

MINISTRY OF HEALTH PROTECTION OF UKRAINE

Odessa national medical university

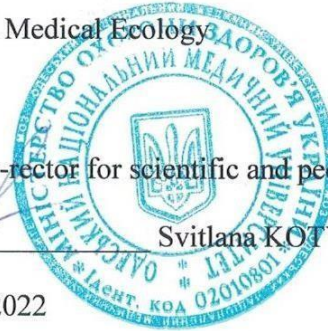
Department of Hygiene and Medical Ecology

APPROVE

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METHODOLOGICAL DEVELOPMENT TO
PRACTICAL LESSONS

Medical Faculty, course 4

Educational discipline DIETOLOGY

Approved:

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PRACTICAL LESSON #1

Topic: Rational nutrition. Basic principles and rules.

Purpose: To form a system of scientific and practical knowledge about the essence of rational and healthy nutrition in the applicants, to gain knowledge about the composition of food products, their role for the human body, principles of food ration composition, nutrition culture. To give the necessary knowledge to understand the phenomena that occur in the human body when consuming food, their impact on health. To inculcate a culture of healthy eating, to promote the formation of habits, regarding rational nutrition, to promote the development of skills, regarding the preparation of healthy food.

Basic concepts: Rational nutrition, proteins, fats, carbohydrates, minerals, vitamins, replaceable and essential amino acids, energy value, calorie content of food

Equipment: Laptop, projector.

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).
2. Control of the reference level of knowledge of the question (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

3. Question:

- 1 What part of the diet should be proteins, carbohydrates, fats?
2. What features should be taken into account when preparing a diet?
3. What is the energy value of food?
4. What should be the distribution of the energy value of the daily ration?
5. What is body mass index and how is it determined?
6. What should be the diet?
7. What should be the average energy value of an adult's diet?

Formation of professional skills:

1. Carry out calculations of the main exchange.
2. Calculate the body's energy expenditure
3. Determine the actual ratio between the main nutrients - proteins, fats and carbohydrates
4. Make a daily schedule with energy consumption for various types of activities.

HYGIENE AS A SCIENTIFIC DISCIPLINE, ITS PURPOSE, TASKS, SANITATION

People have long understood the importance of nutrition for health and life. Over the centuries, the practical recommendations on nutrition of the outstanding physician of the Middle Ages, Abu Ali Ibn Sina (Avicenna), have been applied. In his well-known work "The Canon of Medicinal Science", the scientist advised to regularly consume a variety of food products, adhere to the diet and the sequence of eating, he saw great harm to health in undernutrition and overeating. These views are close to modern ideas and have not lost their significance even today. After studying the section "Rational and healthy nutrition", students should know: the basics of maintaining the body's homeostasis, cellular and molecular mechanisms for the implementation of these reactions, their regulation and genetic control; functional foundations of a healthy lifestyle; definition and constituent components of a healthy lifestyle, rational nutrition in particular; basics of rational nutrition: the ratio of organic and inorganic substances; the principles of the modern food and drink paradigm (low-calorie, maximum use of dietary fiber, vitamin-containing products, the role of proper water consumption); to be able to develop innovative medical-pedagogical health technologies regarding rational nutrition; evaluate the level of basic metabolism and daily energy expenditure. This practical work will clearly demonstrate the necessary and available quality of nutrition of a particular student and will allow you to pay attention to your own diet, review its quality, justify the need for a full-fledged diet in accordance with energy consumption. Thus, practical work will acquaint students with the basics of rational nutrition and the preparation of daily rations of optimal nutrition in various life situations.

BASIC THEORETICAL KNOWLEDGE

Among the numerous environmental factors that constantly affect the state of the human body, nutrition is one of the most important, as it provides the highest human value - health. The role of

nutrition in ensuring the vital activity of the body is well known: energy supply, synthesis of enzymes, plasticity, etc. Disruption of metabolism leads to the occurrence of nervous and mental diseases, vitamin deficiency, diseases of the liver, blood, etc. Nutrition is the process of entering the body with food, substances, sources of energy, elements necessary for the construction of new cells, to maintain a constant composition of the body's internal environment. Food is an extremely complex mixture of food products. Modern scientists consider food as a source of numerous compounds (several thousand). However, the biological value of food is determined by its content of about 70 nutrients necessary for the human body. The food ration should be composed so that its energy value covers the body's energy expenditure. According to the theory of balanced nutrition, which was first formulated by O. O. Pokrovsky, for the normal functioning of the body and assimilation of food, it is necessary to supply it with all nutrients in an optimal ratio. Research by scientists is aimed at clarifying the optimal human need for nutrients. The most fully developed the principles of the balance of proteins, amino acids, fats, fatty acids, carbohydrates and minerals. The correct diet is an important component of rational nutrition. The regime involves regular eating at certain hours at certain intervals, as well as the distribution of the daily ration according to energy value during the day. Adherence to the diet ensures the rhythmic work of the digestive system, normal assimilation of food and proper metabolism. A balanced diet implies a clear correspondence between the energy received from food and the body's energy expenditure. Unfortunately, most often students eat extremely irregularly, "snacking" on the go 1-2 times a day. It should be remembered that until the age of 25, 6 processes of growth and formation of the body are still incomplete. This age category has significantly greater mental and neuropsychological loads, significant strain on the visual apparatus. Therefore, for today's students, a balanced and rational diet is a necessity - the main physiological factor in strengthening human health. Nutritional problems of students stem from the peculiarities of their work and rest regime. And with constant sports activities of students, the need for all nutrients increases significantly. At the same time, as evidenced by research in this field, the nutrition of students with monotonous food does not correspond to the indicators of rational and healthy nutrition. Rational nutrition - nutrition that is balanced in terms of energy in terms of calories, composition depending on gender, age and type of activity, on cold or warm climate. Ratio (from Latin Ratio) translated from Greek means reason, science, as well as calculation. Thus, rational nutrition is a reasonable, precisely calculated supply of food to a person. It provides:

- The responsibility of nutrition to the physiological needs and energy expenditure of the body;
- Maintaining a quantitative and qualitative balance of the main food and biologically active substances in the daily diet;
- Adherence to the correct diet.

Nowadays, the majority of the population, especially teenagers and students, do not meet this concept of nutrition not only because of insufficient material security, but also because of the absence or lack of knowledge on this issue, as well as because of a contemptuous attitude towards it. Increasingly, students are eating foods and drinks that are high in calories but low in nutrients, which has been dubbed "junk food." This negatively affects the health of young people, leads to the development of the so-called "hidden hunger", nutrient deficiency, primarily minerals and vitamins. It is known that high-calorie drinks are much more dangerous than sweets (candies, cakes, etc.). The fact is that calories entering the body with liquid are absorbed instantly, without any energy expenditure. Usually a person cannot calculate the amount of drink he needs and drinks more than he needs. The situation is different with sweets: solid food is digested more slowly, it creates a feeling of satiety, as it stays in the stomach the longest. In addition to the above, about 10% of the energy received by the body is spent on its assimilation. Carbonated water is a mixture of phosphoric acid, sugar, caffeine, various dyes and flavorings. The harm from carbonated drinks can be compared with their popularity and put an equal sign between them. Carbonic acid contained in carbonated drinks extends their shelf life, but it is it that irritates the mucous membrane of the stomach and contributes to its increased secretion, disrupting the acid-base balance. "Fashionable" unnatural fast foods with chemical additives, preservatives, dyes, sugar and its artificial substitutes, refined products, chips, alcohol, caffeine, tobacco are harmful stimulants that, due to a high rise in insulin levels, lead to a significant release of serotonin (the mood hormone) . But the improvement in well-being does not last long, and soon, in order to avoid depression from a lack of serotonin, the brain begins to demand the next portion of stimulants. Thus, a person becomes addicted to stimulants, which have a cumulative effect on metabolic disorders and cause great harm to the body, causing serious diseases. And the main consumer of these "products" is young people. It should also be noted the harmful effect on students' health of their wide consumption of refined sugar, which is present as

additives in many products (candies, cakes, cookies, cakes, sweet drinks, etc.). A large amount of calcium is spent on its assimilation, which in turn washes calcium out of the bone tissue and contributes to osteoporosis. In addition, for the absorption of white sugar, B vitamins are extracted from various organs, which leads to their deficiency. And people, especially young people, suffer from nervous excitability, indigestion, fatigue, impaired vision, anemia, heart attacks, muscle and skin diseases. Therefore, rational nutrition is of great importance in the prevention of many diseases: atherosclerosis, ischemia heart disease, myocardial infarction, diabetes, gallstone and kidney stone diseases, hypertension and others. Rational nutrition involves the consumption of mixed food, which includes a variety of food products of animal and vegetable origin - 8 dairy, fish, meat, as well as vegetables, fruits (fruits and berries), processed products, cereals, bakery products, etc. Rational nutrition is based on the following laws: The first law: Energy value is the maintenance of a balance between the energy that comes with food and the body's energy expenditure. Any physical or mental work requires additional energy expenditure. If people engaged in sedentary, "sedentary" work have a daily energy requirement of 2,500-2,800 kcal, then for people engaged in heavy physical work, these values reach 4,000-5,000 kcal. Women's daily energy needs are approximately 15% lower than men's. For inactive men and women aged 18 to 60, the daily energy requirement is 2550-2800 kcal and 2200-2600 kcal, respectively. If a person consumes more calories than the body needs, then the balance is disturbed, and as a result, a fat layer is deposited. Carbohydrates and fats provide the body with the main energy material. Proteins are used mainly as plastic (building) materials, but their excess is also used to obtain energy. The second law is the balance between proteins, fats and carbohydrates, vitamins, minerals and ballast components that enter the body. According to this law, in order to maintain health and lead a full life, a person does not need specific products, but in a certain ratio of nutrients contained in them. For normal development, the human body needs a systematic intake of almost 70 food components, that is, the human body itself does not produce them, it receives them only with food. Various food products have this amount of valuable food components: meat, fish, grains, vegetables, fruits, berries, and others. There are specially developed norms of physiological needs for nutrients and energy for different population groups. This law of rational nutrition dictates the following rule: variety. The third law is compliance with the diet. This is the regularity and optimal distribution of food during the day. A diet that is produced during life and plays an important role in maintaining health. The number of meals affects the metabolism and functional state of the body. A person's well-being is at its best 9 with 3-4 meals a day. This diet is optimal. Healthy diet (healthy diet, English healthydiet) is nutrition that ensures the growth, normal development and vital activity of a person, which helps to strengthen his health and prevent diseases. A rational and healthy diet first of all implies a proper diet. As previously reported, meal times should be clearly defined and fall on the same hours. Irregular eating worsens digestion conditions and contributes to the development of diseases of the gastrointestinal tract. Incorrectly organized nutrition leads to a decrease in work capacity, an increase in susceptibility to diseases and, finally, to a decrease in life expectancy. Energy in the body is released as a result of the oxidation of proteins, fats and carbohydrates. Proteins are vital substances in the body. They are used as a source of energy (oxidation of 1 g of protein in the body gives 4 kcal of energy), building material for cell regeneration (restoration), formation of enzymes and hormones. The body's need for proteins depends on gender, age, and energy expenditure, to make up 80-100 g per day, in particular 50 g of animal proteins. Proteins should provide approximately 15% of the caloric content of the daily diet. Proteins include amino acids, which are divided into replaceable and non-replaceable. The more proteins contain essential amino acids, the more complete they are. Essential amino acids include: tryptophan, leucine, isoleucine, valine, lysine, methionine, phenylalanine, threonine. Fats are the main source of energy in the body (oxidation of 1 g of fats yields 9 kcal). Fats contain valuable substances for the body: unsaturated fatty acids, phosphatides, fat-soluble vitamins A, E, K. The body's daily need for fats is on average 80-100 g, including vegetable fats, which should provide approximately 35% of the caloric content of the daily diet. The greatest value for the body is represented by fats containing unsaturated fatty acids, that is, fats of vegetable origin. Carbohydrates are one of the main sources of energy (oxidation of 1 g of carbohydrates gives 3.75 kcal). The body's daily need for carbohydrates is from 400-500 g, including starch 400-450 g, sugar 50-100 g, pectins 25 g. Carbohydrates should provide approximately 50% of the caloric content of 10 daily rations. If there is an excess of carbohydrates in the body, they turn into fats, that is, an excessive amount of carbohydrates contributes to obesity. In addition to proteins, fats and carbohydrates, the most

important component of rational about nutrition are vitamins - biologically active organic compounds necessary for normal life. Lack of vitamins leads to hypovitaminosis (lack of vitamins in the body) and avitaminosis (absence of vitamins in the body). Vitamins are not formed in the body, but get with products. There are water-soluble and fat-soluble vitamins. In addition to proteins, fats, carbohydrates and vitamins, the body needs minerals, which are used as a plastic material and for the synthesis of enzymes. There are macroelements (Ca, P, Mg, Na, K, Fe) and microelements (Si, Zn, Mn, Co, Cr, Ni, J, Ft, Si). The ratio of proteins, fats and carbohydrates for middle-aged people should be (by mass) 1:1:4 (with heavy physical work 1:1:5), for young people - 1:0.9:3.2. Fig. 1 Food pyramid The "Pyramid" of rational nutrition (Fig. 1) is recommended by Canadian nutritionists. The "Pyramid" of rational nutrition clearly illustrates what and how much a person should eat to form, preserve and strengthen health. The pyramid is a varied diet, which makes it possible to get all the nutrients and calories necessary for a normal weight. The first group at the base of the pyramid includes foods rich in "long" or, in other words, "correct" carbohydrates. These include whole grain bread and pasta, porridge, unpolished rice, etc. These products should form the basis of the diet of the day. You should avoid 11 rolls, croissants, muesli bars - they contain a lot of butter and an excess amount of carbohydrates. The second group includes fruits and vegetables. The third group is vegetable fats, mainly monounsaturated (olive oil or peanut). They are considered useful, in contrast to the saturated fats contained in meat, dairy products, etc. The fourth group is a group of protein-rich products of plant and animal origin. The fifth group is milk and dairy products (cheeses, yogurts, etc.). It is better to use low-fat dairy products. The sixth group is at the very top of the food pyramid and includes foods that must be significantly reduced. Recently, potatoes began to be included in this group because of their high starch content.

The portion of each product in the pyramid has its own value:

Whole grains: bread - 1 piece;

- porridge in dry form - 30 g;
- boiled rice, pasta and other cereals - 90 g;

Vegetables: lettuce - 50 g;

- boiled or raw vegetables - 90 g;
- vegetable juice 175 ml;

Fruits: apple, banana, orange, pear, peach - 1 pc.;

- canned fruits - 125 g;
- 100% fruit juice 175 ml; Dairy products: milk or yogurt - 250 ml;
- hard cheese - 45 g;
- sour milk cheese - 60 g;

Proteins: lean meat, fish, poultry - 60-90 g;

- beans - 180 g;
- eggs - 2 pcs.;
- nuts - 100 g;
- peanut butter - 2 tbsp. spoons;

Fat: olive oil - 1 tsp.

Sweets:

- sugar, honey, jam - 1 teaspoon;
- cookies - 1 pc.

However, there are no universal rational nutritional regimes. It is specific for each person. At the same time, individual characteristics of metabolism, gender, age, and nature of work should be taken into account. The importance of the problem of student nutrition stems from the peculiarities of their work and rest regime. Even at rest during the day, a student spends 1500-1800 kcal of energy. Energy consumption can actually double in a day. The nutrition of students is influenced by the peculiarities of their daily routine, as well as their age and gender, the course of study, and the peculiarities of physiological adaptation. In the first courses, the energy content of food should exceed 5-10%. In 13, the average daily energy value of the diet of male students is 3300 kcal, female students - 2800 kcal. The main supplier of energy is carbohydrates, which should make up 56% of the energy value of the diet, fats - 30-33%, proteins - 12-14%. The diet of students is important. Breakfast should make up 25-30% of the daily energy value of the diet (meat, fish dishes with a side dish, coffee, tea). Second breakfast (during the break) – 10-15%, Lunch – 30-40%, Dinner 15-20%. At night, it is advisable to drink a glass of kefir or ryazhenka. When the load increases (work in student units, industrial practice, sports competitions), energy consumption can

reach from 4,000 to 4,500 kcal per day. At the same time, the diet should include 140-160 g of proteins (of which 60% are of animal origin), 130-140 g of fats (of which 43 g are vegetable oils), 550-600 g of carbohydrates, as well as vitamins A, B1, B2, PP, S. Changes in the regime of nutrition and physical activity often occur as a result of environmental and social changes and transport, environmental protection, food industry, etc., and as a result of these events, the risk of human diseases increases or decreases depending on the body mass index. The body mass index was developed by the Belgian sociologist and statistician Adolphe Quetelet in 1869. It is known that the body mass index (BMI) (English: Body mass index) is a value that makes it possible to assess a person's body weight and thereby indirectly determine whether it is insufficient, normal or excessive. In accordance with WHO recommendations, an interpretation of BMI indicators has been developed. It was established that people with a body mass index of 19.1–25.8 (women) and 20.7–26.4 (men) belong to healthy people and, conversely, people with a BMI that exceeds these limits are included to the risk group. Body mass index (IMT) is a value that allows you to assess the degree of correspondence between the weight and height of an adult. Body mass index (BMI) is the ratio of body weight in kilograms to height in meters squared (BMI) is equal to body weight in kg / height² (in meters). BMI is calculated according to the formula: $BMI = m/h^2$, where: m is body weight in kilograms, h is height in meters, and is measured in kg/m². Depending on the age groups, the limits of the optimal range for BMI change: • for the age group of 19-24 years, the BMI is within 19-24; • for 25-34 years BMI - 19-25.

List of recommended literature (main, additional, electronic information resources):

Main:

1. Hygiene and ecology // textbook for students of higher medical educational institutions in English. /edited by V.G. Bardova – Vinnytsia: NovaKnyga, 2018.
2. Environmental Health: from Global to Local \ Under Howard Frumkin edition – Third edition. - San Francisco, 2016

Additional:

3. General hygiene. Hygiene propaedeutics/Textbook for foreign students. / E.I. Honcharuk, Yu.I. Kundiev, V.G. bardo otter - K.: Higher school, 2000.
4. Korobchanskiy V.A. Hygiene and Ecology \ Korobchanskiy V.A., Vorontsov V.P., Musulbas A.A. - Kharkov, 2006

PRACTICAL LESSON #2

Topic: Basics of nutrition for a healthy and sick person

Goal: To master the methods of rational and medical nutrition,

Basic concepts: rational nutrition, medical nutrition, physiological norms of nutrition

Equipment: Laptop, projector, lux meter

Plan:

4. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).
5. Control of the reference level of knowledge of the question

Question:

1. What is the difference between rational and medical nutrition?
2. What physiological norms of nutrition for different groups of the adult population do you know?
3. What is a diet?
4. What non-traditional methods of human nutrition do you know? What can they lead to?

Formation of professional skills:

1. To be able to calculate the physiological norms of nutrition for the patient

2. Prescribe medical nutrition

1. Basic food substances and their digestibility

Nutrition is the most important physiological need of the body. It is necessary for the construction and restoration of tissue cells, the supply of energy to replenish the body's energy expenditure and substances from which enzymes, hormones, other regulators of metabolic processes and vital activities are formed. Metabolism, function and structure of all cells, tissues and organs depends on the nature of nutrition.

