet for people of different ages;
2. draw up a plan for organizing the regime for people of different ages;
3. feed sick children and adults of different ages.

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Materials which might be helpful.**

Types of feeding

1. Natural (breastfeeding).

2. Artificial feeding.

3. Mixed feeding.

Breastfeeding is the feeding of a young child exclusively with breast milk, both directly from the breast and expressed.

Many factors can affect the beginning and duration of breastfeeding, namely: cultural traditions, education and desires of the mother, the attitude of family members and friends. As a health professional, you play an important role in counseling, educating, and supporting the nursing mother.

Traditional medical practices involving the separation of mother and child, late onset of breastfeeding, breastfeeding at certain intervals, the appointment of additional fluids negatively affected the formation of lactation and led to a decrease in breastfeeding in most developed countries. It was these circumstances that prompted the WHO and the International Children's Fund in the early 1990s to develop and disseminate the Child-Friendly Hospital initiative worldwide.

This program has been widely implemented in maternal and child health care institutions of Ukraine since 2004.

**Normative and legal documentation regulating modern breastfeeding:** Order of the Ministry of Health of Ukraine dated 31.07.2006 №529 / 49 “On approval of the sectoral program Support of breastfeeding in Ukraine for 2006-2010.” ;

• Order of the Ministry of Health of Ukraine dated 20.03.2008 №149 “On approval of the clinical protocol of medical care for a healthy child under three years of age”;

• Order of the Ministry of Health of Ukraine dated 04.08.2006 №540 “On approval of the principles of breastfeeding support, criteria and procedure for assessment of a health care institution for compliance with the status of“ Child-friendly hospital ”;

• Order of the Ministry of Health of Ukraine dated 28.10.2011. №715 “On further implementation of the expanded initiative“ Child-Friendly Hospital ”in Ukraine”.

**12 principles of successful breastfeeding WHO and UNICEF**

**Each institution that provides obstetric services and supervises newborns has:**

1. Have a written policy in relation to the practice of breastfeeding and regularly bring it to the attention of all health personnel.

2. Train all health personnel in the necessary skills to implement this policy.

3. Inform all pregnant women about the benefits and methods of breastfeeding.

4. Help mothers start breastfeeding within the first 30 minutes after delivery.

5. Show mothers how to breastfeed and how to maintain lactation, even if they need to be separated from their children.

6. Do not give newborns any food or drink other than breast milk, except in cases of medical indications.

7. Practice round-the-clock joint placement of mother and newborn in one ward.

8. Encourage breastfeeding at the request of the child.

9. Do not give newborns who are breastfeeding, any artificial means (imitating the breast or soothing).

10. Encourage the establishment of breastfeeding support groups and refer mothers to these groups after discharge from hospital or clinic.

11. Compliance with the international code of marketing of breast milk substitutes.

12. Practice of family childbirth (preparation of partners and assistance to women during childbirth). Free visit of the mother (mother) and the child in the department of joint stay.

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №4 .**

**Topic:** Nutrition with cardiovascular pathology.

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** In the treatment of the patient, one of the most important places is nutrition in cardiovascular pathology. Adequate physiological nutrition helps to restore the functional state of organs and systems, creates conditions for the treatment of the disease.

**Goal**

1. To study the basic requirements for the organization of nutrition of patients with cardiovascular pathology, to be able to prescribe an appropriate diet.
2. Pathogenetic chains of development of defeat of nutritious disturbances at cardiovascular pathology.
3. The main principle and tasks of food at cardiovascular pathology.
4. The list of the products recommended at cardiovascular pathology.

**The student must know:**

1. Etiological factors of cardiovascular pathology
2. Pathogenetic chains of development of lesions of eating disorders in cardiovascular pathology
3. The basic principle and task of nutrition in cardiovascular pathology
4. The list of products recommended for cardiovascular diseases
5. The student must be able to:
6. Prescribe food for cardiovascular disease
7. Give advice on dietary restrictions
8. Assign and specify the duration of the diet 10
9. Assign water-salt regime in cardiovascular pathology

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Tasks for independent work to prepare students for the lesson:**

1. Theoretical questions for the lesson:
2. The main symptoms of cardiovascular pathology
3. Stages of nutrition in cardiovascular pathology
4. The list of products recommended for cardiovascular diseases
5. List of products that are not recommended for cardiovascular disease
6. The initial level of knowledge and skills is tested in solving test questions, design issues.

**Materials which might be helpful.**

Therapeutic nutrition is a very important link in the overall treatment of patients with disorders of the cardiovascular system. Diet therapy for this pathology should help restore impaired circulation, normalize renal function, eliminate metabolic disorders.

The main **purpose** of diet therapy is to restore the disturbed metabolism in the heart muscle, increase myocardial contractile function, fight edema. In addition, the diet should create anti-inflammatory and anti-allergic effects and sufficiently provide the growing body with all the essential nutrients.

The **protein** content in the diets of these patients should meet physiological standards, of which 50-60% should be proteins of animal origin. It is important that at least 1/4 of animal protein accounted for dairy products.

No less important is the **fat component**. It was found that polyunsaturated fatty acids enhance cholesterol metabolism, largely ensure the normal functioning of the heart muscle, affect the stabilization of cell membranes of cardiocytes. This necessitates sufficient introduction into the diet of sick vegetable oils (for young children - at least 10 g per day, for older -up to 25 g). The total amount of fat in the diet is slightly limited due to refractory fats.

The **carbohydrate** component of the diet in cardiovascular diseases is formed mainly due to vegetables and fruits, as well as cereals such as buckwheat and oats, with a limitation of pasta, sugar, which simultaneously leads to a desensitizing effect.

At cardiovascular pathology deficiency of ions of **potassium** and **magnesium** is often observed.

Potassium salts increase diuresis, have a positive effect on the contractile ability of the myocardium. All this is the basis for the appointment of patients with diets high in potassium. From these positions, prunes "Prunes" ("Semper") are recommended for young children suffering from cardiovascular pathology. 100 g of puree contains 330 mg of potassium.

Magnesium salts, which have an antispastic and vasodilating effect, which help lower blood pressure and reduce the effects of hypercholesterolemia, also have a beneficial effect on the functions of the cardiovascular system.

Equally important is the sufficient intake of **calcium** salts in the body of a sick child, which is a regulator of neuromuscular excitability.

Given all the above, in the diet of a child with cardiovascular disease should be widely included milk and dairy products as the main sources of calcium salts, various vegetables, fruits, berries, rich in minerals and vitamins and are carriers of alkaline valences. Vegetables and fruits such as potatoes, cauliflower, carrots, parsley, apples, bananas, plums, apricots, peaches, black currants, dog rose, raisins, etc. are especially recommended.

Normal bowel function is ensured by the use of prunes, cabbage, beet, carrot juices. Bread should be made from whole meal flour.

Patients exclude broths, salty foods, smoked foods, spices, strong tea, chocolate, coffee, cocoa, which prevents their irritating effect on the cardiovascular and nervous systems and has an anti-allergic effect.

The amount of salt should not exceed 6-8 g / day.

The patient should receive food at least 5 times a day in appropriate amounts (excess food has a negative effect on the child's condition).

At development of insufficiency of blood circulation of the I-NA stage the diet is appointed.

At insufficiency of blood circulation of the IIB-III stage the diet № 10 with sharp restriction of table salt and free liquid is appointed (daily quantity of liquid is defined on the volume of urine allocated for the previous day).

Reduce one-time amounts of food while increasing the frequency of feedings. The caloric content of the diet is slightly reduced by reducing the amount of fat by 25-30% of the age norm and some restriction of carbohydrates. Once in 7-10 days recommend unloading low-sodium diets (dairy, fruit, vegetables).

One of the methods of treating **rheumatic fever** in children is medical nutrition.

Rheumatic fever is characterized by systemic connective tissue damage, increased capillary permeability, impaired immunological reactivity and functional state of the nervous system, general metabolic disorders.

Diet therapy for **rheumatic fever** is to prescribe a diet option № 10. In the acute period, it is necessary to fully meet the physiological needs of the body in energy and essential nutrients. The child's diet includes complete protein of animal origin. The amount of fat, as well as protein, must meet age-related physiological norms. Slightly increase the amount of vegetable fats - up to 30% of the total fat in the diet. The content of carbohydrates in the diet is reduced mainly due to refined sugars. Reduce the amount of salt, the total amount of liquid.

Spicy, salty dishes, extractives, strong tea, natural coffee, cocoa, various spices, seasonings are excluded from the diet of patients.

Fractional meals are recommended - up to 5-6 times a day, mainly in the morning and afternoon.

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №5 .**

**Topic:** Features of nutrition with chronic diseases of the pancreas.

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** In the treatment of the patient one of the most important places is nutrition with chronic diseases of the pancreas. Adequate physiological nutrition helps to restore the functional state of organs and systems, creates conditions for the treatment of the disease.

**Goal:** To study the basic requirements for the organization of nutrition with chronic diseases of the pancreas, to be able to prescribe an appropriate diet.

Pathogenetic chains of development of defeat of nutritious disturbances at chronic diseases of the

pancreas. The main principle and tasks of food at chronic diseases of the pancreas.

**The student must know:**

1. Etiological factors of chronic diseases of the pancreas
2. Pathogenetic chains of development of defeat of nutritious disturbances at chronic diseases of a pancreas
3. The main principle and objectives of nutrition in chronic diseases of the pancreas
4. List of products recommended for chronic diseases of the pancreas

**The student must be able to:**

1. Prescribe food for chronic diseases of the pancreas
2. Give recommendations on food restriction
3. Assign the duration of the 5P diet
4. Assign a period of fasting with significant pain

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Tasks for independent work in preparing the student for the lesson**

1. Theoretical questions for the lesson:
2. The main symptoms of chronic diseases of the pancreas
3. Stages of nutrition in chronic diseases of the pancreas depending on the severity of the disease
4. List of products recommended for chronic diseases of the pancreas
5. List of products that are not recommended for chronic diseases of the pancreas
6. The initial level of knowledge and skills is tested in solving test questions, design questions.

**Materials which might be helpful.**

The basis of dietary nutrition in pancreatitis is a diet for liver disease. The purpose of the pancreatic version of the diet is to ensure a sparing regime, the exocrine activity of the pancreas, mechanical and chemical sparing of the stomach, reducing the reflex excitability of the gallbladder.

To this end, the patient's diet excludes foods and dishes that are strong stimuli of digestive secretion, stimulants of bile secretion, and pancreatic secretion. Use sparing culinary processing: boiling, steaming, grinding of various degrees.

Stimulators of pancreatic secretion include sour foods and beverages, fats, fatty foods, raw vegetables and fruits, concentrated vegetable broths, vegetables, and fruit juices.

In the acute period of the disease, a diet is prescribed, which provides maximum functional rest to the pancreas and digestive organs of all levels. This excludes products that stimulate the production of digestive secretions, which contain crude fiber and cause flatulence. Raw vegetables, white cabbage in any form, raw berries and fruits, vegetable and fruit juices, sugar, and sugary substances (honey, jam, etc.) are prohibited.

You can use liquid and grated milk porridge from all cereals (except millet and pearl barley), milk (in dishes), cottage cheese, curd steamed souffle; soft-boiled eggs, steam omelet; slimy cereal soups on the water; meat and fish in the form of souffles, dumplings, steam cutlets; vegetables with crude fiber after heat treatment in the form of puree and steam puddings; ripe fruits and berries of sweet varieties (baked); unsweetened grated dried fruit compotes; jelly, jelly, mousse; unsweetened weak tea, alkaline mineral water, a decoction of dog-rose; butter (in ready meals); wheat crackers.

At a serious condition of the child, the existence of the expressed painful syndrome and intoxication appoint hunger for 1-2 days. In this case, it is recommended to take only 150-200 ml of liquid 5-6 times a day (borscht, weak tea, rosehip decoction). From the 3rd day, as the patient's condition improves, the diet is gradually expanded and within 3-5 days go on a diet , usually for 7-10 days. In the future, the patient is gradually transferred to the pancreatic version of the diet for liver disease, which differs from the main diet for liver disease in the absence of the menu of raw vegetable dishes, white cabbage in any form, vegetable juices, concentrated vegetable broths, and fruit juices. They give fruits and berries - only ripe, non-acidic varieties, without skin, both raw (in the grated form) and after heat treatment.