Nutrition is the main process of intake, digestion, absorption and assimilation of food substances in the body.

The main food substances are proteins, fats, carbohydrates, minerals, vitamins, and water.

Essential nutrients that cannot be produced in the body or are produced in insufficient amounts include proteins, some fatty acids, vitamins, minerals and water.

Replaceable nutrients include fats and carbohydrates.

The intake of essential nutrients with food is mandatory. Substitute food substances are also needed in the diet, because due to their lack of education, other nutrients are consumed and metabolic processes are disturbed.

Dietary fibers, consisting of fiber, and other substances are almost not absorbed by the body, but they are necessary for the normal functioning of the digestive organs and the whole body.

The assimilation of food begins with its digestion in the digestive tract, continues with the absorption of food substances into the blood and lymph, and ends with the assimilation of food substances by the cells and tissues of the body. Under the action of stomach and pancreas enzymes, proteins are split into amino acids, fats into fatty acids and glycerol, galactose.

These components of food substances are absorbed from the small intestine into the blood and lymph, with which they are carried to all organs and tissues. Undigested food enters the large intestine, where feces are formed. Digestibility of food

This is the degree of use of the body's food (nutrients) substances contained in it.

The digestibility of food substances depends on their ability to be absorbed from the gastrointestinal tract. The digestibility coefficients of food substances depend on the characteristics of the products included in the diet, the methods of their culinary processing, and the state of the digestive organs.

With a mixed diet (consisting of animal and vegetable products), the digestibility coefficient of proteins is on average 84.5%, fats – 94%, carbohydrates – 95.6%. These coefficients are used when calculating the nutritional value of individual dishes and the entire diet.

The degree of tension of the secretory and motor functions of the digestive organs during food digestion is called easily digestible food. Inconvenient foods include legumes, mushrooms, meat rich in connective tissue, unripe fruits, over-fried and very fatty foods, fresh warm bread.

Knowledge of the digestibility of nutrients from individual products is especially important in medical nutrition. Different methods of cooking can purposefully change the digestibility of food. 2.

Characteristics of rational and medical nutrition

Rational nutrition (translated from Latin - reasonable) is physiologically complete nutrition of healthy people, taking into account their gender, age, nature of work and other factors. Rational nutrition contributes to the preservation of health, resistance of the body to harmful environmental factors, high physical and mental capacity, as well as active longevity.

The requirements for rational nutrition consist of requirements for the food ration, the diet, and the conditions for eating. Dietary requirements:

1) the energy value of the diet should cover the body's energy expenditure;

- 2) proper chemical composition - the optimal amount of food (nutrient) substances balanced among themselves;
- 3) good digestibility of food, which depends on its composition and method of preparation;
- 4) high organoleptic properties of food (appearance, consistency, taste, smell, color, temperature) affect appetite and its digestibility;
- 5) variety of food due to the range of products and various methods of their culinary processing;
- 6) the ability of food (composition, volume, culinary processing) to create a feeling of satiety;
- 7) sanitary-epidemic harmlessness of food. Mode char vigilance includes the time and number of meals, the intervals between them, the distribution of the food ration according to energy value, chemical composition, and weight of meals.

Important conditions for eating: appropriate setting, table setting, absence of factors distracting from eating. It promotes a good appetite, better digestion and assimilation of food.

Therapeutic nutrition - diet therapy - is the use of specially formulated food rations and nutrition regimes for sick people (with acute diseases or exacerbations of chronic diseases) with a therapeutic or preventive purpose.

Therapeutic and preventive nutrition is used to prevent occupational diseases among workers with particularly harmful working conditions. This type of food is organized at industrial enterprises in the form of free breakfasts, lunches, and dinners, which take into account the effect on the body of various harmful substances (chemical or physical) of an industrial nature.

Balanced nutrition is the body's need for nutrients and the relationship between them (nutrients). When evaluating rations, their balance is taken into account according to many indicators. When calculating according to (I), the number of proteins is taken. For example, if the diet contains 90 g of proteins, 81 g of fats, 450 g of carbohydrates, then the ratio will be 1: 0.9: 5. This ratio is unacceptable for medical diets in which the content of proteins, fats, and carbohydrates changes (in diets for obesity, chronic renal failure).

Indicators of nutritional balance should be taken into account when evaluating diets used in medical and preventive and sanatorium-resort institutions, sanatoriums-prophylactics, dietary canteens.

Nutritional disorders of the body are painful (pathological) conditions arising from a lack or excess of energy supplied with food or food substances. Nutritional disorders of the body can be expressed:

- 1) in the deterioration of metabolism and the reduction of adaptive capabilities of the body, its resistance to adverse environmental factors;
- 2) in the deterioration of the functions of individual organs and systems against the background of metabolic disorders and a decrease in the body's adaptive capabilities, clinical symptoms are not very pronounced;
- 3) in the clinically expressed manifestation of nutritional disorders - alimentary diseases - (vitaminosis, obesity, epidemic goiter).

Nutritional disorders of the body arise only from nutritional disorders. They can be caused by diseases of the body itself, which disrupt the digestion of food and the absorption of nutrients, which impair their assimilation by cells and tissues.

One of the important tasks of dietary nutrition is the prevention or elimination of nutritional disorders of the body caused by diseases. 3. Physiological standards of nutrition for different groups of the adult population

Physiological norms are based on the basic principles of rational nutrition. They are average values that reflect the optimal needs of individual population groups for nutrients and energy.

The specified norms are the basis for the organization of rational nutrition in teams and medical nutrition in medical and preventive and sanatorium-resort institutions.

Nutritional norms for the adult population are divided depending on gender, age, nature of work, climate, physiological state of the body (pregnant and lactating women). In the nutrition standards, persons aged 18-60 are divided into five groups of work intensity:

- 1) mental workers, managers of enterprises, medical workers, educators, educators;
- 2) workers engaged in light physical work - tailors, shoemakers, sellers of industrial goods stores, nurses;
- 3) workers with moderate physical labor – machine operators, fitters, adjusters, chemists, surgeons, bus drivers, railway workers, etc.;
- 4) workers of heavy physical labor - construction workers, metallurgists, foundries, oil and gas industry workers, carpenters, etc.;
- 5) workers engaged in particularly heavy work - underground miners, steelworkers, masons, concrete workers, excavators, loaders. Each of the work intensity groups is divided into 3 age categories:

18-29 years old,

30-39 years old,

40-59 years old.

At the same time, the gradual age-related decrease in energy expenditure is taken into account, which is reflected in the need for energy and nutrients. The division by gender is due to the lower body weight and less intense metabolism in women compared to men. Therefore, the need for energy and nutrients in women of various ages and professional groups is on average 15% lower than in men. Nutritional norms provide for division into three climatic zones: central, southern, and northern.

The energy demand of the population of the northern zone is 10-15% higher than that of the central zone. For the southern zone, compared to the central one, the need for energy is reduced by 5% due to the reduction of fats that are replaced by carbohydrates. 4. Diet

The concept of a diet includes: the number of meals during the day, the distribution of the daily diet according to its energy value, chemical composition, food set, time of eating during the day, intervals between meals, time spent eating.

The correct diet ensures the efficiency of the digestive system and good health.

For healthy people, 3-4 meals with 4-5 hour intervals are recommended; 4 meals a day is most beneficial for those engaged in mental and physical work. It is not advisable to take food earlier than two hours after the previous intake. Eating between main meals suppresses appetite and disrupts the rhythmic activity of the digestive organs.

When eating fast, food is poorly chewed and crushed, insufficiently processed by saliva. This leads to excessive load on the stomach, deterioration of digestion and assimilation of food. When eating in a hurry, the feeling of satiety comes more slowly, which contributes to overeating. The duration of a meal during lunch is at least 30 minutes.

In the first hour after eating a large meal, drowsiness occurs, work capacity decreases. Therefore, during a break in work, the food consumed should not exceed 35% of the energy value and mass of the daily ration, and should not include dishes that are difficult to digest (fatty meat, legumes, etc.).

The dinner should not contain products that burden the secretory and motor functions of the digestive organs, that cause increased gas formation, nocturnal secretion of the stomach (fried dishes, fatty products, with coarse fiber, extractive substances, table salt).

The last meal should be taken no later than 1-2 hours before bedtime. It should make up 5-10% of the daily energy value of the diet and include such products as milk, fruits, juices, and bakery

products. At high air temperature, the appetite decreases, the secretion of the digestive glands is inhibited, and the motor activity of the gastrointestinal tract is disturbed.

Under these conditions, you can increase the energy value of breakfast and dinner, and reduce lunch to 25-30% of the daily amount.

It has been established that the need for food intake is related to individual features of the daily biorhythm of the body's functions. In most people, an increase in the level of these functions is observed in the first half of the day (morning type). These people normally accept a stinky breakfast. In other people, the level of body functions is reduced in the morning, it increases in the afternoon. For them, a dense breakfast and dinner should be moved to a later hour.

In sick people, the diet may change depending on the nature of the disease and the type of medical procedures.

5. Non-traditional methods of human nutrition

Non-traditional nutrition means such nutrition, which to one degree or another differs from the principles of rational and therapeutic nutrition accepted in modern medicine. Some non-traditional methods of feeding the population are perceived incorrectly (therapeutic and preventive for some diseases).

Basic methods of non-traditional nutrition

Reduced (restricted) nutrition and fasting, separate and vegetarian nutrition, raw food and macrobiotic nutrition.

Reduced nutrition and starvation

Reduced nutrition is based on recommendations, according to which to preserve health, a constant sharp restriction of energy consumption (on average 2-3 times compared to physiological norms) is necessary.

Voluntary fasting is also recommended to improve health - stopping food consumption while maintaining water intake. Proponents of reduced nutrition believe that for an adult with a normal body weight, consumption of about 1000 k/cal is sufficient. and 25-30 g of protein per day. The energy value of such a diet is lower than the level of basic metabolism for most people.

Reasonableness of reduced nutrition:

1. Assimilation of the energy of the solar heat of the environment by the body.
2. Adapting the body to limited nutrition by reducing energy expenditure.
3. The existence of a special "living" energy that fills a person's energy expenditure.

These provisions are scientifically untenable. A person can extract energy from incoming vegetable and animal products, or from his own fats, carbohydrates, and proteins. The assumption that the body receives energy from the sun's rays and heat from the environment does not correspond to scientific data. The human body is capable to a certain extent and up to a certain limit to adapt to a reduced diet due to a reduction in energy expenditure. In people who are undernourished, the basic metabolism decreases, heat production decreases, a decrease in body temperature with a feeling of constant frostbite is observed. Such a forced restructuring of metabolism, characteristic of the disease (protein-energy deficiency), is unacceptable to the majority of healthy and sick people.

Reduced nutrition is a perversion of the correct position of rational nutrition about moderation in food, adequacy of nutrition to the needs of the body. A semi-fasting diet of reduced nutrition cannot be recommended for most people, as it is harmful to health. Reduced nutrition is used in the treatment of obesity, coronary heart disease (with a large body weight), diabetes.

Forms of starvation:

1. Long-term (2-4 weeks) abstinence from food.

2. Periodic (7-10 days) fasting.

3. Systematic unloading no days with a complete refusal to eat during the day.

Therapeutic fasting was called unloading and diet therapy. Therapeutic fasting is carried out only in special departments of hospitals after examination of the patient.

During long-term starvation, the following can occur in the body: decay and loss of functionally active proteins of tissues and organs, depletion of vitamins and minerals, accumulation of uric acid and products of incomplete oxidation of proteins and fats in the blood. Possible complications: sharp arterial hypotension, a decrease in blood glucose, disturbances in the psycho-emotional sphere leading to mental disorders, hypovitaminosis, damage to the skin, hair, iron deficiency anemia. Cases of death from heart failure due to changes in the breakdown of heart muscle proteins, gastrointestinal bleeding, and acute flatulence due to excessive intake of dense food after fasting have been described.

Restoring nutrition after starvation leads to intensive deposition of fat, in particular the liver. The longer a person is in starvation mode, the faster he later gains body weight. This is due to the fact that with prolonged starvation, the body's biochemical systems adapt to economical energy consumption. Therefore, in case of obesity, long-term fasting is not indicated, since during the recovery period, body weight is quickly replenished even with limited nutrition. In case of obesity, unloading days with complete refusal of food during the day are permissible. Self-treatment of starving sick people is dangerous. One-day fasting cannot harm a healthy person, the benefit of such fasting has not been scientifically proven.

Short-term (1-3 days) fasting is used for some diseases: acute pancreatitis, acute cholecystitis, peptic ulcer disease of the stomach and duodenum complicated by bleeding.

Separate nutrition is the separate, unmixed consumption of products with different chemical composition during meals. Proponents of separate meals in their diet should include:

1) proteins and starch;

- 2) proteins and fats;
- 3) proteins and sugars;
- 4) starch and sugar;
- 5) sour and sweet fruits;
- 6) acidic products with proteins and starch;
- 7) watermelons, milk, melons (separately from other food), do not drink juices between meals.

Their diet should include:

- 1) protein products - meat, fish, cheese, nuts, eggs, etc.;
- 2) starches - cereals, legumes, potatoes, pumpkin;
- 3) fats - vegetable oils, lard, cream, fatty meat.

Separate feeding and related restrictions do not have a significant scientific basis for the following reasons:

1. Digestion of food begins but does not end in the alimentary canal. For better assimilation of food substances, their balanced entry into the cells is necessary.
2. Adaptation of the digestive organs to the high-quality composition of food really ensures complete splitting in the alimentary canal, which is the basis of separate nutrition.
3. Normal intestinal microflora is necessary for the body, and there is no reason to inhibit its activity or to believe that intestinal intoxication is inevitable when eating mixed food. The latter is possible with dysbacteriosis, in particular from eating refined or mainly meat food, due to a lack of consumption of vegetables, fruits, and fermented milk products. Split power is not harmful as long as it is short-lived. Long-term separate feeding can cause a certain detraining of the digestive glands

and possible disruption of digestion when switching to ordinary mixed food. Separate feeding can be used in diseases of the digestive organs (chronic anacid gastritis, gastroduodenitis, pancreatitis).

Vegetarian food

Vegetarianism is a diet of products of plant origin. Vegetarians are considered to be those who consume dairy products and eggs along with plant-based foods while excluding meat and fish from their diet.

There are three types of vegetarianism:

1. Veganism is a strict vegetarianism with the use of only plant foods, a variant of veganism is raw food. Raw food - consumption of plant products in raw form, without heat treatment.
2. Lactovegetarianism - eating plant and dairy products.
3. Lactoovovegetarianism - eating plant and dairy products, as well as eggs.

Among the voluntary reasons for vegetarianism, there are religious, moral and ethical, physiological, and medical ones.

Vegan diets are characterized by a lack of complete proteins and essential amino acids, vitamins B2, B12, and D.

Strict vegetarianism cannot be considered rational for the growing bodies of children and adolescents. The body of a healthy adult can adapt to veganism

Raw food

Raw food is food using raw products: fresh vegetables, fruits, berries, juices, dried fruits, wild edible plants, oilseeds, nuts, sprouted grains, cereals soaked in cold water, honey.

Proponents of raw food use this diet for various reasons:

- 1) the presence of mythical "solar or living" energy in raw vegetable food;
- 2) compliance of raw food with the diet of human ancestors;

- 3) prevention of obesity, since raw food has a low energy value and excludes fast saturation;
- 4) preservation of vitamins and other biologically active substances in raw products.

Raw food is an extreme version of strict vegetarianism, which exacerbates its shortcomings due to the exclusion of bread, flour and cereal products, and potatoes from the diet.

Constantly eating raw food is harmful because it disrupts the body's supply of proteins in terms of quantity and quality. Extraction of protein from raw foods in the alimentary canal is worse than from cooked foods.

Modern science believes that the ancient man's transition from raw food to cooked food expanded his diet and accelerated the assimilation of nutrients. It is a misconception that vegetables and fruits (the main components of raw food) are the source of all vitamins in food. Absolute and constant raw food should be classified as an irrational diet.

Raw food is contraindicated for children, pregnant women and nursing mothers. With a long-term diet of only raw plant products, complications are possible, protein-energy deficiency, polyhypovitaminosis, and anemia develop.

Proponents of raw food, as well as some other directions of non-traditional nutrition, attach great importance to the consumption of sprouted wheat and other cereals. Sprouted grain is recommended for the restoration of vision and hair, in the treatment of exhaustion, obesity, TVS, bronchial asthma. The effect of sprouted grain is associated with the presence in it of auxins, plant growth stimulators, but science has proven that auxins do not affect human and animal bodies, therefore, sprouted grain is imaginary medicine, but it contains more vitamins, minerals, dietary fibers compared with grain processing products.

Nutrition of macrobiotics

The macrobiotic (longevity) nutrition system originated in Japan at the beginning of the 20th century. Macrobiotics believe that in order to improve health and prevent many diseases, it is necessary to avoid animal and poultry meat, animal fats, dairy products, sugar, honey, natural

coffee, and tea. Refined grain products (grains, flour, pasta), industrially produced products, including canned and frozen, table salt are not recommended. Citrus and other imported fruits are not recommended for temperate climates.

The basis of macrobiotic nutrition is grain products: whole rice, whole grains of wheat and other cereals, bread and flour products made from unsifted flour. The diet includes legumes, vegetables, nuts, seeds, and seaweed. At least 50% of the volume of ready-made food should be whole grains of cereals, prepared in various ways (porridge, etc.). Only vegetable oils are used for cooking. Ready meals are seasoned with sea salt. Fluid intake is limited. Dandelion tea, coffee made from cereal grains are recommended for drinks, fruits are allowed 2-3 times a week, and fish 1-2 times a week.

In the macrobiotic nutrition system, it is worth paying attention to the focus on the predominance of unrefined food products in the diet, the rational ratio of sodium and potassium, limiting the consumption of animal fats, cholesterol, sugar, and table salt.

Food rations of macrobiotics, consisting mainly or entirely of cereals, are health-threatening perversions of rational and medical nutrition. Such diets are deficient in amino acids, vitamins, and sources of well-absorbed calcium, iron, and zinc. Protein deficiency, scurvy, hypovitaminosis A, and iron deficiency anemia were found in adults on a cereal diet. Similar complications combined with growth retardation and rickets were observed in children.

Body weight control

The most important indicator of the compliance of nutrition with the needs of the body and the state of health is body weight. For an approximate assessment of body weight, Broca's index is used, according to which in men of average build, normal body weight (in kg) is equal to height (cm) minus 100 with a height of 155-165 or minus 105 with a height of 166-175 cm, or minus 110 with a height of over 175 cm.

For people with a narrow chest, the data obtained is reduced by 5%, and for people with a wide chest, it is increased by 5%.

The body weight of women of appropriate height and build should be approximately 5% less than that of men.

Body weight is called excessive if it is 5-14% higher than normal compared to Broca's index.

If the body weight exceeds the norm by 15% or more, this indicates obesity as a disease.

Degrees of obesity:

I - excess body weight by 15-29%;

II - excess body weight by 30-49%;

III - excess body weight by 50-99%;

IV - 100% excess body weight.

Literature

Main:

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Additional:

3. General hygiene. Hygiene propaedeutics/Textbook for foreign students. / E.I. Honcharuk, Yu.I. Kundiev, V.G. bardo otter - K.: Higher school, 2000.

4. Korobchanskiy V.A. Hygiene and Ecology \ Korobchanskiy V.A., Vorontsov V.P., Musulbas A.A. - Kharkov, 2006

PRACTICAL LESSON #3

Topic: System of standard diets in a medical organization, surgical diets, unloading and specialized diets, special diets

Purpose: To study standard diets and be able to apply them in medical practice

Basic concepts: diet, diet standards, surgical diet, unloading diet, specialized diet, special diets

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

1. The concept of standard diets. Their number and terms of appointment?
2. What are surgical diets, their composition and conditions of appointment?
3. What are unloading and specialized diets, their composition and conditions of appointment?
4. What are special diets?

Formation of professional skills:

1. To study the composition of 15 diets according to Pevzner
2. To study the composition and conditions of prescribing diets of different composition (surgical, unloading, etc.)

SUBJECT TEXT:

The system of standard diets in a medical organization, surgical diets, unloading and specialized diets, special diets

Manuel Pevzner has devoted more than 30 years of his life to the development of a system of medical nutrition tables. His work includes not only personal experience, but also clinical research by doctors in Germany, Austria, and France. The nutritionist himself has always emphasized that his diets cannot replace full-fledged treatment for diseases of any of the systems. But they are able to facilitate recovery and help get rid of the cause of the disease, using a minimum of medications. In addition, the Pevzner table system is a real find for people with chronic diseases.

This is how Manuel Isaakovich Pevzner himself saw the ideal diet (excerpt from the nutritionist's book "Fundamentals of Medical Nutrition"):

"Medicinal nutrition should meet the following requirements: Not only to support the strength of the patient, but also to be a therapeutic agent. Influence the clinical picture of the disease, the nature of the pathological process and the rate of its development. Act on regulatory mechanisms and be a neurohumoral and constitutional therapy. By affecting the body's reactive ability and its vulnerability to inflammatory processes, not only increase the effectiveness of other therapeutic factors, but also reduce the tendency to relapse in chronic diseases. To be a self-sufficient therapeutic factor for a number of diseases. To be effective in cases where other methods of treatment do not help. To be applied to all diseases without exception, since the chemical ingredients of food are involved in the processes of intermediate metabolism, violations of which exist during all diseases. Be a necessary background against which other therapeutic factors are applied. To be prescribed for prophylactic purposes during the dispensation of the population in those cases when the disease develops covertly. It is a preventive measure against the transition of acute diseases into chronic ones. With periodic appointment, for a short time to delay the further development of a chronic disease and the appearance of relapses. To fix the positive result of this or that therapy".

General recommendations for dietary tables according to Pevzner

In addition to individual prohibitions that exist for each table, there are a number of general recommendations that M. Pevzner followed. They are based on his personal experience as a nutritionist and medical beliefs. 1. Yes, from the memories of Manuel Isaakovich's colleagues, we

learn about his dislike of spices. "Pevsner strongly opposed the use of spices in Soviet cuisine, both stimulating and harmful," they write. During meals, he limited himself to salt and black pepper. 2. The Soviet nutritionist also considered fried foods to be a real evil: "... he fiercely cursed all fried foods and recommended that they be cooked in butter or margarine." 3. The third feature of all nutrition systems according to Pevzner is accounting for the composition of the consumed dishes. Manuel Pevzner and his followers were the first in Soviet dietetics to defend a formal approach to food evaluation and suggested calculating how much fat, protein, carbohydrates, and mineral salts it contains. 4. Pevzner believed that mineral salts and vitamins play the most important role in the treatment and support of patients with chronic diseases. It is best to consume them organically from raw vegetables, fruits and berries, the nutritionist claimed. For diseases of the gastrointestinal tract, when none of these products could be included in the diet, Pevzner offered freshly squeezed juices.

Diet according to Pevsner: table No. 1

This diet is used during the treatment of diseases of the duodenum and stomach, mainly in the initial stages. It allows to minimize the manifestations of ulcers and gastritis. The basis of the diet 1 menu is dairy products, vegetable soups and cereals. It is forbidden to take hot and cold food, which can damage the intestinal walls. You can follow this diet for no more than 2 weeks. The daily amount of calories consumed from food should be 2400-2600 kcal.

Diet according to Pevsner: table No. 2

This diet is used in the treatment of diseases of the liver and gastrointestinal tract. The diet is based on low-fat soups and broths. Eliminate the use of products and dishes that contain sugar to avoid diabetes.

Diet according to Pevsner: table No. 3

This diet is suitable for constipation, which is most often the result of improper nutrition. To normalize the digestive process, you need to eat eggs, lean meat, vegetables, cheese and kefir.

Diet according to Pevsner: table No. 4

This diet is prescribed for intestinal diseases. During this diet, you should eat warm food, mainly boiled vegetables, mashed potatoes and cereals. You need to take food in small portions 6 times a day.

Diet according to Pevsner: table No. 5

Diet number 5 is used during liver problems and after gall bladder surgery. Spicy, smoked foods, pickled foods, sour vegetables, berries and fruits, mushrooms, fatty meat and fish, and alcoholic beverages should be excluded from the diet. The menu should include dairy products, non-acidic vegetables, berries, fruits, protein foods, soups, broths prepared on vegetable broths or lean meat.

Diet according to Pevsner: table No. 6

Indications for using this diet are kidney stone and urolithiasis. Its rules include six meals in small portions. It is necessary to remove sausage, smoked products, flour, butter and sweet products from the menu. It is recommended to eat fruits, berries, vegetables and fermented milk products.

Diet according to Pevsner: table No. 7

It is appropriate to follow the diet table No. 7 in case of kidney diseases, in particular, nephritis. This diet is also called a "renal" diet. The daily rate of calorie consumption is at least 3500 kcal, and you need to eat 5-6 times a day. An important rule when creating a menu is to minimize salt consumption - it is recommended to consume a maximum of 2-3 g per day. If you have high blood pressure, remove salt altogether. The amount of fluid consumed per day should not exceed 1 liter. Remove legumes, fatty fish and meat, pickled foods, smoked meats, spicy foods, preserves, and sausage from the diet.

Diet according to Pevsner: table No. 8

It is appropriate to use this diet during obesity. Remove sweets, carbonated drinks, flour bread, fatty meat, all high-calorie products and dishes from the diet. Even overweight children can use this diet.

Diet according to Pevsner: table No. 9

It is used in the initial stage of diabetes. Food is consumed 6 times a day in small portions. The menu should include cucumbers, tomatoes, low-fat fish, low-fat cheese, cabbage, mushroom sauces.

Diet according to Pevsner: table No. 10

Indications for its use are cardiovascular insufficiency. The daily rate of consumed calories should be about 2000 kcal. Confectionery, butter, sweet products, semi-finished products, fast food, alcoholic and carbonated drinks should be removed from the menu.

Diet according to Pevsner: table No. 11

It is recommended to use in the fight against tuberculosis, as well as during pregnancy to increase the level of hemoglobin. As part of Pevzner's 11 diet, the menu should be saturated with fruits, vegetables,

cereals, dairy products, low-fat varieties of meat and fish.

Diet according to Pevsner: table No. 12

It is used to correct malfunctions of the nervous system. Alcoholic drinks, coffee, fatty, fried and spicy dishes are removed from the menu. Dried fruits, eggs, and low-fat dairy products should be included in the diet. The daily rate of calories for diet 12 is 2300-2400 kcal.

Diet according to Pevsner: table No. 13

It is prescribed in the fight against infectious diseases. The daily rate of calories is 2200 kcal. Fried, stewed and baked dishes are removed from the menu.

Diet according to Pevsner: table No. 14

It is used in the treatment of urolithiasis. The daily rate of calories is 2700-3100 kcal. It is necessary to consume 100 g of proteins, 100 g of fats, and 400 g of carbohydrates per day. Food is consumed 4 times a day, and its preparation can be any.

Diet according to Pevsner: table No. 15

Designed for patients who are coming off a diet and returning to a regular diet. Fruits, vegetables, eggs, cereals and broths are added to the menu.

ZERO OR SURGICAL DIET

A zero or surgical diet is shown:

- after operations on digestive organs;
- with disorders of cerebral blood circulation, craniocerebral injuries accompanied by a semi-unconscious state;
- with infectious diseases accompanied by high temperature.

A zero or surgical diet is prescribed for the purpose of:

- provision of nutrition in those conditions when the consumption of ordinary food is impossible, if it is complicated or contraindicated;
- maximum unloading and sparing of the digestive organs;
- prevention of flatulence (intestinal bloating).
- The zero diet is characterized by the maximally possible mechanically and chemically gentle nutrition (liquid, semi-liquid, jelly-like, pureed meals) in the form of three diets that are consecutively prescribed to the patient (diets No. 0A, No. 0B, No. 0B). Diet rations contain the most digestible foods containing proteins, fats and carbohydrates and It is also recommended to include an increased amount of liquid and vitamins in the diet. Restrictions on salt content are introduced. Frequent meals in small portions are indicated.
- Note 1. Diet No. 0B and Diet No. 0B are sometimes referred to as Surgical Diets No. 1A and No. 1B, respectively.
- Note 2. With zero diets, the consumption of Enpits, Inpitan, Ovolact and other special nutritional mixtures is shown.
- Note 3. After zero diets are completed, diets No. 1 or No. 1 surgical are used, which differs from diet No. 1 in the inclusion in the diet of weak meat and fish broths, vegetable broths and the introduction of restrictions on the consumption of whole milk.

DIET No. 0A

- Chemical composition:
- 5 g of proteins;
- 15-20 g of fats;
- 150 g of carbohydrates;
- 1 g of salt;
- 1.8-2.2 liters of liquid.
- Energy value is equal to 750-800 calories.
- Diet No. 0A is usually prescribed for 2-3 days. Consumption of liquid and jelly-like dishes is allowed. Food temperature should not exceed 45 degrees. Up to 200 mg of vitamin C is introduced into the diet, the content of other vitamins depends on medical prescriptions. The recommended seven-eight meal regimen, each meal should not consume more than 200-300 grams
- o Food and meal recommendations
- weak and low-fat meat broth,
- rice broth with the addition of cream or butter,
- strained compote,

- liquid berry jelly,
- sweet decoction of rose hips,
- fresh juices from fruits and berries, diluted with sweet water 2-3 times, in the amount of up to 50 ml per 1 dose.
- If the condition improves, an egg, 10 g of butter and 50 ml of cream are added to the diet on the third day.

Sample menu of diet No. 0A

- At 8 o'clock you should drink 100 g of warm tea, sweetened with 10 g of sugar, and the same amount of liquid fruit or berry jelly.
- At 10 o'clock it is recommended to consume 180 g of liquid from apple compote.
- At 12 o'clock it is allowed to eat 200 g of weak meat broth with the addition of 10 g of butter.
- At 2 p.m., consumption of 150 g of fruit jelly, 150 g of rosehip decoction is shown.
- At 4 p.m., you can drink 150-200 g of tea with lemon and 10-15 g of sugar.
- At 6 p.m., it is desirable to consume 180 g of rice broth with the addition of 10 g of butter or cream, 100-150 g of fruit jelly.
- At 8 p.m., you should drink 180 g of rosehip decoction.
- Before going to bed at night, consumption of 180 g of compote liquid is indicated.

DIET No. 0B, OR No. 1A SURGICAL

Chemical composition:

40-50 g of proteins;

40-50 g of fats;

250 g of carbohydrates;

4-5 g of salt;

up to 2 liters of liquid.

The energy value of the diet is 1500-1600 calories.

Surgical diet No. 1A is indicated after the completion of diet No. 0A. It is usually prescribed for 2-4 days.

With this diet, the diet is supplemented with liquid pureed porridges made of Hercules, rice, buckwheat groats, cooked on meat broth or on a mixture of water and slimy groat soups on vegetable broths, low-fat meat broths with semolina, steamed protein omelets, eggs, steamed soufflé or puree, prepared from lean meat, fish without fat, tendons, fascia, skin, no more than 100 g of cream, non-acidic berry jelly and mousses.

Sample menu of diet No. 1A

- For the first breakfast, it is recommended to consume 200 g of liquid mashed buckwheat porridge on water with the addition of milk and 5 g of butter, a steamed protein omelet from 2 eggs, tea with lemon.
- The second breakfast consists of 100 g of cream, 100 g of rosehip decoction.
- For lunch, you can eat 200 g of meat broth with semolina, 50 g of steamed soufflé from boiled meat, 100 g of compote broth.
- An egg, 150 g of fruit jelly, 100 g of rosehip decoction is allowed for dessert.
- Dinner consists of 50 g of steamed soufflé with boiled fish, 200 g of liquid pureed Hercules porridge on meat broth with 5 g of butter, tea with lemon.
- At night, consumption of 150 g of fruit jelly, 100 g of rosehip decoction is indicated.
- For the whole day, only 20 g of butter and 50 g of sugar.

DIET No. 0B OR 1B SURGICAL

Chemical composition:

80-90 g of proteins;

65-70 g of fats;

320-350 g of carbohydrates;

6-7 g of salt.

The energy value is 2100-2300 calories.

Surgical diet 1B is used to expand the diet and as a transition to physiologically normal nutrition.

The following are added to the diet: mashed and creamy soups, dishes with pureed cooked meat, chicken or fish, cooked in steam, fresh cheese, pureed with the addition of cream or milk to the appearance of thick sour cream, steamed cheese dishes, fermented milk drinks, baked apples, pureed

fruit and vegetable puree, up to 100 g of white bread crackers, milk porridge.

You can add milk to tea. It is recommended to eat six times a day with food, the temperature of which should not exceed 50 degrees (hot dishes) and be less than 20 degrees (cold dishes).

- The first breakfast consists of an egg, 200 g of semolina in milk with 5 g of butter, sweet tea with lemon or tea with milk.

- For the second breakfast, it is allowed to consume 120 g of cheese, rubbed with cream, 100 g of baked apples in the form of puree, 180 g of rosehip broth.

- For lunch, you can eat 300 g of vegetable cream soup, 100 g of meat cutlets t for steam, 150 g of fruit jelly.

- For lunch, it is recommended to eat a steamed protein omelet, 180 g of fruit juice.

- Dinner includes 100 g of steamed souffle from boiled fish, 200 g of Herculean porridge on milk with 5 g of butter, tea with 50 g of milk.

- Before going to sleep, you should drink 180 g of kefir.

UNLOADING DIETS

Weight loss diets are used for overeating and obesity in cases where a low-calorie diet is insufficiently effective. Stimulate metabolism and contribute to the consumption of the body's own fat reserves.

It is recommended to arrange unloading days on days off from work.

Such diets are characterized by some one-sidedness and violation of the principle of balanced nutrition. Therefore, regardless of body weight, they are recommended to be performed 1-2 times a week. If a person suffers from certain diseases and decided to relieve his body a little, then it is necessary to consult a doctor.

The unloading day is a zigzag in nutrition, a kind of shock to the body, which loses 500-800 g of mass per day.

Unloading diets. Alternation is possible for such diets. Fruit (vegetable) days are usually tolerated easily, since a sufficiently large volume of food creates a feeling of satiety and reflexively inhibits the food center. Protein food is also well tolerated, it accelerates the assimilation of carbohydrates and fats.

According to the dominance of food substances in unloading diets, they are divided into protein, sugar, fruit, vegetable, rice-fruit, and fat (sour cream, cream); according to the set of food products - vegetarian, sugar, meat and fish, liquid, combined.

Tea diet

With acute gastritis and enterocolitis - a glass of tea with 10 g of sugar seven times a day

The diet is mixed

6 glasses of warm milk. You can eat 350 g of low-fat boiled meat and 50-60 g of vegetables, dividing both into 4 meals - this is also an unloading day. Meat can be replaced with boiled fish.

Juice diet

For obesity, atherosclerosis, hypertension and diabetes with obesity, diseases of the kidneys, liver and biliary tract.

On a vegetable day, you can use juices (500 mg). For example, freshly prepared carrot (two parts) and beetroot aged in the refrigerator for at least two hours (one part). Drink the mixture in five doses and be sure to eat 150-200 g of fiber (squeezing), which remains after receiving the juice, plus a tablespoon of sour cream (vegetable oil). You need to drink the juice in small sips, holding it in your mouth.

Milk diet

Drink 1-1.5 liters of milk during the day in six to eight doses. It is recommended to drink milk in small sips, keeping it in the mouth longer. This unloading day can be used only in the case of good tolerance of milk, since not all people have lactase - an enzyme that helps to break it down. Less often, milk intolerance is caused by increased sensitivity (allergy) to milk protein.

Dried fruit diet

In case of hypertension, insufficient blood circulation, nephritis, diseases of the liver and biliary tract - 100 g of soaked prunes or dried apricots or boiled raisins 5 times a day.

Oatmeal diet

With diabetes, atherosclerosis with obesity - 140 g of oatmeal on water 5 times a day, total 700 g of porridge (200 g of oat groats); 1-2 cups of tea and rosehip decoction.

Cucumber diet

1.5 kg of fresh cucumbers (15-20 pieces) are divided into five portions. For dinner, you can

additionally eat 50 g of boiled meat (or one egg, 2-3 g of table salt) and drink a glass of unsweetened tea (rosehip decoction). Due to the low calorie content of cucumbers, they can be used more often on unloading days.

Vegetable diet

1.2-1.8 kg of vegetables (except potatoes) in any culinary processing or raw in the form of salads, vinaigrettes should be eaten in six meals. For example, vinaigrette.

Fish diet

Eat 100 g of unsalted boiled fish with a side dish (cabbage, cucumbers, tomatoes) 5 times a day. For breakfast and lunch, you can drink a glass of tea without sugar, coffee with lemon or rosehip broth.

Watermelon diet

With hypertension, circulatory failure, nephritis, gout, diseases of the liver and biliary tract, obesity - 300-400 g of watermelon pulp 5 times a day.

Cheese diet

Option I

Four times a day, eat 100 g of fresh low-fat cheese (preferably homemade) with wheat bran (1-2 teaspoons). They are pre-steamed with boiling water, and after 20-30 minutes the liquid is drained. Cheese goes well with honey, fruits, berries and vegetables, so it is advisable to add it to each portion before meals.

From the daily dose of cheese (400 g), you can prepare cheese casseroles with the addition of fruits, dried fruits or vegetables. For breakfast and dinner, it is advisable to additionally drink a glass of kefir (sour milk, ryazhanka) or rosehip decoction.

Option II

Curd-kefir (milk) diet - 60 g of 9% fat cheese and 1 glass of milk 5 times a day.

Option III

Eat 500 g of low-fat cheese with two glasses of kefir in 5 meals.

Kefir diet

Drink 1-1.5 liters of fresh one-day kefir without sugar in five to six doses at regular intervals. Sour milk of all kinds can be combined with sweet fruits and vegetables.

Meat diet

Option I

Divide 400 g of lean meat, cooked without salt, into four portions, use each portion with a vegetable (except potato) side dish (150-300 g). In addition, on this day, it is advisable to drink a glass of unsweetened tea (rosehip decoction) for breakfast and dinner.

Option II

200-250 g of lean boiled meat, 2 cups of tea without sugar and 1-2 cups of any juice. Divide the food into 5-6 meals.

The diet is rice and compote

With hypertension, circulatory or kidney failure, diseases of the liver and biliary tract - 6 times a day with a glass of sweet compote, 2 times with sweet rice porridge boiled in water without salt. 15 kg of fresh or 240 g of dry fruits, 50 g of rice, 120 g of sugar per day.