The pancreatic diet variant for liver disease can be used for a long time. Terms of dietary treatment are set in each case individually.

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №6.**

**Topic:** Features of nutrition with chronic diseases of the biliary tract and liver.

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** In the treatment of the patient one of the most important places is nutrition with chronic diseases of the biliary tract and liver. Adequate physiological nutrition helps to restore the functional state of organs and systems, creates conditions for the treatment of the disease.

**Goal.**

1. To study the basic requirements for the organization of nutrition of a patient with chronic diseases of the biliary tract and liver, to be able to prescribe an appropriate diet.
2. Pathogenetic chains of development of lesions of nutritional disorders in chronic diseases of the biliary tract and liver.
3. The main principle and task of nutrition in chronic diseases of the biliary tract and liver.
4. List of products recommended for chronic diseases of the biliary tract and liver.

**Specific goals**

**The student must know:**

1. Etiological factors of chronic diseases of the biliary tract and liver
2. Pathogenetic chains of development of defeat of nutritious disturbances at chronic diseases of bilious ways and a liver
3. The main principle and objectives of nutrition in chronic diseases of the biliary tract and liver
4. List of products recommended for chronic diseases of the biliary tract and liver

**The student must be able to:**

1. Prescribe food for chronic diseases of the biliary tract and liver
2. Give recommendations on food restriction
3. Assign a duration of diet 5a
4. Prescribe foods with lipotropic properties

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Tasks for independent work in preparing the student for the lesson**

**Theoretical questions for the lesson:**

1. The main symptoms of chronic diseases of the biliary tract and liver
2. Stages of nutrition in chronic diseases of the biliary tract and liver, depending on the severity of the disease
3. List of products recommended for chronic diseases of the biliary tract and liver
4. List of products that are not recommended for chronic diseases of the biliary tract and liver
5. The initial level of knowledge and skills is tested in solving test questions, design questions.

**Materials which might be helpful.**

Diet is widely used in the medical nutrition of children with chronic diseases of the hepatobiliary system.

The purpose of the diet - normalization of motor function of the gallbladder and bile ducts, improving the functional state of the liver, normalization of metabolic processes that accompany the underlying disease.

The main stimulants of bile include refractory fats (beef, lamb, pork, goose); - vegetable oil, eggs, raw vegetables, fruits, berries.

However, when compiling a specific treatment menu, it is necessary to take into account the nature of the disorders that occur dyskinetic. For patients with dyskinesia of hyperkinetic type, especially in the period of exacerbation, all stimulants of bile secretion are sharply limited.

In order to prevent possible liver dysfunction, in particular fatty infiltration, it is advisable to include in the diet of patients products with lipotropic properties. It is known that lipotropic substances promote the transformation of neutral fat into phospholipids and prevent the development of fatty degeneration of the liver.

Cheese, sour-milk products, buckwheat, and oat groats and dishes from them, meat and fish of low-fat grades, vegetable oils possess lipotropic properties.

The best outflow of bile is promoted by fractional food (5-6 times a day) at the same hours. Excessive food disrupts the rhythm of bile secretion, causes spasm of the bile ducts and the portal vein, a disorder of motor activity of the intestine, which ultimately provokes abdominal pain.

Diet is prescribed for an average of 1 year. With frequent recurrences and concomitant lesions of other digestive organs, the terms of dietary treatment are extended individually. Stable remission for 6-12 months provides a basis for a gradual expansion of the diet.

At an exacerbation of chronic cholecystitis, hepatitis, cirrhosis of a liver appoint the wiped variant of a diet with the wiped food by the food high-grade on chemical composition and power value.

Culinary processing of dishes of the diet in acute period of the disease provides, in addition to boiling and steaming, also wiping.

Diet in acute period of the disease is prescribed for an average of 4-6 weeks

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №7 .**

**Topic:** Features of nutrition with chronic intestinal diseases.

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** In the treatment of the patient one of the most important places is nutrition with chronic intestinal diseases. Adequate physiological nutrition helps to restore the functional state of organs and systems, creates conditions for the treatment of the disease.

**Goal.** To study the basic requirements for the organization of nutrition of a patient with chronic intestinal diseases, to be able to prescribe an appropriate diet.

**Specific goals**

**The student must know:**

1. Etiological factors from chronic intestinal diseases
2. Pathogenetic chains of development of lesions of nutritional disorders in chronic intestinal diseases
3. The main principle and task of nutrition in chronic intestinal diseases
4. List of products recommended for chronic intestinal diseases

**The student must be able to:**

1. Prescribe food for chronic intestinal diseases
2. Give recommendations on food restriction
3. Assign and specify the duration of the diet

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Tasks for independent work in preparing the student for the lesson**

1. Theoretical questions for the lesson:
2. The main symptoms of chronic intestinal diseases
3. Stages of nutrition in chronic intestinal diseases
4. List of products recommended for chronic intestinal diseases
5. List of products that are not recommended for chronic intestinal diseases
6. The initial level of knowledge and skills is tested in solving test questions, design questions.

**Materials which might be helpful.**

*Indications:* acute diseases and acute exacerbation of chronic bowel diseases with severe diarrhea.

*Purpose of appointment:* to provide nutrition in case of digestive disorders, to reduce inflammation, fermentation and putrefactive processes in the bowel, to promote the normalization of the functions of the bowel and other digestive organs.

*General characteristics:* a diet with normal protein content and low energy value due to fats and carbohydrates. Mechanical, chemical and thermal stimuli of the digestive tract are sharply limited. Foods and dishes that increase the secretion of digestive organs, fermentation and putrefaction in the intestine are excluded. Appointed for 1-3 days during the period of diarrhea.

*Culinary processing:* liquid, semi-liquid, pureed, boiled in water or steamed dishes. Very hot and cold dishes are excluded.

*Diet:* 5-6 times a day in small portions in a warm form.

**Tab.Approximate average daily set of products of diet**

|  |  |  |  |
| --- | --- | --- | --- |
| Product | Quantity (g, ml) for children aged | | |
| 3-6 | 7-10 | 11-14 |
| Сereals | 100 |  | 130 |
| Wheat flour | 5 | 7 | 9 |
| >> starch | 10 | 12 | 13 |
| Milk | 40 | 50 | 50 |
| Cheese | 60 | 70 | 80 |
| Sour cream | 2 | 3 | 4 |
| Butter | 15 | 20 | 20 |
| Egg (pcs) | 1 | 1 | 1 |
| Meat | 90 | 100 | 120 |
| Fish | 25 | 30 | 35 |
| Sugar | 40 | 40 | 50 |
| Fresh fruit | 60 | 60 | 65 |
| >> dried fruits | 20 | 20 | 20 |
| Juice | 50 | 50 | 60 |
| Wheat crackers | 60 | 80 | 100 |
| Tea | 0,4 | 0,4 | 0,4 |
| Chemical compounds, g: |  |  |  |
| Proteins | 48,6 | 56,6 | 65,4 |
| Fats | 34,8 | 42,2 | 46,4 |
| Carbohydrates | 214,5 | 262,6 | 290,1 |
| Energy value, kcal | 1414,8 | 1656,6 | 1839,6 |
| Taking into account heat treatment, g: |  |  |  |
| Proteins | 45,7 | 53,3 | 61,4 |
| Fats | 32,0 | 38,8 | 42,5 |
| Carbohydrates | 2 14,5 | 247,5 | 273,0 |
| Energy value, kcal | 1328,8 | 1552,4 | 1720,1 |

**Tab. Approximate one-day diet menu for children of three age groups**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Meal | The name of dishes | | Sizes of meals (g, ml) for children aged (years) | | |
| 3-6 | 7-10 | 11-14 |
| 1st breakfast: | Liquid semolina porridge in water  Calcined pureed cottage cheese  Unsweetened tea  Wheat crackers | | 200  60  200  5 | 220  70  200  20 | 250  80  200  25 |
| 2nd breakfast | Apple jelly | | 200 | 200 | 200 |
| Lunch | Rice slimy soup in meat broth  Steamed soufflé of boiled meat  Rice porridge on the water  Rosehip decoction  Wheat crackers | | 200  90  150  150  15 | 250  100  150  150  20 | 300  110  200  200  25 |
| Afternoon snack | Tum porridge  Wheat crackers | | 200  15 | 200  20 | 200  20 |
| Dinner | Cheese steamed souffle  Liquid pureed rice porridge on the water  Unsweetened tea  Wheat crackers | | 80  200  200  15 | 90  220  200  20 | 100  250  200  25 |
| *Supper* | Dried blueberry drink | | 200 | 200 | 200 |
| Chemical compounds, g: | | |  |  |  |
| Proteins | |  | 47,9 | 60,1 | 72,5 |
| Fats | |  | 38,0 | 45,5 | 49,1 |
| Carbohydrates | |  | 226,5 | 258,0 | 282,3 |
| Energy value, kcal | | | 1442,0 | 1677,5 | 1861,3 |
| Taking into account heat treatment, g: | | |  |  |  |
| Proteins | |  | 44,5 | 56,1 | 68,4 |
| Fats | |  | 35,1 | 41,3 | 46,5 |
| Carbohydrates | |  | 214,8 | 243,7 | 267,3 |
| Energy value, kcal | | | 1355,4 | 1569,1 | 1763,5 |

Diet in acute period

**Indications:**

1) acute intestinal diseases during the period of improvement;

2) chronic intestinal diseases after a sharp exacerbation or in the case of mild exacerbation.

**Purpose:** to provide complete nutrition in conditions of moderately impaired digestion, to reduce inflammation and normalize the functions of the intestine and other digestive organs.

**General characteristics**: a complete diet in terms of energy and chemical composition with a small increase in protein content. Moderately limited mechanical and chemical irritants of the mucous membrane of the digestive tract. Excluded are foods and dishes that increase putrefaction and fermentation in the intestines, as well as those that dramatically stimulate the secretion of the stomach, pancreas, bile and irritate the liver.

**Cooking:** dishes half-grated and chopped, boiled in water or steamed. Hot and cold dishes are excluded.

**Diet**: 6-7 times a day. The dish is served warm.

Diet in recovery period

**Indications:**

1) acute intestinal diseases in the recovery period as a transition to a balanced diet;

2) chronic intestinal diseases in the period of recovery after exacerbation and remission.

**Purpose:** to provide complete nutrition in case of some insufficiency of intestinal functions, to promote the restoration of intestinal functions and the activity of other digestive organs.

**General characteristics**: physiologically complete diet with a small increase in protein and moderate restriction of sodium chloride, mechanical and chemical irritants of the mucous membrane of the digestive tract. Excluded foods and dishes that increase putrefaction and fermentation in the intestine, its secretory and motor function, stimulate the secretion of the stomach, pancreas, bile and irritate the liver.

**Culinary processing**: dishes not crushed, boiled in water or steamed, baked. The temperature of the food is normal.

**Diet:** 5-6 times a day. Dishes are served warm.

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №8.**

**Topic:** Features of nutrition with chronic diseases of the stomach, duodenum.

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.**

In the treatment of the patient one of the most important places is nutrition with chronic diseases of the stomach, duodenum. Adequate physiological capabilities of therapeutic nutrition helps to restore the functional state of organs and systems, creates conditions for recovery.

**Goal. To study the basic requirements to the organization of food of children with chronic diseases of a stomach, a duodenum, to be able to appoint a diet corresponding to a disease.**

**Specific goals**

**The student must know:**

1. Etiological factors of chronic diseases of the stomach, duodenum
2. Variants of chronic diseases of the stomach, duodenum depending on the secretory function
3. The role of diet therapy in the treatment of diseases of the stomach, duodenum
4. Features of the appointment of diet therapy in diseases of the stomach, duodenum, depending on the secretory function
5. Features of the appointment of diet therapy depending on the secretory function of children of different ages

**The student must be able to:**

1. Diagnose chronic diseases of the stomach, duodenum
2. To appoint a diet at chronic diseases of a stomach, a duodenum at the increased secretion
3. To appoint a diet at chronic diseases of a stomach, a duodenum at the lowered secretion
4. To appoint a diet at chronic diseases of a stomach, a duodenum at an exacerbation
5. To appoint a diet at chronic diseases of a stomach, a duodenum at remission

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Tasks for independent work in preparing the student for the lesson**

**Theoretical questions for the lesson:**

1. The role of diet therapy in the treatment of diseases of the stomach, duodenum
2. Influence of a form of chronic diseases of a stomach, a duodenum on features of purpose of diet therapy
3. Influence on features of diet therapy of age, features of a disease
4. The initial level of knowledge and skills is tested in solving test questions, design questions.