Sour cream (fatty) diet

For obesity, less often - for diabetes with obesity - 80 g of 20-30% fat sour cream 5 times a day and 1-2 cups of rosehip decoction.

Apple diet

Divide 1.5-2 kg of raw apples into five portions in raw form or in the form of apple dishes.

Modern regulation of the rational nutrition of athletes includes the following basic provisions of both hygienic and dietary regulation:

- standardization of the chemical composition of food rations;
- regulation of the energy value of food rations;
- determination of the nutrition regime of athletes;
- determination of the range of products and the list of food rations;
- rationing of the volume and mass (weight) of food rations;

Modern regulation of the rational nutrition of athletes includes the following basic provisions of both hygienic and dietary regulation:

- determination of the types (kind) of culinary processing of food products;
- determination of the temperature of the meals consumed;

- determination of the degree of digestibility of dishes and products of the diet and their spiciness (salty, sour, etc.);
- determining the taste qualities of dishes (in case of indications);
- determination of the degree of rarefaction of dishes (liquid content);
- regulation of the safety of individual food products and food rations as a whole and much more.

In the classification of nutritional status, several categories are distinguished:

1. It is optimal when this physiological state and body weight correspond to the height, age, sex, difficulty, intensity and tension of the work being performed.

Excess, caused by hereditary predisposition, overeating, insufficient physical activity, is accompanied by an increase in body weight, obesity, which is of 4 degrees (1- fat deposits that are 15-20% more than normal body weight; 2- degree - 30-49% ; 3 – by 50-99%; 4 – by 100% or more).

3. Insufficient, when the body weight lags behind the age, height - due to malnutrition (quantitative and qualitative), heavy and intensive physical work, psycho-emotional stress, etc.

In addition to the above, Prof. P.E. Kalmykov (St. Petersburg, RF; cited by V.G. Bardov, 2006) also distinguishes the following categories of status:

4. Pre-morbid (pre-morbid), caused, in addition to the above, by certain disorders of the physiological state of the body or pronounced defects in the diet (energy, protein, fat, vitamin, macro-microelement deficiency).

5. Morbid - weight loss caused by one or another disease, starvation (very pronounced defects in the diet - quantitative and qualitative). Starvation can manifest itself in two forms - cachexia (severe weight loss, marasmus), edematous (kwashiorkor), which is caused primarily by the lack of proteins in the diet. Vitamin starvation - in vitamin diseases (scurvy, beriberi, rickets, etc.), deficiency of other nutrients - in the corresponding types of pathology.

Schemes for studying nutritional status depend primarily on the contingent whose nutritional status is being studied.

To maintain energy balance and prevent excess weight gain, the following rules should be followed:

✓ Consume mainly natural plant products rich in dietary fibers, which contain a significantly lower number of calories (1.5 kcal - 2.5 kcal/g) compared to processed ones.

✓ Choose products with a low content of sugar, fat and, accordingly, with low energy density.

✓ Consume drinks that do not contain calories. Limit use juices less than 200 ml per day.

✓ Weigh yourself regularly and monitor your own weight, do it at least once a week.

✓ Exercise daily, at least 30 minutes

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PRACTICAL LESSON #4

Topic: Organizational basics of nutrition in medical and preventive institutions.

Purpose: To teach applicants the basics of nutrition at LPU

Basic concepts: LPU nutrition, diet, energy intake, diet, chemical composition of products, diet

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

- 1) What do you know about the indications for the use of diets?;**
- 2) What is the target (therapeutic) purpose of dietary nutrition;**
- 3) What does the calorie content and chemical composition of food products depend on?**
- 4) What are the features of culinary processing of food do you know?;**
- 5) What is called a diet?;**
- 6) Name the list of permitted and recommended dishes.**

Formation of professional skills:

- 5. Know the indications for using diets**
- 6. Know the caloric content and chemical composition of food products**
- 7. To be able to apply knowledge of culinary processing of food in prescribed dietary nutrition**

SUBJECT TEXT:

ORGANIZATION OF DIETARY (THERAPEUTIC NUTRITION) IN TREATMENT AND PREVENTIVE INSTITUTIONS

In accordance with the physiological principles of building food rations, medical nutrition is built in the form of daily food rations, called diets. Diet therapy requires a differentiated and individual approach. Therefore, any diet must meet a number of general requirements:

1. Vary its calorie content according to the body's energy consumption.
2. To cause optimal filling of the stomach, necessary to achieve an easy feeling of satiety.
3. Satisfy the patient's tastes within the limits allowed by the diet, taking into account the tolerance of food and the variety of the menu. Monotonous food quickly becomes boring and contributes to the suppression of the often reduced appetite, and insufficient stimulation of the activity of the digestive organs worsens the assimilation of food.
4. To ensure the correct culinary processing of food while preserving the high taste qualities of food and the valuable properties of the original food products.
5. Observe the principle of regularity of food. Therapeutic nutrition should be dynamic enough. The necessary dynamism is achieved by applying the principles of "sparing" and "training" that are widely used in diet therapy. The principle of "sparing" involves the exclusion of nutritional factors that contribute to the maintenance of the pathological process or its progression (mechanical, chemical, thermal stimuli, etc.). The principle of "training" consists in expanding the initially strict diet by removing the restrictions associated with it in order to transition to a full-fledged food regime.

The diet of patients should be built individually, depending on the nature of the disease and the peculiarities of its course, the presence of appetite, other methods of therapy, general and work regime. However, in any case, you should not allow more than 4-5 hours of breaks during the day between individual meals and 10-11 hours between the last evening meal and breakfast.

With many diseases (digestive organs, cardiovascular system, infectious diseases, etc.), more frequent meals (5 to 10 times) are necessary. With a five-time meal, it is advisable to introduce a second breakfast, and with a six-time meal - also an afternoon snack. For patients, taking the main amount of food is indicated during the hours of temperature reduction, when appetite usually improves. In this regard, it is advisable for tuberculosis patients to postpone lunch to earlier hours, since the increase in temperature and decrease in appetite is more often observed in the second half of the day.

In night prophylactics and for outpatients who do not take time off from work, it is indicated to take basic amounts of food by volume and calorie content before and after work.

Dietary system is mainly used in medical and preventive institutions. In our country, the diets recommended and approved by the Ministry of Health of the Russian Federation for universal use, developed in the clinic of medical nutrition of the Institute of Nutrition of the Russian Federation with a number system of designation according to the nomenclature proposed by M.I. Pevzner, have gained widespread use. This system of medical nutrition, previously referred to as "group", provides for the existence of 15 basic medical diets (tables) and a group of contrasting, or so-called unloading, diets. In addition, some of the main diets (1, 4, 5, 7, 9, 10) have several options, which include capital letters of the Ukrainian alphabet, which are added to the number of the main diet (for example, 1a, 16, 5a, etc.).

Each diet and its variants are characterized by:

- 1) indications for use;
- 2) target (therapeutic) purpose;
- 3) caloric content and chemical composition

4) peculiarities of culinary processing of food;

5) diet;

6) a list of permitted and recommended dishes.

The used system allows to provide individualization taking into account other principles of medical nutrition in the conditions of serving a large number of patients with various diseases. This is achieved by using one of the most suitable basic diets and its variants with the appropriate diet rection (by adding or removing certain products and dishes, which allow you to adjust the chemical composition and culinary processing). For additional use, it is recommended to use products with certain medicinal properties (cheese, milk, liver, watermelon, apples, etc.). Without prejudice to the variety of food, the same products in different forms of preparation and dishes in different combinations can be introduced to several tables. The applied system ensures the continuity and organization of medical nutrition when serving a large number of patients.

Prescription of medical nutrition for patients in hospital conditions is carried out by writing in the medical history or a list of prescriptions of the number or name of the medical diet with additional instructions if necessary. At the same time, one should keep in mind the possible influence of "food transmissions" (from visitors), which require careful regulation.

At an outpatient appointment and when providing care at home, a therapeutic diet should be recommended taking into account the patient's capabilities and prescribed in writing with a detailed indication of the recommended set of products, cooking methods and diet. In this regard, it is advisable to have ready-made reminders-instructions with recommendations of diets used for the most common diseases, which simplifies the task of the doctor "by prescribing therapeutic nutrition. Appropriate reminders about diets should be given to patients when they are discharged from a medical institution. Diet canteens play an important role in providing medical nutrition to outpatients.

The general management of medical nutrition in the hospital is carried out by the chief doctor or his deputy from the medical department; in the departments of the hospital, these functions are performed by department heads. Organizational and scientific-methodical management of medical nutrition in the hospital is provided by a nutritionist. In the departments, the organization of medical nutrition is carried out by the senior nurses of the departments. Food preparation in the kitchen is managed by a senior foreman (chef). He is under the direct supervision of a dietician. Reception of food from the kitchen, heating and distribution in departments are handled by baristas who are familiar with the composition and therapeutic purpose of various diets.

Receiving food from the kitchen to the department with a centralized food block system is carried out by the barmaid in accordance with the duty schedule; before each meal, she must familiarize herself with the menu, the weight of the prepared dishes and the necessary instructions for distributing food to the sick in the distribution kitchen. Food must be transported in labeled containers with the diet number and number of dishes. The corresponding container is delivered to the distribution kitchen from the branches the day before. It is advisable to send all the food to each department at the same time.

Distribution of food to patients in buffet-distribution offices should be carried out immediately to avoid excessive cooling. Therefore, all free staff should be involved in the distribution of food in a proper Sanodezhda. First, you should serve the bedridden patients, to whose beds, in order to avoid mistakes, it is advisable to attach labels indicating the number of the diet. In the case of cooling food, it should be reheated, for which there should be special devices in every cafeteria.

A menu for each diet with an indication of the weight of the portions should be posted in the cafeteria.
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Main:

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PRACTICAL LESSON No. 5

Topic: Rational nutrition. Basic principles and rules.

Purpose: To get acquainted with the basic concepts of rational nutrition, its principles and rules.

Basic concepts: food, nutrition, diet, human health, nutrients, diet, diets, dietary supplements, macro- and micronutrients, vitamins

Equipment: Laptop, projector, bathometer

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

8. What is rational nutrition
9. Functions and composition of food
10. Diseases associated with eating disorders
11. The concept of the diet, features
12. Peculiarities of nutrition among different population groups

Formation of professional skills:

1. To analyze the quality of food products according to their qualitative composition
2. Be able to conduct explanatory interviews with patients on the topic of proper nutrition
3. Determine the qualitative and quantitative composition of food products when preparing individual diets

SUBJECT TEXT:

Rational (from the Latin ratio - reasonable) is nutrition that satisfies the energy, plastic and other needs of the body, while ensuring the necessary level of metabolism. Rational nutrition contributes to the preservation of health, resistance to harmful environmental factors, high physical and mental performance, as well as active longevity.

There are certain requirements for the food ration. First, the energy value of the diet should cover the body's energy expenditure. The second requirement is the proper chemical composition with the optimal amount of balanced nutrients. Good digestibility of food depends on its composition and method of preparation. So the third requirement is high organoleptic properties of food: appearance, consistency, taste, smell, color, temperature. Fourthly, the food should be diverse due to a wide range of products and various methods of their culinary processing. The fifth requirement - according to its composition, volume and method of steaming, the food should create a feeling of satiety. And another important condition is its sanitary and epidemic safety.

The concept of rational nutrition includes compliance with three main principles: ensuring the balance of energy that comes with food and is spent by a person in the process of life;

satisfaction of the body's need for certain food substances;

compliance with the diet.

Food products should perform three main functions:

supply the necessary material for the construction and renewal of cells;

supply energy for the functioning of the body (blood circulation, heat release, gland secretion, muscle effort, brain work, etc.);

to give the body the ability to resist diseases.

In connection with the listed functions, the substances included in food products are divided into three groups: building (animal and vegetable proteins), energy-generating (carbohydrates and fats), protective (vitamins, mineral salts, some carbohydrates and proteins).

Good absorption of food requires its supply in certain ratios between the main components of

food in the proportion of 50:20:30. The daily intake of calories should be distributed as follows: 50% - carbohydrates, 20% - proteins and 30% - fats.

Carbohydrates form the basis of our food products, such as fresh fruits, vegetables, beans, peas, potatoes, corn, bread, oatmeal, rice.

Fiber, which is a part of vegetables and fruits, is broken down in the human intestine with the participation of bacterial flora. It enhances bile secretion and removal of cholesterol from the body, intestinal peristalsis and provides a feeling of satiety.

The fat content in the daily diet is about 30%. Therefore, it is necessary to be able to limit the daily consumption of fats to this number. Fats are deposited in adipose tissue and form a reserve of energy material. Fats of subcutaneous adipose tissue protect organs from hypothermia, and adipose tissue surrounds internal organs, fixes them and prevents them from displacement and injuries.

Modern nutritionists recommend consuming less fats of animal origin, which are saturated with fatty acids that contribute to the formation of cholesterol, narrowing and clogging of blood vessels. This can lead to stroke and heart attack. Here are foods rich in cholesterol, which are recommended to be eaten only in small quantities: fatty meat of all varieties, as well as liver, kidneys and brains; butter, palm and coconut oil, lard, margarine; smoked sausages, thighs, pates; fatty lactic acid products, including sour cream, mayonnaise, ryazhanka; creams, cakes, cakes, buttery white bread; products containing chocolate and cocoa; fried in butter and salted potatoes and delicate nuts.

Lecithin is a cholesterol antagonist

A cholesterol antagonist is lecithin, which prevents the development of atherosclerosis and helps increase the endurance of the central nervous system. Lecithin is found in the following products: vegetable oils: sunflower, soybean, corn, olive; fatty varieties of sea fish - mackerel, sardines, tuna, salmon, halibut, as well as oysters, mussels, fish oil; oats and buckwheat for groats, bran, bread from coarsely ground flour; low-fat varieties of meat and poultry - turkey, chicken, veal, rabbit, game; most vegetables and fruits; greens in the form of lettuce, parsley, cilantro, spinach, dill, onion, garlic. Baihi tea and walnuts are a good remedy for the prevention of atherosclerosis. A low-fat diet is considered better today.

Protein products should make up about 20% of the calories we consume daily. These include fish, veal, lean beef, lamb, pork, hard cheese, milk, lactic acid cheese, and eggs. Proteins form the basis of the structural elements of cells and tissues of the human body, are part of enzymes, and participate in the production of immunity.

What to eat, how much and how?

The modern recommendations of nutritionists in the field of rational nutrition are as follows:

Follow the 25-50-25 rule to determine the number of calories for each meal: 25% of calories should come from breakfast, 50% from lunch, 25% from dinner. This will help maintain a normal body weight.

Regularity of food. The expediency of eating at the same time is determined by conditioned reflex reactions of the body to the secretion of saliva, gastric juice, bile, enzymes, that is, the entire complex of factors that ensure normal digestion.

Multiplicity of food during the day. Studies have shown that one or two meals have an adverse effect on health and lead to a number of diseases. A healthy person is recommended to eat three or four times a day with the possibility of additional meals (juice in the morning, a glass of kefir before bed, etc.).

It is necessary to sit down at the table only with a feeling of hunger. Do not try to overeat. Distinguish between hunger and thirst. Sometimes it's better to just drink than eat. Take food three or four times a day, do not snack in between meals, you can only drink water or juice.

You should make at least 20-30 chewing movements before swallowing. Most people swallow food only after five to eight chewing movements. You have to learn to chew slowly.

You should not wash down food with water, as this leads to dilution of gastric juice and a decrease in digestive activity. You can drink water 15-20 minutes before a meal, or two hours after it.

Do not eat too hot or too cold food. This is bad for the liver, but gradually getting used to cold raw water, down to meltwater temperature, is good for hardening and health.

When cooking, vegetables lose 90% of their energy qualities, so it is better to eat them raw, steamed or baked.

According to the Harvard School of Public Health, in the US, more than 50% of malignant tumors

of the stomach and pancreas are the result of excessive coffee consumption.

In the first half of the day, preference should be given to foods rich in protein and fat, as they improve metabolism, stay longer in the stomach, maintain a feeling of satiety longer, stimulate the nervous system (meat, fish, eggs, cheese, porridge, dishes from legumes) .

Dinner should include dairy and vegetable dishes that do not overexcite the nervous system before bedtime. You can't overeat at night, but you can't go to bed hungry either. Eating disorders are one of the common causes of upset stomach and duodenum, chronic gastritis and other diseases of the digestive organs.

Do not neglect the norm of salt, do not drink a lot of liquid, coffee. The daily diet should contain no more than 6-10 g of salt, up to 2.5 liters of liquid (free and in the composition of various products and dishes).

Limit, or even better, refuse the use of alcoholic beverages, which disrupt metabolism, cause inflammatory processes in the mucous membrane of the digestive tract, make it difficult to absorb food substances - vitamins, mineral salts, etc.

Avoid bad eating habits.

Nutritionists have compiled a list of foods and products that should not be consumed, they include:

potato chips and french fries are, in fact, a mixture of carbohydrates and fat, plus flavorings; sweet bars such as "Snickers", "Mars", etc., which consist of a large amount of sugar and various chemical additives;

sweet carbonated and flavored drinks such as Cola, Fanta, canned juices;

sausages, sausages, boiled sausage, pate and other products with so-called hidden fats. Lard, internal fat, pork skin, etc. occupy 40% of the weight, but are disguised as meat with the help of flavorings;

canned meat and vegetable products with the use of a large amount of vinegar and other preservatives.

Food should not be the main source of positive emotions, although culinary art is aimed at this.

"Live not in order to eat, but eat in order to live", "A good cook is the enemy of health" and "Hunger is a better cook" - these principles of attitude to nutrition should be adopted by every educated person.

Taking into account the above, one would like to hope that a modern person, despite the high rhythm and complexity of life, will pay enough attention to preserving his health. In our difficult times, do not forget that a properly organized diet will help e to maintain health, energy and high performance.

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1. Hygiene and ecology // textbook for students of higher medical educational institutions in English. /edited by V.G. Bardova – Vinnytsia: NovaKnyga, 2018.
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PRACTICAL LESSON No. 6

Topic Therapeutic nutrition is a factor in therapy and secondary prevention of diseases.

Purpose: To learn how to use nutrition correction techniques for the treatment of diseases.

Basic concepts: food, nutrition, diet, human health, nutrients, diet, diets, disease prevention

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

- 1. What is dietary nutrition**
- 2. The role of food products in disease prevention**
- 3. What is the goal of correcting the patient's diet. Examples**
- 4. What is symptomatic diet therapy**

Formation of professional skills:

- 1. Know the indications for using diets**
- 2. Know the caloric content and chemical composition of food products**
- 3. To be able to use knowledge about dietary nutrition in the prevention of certain types of diseases**

SUBJECT TEXT:

Dietary (therapeutic) nutrition is organized for people with acute or chronic (during periods of remission and exacerbation) diseases. Dietary nutrition is carried out under medical supervision in hospitals (synonym - "dietotherapy"), sanatoriums, prophylactics, as well as in dietary canteens.