**Materials which might be helpful.**

Diet therapy as a natural therapeutic factor remains the leading method of therapy for children with diseases of the digestive system.

General requirements for diet therapy in diseases of the digestive system:

- compliance of nutritional and energy value of food with the age needs of the child;

- in the acute period of the disease exclusion or sharp restriction of a number of products, forced reduction of the energy value of the diet, the organization of a fractional diet;

- inadmissibility of unreasonably long restriction of nutrients;

- providing mechanical, thermal and chemical sparing of the diseased organ;

- adherence to the principle of gradualness in the expansion of nutrition;

- individualization of nutrition in accordance with the nature of the disease, the presence of concomitant pathology, the nutritional status of the child;

- strict adherence to diet;

- variety of food, high taste of food.

Among the chronic diseases of the digestive system in children, the most common are chronic gastritis, gastroduodenitis, peptic ulcer of the stomach and duodenum, chronic diseases of the liver and biliary system (biliary dyskinesia, cholecystitis, hepatitis, cirrhosis of the liver), chronic intestinal diseases, enterocolitis, colitis constipation), diseases of the pancreas (chronic and reactive pancreatitis, chronic pancreatic insufficiency).

**Nutrition in chronic diseases of the stomach and duodenum.**

Dietary treatment for diseases of the stomach and duodenum is based on the principle of influencing the main aspects of pathogenesis - neuro-reflex and acid peptic factors, as well as emerging metabolic disorders (vitamin-mineral imbalance, protein catabolism in ulcerative necrotic lesions and).

Depending on the stage of the inflammatory process and violation of the secretory activity of the stomach, therapeutic diets are used, which provide a consistent reduction in the degree of mechanical, chemical, and thermal sparing of the gastric mucosa: diets № 1a, 1b, 1.

When building diets that spare, exclude or limit products that mechanically irritate the mucous membrane of the gastrointestinal tract, strong stimuli of digestive secretion, use special culinary processing of food (wiping, boiling to softness, boiling, steaming). Prescribe foods and dishes that quickly leave the stomach and slightly irritate its mucous membrane.

The longer the food stays in the stomach, the more it irritates the mucous membrane and stimulates secretory activity. The latter applies entirely to fatty foods. Carbohydrate and protein foods, especially liquid and pasty consistency, quickly leave the stomach and are therefore especially recommended when compiling sparing diets.

Analysis of clinical data shows a pronounced therapeutic effect of diets enriched with animal protein and vegetable oils in quantities exceeding the physiological norm by 15-20%. At the same time the accelerated scarring of an ulcer defect, return the development of the inflammatory process is noted.

During the exacerbation of the disease, the amount of carbohydrates, mostly simple, in the diets of patients is reduced by 1.5 times. This is due to the fact that a diet rich in carbohydrates increases the excitability of the autonomic nervous system and thus exacerbates the symptoms of gastric irritation. As the patient's well-being improves, carbohydrate intake expands to normal physiological needs.

The value of medical nutrition is also determined by the content of vitamins in it. Forced restriction of fresh vegetables and fruits, natural juices, contraindicated in the acute period of the disease, leads to vitamin deficiency. For enrichment of medical rations with vitamins and minerals, it is possible to recommend homogenized fruit and vegetable purees for baby food.

Finally, in the organization of diet therapy for children with diseases of the gastroduodenal system is an important proper diet. A monotonous diet with frequent fractional meals helps to reduce the secretory activity of the gastrointestinal tract and reduce the excitability of the nervous system. Under the influence of sparing diets, as a rule, all clinical manifestations of the disease disappear.

In the period of exacerbation of gastritis, gastroduodenitis or peptic ulcer disease prescribe diet in acute period, characterized by maximum sparing of the gastric mucosa and duodenum by eliminating chemical, thermal and mechanical stimuli of gastric secretion, which reduces the activity of the inflammatory process.

This diet is prescribed for a limited period: with exacerbation of gastritis or duodenitis - for 1-3 days, with exacerbation of gastroduodenitis - for 3-5 days, with exacerbation of peptic ulcer disease - for 7-10 days.

As the inflammatory process subsides, the patient is gradually transferred to a diet , which in terms of calories and composition of essential nutrients is close to the physiological needs of the child. A moderate degree of mechanical, chemical, and thermal sparing of a mucous membrane of a stomach is provided. The menu of which includes crushed wheat crackers, homogenized vegetables, and fruits (canned baby food), vegetable oil (in dishes); fish and meat are prepared in the form of steam cutlets, meatballs, mucous soups are replaced by grated cereals.

In the period of convalescence and remission of the disease prescribe diet , characterized by a moderate degree of sparing.

There are two variants of the diet - with grated and non-grated food.

In the diet with grated food in the range of dishes recommended for the diet in recovery period, add fresh cheese, soft cheese and low-fat, grated; soups grated from whole vegetables (except white cabbage), cereal soups, cereal-vegetable, dairy cereals, with vermicelli or shredded pasta; boiled vegetables (except white cabbage, turnips, radishes, radishes, and legumes); ripe fruits and berries of sweet varieties (after heat treatment); compotes with grated dried fruits; dried wheat bread.

The first version of the diet is prescribed for 3-4 weeks. and then, as the patient's condition improves, replace it with an option with whole food.

The recommended diet, with whole foods is the same as for the first option. Porridges, soups, vegetable dishes after boiling do not wipe; it is allowed to use boiled meat and fish in pieces, ripe raw fruits and berries of sweet grades in the form of puree, without peel, some delicacies (marshmallows, pastilles, dry cookies).

The second version of the diet is recommended for patients with gastritis or duodenitis for 6 months, patients with gastroduodenitis - for 12 months, patients with peptic ulcer disease - for 2-3 years.

At chronic gastritis, gastroduodenitis with secretory insufficiency the diet is appointed that provides mechanical sparing of a mucous membrane of a stomach at the preservation of chemical stimuli of digestive secretion. Diet in terms of energy value and content of essential nutrients meets the age-related physiological needs; is prescribed during convalescence and remission of the disease. Terms of diet therapy are individual (from 6 months to 2-3 years). At an exacerbation of a disease, the diet № 1 with the rubbed food is appointed.

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №9 .**

**Topic:** Therapeutic nutrition for obesity.

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** In the treatment of the patient one of the most important places is nutrition with obesity. Adequate physiological capabilities of therapeutic nutrition helps to restore the functional state of organs and systems, creates conditions for recovery.

**Goal.** To study the basic requirements for the organization of nutrition of an obese patient, to be able to prescribe a diet appropriate to the disease and its degree.

**Specific goals**

**The student must know:**

1. Etiological factors of obesity
2. Degrees of obesity
3. The role of diet therapy in the treatment of obesity
4. Features of the appointment of diet therapy for obesity of varying degrees
5. Features of prescription of diet therapy at obesity of children of different age

**The student must be able to:**

1. Diagnose obesity and its degree
2. Prescribe a diet for 1st degree obesity
3. Prescribe a diet for 2nd degree obesity
4. Prescribe a diet for 3rd degree obesity
5. Prescribe a diet for obesity 4 degrees

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Tasks for independent work in preparing the student for the lesson**

1. Theoretical questions for the lesson:
2. The role of diet therapy in the treatment of obesity
3. Influence of the degree of obesity on the peculiarities of diet therapy
4. Influence on features of diet therapy of age, features of a disease
5. The initial level of knowledge and skills is tested in solving test questions, design questions.

**Materials which might be helpful.**

**Obesity** is a disease whose main symptom is generalized excess fat in the subcutaneous fat and other tissues and organs. It is caused and complicated by neurohormonal and metabolic disorders.

Obesity is based on energy imbalance in combination with chronic hypokinesia, psychological problems, disorders, and diet.

The classification of obesity is given below.

|  |  |
| --- | --- |
| Degree of obesity | Excess body weight,% |
| I stage | 15-25 |
| II stage | 25-50 |
| II stage | 50-100 |
| IV stage | >100 |

Diet therapy remains one of the most important components in the comprehensive treatment of obesity in children, which is based on reducing the energy value of food and achieving a negative energy balance.

**Basic principles of therapeutic nutrition of obesity:**

1. gradual introduction of dietary regimes with low energy value (adaptation period, low-calorie diet, supportive diet);

2. exclusion of foods that stimulate the appetite;

3. correction of diet and nutrition (increase in the frequency of nutrition; shift of food load from the afternoon to the first; extensive use of low-calorie foods);

4. use of contrasting unloading days;

5. change in the quality of drinking regime (replacement of commonly used sweet drinks - juices, compotes, carbonated waters - with degassed alkaline mineral waters, herbal teas, decoctions of apple peel, pears).

6. formation of the correct stereotype of nutrition of the child and his family;

The **adaptation period** of obesity diet therapy involves the initial correction of the diet of a sick child. The duration of the adaptation period is on average 10-14 days, it is common to all forms of obesity and determines the effect of dietary treatment. In the adaptation period of diet therapy, the child's diet should not be sharply limited, it is necessary to bring it to the age physiological norm. In the first days of weight loss treatment is especially intense. An indicator of the correctness of the treatment regimen should be not only a decrease in body weight (on average by 1-3 kg), but also the associated improvement in general well-being, increased neuromuscular and mental tone.

In **a low-calorie diet**, the protein quota should meet the physiological needs of the child and ensure its full development. However, in some cases, high school children on a low-energy diet should increase their protein intake slightly (by about 10% compared to the physiological age norm).

Protein products create a feeling of satiety, which allows the child to more easily tolerate a diet with a limited number of foods. The daily menu of an overweight child should include lean meats (category II beef, veal, rabbit meat, chicken, category II chickens) and fish (cod, pollock, hake, etc.), eggs, and milk. and dairy products, mainly in the form of sour milk drinks (kefir, low-fat and unsweetened yogurt, bio kefir, low-fat cheeses).

Reducing the energy value of the daily diet is provided by reducing the content of carbohydrates and partially fat. In order to prevent hyperoxaluria and hyperururia, alkaline mineral waters and other recommended beverages should be added to the child's diet.

The amount of fat in the diet of an obese child is reduced by 15-30% depending on the degree of obesity. First of all, it is necessary to exclude from the low-calorie diet any sausages, frankfurters, sausages, refractory and hydrogenated fats (beef, lamb, pork, margarine), which have the ability to be actively deposited in the body. The amount of butter with a low degree of obesity may be within the age norm, with significant obesity it is limited. The amount of vegetable oil is slightly increased compared to normal age norms. Vegetable oils (sunflower, corn, olive, soybean, etc.) contain a large amount of linoleic acid, which plays a significant role in the normalization of lipid metabolism. In addition, a diet that contains enough vegetable fats does not cause a feeling of hunger, because fatty foods linger longer in the stomach and reflexively reduces the excitability of the food center. The daily amount of vegetable oil can be 15-20 g in preschool and 25-30 g in school age. It is used mainly in its natural form - for dressing salads, vinaigrettes, added to dishes prepared without fat.

When compiling a low-calorie diet, reducing the number of carbohydrates, especially those that are easily digested, creates an energy deficit in the body of an obese child and stimulates the consumption of its own fat reserves, so depending on the degree of obesity, the total amount of carbohydrates in the child's daily diet 25-50%. The reduction of the carbohydrate quota is due to a significant restriction of sugar, sweets, confectionery, reducing the use of cereals, pasta, as well as bread, especially wheat. However, excessive restriction of carbohydrates is not justified, because it increases their formation from proteins due to gluconeogenesis. In addition, the lack of carbohydrates in the diet, especially with high-fat content, can lead to the formation of ketone bodies in the blood. Vegetables and fruits are an important part of a low-calorie diet.

Fiber (cellulose) and pectin substances contained in vegetables and fruits are almost not absorbed by the human body: they form fecal masses, stimulate intestinal motility, are a food substrate for the normal intestinal microflora. Foods rich in plant fibers give a feeling of filling the stomach, affect the regulation of carbohydrate and fat metabolism, bind water, promote cation metabolism. Fruits and vegetables provide the child's body with minerals, vitamins, have a diuretic effect, removing excess fluid from the body. To this end, the child's diet includes cucumbers, cabbage, zucchini, tomatoes, pumpkin, radishes, carrots, turnips, asparagus, leafy greens, unsweetened fruits and berries. The amount of potatoes, which contains a large percentage of starch, is limited to 1 / 2-1 / 3 of the norm, which is recommended by replacing it with other vegetables.

Carbonated fruit drinks, as well as canned compotes, fruit purees and juices of industrial and home preparation, which are high in sugar, should not be used in the diet of obese children. Preference is given to natural freshly prepared sweet and sour juices, fresh and dried fruits and berries without added sugar, decoctions of apple peel, pears, alkaline degassed mineral water (Borjomi, Essentuki-4, etc.), and herbal teas.

Children of school age on the background of a low-calorie diet 1-2 times a week can spend unloading days. A sharp transition for 1-2 days to a diet with low energy value (about 1000 kcal), poor in salt, causes a restructuring of metabolism and stimulates the mobilization and consumption of energy resources of spare fat.

**Unloading days** alternate. Usually start with more nutritious (meat, fish, cheese, and dairy), and then move on to fruit and vegetables. Good results are given by use of double unloading days, for example, at first the "meat" day, and then "apple" is appointed. The amount of fluid these days is not limited.

Variants of daily sets of products of unloading days are presented in the table.

Table Variants of daily sets of products of unloading days for school-age children

|  |  |  |
| --- | --- | --- |
| Variant | Product | Amount |
| 1 | Boiled meat without salt.  Vegetables (cabbage, lettuce, fresh  cucumbers tomatoes) | 250-350  From 400-500 g to 1 kg |
| 2 | Boiled fish without salt (pike perch, pike, cod, perch)  Vegetables (cabbage, lettuce, fresh cucumbers, tomatoes). | 300-400 g  From 400-500 g to 1 kg |
| 3 | Semi-fat cheese  Milk of 2,5% of fat content | 500-600 g  3-4 cups |
| 4 | Milk, sour milk drinks (kefir, bio kefir, acidophilus) with low-fat content | 1.5-2 liters |
| 5 | Apples, various berries, and fruits (except grapes and bananas) | 1.5-2.5 kg |
| 6 | Various vegetables (cabbage, fresh cucumbers, tomatoes, carrots, beets) are mostly fresh in the form of salads: | 1.5-2.5 kg |

A certain number of products should be divided into 5-6 receptions. One of the main factors in the treatment of recovery in children is an increase in increased appetite due to the consumption of general, but low-calorie, mostly protein-vegetable, food, as well as part of its fractional intake (5-6 times a day), which creates more violence. A monotonous diet stimulates the appetite less than a varied one.

To **reduce appetite** and prepare the feeling of hunger from the diet of these children exclude any quality substances, straightforwardness, extractives, spicy, salty, and common foods. The first dishes should be vegetarian. Meat, chicken, fish, and mushroom broths are completely excluded from the food of a child with a revival.

Food **is prepared** boiled. For breakfast, lunch, and dinner you should give dishes of raw and cooked vegetables (salads, vinaigrettes with vegetable oil, boiled and stewed vegetables, vegetable stews, etc.).

As for **snacks,** obese children are given vegetable salads, but varieties of cheese, low-fat ham in small quantities.

Meat and fish dishes are prepared in the form of boiled or steamed cutlets, meatballs, meatballs. As a side dish for dishes other than a variety of vegetables. If possible, crumbly buckwheat, pearl barley, rice, and millet porridge are allowed.

The egg is boiled hard, but not more than 1 egg a day, so it is recommended for cooking.

The daily diet of the child should be distributed so that the main part of it came in the morning, ie during the year of greatest physical activity (65-70% of total daily calories). The last meal should be no later than 2-3 g before bedtime.

Maintaining a diet, prescribed after reaching body weight, which corresponds to the harmonious physical development of the child. Its duration is not limited. During this period, it is possible to provide a gradual expansion of the diet for fortified foods and energy value to large, at which the child will stably maintain the appropriate body weight. With the help of this diet, you can spend unloading days.

An important component of treatment in children is a rational (dosed) motor load, due to which muscle activity adversely affects blood circulation, activity, and activity of the endocrine system, helps to normalize the volume of substances, and increase immunity.

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №10.**

**Topic:** Therapeutic nutrition for iron deficiency anemia.

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** In the treatment of the patient one of the most important places is the nutrition of a patient with anemia. Adequate physiological capabilities of therapeutic nutrition helps to restore the functional state of organs and systems, creates conditions for recovery.

**Goal.** To study the basic requirements for the organization of nutrition of patients with anemia, to be able to prescribe a diet appropriate to the disease and its degree.

**Specific goals**

**The student must know:**

1. Etiological factors of anemia
2. Degrees of anemia
3. The role of diet therapy in the treatment of anemia
4. Features of the appointment of diet therapy for anemia of varying degrees
5. Features of the appointment of diet therapy for anemia in children of different ages

**The student must be able to:**

1. Diagnose anemia and its degree
2. Prescribe a diet for grade 1 anemia
3. Prescribe a diet for grade 2 anemia
4. Prescribe a diet for grade 3 anemia

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Tasks for independent work in preparing the student for the lesson**

**Theoretical questions for the lesson:**

1. The role of diet therapy in the treatment of anemia
2. The influence of the degree of anemia on the peculiarities of the appointment of diet therapy
3. Influence on features of diet therapy of age, features of a disease
4. The initial level of knowledge and skills is tested in solving test questions, design questions.

**Materials which might be helpful.**

Iron deficiency anemia is one of the most common diseases. This pathology affects more than 2 billion people, - 1/3 of the total population of the Earth. The most common iron deficiency anemia occurs in infants and young children. Frequently ill children, premature babies, and children living in environmentally unfavorable regions of the country are prone to developing anemia.  
 Prevention of iron deficiency anemia in infants and young children is a balanced diet with adequate iron and vitamins. According to the iron content, food products are divided into 3 groups:

• **rich in iron** (more than 5 mg per 100 g of product): beef liver, egg yolk, oatmeal, peas, beans, prunes, dog rose;

• **moderately rich in iron** (from 1 to 5 mg per 100 g of product): beef tongue, pork liver, chicken, catfish caviar, eggs, wheat, oatmeal, spinach, cabbage, potatoes, black currants, apples.

• **poor in iron** (less than 1 mg per 100 g of product): cow's milk, butter, carrots, strawberries, grapes, oranges, tangerines, rice, semolina, fish products (pollock, carp)

Foods contain two main types of iron: **heme iron**, the source of which is hemoglobin and myoglobin (found in meat products) and **non-heme iron**. Heme iron is well absorbed, and other ingredients do not affect its absorption. The absorption of non-heme iron is significantly affected by other components of the diet.

Absorption of iron improves under the influence of amino acids contained in meat and fish. Thus, adding 50 g of meat to a vegetable dish increases the absorption of iron contained in them, 2 times. Absorption of iron also increases in the presence of ascorbic, citric, glutamic acids, fructose. Therefore, some fruits and vegetables that contain sufficient amounts of these acids can be used to improve iron absorption. For example, orange juice in

2.5 times increases the absorption of iron from plant products.

A very important aspect of prevention and treatment of anemia in infants - the maximum preservation of breastfeeding. It is known that iron from breast milk is absorbed and assimilated much better than from mixtures based on cow's milk.

At development of anemia at the children who are on natural feeding, it is necessary to provide first of all high-grade food of mother, and also to carry out the corresponding correction of a food ration of the child. In the mother's diet should be widely used foods high in iron (offal, meat, eggs, etc.), as well as vegetables and fruits, which include substances involved in hematopoiesis: copper, cobalt, iron and others. These include carrots, cauliflower, beets, tomatoes, apples, pears, figs, persimmons, dried apricots, black currants, plums. It is also recommended to introduce new special milk-based products enriched with protein, vitamins and minerals in the diet of a nursing mother - "Femilak I" and "Femilak II", intended for pregnant women and nursing mothers.  
If a child with iron deficiency anemia is forced to switch to artificial feeding, then in his diet should use modern adapted milk formulas, enriched with the whole complex of vitamins and trace elements. At the same time for children of the first months of life such adapted mixes as "Similak with iron", "Enfamil with iron" in which the iron content makes 1,2 mg on 100 ml of ready mix are recommended. Children in the second half of life are given - milk formulas with higher protein content. For children with anemia, we can recommend iron-fortified mixtures "Semper Baby 2", "Enfamil 2", "Heinz for children from 6 months", "NAS 6-12".

Both natural and artificial feeding in the diet of a child suffering from anemia, at an earlier date use juices and fruit purees - respectively, 1.5-2 months. life. Also at an earlier date (2-4 weeks earlier than healthy children) are introduced yolk and all kinds of complementary foods. It is necessary to begin supplementary food with vegetable purees, preferring vegetables, richer in iron and ascorbic acid (potatoes, carrots, spinach, beets, cabbage, etc.). In the vegetable puree you can add finely chopped greens (dill, parsley), which is a rich source of iron and vitamin C.

Early introduction of meat dishes as sources of heme iron is necessary in the child's diet. **Minced meat** can be given from 5 months, starting with 1/4 teaspoon, gradually increasing its amount to 30 g per day, up to 8 months. - up to 60 g, up to a year - up to 70 g

It is also important to include in the diet of children a sufficient amount of foods high in ascorbic acid, which contributes to a more complete absorption of iron.

It is found in

* fresh rose hips (650 mg / 100 g),
* black currants and sea buckthorn (200 mg / 100 g),
* slightly less in garden strawberries (60 mg / 100 g),
* oranges (60 mg / 100 g),
* grapefruits (45 mg / 100 g),
* spinach (55 mg / 300 g),
* lemons (40 mg / 100 g),
* tangerines (38 mg / 100 g),
* gooseberries (30 mg / 100 g).

When using these products in the diet of sick children, you can increase the absorption of iron from food almost 5 times.

In the diets of children with iron deficiency anemia, the quota of meat products should be increased by about 15-20%. It is better to give the daily norm of meat small - in 2 receptions, in the morning with a vegetable dish or gray porridges, and preference is given to oatmeal and buckwheat.

In addition to diet therapy, in the treatment of anemia should use iron drugs in age-appropriate dosage. Give iron supplements immediately after a meal in combination with ascorbic acid or juice of black currant, sea buckthorn, citrus, which promotes better absorption of iron in the intestine.

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №11 .**

**Topic:** Features of nutrition in lactose intolerance.

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** In the treatment of the patient one of the most important places is nutrition in lactose intolerance. Adequate physiological capabilities of therapeutic nutrition helps to restore the functional state of organs and systems, creates conditions for recovery.

**Goal.** To study the basic requirements to the organization of food of children with lactose insufficiency, to be able to appoint a diet corresponding to a disease.

**Specific goals**

**The student must know:**

1. Etiological factors of lactose insufficiency
2. Variants of lactose deficiency
3. The role of diet therapy in the treatment of lactose intolerance
4. Features of diet therapy for lactose intolerance of various types
5. Features of diet therapy for lactose intolerance in children of different ages

**The student must be able to:**

1. Diagnose lactose intolerance and its variant
2. Prescribe a diet for congenital lactose intolerance
3. Prescribe a diet for transient lactose intolerance
4. Prescribe a diet for acquired lactose intolerance

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Tasks for independent work in preparing the student for the lesson**

**Theoretical questions for the lesson:**

1. The role of diet therapy in the treatment of lactose intolerance
2. Influence of a variant of lactose insufficiency on features of purpose of diet therapy
3. Influence on features of diet therapy of age, features of a disease
4. The initial level of knowledge and skills is tested in solving test questions, design questions.