Dietary nutrition is distinguished by the following signs and features:

The purpose of feeding a sick person is not only to maintain the general nutritional status, but also to implement diet therapy, dietary nutrition can affect the clinical picture of the disease, the nature and types of development of the pathological process;

dietary nutrition not only increases the effectiveness of other therapeutic methods, but also reduces the frequency of relapses

aggravated chronic wounds, as well as the transition of acute pathologies to chronic ones (prophylactic role);

· In some cases (Iron deficiency anemia, phenylketonuria, celiac disease) dietary nutrition can be a leading therapeutic factor. medical nutrition is a differentiated diet therapy that takes into account the pathogenesis, clinical picture and dynamics of the pathology. 3 Links: 1) symptomatic diet therapy

2) organ-specific diet therapy, which takes into account the nature of the damage to the "interesting organ or system;

3) metabolic diet therapy, which ensures adaptation of the chemical composition of the diet to the level and nature of metabolic and disorders inherent in one or another type of disease.

Rational diet therapy involves the use of all three directions

Principles of medical nutrition. 1. Correspondence of nutrition to the needs and capabilities of the patient's body. It is necessary to establish a balance between the physiological need for food substances and energy (in accordance with the requirements of rational nutrition) and the ability of an unhealthy body to efficiently dispose of them. With various diseases, it is necessary to limit the content of certain nutrients in the diet: proteins (for rheumatism, most kidney pathologies, allergies), fats (for diseases of

the liver, exit routes, large intestine, atherosclerosis), carbohydrates), table salt (for all kidney diseases, hypertension). malabsorption syndrome. . However, a short-term, but significant reduction in the amount of unchanged nutrients in the diet can lead to a worsening of the patient's condition. This primarily concerns the need to limit protein. One of the methods of leveling its absolute deficiency in nutrition (40 g at the physiological norm of 100 g) is the method of increasing the biological value of nutrition due to the preferential use of products containing complete animal proteins.

Another technique that allows you to maximally level the imbalances of the therapeutic diet is the alternation of different options of the same therapeutic table (within the existing nomenclature), which differ in the degree of restriction.

According to modern ideas, long-term sparing does not lead to improvement of the patient's clinical condition, but to the strengthening of the pathological process. Due to this, the doctor must carefully monitor the dynamics of the disease and, with its positive development, transition to a less gentle diet (zigzag training system) 3) Accounting for non-specific features of the patient's metabolism. Weakening of enzyme systems that ensure full processing and absorption of food in the gastrointestinal tract and at the cellular level, as well as adaptive and protective processes. implies the need to use absolutely benign and safe food. The use of perishable products is allowed in the initial period (preferably in the first third) of their total shelf life.

Taking into account the subjective attitude of patients to nutrition. This principle is based on the known psycho-emotional status of the sick person. All patients have, at a minimum, an asthenic syndrome, within which appetite decreases and often there is an inversion of taste, and even a negative attitude towards compliance with the diet. Methodical methods of medicinal cooking are of great importance in this regard. 5). An individual approach to prescribing medical nutrition. Carrying out reasonable diet therapy requires painstaking preliminary work on collecting anamnesis, analysis of clinical picture and laboratory studies, including parameters of nutritional status *.

6) Strict adherence to the diet.

there is a well-established nomenclature of dietary (treatment) tables, proposed. Pevsner (15 main tables (marked with numbers and letters))

New nomenclature of diets. In order to optimize medical nutrition, improve the organization and improve its quality management, since 2003 a new nomenclature of diets - a system of standard diets (five types of diets) - order 330 of August 5, has been introduced in the LPU. cooking and average daily set of products.

When using the system of standard diets, the diets of the previously used number system (diets No. 1... 15) are combined. in standard diets prescribed for various diseases depending on the stage, severity of the disease or complications from various organs and systems:

the main version of the standard diet (No. 1.2.3.5.6. 7, 9, 10, 13, 14. 15 of the number system) - basis: B-85-90g/day, Z-70-80; YB-300-330, 2170 -2400 kcal)

diet option with mechanical and chemical sparing (No. 1b, 4b, 4c. 4p):

a variant of the diet with an increased amount of protein - a high-protein diet (No. 4r. 4 a/r. 5n, 7v, 7g, 9b, 10b, 11. R-I, R-II);

a variant of a diet with a reduced amount of protein - a low-protein diet (No. 7a, 7b); B-up to 60g/day

A low-calorie diet option is a low-calorie diet {No. 8, 9a. 10s).1540-1640 kcal

Individualization of the chemical composition and caloric content of standard diets should be carried out by the selection of medical food dishes available in the card file, increasing or decreasing the number of buffet products (bread, sugar, oil), control of food home transfers for patients undergoing treatment in the hospital, as well as by using medical and enteral nutrition dietary supplements and ready-made specialized mixtures.

Correct organization of dietary (medicinal) nutrition is an indispensable condition for rational treatment. A nutritionist is responsible for the organization of medical nutrition and its more adequate use in all departments of health care institutions. He manages nurses (dietitians), supervises the work of the food block,

In nursing homes with 100 or more beds, a board for therapeutic nutrition is created, which is an advisory body. It consists of: the chief physician (or his deputy for medical work, a nutritionist, department heads — doctors, intensive care physicians, a gastroenterologist, a therapist, a transfusion specialist, a surgeon (members of the nutritional support team), the deputy chief physician for the economic part, dietitians, the head of production (or chef) Other specialists of the brewery can be involved in the work of the board.

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PRACTICAL LESSON No. 7

Topic: Nutrition and health of the population. Basics of rational nutrition. The influence of nutrition on the general and dental health of the population. Food biosafety.

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Purpose: To acquaint applicants with modern nutritional problems. Consider the influence of the socio-economic component on the nutritional status of the population.

Basic concepts: nutrition, hypodynamia, overeating, basic metabolism, energy value, specific dynamic food, energy expenditure, proteins, fats, carbohydrates, vitamins, qualitative composition of food, quantitative composition of food.

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

- 1. What does the change in the quality of nutrition of the population depend on?**
- 2. What complications does irrational nutrition lead to?**
- 3. Basic concepts about surrogate, falsified, canned products, concentrates and products that contain contaminants (synthetic dyes, stabilizers, emulsifiers and xenobiotics), and their effects on the body.**
- 4. Resolution of the Cabinet of Ministers of Ukraine "On approval of sets of food products, sets of non-food products and sets of services for the main social and demographic groups of the population"**

Formation of professional skills:

Know and apply methods:

- ensuring the growth and development of the young generation;**
- formation of high levels of health;**

- restoration of working capacity;
- Increase in life expectancy;
- Improving the quality of life;
- Reducing the level of alimentary diseases;
- Protection of the population from the entry of contaminants into the human body through food;
- Acceleration of recovery and prevention of relapses of diseases

SUBJECT TEXT:

Public health ("Public health", defined by WHO) is the science and practice of preventing diseases, increasing life expectancy and strengthening health through the organized efforts of society. Therefore, public health is the main element of the existence and full development of society and the state as a whole. In modern realities, the burden of chronic non-communicable diseases (diabetes, cancer, cardiovascular diseases, chronic respiratory diseases), which cause more than 2/3 of the total morbidity and about 86% of deaths in Ukraine, is defined as the first and most important problem of the public health system of Ukraine. This is evidenced by high (twice as high as in the countries of the European Union) mortality, low life expectancy (the gap with the EU is more than 10 years), the highest rates of depopulation in Europe, and rapid aging. It is possible to influence the health of the population only through the joint efforts of the state, the public, and the individual. But in a broad sense, the biggest contribution can be made through investing time, money and resources in it. Such means should be considered physical activity, lifestyle, ecology of life and rational nutrition. Nutrition can cause changes in health in the following ways: 1. Ensuring the growth and development of the young generation; 2. Formation of a high level of health; 3. Restoration of working capacity; 4. Increase in life expectancy; 5. Improving the quality of life; 6. Reducing the level of foodborne diseases; 7. Protection of the population from the entry of contaminants into the human body by alimentary means; 8. Acceleration of recovery and prevention of relapses of diseases (3).

WHO notes that nutrition changes over time under the influence of numerous factors and complex interactions. Income, food prices (which influence the availability and affordability of healthy foods), individual tastes and religious beliefs, cultural traditions, and geographic, environmental, social, and economic factors all interact in complex ways to shape individual dietary patterns. . Creating an enabling environment for healthy nutrition, including food systems that promote a diverse, balanced and healthy diet, therefore requires the involvement of many sectors and stakeholders, including government, the public and the private sector. Irrational nutrition can lead to alimentary diseases associated with complete hunger or partial malnutrition. This, in turn, causes nutrient deficiency or an excess of some food components. Surrogate, falsified, canned products, concentrates and products that contain contaminants (synthetic dyes, stabilizers, emulsifiers and xenobiotics) often cause food allergies or idiosyncrasies, psychogenic food intolerance. In Ukraine, the relevance of problems related to the quality and nature of nutrition is determined by the low ability of the majority of the population to provide a full-fledged diet, persistent violations of the nutrition structure, and the significant spread of food-dependent pathology. One of the indicators of population nutrition is the economic availability of products, which is defined as the share of food costs in total costs.

In the US, the food availability indicator is 11–12%, and even in it does not exceed 25% of the total population. The average Swede spends 23% of his income on food, the Japanese and French 18–19%, the Dutch, Germans and English 14–15%, Canadians 12%. In Japan, a family is considered poor if the indicator of food availability exceeds 35%. 60% is considered the limit for this indicator. The indicator of food availability in Ukraine in 2012 was 52.0%. (Kharchenko). It is cause for concern that the sets of food products for the working population in Ukraine, determined by the Resolution of the Cabinet

of Ministers of Ukraine "On the approval of sets of food products, sets of non-food goods and sets of services for the main social and demographic groups of the population", do not fully meet the needs for maintaining an active physical condition in adults, development of children and adolescents. Thus, it is the government that has a central role in creating favorable conditions for healthy eating. According to WHO, effective policy interventions to create conditions conducive to healthy eating include:

1. Ensuring coherence of national policies and investment plans, including policies in the field of trade, food industry and agriculture, to promote healthy nutrition and protect the health of the population:

- strengthening incentives for producers and retailers to grow, use and sell fruit and vegetables;
- reduce the influence of factors that encourage the food industry to continue or expand the production of processed food products containing saturated fats and free sugars;
- promote changes in the composition of food products in order to reduce the content of salts, fats (i.e. saturated fats) and free sugars;
- implement the recommendations of the WHO regarding the marketing of food products and soft drinks for children;
- establish standards that promote healthy eating practices by ensuring access to healthy, safe and affordable products in preschools, schools, other government institutions and workplaces;
- use regulatory and voluntary tools such as marketing, food labeling policies, economic incentives or disincentives (eg tax laws, subsidies) to promote healthy eating;
- encourage multinational, national or local catering businesses to improve food products, ensure the availability and accessibility of value products and review portion sizes and prices.

2. Stimulation of consumer demand for healthy food products and dishes:

- increase consumer awareness of healthy food;
- develop policies and programs for schools that encourage children to choose and maintain healthy food;
- teach children, teenagers and adults about nutrition and healthy eating practices;
- stimulate the development of culinary skills, including in schools;
- support information at the point of sale, including through labeling that provides accurate, standardized and understandable information on the nutrient content of food products, in accordance with the guidelines of the Codex Alimentarius Commission; • provide consultations on nutrition and diet as part of providing primary health care.

3. Promotion of proper nutrition practices for infants and young children:

- comply with the international rules for the sale of breast milk substitutes;
- implement policies and use practical methods aimed at protecting working mothers;
- strengthen, protect and support breastfeeding in medical institutions and local societies.

3.2. The influence of nutrition on the state of population health

The quality of nutrition of the population of any country plays an important role in shaping the health of the nation. According to the WHO, the alimentary factor is one of the leading determinants of health. Decreased in quantity or decreased in quality of consumption of food substances or individual components, insufficient caloric content of the diet lead to disruption of metabolic processes and physical development of the body, decreased immunity, incidence of anemia, endocrine diseases, alimentary dystrophy, and other types of pathologies. More than 170 million children in the world are underweight, of which 3 million die annually. According to WHO data, death from low body weight takes 130 million years of healthy life from children from poor families every year. Along with the high prevalence of undernourishment, more than 1 billion adults on the planet are overweight, and more than 300 million are obese. Economic calculations show that unhealthy nutrition leads to significant costs for treatment, diagnosis, care of patients and their rehabilitation in medical institutions, about significant losses related to losses for production due to diseases, as well as loss of income for families. In Germany, these costs make up 30% of the total costs in the health care system, in the USA - 137 billion dollars in year. The results of the analysis show that 4.5% of healthy life years are lost due to poor nutrition due to premature mortality and disability.

The problem of nutrition and its impact on the health of the population of Ukraine as a whole and individual groups was studied by a large number of scientists, in particular M.I. Peresichnyi, N.V. Tsymbalista, N.V. Bankovska, P. Karpenko, M. Gulich, A. Hoychuk, V. Vlasov, L. Denysenko, I. Smirnova, V. Perederii, N. Kharchenko and others. Analysis of individual studies shows that as a result of poor nutrition in Ukraine, the following have significantly increased: - the incidence of endocrine diseases, - nutritional disorders and metabolic disorders, - the tendency to gain excess body weight and the spread of obesity, - the rate of circulatory diseases, - the rate of oncological diseases. - the level of mental disorders. A depressed state, apathy, disharmony with the outside world and oneself, as the consequences of nutritional deficiencies, are reflected in the formation and assimilation of social roles of young people, often becoming an obstacle on the way to self-realization and creative expression. The experience of many countries of the world shows that a complete, rational diet gives positive results in reducing the level of morbidity and improving health indicators. Analysis of data on the state of health of the population of Ukraine, the spread of diseases closely related to the state of nutrition, indicate that Ukraine has developed an extremely threatening situation. The European Economic Commission of the United Nations conducted a European Economic Survey in Eastern Europe, including Ukraine. A decrease in the consumption of food products - milk, fruits, vegetables - has been established. A transition to cheaper sources of calories was noted - increased consumption of bread, flour and confectionery products. In its research, the WHO substantiates the significant influence of the food factor on the spread of chronic non-infectious diseases and the extension of human life. Intensive environmental pollution contributes to the constant increase in food contamination with nitrates, pesticides, salts of heavy metals, and radionuclides. Thus, 60–80% of foreign substances enter the body with food. Qualitatively and quantitatively insufficient nutrition against the background of negative environmental conditions leads to a decrease in the body's protective forces, the catastrophic growth of not only many non-infectious chronic diseases, but also the progression of genetically dependent diseases, because the degree of mutagenic activity of a number of toxic elements depends on substandard food. In countries (Norway, Denmark, the Netherlands, Finland, Iceland and others) nutrition programs have been developed and implemented, which have already had a positive effect, as evidenced by the publications of foreign authors on the effectiveness of the development and implementation of measures to improve the nutrition of the population.

3.3. Individual nutrition as a component of social

In order to solve the problem of nutrition at the level of society, it is necessary to understand its composition and origin. For a better understanding, let's highlight the individual nutrition of a person and build a scheme of its formation.

The scheme of formation of individual nutrition So, the nutrition of each person to one degree or another (in an individual ratio) consists of public and home nutrition, and they, in turn, are definitely formed from products of industrial and home production. Let's consider the components of this phenomenon. Public catering is a field of production and trade activity in which products of own production and purchased goods, as a rule, are intended for on-site consumption, are produced and sold. A public catering establishment is an organizational and structural unit in the field of public catering, which produces, prepares and sells culinary products, bakery, flour, confectionery and purchase goods. Types of catering establishments: — restaurants; — bars; — cafes, cafeterias; — canteens, including canteens at enterprises, educational institutions, etc.; — snack bars; — buffets, shops of culinary products; — kitchen factories, procurement factories. Public catering is a special

and specific branch of the national economy. If food industry enterprises produce food products, but do not sell them to the population, and trade enterprises organize delivery, storage and sale of goods, then three functions are embodied in public catering enterprises: production of lunch products, culinary and confectionery products, implementation and organization of rational nutrition of people. Homemade food is food that involves the preparation and consumption of food at home. This type is more economical, individually oriented, but does not always meet the needs of the human body, which is largely related to the modern standard of living of the population of Ukraine. In both types, products of industrial production are used, and in home cooking, products of home and industrial production are used in different proportions depending on the place of residence (home production is mostly used by residents of rural areas). According to Law of Ukraine dated 12.23.1997 No. 771/97-VR "On the basic principles and requirements for the safety and quality of food products... a food product is a substance or product (unprocessed, partially processed or processed) intended for human consumption." Food products include beverages (including drinking water), chewing gum, and any other substance that is specifically incorporated into a food product during production, preparation, or processing. The term "food product" does not include: - fodder; - live animals, if they are not intended to be placed on the market for human consumption; - plants (before harvest); - Medicines; - cosmetic products; - tobacco and tobacco products; - narcotic and psychotropic substances (within the definitions of the United Nations Convention on Narcotic Drugs of 1961 and the United Nations Convention on Psychotropic Substances of 1971); - residues and pollutants. According to the above-mentioned Law of Ukraine, a dangerous food product is a food product that is harmful to health and/or unfit for consumption. When establishing the danger of a food product, the following are taken into account: a) normal conditions of use of the food product by the consumer, each stage of its production, processing and circulation; b) information provided to the consumer, in particular about labeling, including information about the date of final sale, and other publicly available information about avoiding negative health consequences associated with a food product or a category of food products. When establishing the harmfulness of a food product for health, the following are taken into account: 1) the possible short-term or long-term impact of the food product on the health of the person who consumes it and on future generations; 2) possible cumulative effect of toxicity; 3) special sensitivity of the organism of a separate category of consumers, if the food product is intended for this category of consumers. Of course, the food industry fully provides a variety of products.

Literature

Main:

1. Hygiene and ecology // textbook for students of higher medical educational institutions in English. /edited by V.G. Bardova – Vinnytsia: NovaKnyga, 2018.
2. Environmental Health: from Global to Local \ Under Howard Frumkin edition – Third edition. - San Francisco, 2016

Additional:

3. General hygiene. Hygiene propaedeutics/Textbook for foreign students. / E.I. Honcharuk, Yu.I. Kundiev, V.G. bardo otter - K.: Higher school, 2000.
4. Korobchanskiy V.A. Hygiene and Ecology \ Korobchanskiy V.A., Vorontsov V.P., Musulbas A.A. - Kharkov, 2006

PRACTICAL LESSON No. 8

Topic: Modern ideas about the biological role of nutrients and their importance in the metabolism of substances in the body in normal and pathological conditions

Purpose: To get acquainted with modern ideas about the biological role of nutrients and their importance in the metabolism of substances in the body in normal and pathological conditions

Basic concepts: nutrition, proteins, fats, carbohydrates, minerals, vitamins, digestive disorders, alimentary diseases, prevention

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

1. The role and importance of proteins in the human body. Diseases arising from shortage or damage.
2. The role and importance of fats in the human body. Diseases arising from shortage or damage.
3. The role and importance of carbohydrates in the human body. Diseases arising from shortage or damage.
4. The role and importance of minerals in the human body. Diseases arising from shortage or damage.
5. The role and importance of vitamins in the human body. Diseases arising from shortage or damage.

Formation of professional skills:

1. To be able to diagnose alimentary diseases.

SUBJECT TEXT:

Squirrels Proteins are the main component of food. Their main purpose is the construction of cells and tissues necessary for growth, development (plastic role) and the implementation of vital functions of the body. Proteins are part of immune bodies, hormones, enzymes. In the gastrointestinal tract, food proteins are broken down into simpler amino acid compounds under the influence of digestive juices. The latter participate in the formation of new proteins characteristic of the human body.