**Materials which might be helpful.**

Lactase deficiency (LD) is a congenital or acquired deficiency in the production of lactase in cats - disaccharide, which is an enzyme of decent digestion that breaks down milk sugar.

There are transient, congenital, and acquired forms of LN.

**The transient** form of LD is a physiological phenomenon of the first 2 months; the life of a child. It is associated with immaturity of enzyme systems, has minor clinical manifestations, and does not require correction.

**Primary (congenital**) LD begins immediately after birth when the baby begins to prepare milk. After 30 minutes - 2 hours after the year the child appears due to vomiting, upbringing, anxiety, agitation, painful screaming due to spasms and flatulence. In the future, it is necessary to monitor the accountability of defecation with a sour smell, when the lactose content increases.

**Secondary** (acquired) LD develops in the first age, which follows the disease of the digestive tract.

**Principles of treatment of lactase deficiency**

The central place in the treatment of LD, especially in children of the first year of life, is determined by specialized products of industrial production of low- and lactose-free products containing lactic acid and in severe cases - fermented milk products. Children in the first year of life should be switched to low-lactose or a lactose-free formula. On packages with mixtures in which the amount or absence of lactose is significantly reduced: SL (sinus lactose), LF (lactose-free), LL (low lactose).

Low-lactose time mixtures are best recommended in the absence of secondary lactase; lactose-free - at primary. If the child has signs of indigestion and observation of nutrients, therefore, fat, it is gaining weight, significantly lags behind in physical development, while for a long time is reflected in unstable defecation, then you can use lactose-free mixtures based on hydrolytic proteins with the release of medium-chain triglycerides, which are well absorbed and contribute to the positive dynamics of weight gain.

Low-lactose and lactose-free mixtures are represented by products in which the carbohydrate component contains little or no private lactose. In the latter case, carbohydrates are represented by dry corn molasses or maltodextrin. Protein and fat components of such mixtures are included in human milk. In addition, the composition of these mixtures includes trace elements, vitamins, essential AMK. The osmolarity of these compatible incomes is low, which reduces the risk of diarrhea.

Too low- and lactose-free recovery of the mixture: Detalact low-lactose (MKK Balta, Ukraine), NAN lactose-free (Nestle), Nutrilon low-lactose (Nutricia), Human Heilnahrug.

**NAN lactose-free** is a nutritious mixture without lactose, which is intended instead of milk in the diet of children suffering from lactose intolerance. A mixture enriched in nucleotides, which are the primary structural elements of RNA and DNA. In addition, a mixture enriched in taurine. The ratio of raw proteins to casein adaptation to breast milk. Carbohydrates are represented by maltodextrin, the fatty component - vegetable oils. The amount of iron and phosphorus decreases, includes zinc, iodine, selenium, vitamins, and minerals.

**Nutrilon low-lactose** is a mixture with low osmolarity, which causes a decrease in lactase activity, contains adapted protein and fat components, vitamins, minerals, and trace elements. According to their composition and nature of observation in the child's body ° The mixture is close to breast milk. The mixture can be used for the differential diagnosis of cow's milk and lactose intolerance.

In the absence of special low-lactose or lactose-free mixtures, you can use soy-based mixtures that do not contain lactose: soy detolact (MKK Balta, Ukraine), NAS Soy (Nestle), Nutrilon Soy (Nutricia), En-Famil-soy, Pulev V, Similak-isomil, Frisosoy, Humana-ZTs Fitolakt, Tutteli, Heinz-soy mixture.

Abroad, drugs that break down lactose in milk have become widespread in recent years.

An example of such a drug **is Kerulac** (Yamanuchi Europe). Add a few drip preparations to breast or cow's milk followed by incubation for 2-3 hours from rhyme lactose-free product.

The effectiveness of the diet indicates an improvement in the general condition of the elimination of dyspeptic symptoms, increasing the pH to 6-6.5. In the case of ineffective treatment, specific symptoms persist, the pH is kept within 5 or less.

In the case of exclusion of lactose with food, the need for carbohydrates provides sucrose, dextrin maltose, starch.

It should be remembered that prolonged emissions from the diet of dairy and other products that produce lactose, lead to a decrease in dietary calcium required for consumption during the period of intensive growth. You need to listen, use the intake of calcium and vitamin D.

Cancellation of a lactose-free diet is possible after control loads of milk. An indicator of the use of lactose tolerance i An indication of the use of lactose tolerance is the absence of feline messages after loading.

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №12.**

**Topic:** Features of nutrition with alimentary, neurogenic, inflammatory constipation.

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** In the treatment of a sick child, one of the most important places is the nutrition of children with alimentary constipation. Adequate physiological capabilities of therapeutic nutrition helps to restore the functional state of organs and systems, creates conditions for the recovery of the child.

**Goal.** To study the basic requirements to the organization of food of children with alimentary constipations, to be able to appoint a diet corresponding to a disease.

**Specific goals**

**The student must know:**

1. Etiological factors of alimentary constipation
2. Variants of alimentary constipation depending on the etiology
3. The role of diet therapy in the treatment of alimentary constipation
4. Peculiarities of diet therapy for alimentary constipation depending on the etiology

**The student must be able to:**

1. Diagnose alimentary constipation
2. To appoint a diet at alimentary constipations
3. Prescribe a diet for pseudoconstipation
4. To appoint a water mode at alimentary constipations

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Tasks for independent work in preparing the student for the lesson**

**Theoretical questions for the lesson:**

1. The role of diet therapy in the treatment of alimentary constipation
2. Influence of constipation options on the peculiarities of diet therapy
3. Influence on features of diet therapy of age, features of a disease
4. The initial level of knowledge and skills is tested in solving test questions, design questions.

**Materials which might be helpful.**

The organization of dietary food for chronic constipation needs considerable attention.

Chronic delay in bowel movements for more than 48 hours. can be considered as constipation. The causes of constipation are various. In childhood, we can identify the following forms of constipation, the most common:

1) functional constipation, which includes alimentary and neurogenic (dyskinetic, reflex in diseases of the digestive system and genitourinary system, as well as due to the suppression of the urge to defecate);

2) inflammatory constipation (colitis);

3) organic constipation observed in abnormalities in the development of the colon (Hirschsprung's disease, dolichosigma).

Features of dietary treatment of constipation largely depend on its etiopathogenesis. The greatest effect of diet therapy can be obtained with functional constipation of alimentary origin.

Alimentary constipation occurs due to the low content in the diet of foods rich in fiber and fiber; the advantage of easily digestible food, dry eating, eating disorders, prolonged stay on a diet.

In young children, constipation is often observed during monotonous breastfeeding. Prevention of constipation at this age - the timely introduction of complementary foods, especially fruits and vegetables.

In infancy, there may be "pseudo-constipation" due to increased absorption or lack of breast milk or formula (with hypogalactia, vomiting, sluggish sucking, oral defects).

In these cases, too little fecal mass is formed to cause the urge to defecate. Normal bowel movement is achieved after eliminating the immediate cause of the disease and proper breastfeeding.

With alimentary constipation in older children, medical nutrition is primarily in the organization of a proper diet, which excludes food "dry" and the appointment of a diet №3. Thus from a diet of the child exclude the products and the dishes slowing down peristalsis of intestines. Prohibit strong broths, mushrooms, fatty and spicy foods, turnips, radishes, radishes, white cabbage, garlic, onions, soft pastries, coffee, strong tea, green peas, and beans without heat treatment. Limit the use of easily digestible cereals (semolina and rice), pasta.

Food is steamed, boiled, baked, without chopping food

Diet № 3 is complete in terms of essential nutrients and energy. Meals are given hot, warm, and cold 4-5 times a day. You can prescribe foods and dishes that are recommended for diets № 2 and 4c, expanding the range of vegetables and fruits.

Especially recommended are dried fruit compotes and soaked dried fruits (prunes, dried apricots, figs); vegetables with crude fiber (carrots, beets, zucchini, pumpkin, tomatoes, cucumbers); sugars (honey, jam, etc.); fruit and vegetable juices. All these products contribute to the moderate development of fermentation processes and the involvement of fluid in the intestine. Vegetable salads with vegetable oil, one-day kefir, sour cream have a good tolerating effect.

When prescribing a diet to patients with **neurogenic functional constipation** should take into account the nature of intestinal dyskinesia.

Patients with hypomotor dyskinesia of the intestine need a diet rich in fiber. To this end, diet № 3 increases the number of raw vegetables and fruits, dried fruits. Additionally, wheat bran is prescribed, boiled, left for 20 minutes, then the excess water is drained, and the cuts are mixed into dishes or eaten in its pure form. The initial dose of cuts is 1 / 2-1 teaspoon. Then their number increases every 3-5 days to 1-2 tablespoons. An essential condition for the treatment of cuts is additional fluid intake (from 1 to 11/2 liters of free fluid per day) to avoid compaction of fecal masses. This diet is used until the appearance of soft stools.

A good effect can be obtained by taking a cool liquid on an empty stomach (from 1/4 to 3/4 cup of mineral water with a small content of gas, boiled or water, milk with honey, sour milk drinks, juice), as well as vegetable oil - from 1/2 teaspoon to 1 tablespoon on an empty stomach, and then 1-2 times a day before meals.

Nutrition in neurogenic and inflammatory constipation with hypermotor dyskinesia requires sufficient attention.

Neurogenic and inflammatory constipation often occur with hypermotor dyskinesia, which has a clinical picture of irritable bowel syndrome. There is paroxysmal abdominal pain without clear localization, there are spastic, painful on palpation of the colon, a typical radiological and endoscopic picture (spasm and inflammation).

The purpose of the diet for hyper motor constipation is to maximally relieve intestinal spasm and normalize its motor activity. Therefore, dietary treatment consists of two stages.

At the first stage, conditions are created for chemical and mechanical sparing of the mucous membrane at all levels of the gastrointestinal tract with restrictions to a minimum of products that enhance the processes of putrefaction and fermentation, and hence gas formation. A diet is prescribed that is close in composition and cooking to the diet №4b. Vegetables and fruits are given only after heat treatment, vegetable products, sour-milk drinks, mineral waters without gas of room temperature are used from the allowed products. As the pain syndrome acquires, the spasm of the intestine decreases (on average after 7-10 days), the diet is gradually expanded and the second stage of dietary treatment is carried out, which corresponds to diet №3.

At the second stage of diet therapy of hyper motor constipation enters the products rich in crude fiber, fruit, and vegetable juices. Vegetables and fruits are given raw.

With **organic constipation**, which is due to the congenital pathology of the intestine,

the motor function of the colon is usually reduced. However, medical nutrition in this case is similar to that of irritable bowel syndrome. Exclude or limit foods rich in fiber, because an increase in fecal mass can lead to distension of the intestine and increase constipation.

Vegetable and fruit juices, dried fruit compotes, vegetable salads with vegetable oil, pure vegetable oil, prunes, honey, sour milk drinks, buckwheat, and oatmeal dishes are prescribed to such patients. Raw vegetables and fruits are allowed in limited quantities.

Dietary treatment of patients with organic constipation is symptomatic and in no way precludes the indicated surgery.

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №13 .**

**Topic:** Nutrition with pathology of the urinary system. Features of nutrition in glomerulonephritis.

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** In the treatment of the patient one of the most important places is nutrition with pathology of the urinary system. Adequate physiological nutrition helps to restore the functional state of organs and systems, creates conditions for the treatment of the disease.

**Goal.** To study the basic requirements for the organization of nutrition of a patient with pathology of the urinary system, to be able to prescribe an appropriate diet.

**Specific goals**

**The student must know:**

1. Etiological factors in glomerulonephritis
2. Pathogenetic chains of development of lesions of nutritional disorders in glomerulonephritis
3. The main principle and task of nutrition in glomerulonephritis
4. List of products recommended for glomerulonephritis

**The student must be able to:**

1. Prescribe food for glomerulonephritis
2. Give recommendations on food restriction
3. Assign and specify the duration of the diet
4. Assign and specify the duration of the diet
5. To appoint a water - salt mode at glomerulonephritis

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Tasks for independent work in preparing the student for the lesson**

**Theoretical questions for the lesson:**

1. The main symptoms of glomerulonephritis
2. Stages of nutrition in glomerulonephritis
3. List of products recommended for glomerulonephritis
4. List of products that are not recommended for glomerulonephritis
5. The initial level of knowledge and skills is tested in solving test questions, design questions.