A lack of proteins in food leads to metabolic disorders, anemia, a decrease in the body's defenses, and mental retardation. With a long-term insufficient intake of proteins with food, a disease called kwashiorkor disease develops in children, which means "disease of a child taken from the breast" and transferred to a carbohydrate diet with a severe lack of animal protein. Kwashiorkor causes both persistent, irreversible constitutional changes (decrease in average growth, body weight, etc.) and personality changes.[...]

The source of protein is many products of animal and vegetable origin (meat, fish, milk, cheese, eggs, legumes, bread, etc.). Depending on this, proteins are divided into animal and vegetable. Proteins of animal origin are considered complete and are better absorbed by the body, as they contain essential amino acids needed by the body. Plant proteins are less valuable, the largest amount of complete proteins is in soybeans, peas, beans, and rye flour. A protein is considered complete if it contains a balance of essential amino acids.

The nutritional value of proteins depends on their amino acid composition. Of the 20 amino acids formed during protein hydrolysis, 8 are irreplaceable and cannot be synthesized in the human body: tryptophan, lysine, methionine, valine, threonine, leucine, isoleucine, phenylalanine. The rate of protein per day depends on age, gender, activity. The average protein rate for the adult population: for men - 65-117 g, for women - 58-87; for the elderly: for men - 61-68 g, for women - 55-61; for preschoolers - 53-69 g, for schoolchildren - 77-98 g. Proteins of animal origin should make up 60% of the total amount of protein for children and 55% - for adults. At the expense of protein, 11-13% of the total energy value of the diet should be provided. When 1 g of protein is burned, 4 kcal or 16.7 kJ

are released.

The product of daily consumption should be oil. Vegetable oils are excellent sources of PUFAs and vitamin E. PUFAs contribute to the growth and development of a young organism, its resistance to infection, have a normalizing effect on the walls of blood vessels, increasing their elasticity, and participate in metabolism.

Excess fat leads to deterioration of the assimilation of other components of food, inhibits gastric secretion and complicates the digestion of proteins, their assimilation, suppresses the functions of the hematopoietic, insulin apparatus, thyroid gland, promotes blood clot formation, disrupts the activity of the nervous system, metabolism, disrupts the activity of the nervous system, metabolism her disease.

The average need for fats is 80-100 g per day, including 25-30 g of vegetable origin (especially after 30 years, it is recommended to use 1 tbsp. l per day). Fat should provide 28-33% of the daily energy of the diet.

Carbohydrates Carbohydrates are the main source of easily digestible energy in the body (burning 1 g of carbohydrates releases 4 kcal, or 16.7 kJ). With their help, the necessary concentration of sugar in the blood is maintained, the exchange of proteins and fats is regulated. Carbohydrates have the property of protecting proteins from being spent on energy purposes, contributing to a more complete use of them for their intended purpose. The main sources of carbohydrates are products of vegetable origin. The most concentrated source of carbohydrates is sugar (99 g per 100 g of product). A lot of carbohydrates in honey (72-76 g), jam, jams (65-74 g).

In food p in products, carbohydrates are contained in the form of simple and complex compounds. Simple ones include monosaccharides (glucose, fructose) and disaccharides - sucrose (cane and beet sugar), lactose (milk sugar). Complex carbohydrates include polysaccharides (starch, glycogen, pectin substances, fiber).

Glucose and fructose are found mainly in berries and fruits, in honey. Mono- and disaccharide are easily dissolved in water, quickly absorbed in the digestive tract. Part of the glucose enters the liver, where it turns into animal starch glycogen. Glycogen is a carbohydrate reserve in the body, which, as needs grow, is used to feed muscles, organs and working systems. Excess carbohydrates turn into fat

Microelements and macroelements in human nutrition

The body needs minerals in the same way as vitamins. Moreover, many vitamins perform their role in metabolism in close interaction with certain mineral elements.

All mineral elements depending on their content in our body and food it is customary to divide into trace elements (the content of which in living organisms is less than 0.001%) and macroelements (the content of which in living organisms is more than 0.001%).

Human need for trace elements: iron, copper, zinc, cobalt is extremely high small, it is thousandths of a gram.

76 trace elements have been found in the human body, but scientists suspect that this is far not all.

The need for macronutrients: sulfur, phosphorus, sodium, potassium, calcium, chlorine, magnesium -

is larger and ranges from hundreds of mg to several grams.

Such macroelements as sulfur and phosphorus are biogenic elements. All fabrics of the human body consist of these macroelements, as well as hydrogen, carbon and oxygen

The main part of mineral elements enters the body with food.

The total amount of macronutrients that should enter the human body day should be 200 mg.

In the body of each of us there is a constant amount of each mineral element. But sometimes, for example, during illness, pregnancy or prolonged hunger, the amount of macronutrients decreases. If the lack of any macronutrient continues for a long time, it can cause the development of various diseases.

The largest amount of macronutrients is found in bones, muscles, ligaments and of blood. But an equally important function of macronutrients is maintaining the acid-base balance. Acid-alkaline balance in tissues is necessary for physiological course of all exchange processes.

Unfortunately, the diet of a large part of people, especially children, pregnant women and lactating women does not provide sufficient intake of a whole range of the most important mineral salts and trace elements, and this leads to unfavorable changes in health.

Vitamin and mineral complexes, as well as, help to replenish their deficiency food products specially enriched with vitamins and minerals.

Microelements

It is known that the majority of all chemicals found in nature. elements (81) were found in the human body.

12 elements are called structural because they make up 99% of the elemental composition of the human body (Z, Pro, H, N, Ca, Mg, Na, K, S, P, F, Cl).

At the same time, the main building material is four elements: nitrogen, hydrogen, oxygen and carbon.

Other elements, being in the body in small quantities, play an important role in influencing the health and condition of our body.

The mineral composition of the intracellular fluid, according to scientists, is similar to the composition

of the prehistoric sea and is strictly maintained at the same level, even if in its own it is necessary to absorb chemical elements of other tissues (for example, bone).

Minerals together with water ensure stability of osmotic pressure, acid-base balance, processes of absorption, secretion, hematopoiesis, bone formation, blood clotting; without them, the functions of muscle contraction would be impossible, nerve conduction, intracellular respiration.

2

Microelements act in the body by entering in one form or another and in small amounts in the structure of biologically active substances, mainly in the form of enzymes (enzymes).

Disrupted ecology, increasing the pace of life with an inevitable increase in stress situations, methods of food processing that "kill" biologically active substances substances that are not always high-quality food products - this is far from a complete list the reasons for the increase in the deficiency of vital microelements and the excess of toxic ones, cause irreparable damage to health.

Residents of megacities suffer, as a rule, from an excess of heavy metals in the body: lead, arsenic, cadmium, mercury, chromium, nickel. It is no secret that they are difficult metals are dangerous to health.

For example, the accumulation of mercury in the body occurs imperceptibly, gradually, therefore mercury

so insidious that when poisoned with it, no specific, bright symptoms appear expressed symptoms. As a result of such poisoning, speech impairment is possible, nervousness, appearance of a state of fear, drowsiness, leukopenia (decrease the number of leukocytes in the blood).

It is often possible to observe such changes in appearance human appearance: hair become dull, with cut ends, nails layer and break, skin acquires an earthy shade, loses its elasticity.

Hair, like no other biological substrate, reflects processes over the years flow in our body. Concentration of all chemical elements in hair many times higher than in the usual liquids for analysis - blood and urine. In serum blood, for example, can determine the content of 6-8 elements, and in hair - 20-30. Statistics show that the content of trace elements in the hair reflects

trace element status of the body as a whole, and hair samples are intellectual. gambling indicator of mineral metabolism. The hair itself helps to diagnose chronic diseases, when they do not reveal themselves yet. An important advantage of this non-invasive (that is, without penetration into tissues and organs) human) of the method is that the sample fence can be made without injury to the patient and the person is not at risk of getting any infection.

VITAMINS

Vitamins are a group of low-molecular organic substances that have a diverse structure and physicochemical properties, are absolutely necessary for the normal functioning of the body and perform catalytic functions in it directly or as part of more complex compounds. Vitamins ensure the normal flow of biochemical and physiological processes in the body and can be classified as a group of biologically active compounds that, in very small concentrations, affect metabolism. Food and intestinal bacteria serve as a source of vitamins for humans. The latter themselves synthesize most of the vitamins and are an important source of their supply to the body. Some vitamins come with food in the form of precursors - provitamins, which are transformed into biologically active forms of vitamins in the tissues of the body. Individual vitamins are a group of compounds similar in chemical structure. Such variants of the same vitamin are called vitamers. They have a similar specific, but different in strength, biological effect. Antivitamins are substances that prevent the body from using vitamins. The action of antivitamins occurs by binding and destroying the corresponding vitamins, as well as due to the inclusion of an antivitamin instead of a vitamin in the synthesized coenzyme, which makes it impossible for such a coenzyme to participate in biocatalysis. The biological role of most known vitamins is that they are part of coenzymes and prosthetic groups of enzymes and, therefore, are used by the body as a building material in the synthesis of the corresponding non-protein parts of enzymes. Thus, the regulatory effect of vitamins on metabolism is related to enzymes. 4 Coenzymes, which include vitamins, give enzymes catalytic activity. People's daily need for vitamins depends on age, physical activity, state of health, etc., and is for most vitamins, on average, a few milligrams, except for vitamin B12 and D, the rate of which is much lower (3 and 30 µg), and vitamin C, the need for which is much higher - 100 mg (see Table 3). During muscle activity, the need for vitamins increases 2-4 times due to the intensity of their removal from the body and greater use in the process of metabolism. But an excess of certain vitamins does not increase a person's physical capacity, and significantly increased concentrations can worsen the state of health. Norms of vitamins also increase in the case of the use of antibiotics, which impair their entry into the tissues, because they damage the beneficial intestinal microflora. And it promotes the assimilation and synthesis of certain vitamins. Vitamins enter the human body mainly with products of plant origin, where their synthesis takes place. In products of animal origin, they are found in liver, butter, meat, and egg yolks. The discovery of vitamins is connected with the development of many researchers - doctors, biochemists, physiologists, who established the presence of certain compounds in food products that are necessary for normal life - "additional nutritional factors". Specific diseases associated with nutritional disorders - scurvy (scurvy), beriberi, pellagra, rickets ("English disease"), hemeralopia ("chicken blindness") have been known to mankind for centuries. Thiamin (vitamin B1), obtained in 1911 by the Polish researcher K. Funk from rice bran, was the first vitamin to be proven as a necessary nutritional factor. The compound isolated 5 by K. Funk prevented the development of beriberi (polyneuritis caused by long-term consumption of polished rice) and contained an amino group in its structure, which became the basis of the term "vitamins" proposed for all additional nutritional factors (vitaminum - amine of life; lat.).

CLASSIFICATION OF VITAMINS

Currently, about 50 vitamins and vitamin-like substances are known. Given that the discovery of the first vitamin preparations significantly preceded the deciphering of their chemical structure, empirical names (nomenclature) of vitamins, containing a capital letter of the Latin alphabet with a numerical index, were historically developed; in the modern names of vitamins also indicate their chemical nature and, in some cases, the main biological effect with the prefix "anti-". Depending on their physical and chemical properties (solubility in water or lipids), vitamins are divided into two large groups: fat-soluble and water-soluble. Fat-soluble vitamins Vitamin A (retinol; antixerophthalmic). Vitamin D (calciferol; anti-rickets vitamin). Vitamin E (α-tocopherol; reproduction vitamin). Vitamin K (phyloquinone; antihemorrhagic vitamin). Vitamin F (a complex of polyunsaturated fatty

acids). Water-soluble vitamins Vitamin B1 (thiamine; antineuritis vitamin). Vitamin B2 (riboflavin). Vitamin B3 (niacin; antipellagra vitamin). Vitamin B5 (pantoic acid; antidermatitis vitamin). Vitamin B6 (pyridoxine; antidermatitis vitamin). Vitamin B7 (biotin; antiseborrheic vitamin). Folic acid (pteroylglutamate; anti-anemic vitamin). Vitamin B12 (cyanocobalamin; anti-anemic vitamin). Vitamin C (ascorbic acid; anti-scurvy vitamin). Vitamin P (rutin; permeability vitamin). Each of these groups contains a large number of different vitamins, which are designated by letters of the Latin alphabet. It should be noted that the order of these letters does not correspond to their usual arrangement in the alphabet and does not exactly coincide with the historical sequence of the discovery of vitamins. In the given classification of vitamins, the chemical names and the most characteristic biological properties of this vitamin are indicated in parentheses - its ability to prevent the development of one or another disease. Usually, the name of the disease (rickets, scurvy, xerophthalmia) is preceded by the prefix "anti", which indicates that this vitamin prevents or eliminates this disease. In addition to these two main groups of vitamins, there is a group of substances with different chemical properties that are partially synthesized in the body and have vitamin properties, they are combined into the vitamin-like group. These include: vitamin B15 (pangamic acid), lipoic acid, choline, orotic acid, inositol, para-aminobenzoic acid, ubiquinone, carnitine, linolenic acid, linoleic acid, vitamin V (anti-ulcer factor) (table 4). 7

CONCEPTS OF AVITAMINOSIS, HYPOVITAMINOSIS AND HYPERVITAMINOSIS

The state of health of a person, his ability to perform physical work and recover after it depends on the speed of biochemical reactions in the body. Therefore, if the content of vitamins in the body does not correspond to the physiological norm, it can cause various disorders of metabolism and the course of functions and lead to illness and even death of the body. Depending on the supply of vitamins to the body, the following three conditions are distinguished: avitaminosis, hypovitaminosis, and hypervitaminosis. Avitaminosis is a pathological change in metabolism caused by a long-term lack of vitamins in body tissues and manifested by specific diseases. In medical practice, the action of vitamins is called an antidote to this disease. For example, vitamin D prevents small children from getting rickets, so it is also called anti-rickets, vitamin C - scurvy (antiscorvy), vitamin B1 - beriberi or polyneuritis (antineuritis). The causes of vitamin deficiency can be: poor nutrition, impaired absorption processes in the intestines, accelerated decay in tissues or excretion from the body, for example, during stress or physical exertion. Hypovitaminosis is certain changes in the metabolism caused by a reduced content of vitamins in the tissues of the body and is accompanied, for example, for vitamin A by a decrease in the clarity of vision at dusk, which is called "chicken blindness", for vitamins of group B - changes in the condition of the skin (dermatitis), for vitamin C - by reducing the body's resistance to infectious diseases, etc. Hypovitaminoses are observed in the case of poor nutrition, impaired absorption of vitamins in the intestines, or in the spring, when their content in food products has decreased. For the timely detection of such a condition, the content of vitamins in the blood and urine should be determined. Hypervitaminosis is a change in metabolism that is caused by an excess of vitamins in body tissues, which is characteristic of fat-soluble vitamins, especially A and D. Thus, when vitamin A accumulates in tissues, you can lose hearing, hair, and even die, because it, like vitamin D, is toxic in large quantities. The use of vitamin C in excessive amounts for a long time, especially synthetic, acidifies the liquid environment, activates the processes of thrombus formation and peroxide oxidation of substances that damage cell membranes. The main causes of vitamin deficiency states (hypo- and avitaminosis) are: 1. Decrease (or absence) of a certain vitamin in the body as part of food products (as a result of an irrational diet or improper cooking of food products); such conditions were called exogenous hypo-(a)-vitaminoses. 2. Violation of the assimilation of certain vitamins by the cells of the body (due to disorders of their absorption in the digestive tract or the inability of the biochemical systems of the body to include the vitamin in metabolic processes, in particular due to obviousness of their structural competitors - antivitamins) - endogenous hypo-(a)-vitaminoses. 3. Increased removal of vitamins from the body or increased utilization of them in biochemical and physiological processes (situations that may occur during lactation, pregnancy, exhausting physical work, being in extreme temperature conditions, severe infectious diseases, etc.). Under the conditions of hypo- and avitaminosis, deep disturbances of certain metabolic processes and cellular functions occur, in which vitamins are involved as specific biomolecules. According to the mechanism of action, vitamins are coenzymes of complex enzymes (or participate in the synthesis of 9 coenzymes as their components), are part of biomembranes, perform certain regulatory functions at the level of individual cellular structures and the whole organism. Vitamins included in this class are oily substances that interact well with hydrophobic solvents; due to the presence of long

hydrocarbon (mainly isoprenoid) radicals in the structure of molecules, most of these vitamins are components of biomembranes that perform specific biological functions, in particular, they are powerful bioantioxidants (vitamins E, A, K). The absorption of fat-soluble vitamins in the intestine depends on the presence of surface-active components of bile and may be disturbed in the case of obstruction of the bile ducts, which is accompanied by symptoms of vitamin deficiency. On the other hand, in contrast to water-soluble vitamins, excess (in relation to physiological needs) intake of fat-soluble vitamins (especially A, D, K) is dangerous for the human body, since these compounds can accumulate in tissue depots and cause toxic effects (hypervitaminosis).

FAT-SOLUBLE VITAMINS. BIOANTIOXIDANTS

Fat-soluble vitamins are absorbed in the intestines and transported to tissues only together with fats. They can be deposited and stored in fatty tissues, so the body is less dependent on their insufficient intake. Fat-soluble vitamins include 4 groups of vitamins A, D, E and K (Table 2, 3). 10 Vitamin A (retinol, antixerophthalmic). In the absence of food, a number of specific biological changes (pathological) develop: the impression of epithelial tissues (dryness, desquamation of the epithelium), including the cornea of the eye (its dryness and inflammation is called xerophthalmia, and the softening and necrosis of the cornea is called keratomalacia, vision impairment (twilight or "chicken" blindness. With A-vitaminosis, there is also stunted growth, weight loss, and general exhaustion of the body. Dryness of the skin and mucous membranes, which facilitates the penetration of pathogenic bacteria into the body, leads to the occurrence of dermatitis, bronchitis, and catarrh of the respiratory tract. Vitamin A prevents from these infectious diseases, therefore it belongs to the group of anti-infectious vitamins. Vitamin A affects the barrier function of the skin, mucous membranes, the permeability of cell membranes and the biosynthesis of their components, as well as the biosynthesis of protein. A-vitaminosis is always accompanied by night blindness, which is a characteristic and early sign of this type of vitamin deficiency and most enriched with vitamin A organ. The value of vitamin A in the process of light perception has been determined. The process of light perception depends on the special photoreceptor complex protein rhodopsin, which is located in the retina, in the receiving terminal apparatus of the optic nerve. Rhodopsin plays the role of a photochemical sensitizer very sensitive to the action of light, under the influence of which it disintegrates. The brighter the lighting, the more rhodopsin breaks down, as a result of which the sensitivity of the retina to the perception of small light intensities increases. Rhodopsin is a complex protein consisting of a protein part - opsin and a chromophore (prosthetic group) - an aldehyde form of vitamin A. In the light, rhodopsin breaks down through a number of intermediate products with the formation of the pigment retinol (or retinen - aldehyde of vitamin A) and opsin. Retinol, in its turn, is restored to vitamin A under the action of the dehydrogenase enzyme. In the retina, during adaptation of the eye to light, rhodopsin breaks down, as a result of which vitamin A is released. In the retina, which is adapted to darkness, on the contrary, resynthesis of rhodopsin and free there is almost no vitamin A in it. Hence the known connection between Avitaminosis and night blindness. In connection with the deficiency of vitamin A in the body, which is part of rhodopsin, the synthesis of the latter is delayed, the retina perceives weak light stimuli poorly, and night blindness develops. With hypovitaminosis A, when the body experiences only a slight lack of this vitamin, the picture of the disease is not as acute as when there is a complete lack of vitamin A in food. In such cases, it is important for the doctor to determine the content of vitamin A and carotenes in the blood. Their normal total composition in the blood is 60-65 mg%. With hypovitaminosis, this indicator drops sharply. The picture of the disease is much more complicated in those cases when vitamin A or carotenes get with food in sufficient quantities, but it occurs and progresses Avitaminosis. Most often, this is associated with a violation of the absorption of fats in the intestines, and therefore, of vitamins that are soluble in fats. This is observed, for example, with blockage of the bile ducts. At the same time, per os therapy is pointless, it is necessary to inject the vitamin directly into the blood or tissues. From the very beginning of the study of vitamin A, its unique stimulating effect on the processes of cell growth and differentiation ("growth vitamin") was established. According to modern ideas, this biological function is realized by trans-retinoic acid (TR), which is formed in the body from the aldehyde form of vitamin A. The basis of vitamin A's stimulation of the processes of growth and development of organisms (morphogenesis) is the influence of trans-retinoic acid on 12 transcription processes. Nuclear receptors for RK belong to the superfamily of transcription regulators, together with receptors for steroid hormones, vitamin D3 and thyroxine, the molecular genetic mechanisms of which are the objects of modern research. A characteristic manifestation of vitamin A deficiency in humans is marked dryness of mucous membranes covered with a single-layered flat epithelium lining

the gastrointestinal and respiratory tracts, urinary and genital tracts, eyeball, lacrimal and auditory canals, etc. The introduction of vitamin A preparations or products containing it counteracts the indicated pathological manifestations, in particular dryness of the eyeball ("antixerophthalmic" vitamin, "axerophthol"). The biochemical basis of this group of effects of vitamin A is its stimulating effect on the biosynthesis of glycoproteins, which make up the basis of mucins - mucous formations that cover the mentioned epithelial covers. There are data on the participation of vitamin A in the functioning of glycosyltransferases of the endoplasmic reticulum and the Golgi complex, namely, the coenzyme function of retinol as a lipid carrier of oligosaccharide residues through lipoprotein membranes to the glycosylation sites of the peptide part of the glycoprotein.

In the absence of oxygen, vitamin A can be heated to 120-130°, while no changes in its chemical (and biological) properties are observed. In the presence of oxygen, vitamin A is destroyed quite quickly, which must be taken into account when storing food products and preparations of vitamin A. Sources of vitamin A for humans are products of animal origin: fish oil, butter, sour cream, milk, egg yolk, liver and red vegetables (carrots, peppers, tomatoes, apricots). Vegetables contain vitamin A in the form of a provitamin, which is β -carotene, the molecule of which breaks down in the intestinal wall of humans and animals to form two molecules of vitamin A1. It has been established that the daily requirement for an adult is 1.5-2.5 mg of vitamin A or 3-5 mg of β -carotenes. When calculating the daily need for vitamin A, the following should be kept in mind: 1. In infectious diseases, the need for vitamin A increases. 2. The assimilation of vitamin A and carotenes depends on the content of fats in food and the degree of their absorption in the intestines. The presence of bile acids in the intestines is extremely important for the assimilation of carotenes. Carotenes are absorbed much worse than vitamin A. 3. In the body, 90% of all vitamin A reserves are concentrated in the liver, which in adults contains about 10-30 mg of this vitamin per 100 g of tissue. In case of liver diseases, the daily intake of vitamin A should be increased. 4. With systematic eye strain, the daily intake of this vitamin should also be increased. Therefore, the daily dose of vitamin A should be increased by 50% for representatives of such sports as shooting, fencing, mountain skiing, motor sports. In medical practice, natural preparations of vitamin A and synthetic 14 retinol acetate and retinol palmitate are used for people whose work involves eye strain and to increase the body's resistance to infections.

Vitamin D (calciferol, anti-rickets). In the absence of this vitamin in the diet of children, the well-known disease rickets develops. Its cause is a disorder of phosphorus-calcium metabolism and a violation of the deposition of calcium phosphate in bone tissue. It is believed that with vitamin D, the absorption of calcium and phosphorus in the gastrointestinal tract and the formation of phosphoric esters of a number of organic compounds are disturbed, it is quite likely that these two processes are interconnected. In general, the effect of vitamin D is manifested in an increase in the content of calcium and phosphates in the blood. Vitamin D exists in the form of several vitamers. The most common vitamers are D2 and D3, which can be considered as derivatives of sterols.

Provitamins D2 and D3 are actually ergosterol and cholesterol. It is important that D3 is a natural anti-rickets vitamin found in human tissues. D3 is part of the lipoids of human skin. Therefore, children's rickets is cured if children get the opportunity to sunbathe, i.e. expose the surface of their body (skin) to sunlight or a quartz lamp. The biological function of D vitamins is the regulation of calcium homeostasis. Cholecalciferol - vitamin D3, which is formed in the human body from 7-dehydrocholesterol, is a precursor of the factor of the hormonal type of action of calcitriol, which induces the synthesis Ca-binding proteins of enterocytes and is, thus, the main regulator of the absorption of Ca²⁺ ions in the intestine, necessary for bone formation and control of multifaceted Ca-dependent biochemical processes. The most common causes of vitamin D deficiency with calcium-phosphorus metabolism disorders, osteomalacia, and the development of rickets in children are reduced solar irradiation of the skin, as well as reduced consumption of animal products containing cholecalciferol. 16 Sources of vitamin D are: fish oil, butter, cow's milk, egg yolks, vegetable oils, yeast. The body's daily need for vitamin D depends on a number of conditions: age, work performed, the general physiological state of the body, the ratio of calcium and phosphorus salts in food. On average, 12 - 25 mcg of this vitamin are administered to small children, 2.5 - 10 mcg to adults. Practical application: in the form of natural preparations of vitamin D (fish oil), synthetic - ergocalciferol or cholecalciferol.

Vitamin E (tocopherol, reproduction vitamin). The properties of vitamin E have a group of tocol derivatives α , β , and γ - tocopherols, which were first isolated from vegetable oils. α -tocopherol has the greatest biological activity. In the absence or lack of vitamin E in humans, embryogenesis

(development of the fetus in the mother's body) is disrupted and degenerative changes in the reproductive organs are observed. A more in-depth study of avitaminosis showed that E-avitaminosis manifests itself in a violation of the normal functioning and structure of many tissues: 17 develops muscular dystrophy, degeneration of the spinal cord and paralysis of the limbs, fatty degeneration, etc., that is, a general disease of the body. The mechanism of action of vitamin E is twofold. On the one hand, it is the most important intracellular agent that prevents the oxidation of fats and other easily oxidized compounds, one of the strongest natural antioxidants, primarily lipids, but this role of vitamin E is not dominant. On the other hand, vitamin E functions as a carrier of electrons in oxidation-reduction reactions associated with the reserve of energy released at the same time. Since this energy ensures the normal flow of biochemical processes, the numerous functional disorders observed in E-avitaminosis are understandable. Thus, vitamin E has a wide range of biological activity - its deficiency is accompanied by numerous changes in metabolic processes and physiological functions of the body. The most characteristic of E-avitaminosis are profound disorders of reproductive function in both men (abnormal spermatogenesis) and women (inability to fertilize and carry a pregnancy), muscular dystrophies, necrotic-dystrophic processes in the liver. The antiradical and membrane-stabilizing properties of vitamin E are the biochemical basis of its biological function as the most powerful bioantioxidant. By counteracting the peroxidation of biomolecules (lipids, proteins, nucleic acids), α -tocopherol protects cellular structures from the cytotoxic action of free radicals of both endogenous origin and xenobiotics entering the body from the external environment. Sources of vitamin E are cereal seeds and oils pressed from them, as well as rosehip berries and apple seeds, lettuce, cabbage. The richest sources of vitamin E in human nutrition are oils 18 (sunflower, corn, soybean, etc.), fresh vegetables and animal products (meat, butter, egg yolk). Vitamin E is widely distributed in nature. This explains the relative rarity of E-avitaminosis in natural food conditions. Vitamin E is deposited in the body in many tissues (muscles, pancreas, adipose tissue). Its reserves in the body compensate even for a complete absence of the vitamin in food for several months. The daily requirement for vitamin E- α -tocopherol is 10-20 mg.

Vitamin K (phyloquinone, antihemorrhagic). With K-avitaminosis, subcutaneous and intramuscular hemorrhages (hemorrhages) appear, blood coagulation decreases (nosebleeds, bloody vomiting may occur). Vitamin K takes part in the synthesis of prothrombin enzyme protein - a globular protein that is constantly present in the blood. Prothrombin turns into thrombin, and the latter causes the conversion of fibrinogen into fibrin, which forms a blood clot and directly ensures blood clotting. Vitamin K as a component of the respiratory chain (ubiquinone or coenzyme Q) takes part in redox reactions and affects anaerobic processes of energy generation. Vitamin K deficiency is associated with a violation of the process of prothrombin formation in the liver. This causes a delay in blood coagulation processes and is accompanied by bleeding. One of the causes of K-avitaminosis in humans is a violation of absorption in the intestine of fat-soluble vitamins, in particular vitamin K, as a result of the cessation of access to the intestine of bile. The lack of vitamin K in a person's food cannot be the reason for the development of avitaminosis, because the intestinal microflora usually produces this 19th vitamin in an amount sufficient to cover the body's need for it. Vita belongs to the group of vitamins K mines K1 and K2. Their cyclic structure is based on the 1,4-natoquinone ring. In addition to vitamins K1 and K2, a number of naphthoquinone derivatives have vitamin properties, in particular, a synthetic analog of vitamin K, designated vitamin K3. On its basis, a number of derivative compounds were synthesized, one of which is vikasol, the sodium salt of the bisulfite derivative of vitamin K3, which was synthesized by the Ukrainian biochemist A.V. Palladin, and found wide application in medical practice. Sources of vitamin K for the human body are mainly vegetable foods (cabbage, tomatoes, lettuce); a certain amount of vitamin is contained in liver (especially pork), meat. A significant amount of the vitamin is also synthesized by the intestinal microflora, which can meet the needs of the human body for this vitamin even in conditions of reduced intake with food products. The daily need for vitamin K is 200-300 μ g.

Vitamin F Vitamins of group F are understood as a group of polyunsaturated fatty acids of plant origin - mainly linoleic and linolenic, which are precursors in the synthesis of biologically active eicosanoids - derivatives of arachidonic acid (prostaglandins, thromboxanes, leukotrienes). Sources of polyunsaturated fatty acids are mostly vegetable oils, to some extent - animal fats, butter, eggs. The human body's daily need for vitamin F is about 2-6 g.

WATER-SOLUBLE VITAMINS.

Water-soluble vitamins easily enter the body together with water, and their excess is quickly excreted

with urine. Therefore, the body needs a systematic supply of these vitamins. In the event of their insufficient supply or long-term non-supply or non-assimilation, hypovitaminosis or vitamin deficiency develops. At the same time, they are not detected in urine. Water-soluble vitamins include B vitamins (B1, B2, B3, B6, B12), vitamins C, P, PP or B5, H, as well as folic acid, which is often considered a vitamin-like substance (Table 1, 3, 4).

Vitamin B1 (thiamine, antineuritis) occupies a special place in the history of the science of vitamins - it was the first crystalline vitamin that was obtained in the laboratory (isolated by Funk in 1912). Vitamin B1 is a compound made of pyrimidine and thiazole rings. Since vitamin B1, in addition to the amino group, contains a sulfur atom in the molecule, it is called thiamine. Polyneuritis (beri-beri disease) develops with vitamin B1 deficiency - progressive degeneration of nerves, as a result of which the skin loses sensitivity. Violation of the secretory and motor function of the gastrointestinal tract, heart pain, and ultimately paralysis and death were noted. Biochemical disorders in B1 vitamin deficiency include a negative nitrogen balance, increased urinary excretion of amino acids and creatine, and a sharp increase in the blood concentration of α -keto acids (mainly pyruvic acid). The mechanism of action of vitamin B1 is now quite clear. In the human body, thiamine, which comes with food, is transformed into thiamine pyrophosphate (coenzyme), which is an active group of specific enzymes that accelerate the breakdown of pyruvic acid and α -ketoglutaric acid (by their decarboxylation) in the body. It should be noted that these ketoacids are normal intermediate products of the transformation of carbohydrates in human tissues. Thus, in the absence or lack of intake of vitamin B1 in the body, it becomes impossible to carry out normal carbohydrate metabolism, especially the oxidation of pyruvic and ketoglutaric acids. At the same time, other types of exchange are disrupted. Accumulation of pyruvic acid (which is a poison for the nervous system) with a lack of vitamin B1 leads to serious consequences, with B1-avitaminosis. The carbohydrate metabolism of the brain is especially sharply disturbed with vitamin B1 deficiency. Vitamin B1 is also necessary for other important biochemical processes. Thiamine pyrophosphate is a coenzyme of transketolase, which participates in the pentose cycle of carbohydrate oxidation and in the formation and secretion of HCl. B1-avitaminosis decreases the acidity of bile juice. Vitamin B1 promotes a specific (suppressive) effect on cholinesterase, an enzyme that breaks down acetylcholine. Sources of vitamin B1 are mainly bread and cereals (buckwheat, oatmeal) in cases where the grain does not lose its germs and shells during processing, which mainly contain thiamine (rye flour, unpolished rice). There is a lot of vitamin B1 in baker's and brewer's yeast. The daily need for thiamine is 1.5-2 mg. The body needs the largest amount of vitamin B1 with a predominantly carbohydrate diet. It is generally accepted that 1 mg of thiamine is needed for 1 g of carbohydrate food. (On the contrary, fats reduce the need for thiamine).

Vitamin B2 (riboflavin). According to its chemical structure, vitamin B2 (riboflavin) is a derivative of isoalloxazine and ribitol alcohol. B2-vitaminosis is expressed in growth arrest, hair loss, damage to the mucous membranes (especially in the corners of the mouth), rapid eye fatigue, reduced work capacity, disruption of normal hemoglobin synthesis, pathological changes that also occur in the nervous system. The mechanism of action, that is, participation in the metabolism of substances Tamine B2, studied. Riboflavin as a coenzyme (FAD, FMN) is a part of flavin enzymes that participate in numerous reactions of oxidation of substances, most of which proceed with the formation of energy. In medical practice, various forms of riboflavin are used for skin and eye diseases, poorly healing wounds and ulcers, liver damage, exhausting muscle work, etc. Sources of vitamin B2: yeast, liver, kidneys, fish products, milk, eggs, cheese, green vegetables. A person's daily need for riboflavin is 2.0-2.5 mg.

Vitamin PP (vitamin B5, nicotinic acid, nicotinamide, antipelargic). Properties of vitamin PP (niacin) have nicotinic acid and its amide, which are interconvertible molecular forms in the body. Vitamin PP Vitamin PP is a necessary factor for the course of many chemical reactions associated with the oxidation of substrates of carbohydrate, lipid, amino acid and other types of metabolism. In the absence of food, a person develops a disease called pellagra. The most characteristic signs of this disease are skin lesions (dermatitis), gastrointestinal tract and nervous system disorders. Dermatitis is most often localized symmetrically on the right and left hands, on the right and left cheeks, open skin surfaces not protected by clothing from sunlight. Direct sunlight is of great importance in the development of pellagra dermatitis. The mechanism of action of vitamin PP is well known. Nicotinic acid amide is part of the coenzymes of dehydrogenases - nicotinamide adenine dinucleotide (NAD) and (NADP), the most important enzymes of biological oxidation. It follows from this that the absence of nicotinic acid in food leads to a violation of the synthesis of coenzymes that catalyze redox

reactions, to a violation of the mechanism of oxidation of the most important substrates of tissue respiration. It is known that a certain amount of nicotinic acid is synthesized in the human body from the amino acid tryptophan. This synthesis takes place with the participation of vitamin B6. Thus, PP-vitaminosis develops with insufficient protein nutrition (little tryptophan) and lack of 25 vitamin B6. Therefore, nowadays pellagra is considered not as pure vitamin deficiency, but as polyvitaminosis, that is, a disease caused by the lack of a number of vitamins and dependent on the amount of tryptophan in the diet. The main sources of nicotinic acid and its amide are: rice, wheat bread, meat, liver and kidneys, potatoes, carrots and other products. The daily requirement is 15-25 mg for adults; 15 mg for children.

Vitamin B6 (pyridoxine, antidermatitis). Vitamin B6 is considered as a combination of three individual substances: pyridoxol, pyridoxal, pyridoxamine (pyridoxamine derivatives). Vitamin B6 Each of them plays the role of a vitamin, since in the body it is possible to turn into pyridoxal phosphate, which precisely participates in the chemical reactions associated with the activity of this vitamin, because it is a prosthetic group of enzymes involved in the exchange of amino acids (it is known that 20 pyridoxal enzymes). Participates in the reaction of transamination of amino acids, providing the necessary fund for the synthesis of proteins in the body. It is quite natural that the absence of pyridoxine in food is accompanied by a sharp violation of protein metabolism. The main symptom of B6 vitamin deficiency is hematopoietic disorders and the development of various types of dermatitis that cannot be treated with nicotinic acid. B6-vitaminosis is accompanied by a violation of lipid metabolism, which leads to the development of atherosclerosis. Among the biochemical changes in vitamin B6 deficiency, there is a violation of nitrogen metabolism and metabolism of the amino acid tryptophan. The best source of vitamin B6 for humans is: bread, yeast, legumes, wheat germ, meat, fish. The need for vitamin B6 is 2-3 mg per day, which increases with rapid growth, significant physical exertion, and sports training.

Vitamin B3 (pantothenic acid, antidermatitis). Vitamin B3 is a combination of pantoic acid and alanine, which are connected by a peptide bond. In the body, pantothenic acid is used for the synthesis of coenzyme A (KoA-SH) - an acylation coenzyme, which is one of the key coenzymes in carbohydrate metabolism reactions (oxidation of pyruvic and α -ketoglutaric acids), oxidation and synthesis of 27 fatty acids, amino acid metabolism, use of acyl radicals in the biosynthesis of steroids, detoxification processes, etc. Intestinal microflora synthesizes pantothenic acid and secretes it into the intestines. Nevertheless, a person may still experience numbness of the toes, burning pain in the fingers and soles ("burning feet"). All this is explained by the fact that B3 is part of coenzyme A. Isolated avitaminosis in humans rarely occurs and can manifest itself in numerous non-specific disorders of various organs and systems (skin, mucous membranes, hair, nervous system, internal organs). As a therapeutic and preventive agent, pantothenate is included in various cosmetic products and shampoos. Pantothenic acid is contained in sufficient quantities in most products of vegetable and animal origin (flour and cereals, cereals, eggs, milk, yeast, etc.); the significant distribution of the vitamin in biological objects was reflected in its name (pantothenos - omnipresent, widespread; Greek). The synthesis of pantothenic acid by the intestinal microflora is insufficient to cover the daily needs of the human body. The daily need for pantothenic acid is 5-10 mg.