**Materials which might be helpful.**

According to current data on the pathogenesis of certain diseases of the urinary system and their manifestations, dietary nutrition must meet the following requirements:

1) ensuring the rest of the diseased organ of the urinary system by limited introduction of food ingredients, metabolic products of which are excreted mainly by the kidneys. First of all, this restriction applies to animal protein, because the products of its metabolism affect not only the pathological mechanisms of glomerulonephritis, but also the formation of non-immune hemodynamic factors that contribute to disease progression;

2) correction of the resulting disorders of nitrogen, water-salt metabolism and acid-base balance, which may be due to the disease itself (eg, salt-losing syndrome in pyelonephritis) and side effects of some drugs (eg, treatment with prednisolone and diuretics);

3) the exclusion of products that contribute to the sensitization of the body, as well as a large number substances (eg sodium), which in some way affect the development of some clinical syndromes (hypertensive, nephrotic) and side effects of certain drugs (hypertension prednisolone treatment).

Taking into account these requirements, medical diets for children with diseases of the urinary system are created on the basis of diets № 7 and № 5 with appropriate correction depending on the characteristics of the pathological process and the severity of the disease.

The duration of diet therapy in children with kidney disease is determined by the condition of patients, clinical manifestations of the disease, its activity, treatment methods used and the state of renal function.

**Therapeutic nutrition for glomerulonephritis**

In the treatment of children in the active stage of acute and recurrence of chronic glomerulonephritis in the functionally compensated stage (nephrotic form, mixed form: nephrotic syndrome with hematuria or hypertension) diets № 7 and № 5 are used, which differ in protein and sodium content.

Diet (egg-potato, dairy-vegetable) is characterized by a moderate restriction of protein (up to 1 - 1.2 g / kg body weight), which is achieved by excluding from the diet for the entire active period of the disease a number of products of animal origin - meat, fish, cheese.

The set of products used in the diet is quite diverse and includes mandatory daily intake of such products of animal origin as chicken egg, kefir, milk. Besides, butter and vegetable oils, all groats and pasta, in unlimited quantity of vegetables, fruit, juices are recommended.

Due to the infectious-allergic nature of glomerulonephritis, products that cause allergic reactions are selectively excluded from the diet.

**Food is prepared without salt.**

Fluid intake is not limited because the child does not feel thirsty due to a decrease in sodium in the diet. However, it is necessary to periodically take into account the amount of fluid consumed and excreted to detect hidden edema.

**In chronic glomerulonephritis** with moderate urinary syndrome, a diet containing protein is recommended according to the age of the child in the main food ingredients , but salt-free. In the absence of clinical effect from the conducted complex therapy and increase in expressiveness of a urinary syndrome appoint a diet.

Due to the fact that many patients on the background of corticosteroid therapy increases appetite, they temporarily increase the protein quota due to the additional introduction of 200 ml of kefir or milk.

Particular attention should be paid to children in whom in the active stage of glomerulonephritis there is a **salt-losing syndrome** in the form of hyponatremia, low blood pressure, dizziness, weakness, lethargy, cold sweats. Correction of the above symptoms is carried out by dosing (up to 3.0 g / day) of salt, and the child during the day self-salting food. After elimination of signs of a hyponatremia salt is gradually removed from a diet, thus controlling arterial pressure and concentration of sodium in blood serum.

In order to correct **hypocalcemia and hypokalemia**, which very often occur in children with glomerulonephritis in the use of diuretic and corticosteroid therapy, prescribe specially designed bakery products enriched with calcium (bread, muffins, crackers, cookies), and foods (rich, cookies), and foods (rich, cookies). dried apricots, raisins, prunes). This significantly reduces the intake of calcium carbonate tablets, potassium chloride, which is extremely important in the presence of gastrointestinal complications arising from the side effects of steroid therapy.

A prerequisite for the effectiveness of the diet is its enrichment with polyunsaturated fatty acids of Omega-6 class up to 35 g / day in the form of vegetable oil, while the ratio of polyunsaturated fatty acids of Omega-6 and Omega-3 classes becomes equal to 2: 1.

At **a heavy** condition of the child with glomerulonephritis in connection with accession of complications from a gastrointestinal tract (pancreatitis, gastritis, steroid erosions, ulcers) temporarily individually appoint a diet with complete exclusion of table salt and restriction of meat to 4 times in meat. (lunch only). It is not recommended to eat meat for dinner due to the risk of developing hyperuria.

Diet №7 is prescribed for the entire active period of glomerulonephritis. It helps to reduce the edema syndrome, reduce hypertension, correct electrolyte disturbances. It is important to follow the stages in the implementation of therapeutic nutrition. In conditions of complete clinical and laboratory remission in acute and chronic glomerulonephritis in 1 month after the abolition of pathogenetic therapy, the diet is gradually expanded, alternately and consistently introducing every 4 weeks products containing animal protein (meat, fish, cheese), gradually passing pa diet № 5. At the same time add salt to 1 g per month. By the end of the 4th month, the amount of salt in the child's diet increases to 5 m per day. Against this background, it is necessary to strictly monitor blood pressure, blood and urine composition. In cases of deterioration of the child's health and the appearance of even small changes in the analysis of urine, it is necessary to return to the diet №7.

**Diet**

**Indications:** Indications for use: acute and chronic glomerulonephritis in the active stage of the disease; initial stage (tubular) of chronic renal failure; hyperuria.

**Purpose:** reduction of the inflammatory process in the kidneys by limiting the protein load, preventing disease progression; reduction of hypertensive and edematous syndromes; reduction of hyperazotemia; correction of electrolyte disturbances and acid-base balance.

**General characteristics**: diet of high energy value due to easily digestible carbohydrates and vegetable fats; salt-free, dairy-vegetable, potato-egg; animal protein is limited to 30% of the age physiological norm by excluding meat, poultry, fish, cheese. Children with decreased appetite, anorexia (during the abolition of prednisolone) and individual intolerance to chicken eggs are temporarily allowed to replace it with cheese, boiled meat, fish (not more than 50 g per day).

Energy value and chemical composition: proteins 80 g (50-60% - animal), fats 90-100 g (25% -vegetables), carbohydrates 400-450 g (80-90 g of sugar), 2700-2900 kcal. Free liquid - 0.9-1.1 liters. Vitamins C, P and group B are given in increased amounts.

**Culinary processing**: when cooking, chopping, shredder, boiling to softness, quenching, pureeing, frying, baking are allowed; dishes are prepared without salt.

Diet: fractional, 4-5 times a day; food temperature from 20 to 600C.

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №14 .**

**Topic:** Features of nutrition in dysmetabolic nephropathy (hyperoxaluria, hyperururia,

hyperphosphaturia).

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** In the treatment of the patient one of the most important places is nutrition in dysmetabolic nephropathy (hyperoxaluria, hyperururia, hyperphosphaturia). Adequate physiological capabilities of therapeutic nutrition helps to restore the functional state of organs and systems, creates conditions for recovery.

**Goal.** To study the basic requirements for the organization of nutrition in dysmetabolic nephropathy (hyperoxaluria, hyperururia, hyperphosphaturia), to be able to prescribe a diet appropriate to the disease.

**Specific goals**

**The student must know:**

1. Etiological factors in dysmetabolic nephropathy (hyperoxaluria, hyperururia, hyperphosphaturia)
2. Options for dysmetabolic nephropathy - hyperoxaluria, hyperururia, hyperphosphaturia
3. The role of diet therapy in the treatment of dysmetabolic nephropathy (hyperoxaluria, hyperururia, hyperphosphaturia)
4. Peculiarities of diet therapy for dysmetabolic nephropathy (hyperoxaluria, hyperururia, hyperphosphaturia)

**The student must be able to:**

1. Diagnose dysmetabolic nephropathy (hyperoxaluria, hyperururia, hyperphosphaturia)
2. Prescribe a diet for dysmetabolic nephropathy - hyperoxaluria
3. Prescribe a diet for dysmetabolic nephropathy - hyperuraturia
4. Prescribe a diet for dysmetabolic nephropathy - hyperphosphaturia

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Tasks for independent work in preparing the student for the lesson**

**Theoretical questions for the lesson:**

1. The role of diet therapy in the treatment of dysmetabolic nephropathy (hyperoxaluria, hyperururia, hyperphosphaturia)
2. Influence of the form of dysmetabolic nephropathy (hyperoxaluria, hyperururia, hyperphosphaturia) on the peculiarities of diet therapy
3. Influence on features of diet therapy of age, features of a disease
4. The initial level of knowledge and skills is tested in solving test questions, design questions.

**Materials which might be helpful.**

**Nutrition in dysmetabolic nephropathy**

At a hyperoxaluria the purpose of a medical diet - removal of functional loading on an active part of a nephron - the tubular device. The diet is called potato-cabbage because it consists of potatoes, cabbage and other vegetables cooked in different ways. It is envisaged to exclude extractives - broths, products rich in oxalic acid and oxalates (leafy vegetables, strong tea, cocoa), as well as vitamin C. White bread, vegetable and butter, sour cream are allowed. In order to alkalize the urine, prevent hypokalemia and hypomagnesemia introduced a large number of sweet fruits (pears, bananas, apples "Golden"), Meat and fish in boiled form in the diet are not limited. Protein products are included in the menu in the morning to prevent overload of the tubular apparatus of the kidneys.

The ratio of basic food ingredients (proteins, fats, carbohydrates) is maintained within the age requirements. To increase diuresis prescribe a large amount of fluid: children 7-10 years in addition to the usual diet of at least 1 liter, over 10 years - up to 2 liters in the form of alkaline mineral waters ("Slavic", "Smirnov", "oil") 1 month for 3 courses per year. At the same time it is important to watch diuresis that all drunk liquid was allocated. It is shown the intake of additional fluid at night. Night urine is more concentrated, which creates conditions for the crystallization of various salts. In addition, a complex of vitamins A and E in age-appropriate dosage is recommended.

**Recommendations for the use of various products for crystalluria**

|  |  |  |
| --- | --- | --- |
| Deseases | Продукти | |
| Restrict | Allow |
| Hyperoxaluria | Cherries, strawberries, currants, Antonov apples, grapes, blueberries, cranberries, plums, all citrus, radishes, beans, peas, parsley, dill, lettuce, beets, rhubarb, sorrel, spinach, coffee, cocoa, chocolate, cheese, cheese | Cabbage, potatoes, carrots, melons, watermelons, apricots, peaches, figs, pears, bananas, raisins, prunes, dried apricots, meat, butter and vegetable oil, fish, sugar, honey |
| hyperuria | Beef, pork, poultry and rabbit meat, jellies, meat semi-finished products, broth (mushroom, meat, chicken, fish), all legumes | All dairy and sour-milk products, all vegetables and fruit |
| Hyperphosphaturia | Milk, cheese, eggs, mushrooms, nuts, cocoa, coffee, strong tea, sweet apples, berries, pears | Meat, fish, pate, butter and vegetable oil, peas, Brussels sprouts, pumpkin, all sour apples, cranberries, red currants, sour drinks. |

The use of potato-cabbage diet is indicated for 2-3 months and is accompanied by a significant decrease in oxalate excretion. Potatoes contain a moderate amount of oxalic acid and a significant amount of calcium. Oxalic acid is almost not absorbed in the intestine, and calcium keeps oxalates undissolved and provides almost complete excretion of feces. The usual diet contains from 97 to 930 mg of oxalates, but only 2.3-4.5% are normally adsorbed in the intestine.

Weakly alkaline mineralized waters are used: Slavic, Smirnov, Naftusya, Obukhov (in the same doses as for hyperoxaluria) 3 times a day before meals for a month. Conduct 2-3 courses per year. Useful herbal medicine: decoction of cranberry leaves, kidney tea, bear ears. Take decoctions of herbs for 2 weeks each month, without combining with mineral water. Potato-cabbage diet promotes alkalization of urine is recommended 1-2 times a week.

At a cystinuria it is necessary to limit methionine and other sulfur-containing amino acids. Cheese, fish, mushrooms, egg white are completely excluded from the diet. The potato-cabbage diet is shown. Need a high-liquid drinking regime, intake of low-mineralized alkaline water, lemon juice, cranberries, cranberries.

At a hyperphosphaturia it is necessary to reduce the use of egg yolks and milk. The diet includes cabbage, tomatoes, cranberry juice, butter; infusion of dog rose, corn stigmas, dill, green tea, cranberry juice, black currant juice, lemon drink, mineral water (narzan). Prescribe vitamins A and D.

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №15 .**

**Topic:** Features of nutrition in infectious diseases

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** In the treatment of a sick child, one of the most important places is the nutrition of children with childhood infections. Adequate physiological nutrition helps to restore the functional state of organs and systems, creates conditions for the treatment of the disease.

**Goal.** To study the basic requirements to the organization of food of children at children's infections, to be able to appoint a diet corresponding to a disease.

**Specific goals**

**The student must know:**

1. Etiological factors in childhood infections
2. Pathogenetic chains of development of defeat of nutritious disturbances at children's infections
3. The main principle and objectives of nutrition in childhood infections
4. List of products recommended for childhood infections
5. List of mixtures recommended for childhood infections in young children

**The student must be able to:**

1. Prescribe food for childhood infections
2. Give recommendations for fluid intake in childhood infections
3. Add foods that are recommended for childhood infections
4. Prescribe mixtures recommended for childhood infections in young children

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Tasks for independent work in preparing the student for the lesson**

**Theoretical questions for the lesson:**

1. The main symptoms of childhood infections
2. Stages of nutrition in childhood infections depending on the severity of the disease
3. List of products recommended for childhood infections
4. The list of mixes appointed at children's infections
5. The initial level of knowledge and skills is tested in solving test questions, design questions.

**Materials which might be helpful.**

**BASIC PRINCIPLES OF MEDICAL NUTRITION OF CHILDREN WITH INFECTIOUS DISEASES.**

Pathogenetically sound, properly constructed therapeutic nutrition (taking into account the specifics, stage, and severity of the disease, the presence of concomitant pathology) promotes a favorable course of the disease, increases the body's defenses, activates anabolic processes, leading to recovery.

**NUTRITION IN ACUTE CHILDHOOD INFECTIONS.**

Acute respiratory viral diseases, sore throats, as well as acute childhood infections (rubella, measles, scarlet fever, chickenpox, mumps, etc.) are usually accompanied by fever and intoxication of varying degrees. In these conditions, all types of metabolism are disturbed.

Due to fever, rapid breathing, significant fluid loss, water-salt metabolism is disturbed, blood clotting occurs, intoxication develops. Therefore, a sick child must first be provided with sufficient fluids, which are usually given in the form of frequent drinking. For this purpose, use boiled water, not very sweet tea, and a compote of dried or fresh fruit. Especially useful drinks enriched with vitamins: tea with lemon, rosehip infusion, fruit, or berry juices (but not too sour or sweet). Drinking to a sick child should be given warm. Only in cases where the patient has nausea or vomiting, the proposed drinks should be at room temperature. In determining the required amount of fluid for a child with symptoms of toxicosis based on his body weight. Thus, for children under 1 year of age for each kilogram of body weight, it is necessary to give 150-200 ml of fluid per day, for older children - 120-170 ml.

In most diseases in the acute period in the presence of high fever, toxicosis, the patient should be fed in small portions - up to 5 - 6, and sometimes up to 7 times a day, which provides better digestion and promotes faster recovery of impaired body functions.

All dishes are served in liquid or semi-liquid form. Vegetables and cereals should be boiled until soft and rubbed, poultry, and fish cooked in the form of puree or souffle.

When compiling the diet of a sick child, it is necessary to take care of sufficient inclusion of proteins, especially of animal origin, especially milk proteins, which have a lipotropic effect. This is very important for improving the function of the liver, the work of which suffers from any infectious disease due to the need to neutralize toxic substances in the body.

At a long course of an illness at children's appetite often sharply decreases, weight loss, development of malnutrition is noted. Therefore, during the period of detection in the child's diet should increase the amount of protein by about 15 - 20% compared to the age physiological norm, which is provided by easily supplied protein products - raw materials, fish, eggs. At various decreases in appetite it is possible to use special protein additives, specialized high-protein products ("Protein empit", "Low-calorie empit", "Nutrilon", "Protifar", etc.), and also specialized children's canned food on the basis of meat and poultry. Peculiarities in the diet of a child with an acute organism have fermented milk products (kefir, bio kefir, acedofelin, "Biolact"), which are easily formed and involved in the organization and require a minimum amount of agricultural products, which contributes to the normalization of intestinal microflora. In addition, the inclusion in the diet of a child of fermented milk products helps to improve appetite, which is very important in any disease. Adapted fermented milk mixtures ("Bifilin", "NAS sour-milk", etc.) are also widely used in the medical nutrition of sick children of the first year of life with acute infectious diseases. Fermented milk products made from whole milk are also added to the diet.

The amount of fat in the rational diseases of the child, the quality of fever, should not be increased, because fats contribute to the strengthening of the internal environment, which is already sent in the disease. The total amount of fat component in rational diseases does not cause a revision of the physiological norm, and in some cases, especially in the first days of the disease, maybe lower.

The content of carbohydrates in the child's diet in the body during the period of existence in the presence of high body temperature and the phenomenon of toxicosis should not be high, because they often increase the number of processes in the intestine. Carbohydrates in the diet of a child should be introduced at the expense of vegetables, fruits, and berries, which are also the main sources of fiber and pectin, necessary for the regulation of intestinal function.

During any acute illness, the child's need for vitamins increases, due to the fact that the usual diet should be added to a variety of fruits, berry and vegetable juices, special fortified drinks. It is also necessary to additionally prescribe vitamin preparations, with the first support of vitamins C, A, and group B, which improve the substances that increase and increase the level of safety.

In process of improvement of a condition of the patient, decrease in temperature, elimination of the arising toxicosis the diet of the patient gradually expands and approaches physiological.

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**Methodical instruction to lesson №16 .**

**Topic:** Features of nutrition in celiac disease.

**Venue:** classroom, department of the city children's clinical hospital.

A number of hours - 2.

**Topicality.** In the treatment of the patient one of the most important places is nutrition in celiac disease. Adequate physiological nutrition helps to restore the functional state of organs and systems, creates conditions for the treatment of the disease.

**Goal.** To study the basic requirements to the organization of food at celiac disease, to be able to appoint a diet corresponding to a disease.

**Specific goals**

**The student must know:**

1. Etiological factors of celiac disease
2. Pathogenetic chains of celiac disease
3. The main principle and task of nutrition in celiac disease
4. List of products that contain or do not contain gluten
5. Stages of nutrition in celiac disease

**The student must be able to:**

1. Diagnose celiac disease
2. Assign stages of nutrition in celiac disease
3. Exclude from the diet products containing gluten
4. Recommend gluten-free products
5. Recommend mixtures recommended for celiac disease in young children

**Basic knowledge, skills, abilities necessary for studying the topic (interdisciplinary integration)**

|  |  |
| --- | --- |
| **Names of previous disciplines** | **Acquired skills** |
| Physiology | Features of digestive processes |
| Biochemistry | Food components, their structure, role in the body. |

**Tasks for independent work in preparing the student for the lesson**

**Theoretical questions for the lesson:**

1. The role of food in the development of celiac disease
2. The main symptoms of celiac disease
3. Stages of nutrition in celiac disease depending on the phase of the disease
4. List of products that contain or do not contain gluten
5. List of mixtures prescribed for celiac disease
6. The initial level of knowledge and skills is tested in solving test questions, design questions.

**Materials which might be helpful.**

**Celiac disease** is a genetically determined disease based on selective intolerance to gluten proteins (gliadin, gluten) contained in some cereals (wheat, rye, barley, oats). The cause of the disease is the absence or insufficient production in the cells of the intestine of enzymes (aminopeptidases), which are necessary for the deamination of gliadin. Celiac disease is an example of classical malabsorption because this disease disrupts the absorption of almost all food ingredients. Along with hereditary celiac disease, there is a celiac syndrome that develops after severe infections (especially intestinal) on the background of irrational antibiotic therapy and inadequate nutrition.

**Clinic.** The disease most often manifests itself at 11-12 months or a little later in children who overeat cereal products. Healthy children become irritable, lose their appetite, have an increase in the size of the abdomen due to bloating and bulky, smelly, foamy, and sometimes greasy stools. There is no pathogenic flora in the feces. Then there are signs of rickets, symptoms of multivitamin deficiency develop, there is a delay in psychomotor development. The only plausible method for the diagnosis of celiac disease is the histological analysis of biopsies of the small intestinal mucosa. At carrying out three biopsies of the small bowel (in the period of diagnosis, after the beginning of treatment, and after provocation by gluten). The diagnosis of celiac disease is also confirmed by serological methods, determine antigliadin antibodies (AC1A, IgG, ACA, IgA).

**The treatment** of celiac disease is complex, but the determining factor in the pathogenetic therapy of intestinal diseases is therapeutic nutrition.

The main principle of the diet for celiac disease is the exclusion from the diet of foods containing gluten. In this way, it is possible to "bypass" the metabolic block in the body. Cereals, flour, pasta, bread, and bakery products from rye, wheat, barley, oats are completely excluded from the diet. It is necessary to know that such products as pâtés, minced meats, sausages, sausages contain flour of cereals. The set of products that do not contain gluten is quite wide and allows the patient to provide adequate nutrition (see table).

|  |  |
| --- | --- |
| **Food products containing gluten** | **Gluten-free foods** |
| Wheat, rye, oat flour  Semolina, pearl barley, oatmeal  "Hercules", oatmeal  Bread, crackers, pasta, confectionery  flour products  Milk formulas (B-oats, "Baby", "Health",  "Krepish" with oatmeal,  milk-semolina, milk-oat)    Meat soups and sauces with flour seasoning  Pâtés, minced meat, sausage, sausages | Rice, buckwheat, cornflour and  cereals, cornflakes  Milk, cheese, cottage cheese  Milk mixes "Baby", "Vitalakt",  "Detalakt", "Kid" with rice, buckwheat  groats  Fermented milk products  Eggs  Low-fat beef, poultry, rabbit  Fish  Potatoes, carrots, and other vegetables  Beans, fruits, juices  Sugar, honey, jam, marshmallows  Vegetable and butter |

**Basic principles of nutrition in celiac disease.**

Objectives of diet therapy:

1. Exclude from the diet nutrients that are not tolerated by the body (gliadin) - elimination diet.

2. Affect impaired intestinal function.

3. Normalized metabolism.

In the **acute period,** when there are detailed clinical symptoms of malabsorption syndrome, severe intoxication, patients are usually in the intensive care unit, where they receive detoxification treatment, partial parenteral nutrition. In order to maximize the sparing of the gastrointestinal tract, the removal of toxic metabolic products from the body of the child for 4-6 hours. prescribed water-tea diet (Ringer's solution, unsweetened tea in combination with saline solutions, oralit, rehydration) at the rate of 150-200 ml of fluid per 1 kg of body weight per day.

In the next 5 days, the transition to a gluten-free diet in full should be carried out by a gradual trial feeding with concentrated rice broth and sour milk mixtures. Then very carefully, not earlier than the 3-4th day of stay in a hospital, the porridge from rice and buckwheat flour prepared on water (without oil and sugar), ground beef is entered; decoction of dried apples. The following is allowed calcined cheese, which is better tolerated than sour milk, because calcium salts have anti-inflammatory effects on the intestinal mucosa, promote the formation of feces.

Due to secondary lactase deficiency, children with celiac disease in the acute period should completely exclude milk and dairy products. In the presence of sucrose deficiency, sugar is replaced by glucose.

At this stage, we can recommend adapted lactose-free milk formulas NAS Lactose-free and NAS Soy (Nestle), Nutrilon low-lactose (Nutricia). The industry produces a wide range of cereals, fruit, vegetables, gluten-free meat purees that do not require jam. The absence of gluten in the products is indicated by a special sign on the label (crossed out spikelet), or an inscription stating that the product does not contain gluten.

In the more severe course of the disease in the diet of children, it is recommended to use therapeutic mixtures based on protein hydrolysates. These products contain partially fermented proteins and fats, triglycerides, which are easier for the child to absorb. Patients improve appetite, normalize bowel movements, and increase body weight. At the exhaustion of patients with celiac disease, it is possible to apply therapeutic mixes on the basis of protein hydrolysates with the addition of triglycerides with an average length of a chain.

By the 10th-14th day, children are completely transferred to the gluten-free diet, conventionally designated by us as **C1 - celiac (first option).** This therapeutic diet provides maximum mechanical and chemical sparing of the intestinal mucosa: the dishes are served grated or steamed. Vegetables are sharply limited, potatoes and carrots are allowed in limited quantities for the preparation of the first dish. Fruits, fresh juices are excluded. Diet C1 - with normal protein content, restriction of fat (15%), and carbohydrates (25%), with the exception of milk and sugar restriction. Restriction of fats and carbohydrates is associated with reduced fat tolerance and the presence of disaccharide deficiency in patients. As food tolerance increases, fermented milk medicinal products are used in the diet to improve intestinal biocenosis: fermented milk lactobacterin without lysozyme and with lysozyme, biolact, bifilact, and fermented milk lactobacterin enriched with zinc (to improve metabolic processes and correction).

On this diet C1 patients are on average for 1 week and then individually, as the exacerbation subsides, they are transferred to the **diet C2 - celiac (second option).** The diet is also mechanically and chemically sparing, without milk, with a restriction of sugar, with some restriction of fats, but with the increased by 10-15% in comparison with norm protein maintenance (for the purpose of restoration of the broken protein metabolism, removal from dystrophy). Natural protein products (cheese, kefir, meat, eggs), as well as medicinal fermented milk products and protein epit are used for protein subsidy. On this diet, children are from 2 to 6 months. (period of convalescence).

Then, in the transition to clinical remission in the absence of local and enteral syndrome, patients are transferred to the third variant of the **diet (diet C3).** Its general characteristics are the same as the second version of the diet but differ in that this option is less gentle. Dishes are prepared unwashed. Baked apple, fresh fruit juices are introduced into the food individually: apple, blueberry. Buckwheat, rice, or cornmeal cakes are added to the diet.

Children with true celiac disease should follow a diet for life.

With celiac syndrome, you can expand the diet only after a special examination of the mucous membrane of the small intestine, and not earlier than 3-5 years after the appointment of a gluten-free diet

**Essential Reading:**

1. Christopher Duggan, John B. Natkins. Nutrition in Pediatrics. 5th Edition. People"s Medical Publishing house. USA Shelton. Connecticut;2016 -2814p.

2. Prof. Ebenezer, O. Ojofeitimi. Nutrition in Health and Diseases. Course Guide.2018 -148p.

3. Ronald E. Kleinman, Frank R. Greer, Pediatric Nutrition, 8th Edition, AAP Committee on Nutrition.2019 -320p

**Supplemental Reading:**

1. World Health Organization (WHO). Nutrition: complementary feeding. http://www.who.int/nutrition/topics/complementary\_feeding/en//. Accessed December 18,

2016

2. Hanson, M., Gluckman, P., and Bustreo, F. (2016). ‘Obesity and the health of future generations’, The Lancet Diabetes & Endocrinology, 4(12), pp.902-967

3. American Academy of Family Physicians. Clinical preventive service recommendation. Iron deficiency anemia. <https://www.aafp.org/patient-care/clinical-recommendations/all/iron-deficiency-anemia.html>. Accessed February 12, 2018

**Web-based and electronic resources:**

1. www.bda.uk.com British Dietetic Association

2. www.nutrition.org.uk British Nutrition Foundation: general food and nutrition information

3. www.nutrition.org American Society for Nutritional Sciences

**The methodical instruction is made by MD, PhD, Associate Professor Romaniuk O.**

**Approved at the meeting of the department**

**"15" June 2023, protocol № 14**

**NUTRITION OF CHILDREN WITH**

**INSULIN-DEPENDENT DIABETES MELLITUS**

Diet therapy is one of the important methods of treating patients with diabetes, the most important factor in achieving sustainable compensation for the disease.

Basic principles of dietary treatment of children and adolescents with non-insulin-dependent diabetes mellitus:

1. Therapeutic nutrition should meet the physiological needs of the main food ingredients of a child of this age.

2. Patients with diabetes do not need a "separate table" and special culinary processing of food. Exclude only refined carbohydrates from the regular diet and prefer foods that do not cause a significant increase in blood glucose levels.

3. Nutrition recommendations should be adapted as much as possible to the stereotype of family nutrition and the habits of a sick child.

4. The patient must be able to freely use the equivalent replacement of products, which will further bring the nature of his diet to the diet of a healthy person and allow him to freely eat outside the home.

The ratio of the main food ingredients in the diet of a diabetic patient should not differ from that in the diet of healthy children. At least 50% of the caloric content of the diet is covered by carbohydrates, up to 30% - by fats, and about 20% - by proteins.

Refined carbohydrates (sugar, jam, candy, chocolate, etc.) are completely excluded, as they increase blood glucose levels very quickly and significantly. The consumption of so-called unprotected carbohydrates (white bread, semolina), which have a significant glycemic effect, is minimized. At the same time, the amount of foods containing dietary fiber (vegetables, fruits, legumes, greens), which regulate digestive processes, reduce the absorption and promote the excretion of monosaccharides and cholesterol. The systematic consumption of food containing sufficient fiber (at least 30 g / day) lowers blood glucose levels and normalizes lipid metabolism. Based on this, in the diet of a child with diabetes, a large place is given to vegetables, especially low in easily digestible carbohydrates (cabbage, cucumbers, tomatoes, eggplant, zucchini, turnips, turnips, radishes, sweet peppers, celery, rhubarb, lettuce, parsley, garlic, herbs), which can be used in any quantities. Consumption of carrots, beets, green peas, which have slightly more easily digestible carbohydrates, should be considered. Potatoes, compared to other vegetables, have a fairly high content of carbohydrates, represented by starch, and relatively little dietary fiber. This explains the significant rise in blood glucose levels after eating potatoes, which requires careful consideration of its amount in the diet of patients with diabetes. On average, school-age children should be limited to 150 - 200 g / day, adolescents - up to 250 g / day

Of the cereals, preference is given to those with a high content of dietary fiber (more than 1.0 - 1.5 g per 100 g of product) - buckwheat, oats, pearl barley, corn, wheat. Cereals with a low content of dietary fiber (less than 0.4 g per 100 g of product), such as semolina, are not recommended for patients with diabetes. Rice and pasta are allowed because they do not cause a sharp rise in blood glucose. From bakery products use black bread or bread with the addition of cuts. The digestibility of such varieties of bread is much lower, and the rise in blood glucose is not so pronounced.

Fruits and berries contain a large number of easily digestible carbohydrates in the form of sugars (glucose, fructose, and sucrose). The content of sugars in fruits and berries differ significantly. The richest in sugars (12.5 - 17.5%) are grapes, dates, bananas, figs, persimmons, so they are completely excluded from the diet of patients. In other fruits and berries, the carbohydrate content is in the range of 5 to 10%. The content of dietary fiber in berries and fruits also varies considerably. In this regard, for diabetics, it is better to eat berries and fruits that contain a minimum amount of carbohydrates and sufficient dietary fiber (raspberries, strawberries, blueberries, blackberries, pears, apples, oranges, lemons, gooseberries).

The amount of fat in the diet of a patient with diabetes mellitus, who has normal physical development and is in a state of compensation, should provide no more than 30% of the daily caloric content of the diet. It is very important that the daily amount of cholesterol does not exceed 300 mg, and the ratio of unsaturated and saturated fatty acids was 1: 1. if the patient has a predisposition to hypercholesterolemia or hyperlipidemia, the level of unsaturated fatty acids in the diet should be higher than specified.

In insulin-dependent diabetes, not only carbohydrate but also protein metabolism is disrupted, because insulin is necessary for the body to absorb amino acids and protein synthesis. Thus, sufficient intake of complete protein from food is an important factor in diet therapy. However, an excess of protein in the diet of a sick child is as unfavorable as its deficiency. With a large amount of protein in the diet, there is an undesirable load on the liver and kidneys, which can lead to disruption of their function.

The amount of protein in the diet of a child with normal physical development with insulin-dependent diabetes should cover 15-20% of the daily caloric intake. At least 60% of the total amount of protein should be proteins of animal origin. To this end, the diet includes low-fat meats, fish, poultry, low-fat cheese, eggs. It is necessary to limit sharp and salty dishes, smoked products, and spices.

An important stage in the selection of adequate diet therapy is the individualization of the standard diet, ie correction of the daily energy value of the diet, set of products, menus, hours of meals according to lifestyle, family stereotype, patient habits. All family members of a sick child should know that when replacing one dish with another, the basic rule must be followed: a new dish or product must contain the same amount of basic food ingredients. At the same time, special attention should be paid to the carbohydrate component.

At this time, in order to equivalently replace carbohydrate-rich products use such a concept as a unit of bread (BU). One BU contains 10 - 12 g of carbohydrates (this is the amount contained in 25 g of black bread). When using this unit, all carbohydrate products are evaluated by their content of BU. So in 100 g of black bread contains 4 BU, in one apple of average size 1 BU.

In the table. presented data on the recommended chemical composition of the daily diet for children of different ages with diabetes, with the transfer of the number of carbohydrates in HO

**The amount of essential nutrients in the daily diets of patients with diabetes of different ages.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Food ingredients (% of daily calories) | Caloric content of the diet, kcal/age of children, years | | | | |
| 1500  (5-6) | 1800  (7-9) | 2000  (10-11) | 2200 (12-13) | 2500 (14-15) |
| Carbohydrates, g (50%) | 188 | 225 | 250 | 275 | 313 |
| Proteins, g (20%) | 75 | 90 | 100 | 110 | 125 |
| Fats g (30%) | 50 | 60 | 67 | 74 | 84 |
| BU | 15-19 | 18-22,5 | 20-25 | 22-27,5 | 26-31 |

Rational nutrition in diabetes involves a clear distribution of calories in the daily diet by the number of meals. The most acceptable traditional mode of distribution of daily calories into 3 main meals and 3 additional.

It is very important for the sick child and his family members to understand the need for strict implementation of nutrition recommendations to maintain good health and performance, as well as constant control (self-monitoring) of the patient's diet. Self-control means drawing up by the patient or family members of the individual food plan which on the one hand is strictly based on medical recommendations, and on the other hand - considers features of a daily routine and preferences in the food of the child. To do this, daily calculate the chemical composition of the diet, compare the figures with the recommended, analyze the mistakes, find out the reasons, assess their impact on the condition of a sick child, and then make appropriate adjustments.

Distribution of the chemical composition of the daily diet of children with diabetes of different ages

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Meals (% of daily calories) | Food ingredients, g. | Caloric content of the diet, kcal/age of children, years | | | | |
| 1500  (5-6) | 1800  (7-9) | 2000  (10-11) | 2200 (12-13) | 2500 (14-15) |
| Lunch (30%) | Carbohydrates, g | 56,5 |  | 75 | 84 | 94 |
| Proteins, g | 22,5 |  | 30 | 34,5 | 38 |
| Fats g | 15 |  | 20 | 22,5 | 25 |
| 1st breakfast and 1st dinner (by 15% | Carbohydrates, g | 47 |  |  |  |  |
| Proteins, g | 13,5 |  |  |  |  |
| Fats g | 12,5 |  |  |  |  |
| 2nd breakfast (20%) | Carbohydrates, g | 18,5 |  |  |  |  |
| Proteins, g | 7,5 |  |  |  |  |
| Fats g | 5 |  |  |  |  |
| Afternoon and 2nd dinner (by 10%) | Carbohydrates, g | 9,5 |  |  |  |  |
| Proteins, g | 4 |  |  |  |  |
| Fats g | 2,5 |  |  |  |  |