Vitamin H (biotin, antiseborrheic). Vitamin H (biotin) is a derivative of monocarboxylic valeric acid, thiophene, and a cyclic form of urea. Vitamin H takes part in the exchange of higher fatty acids, nitrogenous bases and nucleic acids, as well as in the biosynthesis of glucose. Therefore, it is necessary for the function of muscles and the nervous system. Avitaminosis of vitamin H is not characteristic, since vitamin H is synthesized by intestinal microflora. 28 Hypovitaminosis can develop when consuming a large number of raw chicken eggs, which contain the protein avidin, which opposes the normal absorption of vitamin H. With a lack of vitamin H, the following symptoms are observed in a person: skin inflammation, muscle pain, reduced work capacity, hair loss, increased fat secretion sebaceous glands of the skin (seborrhea), nail damage. The mechanism of action of vitamin H is multifaceted. The main role is that it performs a coenzyme function in the composition of enzymes that accelerate carboxylation reactions. Accepting carbon dioxide (CO₂) with the formation of carboxybiotin, vitamin H participates in the following biochemical reactions: - biosynthesis of fatty acids (carboxylation in the enzyme acetyl-CoA-carboxylase of acetyl-CoA to malonyl-CoA); - transformation of pyruvate into oxaloacetate during gluconeogenesis reactions (as part of pyruvate carboxylase); - carboxylation reactions in the biosynthesis of the purine nucleotide core. Beef liver, milk, soy, peas, mushrooms are rich in vitamin H. The daily need for biotin is about 10 mg.

Folic acid (folicin, anti-anemic vitamin). Folic acid (ФК; vitamin Bc, folacin) is chemically a derivative of pterins - pteroylglutamic acid, which contains fragments of p-aminobenzoic acid (PABA) and glutamic acid combined with a derivative of pteridine (pterin). Folic (pteroylglutamic) acid Folic acid (vitamin Bc) takes part in the exchange of amino acids and nucleic acids, which is associated with an increase in protein synthesis (anabolic effect). Folic acid contributes to the absorption of vitamin B12 and thus enhances blood formation processes, showing an anti-anemic effect. It is capable of attaching hydrogen, which determines its participation in oxidation-reduction processes related to energy generation. The coenzyme form of folic acid is its hydrogenated derivative 5,6,7,8-tetrahydrofolic acid (THFK). The coenzyme functions of THFK consist in the intermolecular transfer of one-carbon fragments (methyl, methylene, methenyl, oxymethyl, formyl), which are used in many reactions of amino acid metabolism, synthesis of nucleotides (DNA thymidylate, purine nuclei of DNA and RNA), physiologically active compounds. Folic acid is biochemically related to the exchange and functions of vitamin B12, namely: - THFK (in the form of N 5 - methyltetrahydrofolate) together with vitamin B12 (methylcobalamin) participate in the reaction of methionine synthesis (homocysteine methyltransferase reaction); the physiological significance of the process lies in the formation of methionine - a donor of methyl groups in methylation of nucleotides of nucleic acids (DNA and certain classes of RNA), synthesis of choline, creatine, etc.; - deficiency diseases of both vitamins often occur together and have a similar clinical picture. A classic manifestation of folic acid deficiency is spru disease, characterized by macrocytic anemia and foamy diarrhea (spruw - foam; Dutch); the disease develops as a result of consuming a protein-depleted diet, which leads to a violation of both the synthesis of folic acid by microorganisms and (subsequently) the assimilation of vitamin B12. Folic acid deficiency manifests itself in a violation of the synthesis of nucleic acids and hematopoietic processes, which leads to a decrease in the amount of hemoglobin (anemia and leukopenia). Folic acid hypovitaminosis is manifested by bleeding of the mucous membranes of the mouth and gums, damage to the gastrointestinal tract, fatty infiltration of the liver, the development of dermatitis, stomatitis. The richest natural sources of folic acid are the leaves of green plants, in which it is synthesized (hence the name of the vitamin: folium - leaves; Latin). Human needs for vitamin are provided due to its synthesis by intestinal microflora, as well as consumption of plant and animal food; a significant amount of folic acid is found in the liver and yeast. Dysbacteriosis caused by long-term use of sulfonamide drugs can lead to the development of vitamin deficiency, which, acting as structural analogs of PABA (a component of the pteroylglutamic acid molecule), block the formation of folic acid in bacterial cells, which is necessary for the synthesis of the microorganisms' own nucleic acids. The daily need for folic acid is 200-400 µg.

Vitamin B12 (cobalt amine, anti-anemic). Vitamin B12 has a complex structure similar to hemoglobin. It consists of 4 pyrrole rings, which are connected not by an iron atom, but by a cobalt (Co) atom. Vitamin B12 Vitamin B12 extracted from the liver contains 4.5% cobalt. It is the only vitamin known today that has a metal (cobalt) coordinated to nitrogen atoms in 32 of its molecules. Cobalt is bound to the cyano group and is therefore called cyanocobalamin. The lack of vitamin B12 in the human body is the cause of pernicious anemia. Its leading symptom, along with a decrease in erythrocytes, is an increase in their volume, which is indicated by an increase in the color index and a decrease in the level of hemoglobin. In addition, there are complaints about the functions of the alimentary tract, weakness and often disorders of nervous activity. The disease is always accompanied by a decrease or complete absence of secretion of gastric hydrochloric acid. The use of vitamin B12 preparations for medical purposes has found an interesting feature: vitamin B12 has an anti-anemic effect in malignant anemia (or pernicious anemia, Addison-Birmer disease) only when it is administered parenterally, and, on the contrary, it is weakly active when used orally. However, if vitamin B12 is given in combination with neutralized gastric juice (which is inactive by itself), a good therapeutic effect is observed. It is believed that in healthy people, the gastric juice contains a protein - glycoprotein transcorsin (the so-called "internal Castle factor"), which combines with vitamin B12 ("external Castle factor"), forming a new, complex protein. Vitamin B12 bound in such a protein complex can be successfully absorbed from the intestines. In the absence of the "intrinsic Castle factor", the absorption of vitamin B12 is dramatically impaired. In patients with pernicious anemia, the gastric juice lacks transcorsin, which is necessary for the formation of a complex with vitamin B12. In this case, the absorption of vitamin B12 is disturbed; the amount of vitamin that entered the body decreases; a state of vitamin deficiency occurs. These data provided a new explanation for the relationship that exists between the development of pernicious anemia and 33 disorders of gastric function. Although pernicious anemia is a vitamin deficiency, it arises due to an organic disease of

the stomach - a violation of the secretion of the "internal factor of Castle" by its mucous membrane. Vitamin B12 (cyanocobalamin) takes part in the synthesis of nucleic acids and the exchange of amino acids, which leads to the activation of protein synthesis, growth and recovery processes. Thus, Vitamin B12 has a significant anabolic effect. It increases the number of erythrocytes and predisposes to fatty infiltration of the liver (lipotropic effect), and also improves the metabolism of the amino acid methionine and affects the processes of biological oxidation of pyruvic and acetic acids. Coenzyme forms of vitamin B12 participate in the catalysis of biochemical reactions by the following enzymes:

- methylmalonyl-CoA mutase (an enzyme that catalyzes the reaction of converting methylmalonyl-CoA to succinyl-CoA); coenzyme is 5-deoxyadenosylcobalamin. The reaction is important for the metabolism of methylmalonyl-CoA, which is formed during the splitting of amino acids with branched chains - L-valine, L-leucine, L-isoleucine and α -oxidation of fatty acids with an odd number of carbon atoms;
- homocysteine-methyltransferase (in the reaction of methionine synthesis from homocysteine); coenzyme is methylcobalamin, which transfers the methyl group to homocysteine from N⁵-methyltetrahydrofolate. The biochemical significance of the reaction lies in the production of methionine, which is the main donor of methyl groups in the reactions of synthesis of physiologically active compounds, methylation of nucleotides of nucleic acids, etc. The biochemical basis of the development of malignant vitamin B12-dependent anemia is a violation of the biosynthesis of nucleic acids and proteins, which is manifested primarily in tissues with intensive cell proliferation, which includes hematopoietic tissue. This form of anemia is characterized by a significant decrease in the number of erythrocytes (to $1.5-2 \cdot 10^{12} / l$ with a norm of $5 \cdot 10^{12} / l$) with an increase in their volume and a change in the shape of 34 cells (macrocytic, megaloblastic anemia); characteristic symptoms of the disease are also disturbances on the part of the peripheral nervous system due to demyelination of nerve trunks (funicular myelosis), cheilitis and glossitis ("polished" tip of the tongue). The disease develops as a result of atrophic gastritis, stomach cancer, gastrectomy, invasion by the helminth *Trichostrongylus axei*. The needs of the human body for vitamin B12 are largely provided due to its synthesis by the microflora of the large intestine; in addition, cobalamin is contained in sufficient quantities in animal food - the richest source of vitamin B12 is the liver, which contains up to 100 mg of vitamin/100 g of product, meat, fish, milk. The daily requirement of the vitamin is 2-5 μ g.

Vitamin C (ascorbic acid). Ascorbic acid is an unsaturated compound and does not contain a COOH group. Under the influence of enzymes, ascorbic acid is easily oxidized (gives up hydrogen) and turns into dehydroascorbic acid, which, adding hydrogen atoms, again is converted into ascorbic acid. Thus, vitamin C takes part in redox reactions of tissue respiration. Oxidation of ascorbic acid to dehydroascorbic acid prevents its destruction and removal from the body. This process is enhanced by the effect of vitamin P. Vitamin C (ascorbic acid) takes part in redox reactions and hydrogen transfer during aerobic energy production. It affects the synthesis of collagen protein, which contributes to the preservation of the integrity of supporting tissues (cartilage and bones) and the normal integrity of vessel walls. The activity of many enzymes depends on the presence of ascorbic acid. First of all, this refers to enzymes that participate in the exchange of amino acids and nucleic acids, the biosynthesis of proteins in muscles, which determines the anabolic effect of vitamin C. This vitamin stimulates hematopoietic processes, improves the absorption of iron from the intestines and improves the protective function of the liver, which increases resistance of the body to various toxic substances and promotes its faster recovery after intense physical exertion. Vitamin C affects the synthesis of adrenal hormones, including corticosteroids, which improves the body's adaptive reactions, increases the body's resistance to infectious and cold diseases. Thanks to such biological functions, it is widely used in medicine and sports. With vitamin C deficiency, scurvy develops in the body - a disease characterized by increased permeability and fragility of blood vessels, especially capillaries. With C-avitaminosis, even a small mechanical action can cause hemorrhages on the skin, which in some cases can be fatal. Thus, hemorrhage into the pericardium, which occurs in scurvy, can cause death due to the cessation of the activity of the heart, compressed by the spilled blood; usually with this disease damage to bones and 36 especially teeth is also observed. The basis of these phenomena is a violation of collagen protein synthesis, which causes pathological changes in vascular walls and supporting tissues. Collagen gives density to the vessel walls. C-hypovitaminosis leads to a violation of protein metabolism, a decrease in resistance to various diseases, mainly of the gastrointestinal tract and respiratory tract, the occurrence of caries in the teeth, bleeding gums, a violation of the structure and function of the joints. General disorders in the body with vitamin C deficiency are characterized by a decrease in work capacity, adaptive capabilities of the body,

especially in conditions of intense physical and mental activity, stressful situations, changes in environmental temperature, and increased susceptibility to the action of infectious factors. Despite many years of research, the molecular mechanisms of the biological effects of vitamin C are still not fully understood. Reactions where the participation of ascorbic acid is definitively clarified are the hydroxylation of biomolecules during the following biochemical transformations: - collagen biosynthesis, namely in the post-translational modification of protein with the formation of mature collagen by hydroxylation of proline and lysine residues to the corresponding hydroxyamino acids; in the process of hydroxylation of proline to 4-hydroxyproline, Fe^{2+} is involved - the ascorbate-dependent enzyme prolylhydroxylase - the role of vitamin C is to regenerate the reduced form of the iron ion, necessary for the catalytic cycle; - biosynthesis of dopamine, noradrenaline and adrenaline (hydroxylation stages in the cycle and side ring of catecholamines); - biosynthesis of steroids (numerous hydroxylation reactions at the stages of formation of cholesterol and biologically active steroid hormones); - serotonin biosynthesis (tryptophan hydroxylation reaction); - tyrosine catabolism (through the stage of formation of homogentisic acid). Iron ions (Fe^{2+} – Fe^{3+}) are also involved in most biocatalytic processes that take place with the participation of ascorbic acid, acting as reverse electron donors and forming in the process of reactions a molecular form (Fe^{3+} –O -) that is toxic to biostructures and can stimulate reactions peroxidation of biomolecules. As already mentioned for the reaction of hydroxylation of proline, ascorbic acid in these reactions performs a specific antioxidant function, ensuring the regeneration of the reduced form of iron, that is, neutralizing the highly active molecular structure (Fe^{3+} –O -). Vitamin deficiency develops, as a rule, under the conditions of an irrational diet (lack of fresh plant products) or improper culinary preparation of food dishes. Heat treatment of products at high temperatures, in the presence of oxygen and metals (heating products in metal dishes!) is especially harmful for the content of ascorbic acid. Daily need for vitamin C - 50-70 mg; it increases during pregnancy, lactation, infectious diseases, and intense muscle activity.

Vitamin P (rutin, permeability vitamin). Vitamin P is a flavin derivative of yellow glucosides: Vitamin P (rutin), as well as other substances with P-vitamin activity (citrine, quercetin, hesperidin, catechins), participate in redox salivary reactions and stimulate tissue respiration, as well as regulate the permeability of capillaries. This effect of vitamin P is interconnected with vitamin C, which led to the creation of their complexes (ascorutin and galascorbin). These drugs improve the condition of the walls of blood vessels, regulate the acid-forming function of the stomach, 39 processes of bile formation, and the speed of restorative reactions in the body. With a lack of vitamin P in the body, the permeability of capillaries increases, which is accompanied by sharp hemorrhages after squeezing the tissue, pain in the limbs, general weakness and rapid fatigue. The main biological feature of vitamin P is the ability to strengthen the vascular wall and reduce its permeability ("Permeability vitamin"; English). Insufficiency of vitamin P can develop in the absence of plant products in the diet and usually accompanies the insufficiency of ascorbic acid, so scurvy can be considered to a certain extent as a manifestation of the insufficiency of these two vitamins. The mechanism of action of vitamin P is associated with participation in the restoration of ascorbic acid and preservation of its tissue reserves. The need for vitamin P for humans has not been established; 100-200 mg of vitamin P per day (usually in the form of rutin) are administered for therapeutic purposes (strengthening of blood vessels).

Literature

Main:

1. Hygiene and ecology // textbook for students of higher medical educational institutions in English. /edited by V.G. Bardova – Vinnytsia: NovaKnyga, 2018.
2. Environmental Health: from Global to Local \ Under Howard Frumkin edition – Third edition. - San Francisco, 2016

Additional:

3. General hygiene. Hygiene propaedeutics/Textbook for foreign students. / E.I. Honcharuk, Yu.I. Kundiev, V.G. bardo otter - K.: Higher school, 2000.

4. Korobchanskiy V.A. Hygiene and Ecology \ Korobchanskiy V.A., Vorontsov V.P., Musulbas A.A. - Kharkov, 2006

PRACTICAL LESSON No. 9

Topic: Physiology and pathophysiology of digestion

Purpose: to know the main patterns of gastric secretion disorders, quantitative and qualitative changes in gastric juice.

Basic concepts: nutrition, rational nutrition, gastrointestinal function disorders, digestive disorders, pathophysiology, development of gastrointestinal tract diseases.

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

1. The concept of indigestion.
2. Consequences of allocation of different departments of the alimentary canal (experiments of Y. S. London).
3. Indigestion in the oral cavity.
4. Disorders of the secretory function of the stomach, classification. Disorders of motor function.
5. Etiology and pathogenesis of gastric and duodenal ulcers. Experimental models.
6. Disturbance of intestinal digestion. Interrelationship of wall and cavity digestion disorders.
7. Liver failure. Etiology and pathogenesis. Violations of various types of metabolism. Manifestations
8. Functional tests of the liver.
9. Definition of the concept of "jaundice". Classification of jaundice. Etiology and pathogenesis. Bilirubin circulation. Changes in the body in certain types of jaundice.

Formation of professional skills:

1. Explain normal and pathological types of gastric secretion.
2. To analyze the mechanism of development of hypo- and hypersecretion, hypo- and hyperacidity.

3. To explain the influence of secretory disorders on the mechanism of disturbances in the motor function of the stomach.

4. To apply the received ideas about the mechanisms of indigestion in the stomach for a correct understanding of their role in the pathogenesis of diseases of the gastrointestinal tract.

SUBJECT TEXT:

It is known that the average human body consists of water - 60-65%, proteins - 15-20%, fats - 19%, salts - 5.8%, carbohydrates - 0.6%. All these substances must be constantly replenished. Unlike plants, animals (including humans) do not create nutrients themselves, but obtain them from the environment. To do this, they consume food, process it and extract nutrients necessary for their vital activity, which enter the blood and are absorbed from it by cells. Digestive insufficiency is a discrepancy between the ability of the digestive system to digest and absorb nutrients with the volume and/or composition of the incoming food. Digestive insufficiency accompanies a wide range of diseases of the gastrointestinal tract, and can also occur in a healthy person as a result of an unbalanced diet or too much food eaten, and therefore it is very common in the daily practice of a gastroenterologist. The consequence of indigestion is insufficiency of digestion. Currently, the main pathophysiological mechanisms of indigestion can be classified as follows: cavity digestion disorders, parietal digestion disorders, mixed form of indigestion syndrome.

CAUSES OF INSUFFICIENCY OF CAVITY DIGESTION

- Diseases of the pancreas, both hereditary and acquired (chronic pancreatitis, condition after pancreatectomy, pancreatic cancer, cystic fibrosis).
- Secretory insufficiency of the stomach (atrophic gastritis, post-gastrectomy syndrome).
- Deficiency of bile acids or asynchrony of the flow of bile into the small intestine in case of biliary obstruction, hepatitis, cirrhosis, CKD, after cholecystectomy.
- Inactivation of digestive enzymes in gastroduodenitis, peptic ulcer disease, dysbacteriosis of the small intestine.
- Violation of transit of intestinal contents and mixing of enzymes with chyme in duodenal and gastrostasis, irritable bowel syndrome.

CAUSES OF VIOLATION OF PARIETAL DIGESTION

Disturbances of parietal digestion are associated with impaired function of parietal digestive enzymes (for example, lactase deficiency). Disturbances of parietal digestion develop as a result of disaccharidase deficiency (congenital and acquired lactase deficiency); dystrophic changes or death of enterocytes (gluten enteropathy, sarcoidosis, Crohn's disease, excessive bacterial growth). With insufficiency of digestion, a large amount of undigested nutrients remains in the intestinal cavity, which leads to a violation of the composition of the internal environment of the intestine, including changes in pH, osmotic pressure, and chemical composition. These changes lead, on the one hand, to secondary damage to the intestinal mucosa and even greater disruption of digestive processes, and on the other hand, to a change in the composition of the intestinal microflora, which exacerbates existing disorders. In the clinic, insufficiency of digestion, manifested by a number of rather characteristic syndromes and laboratory changes, is designated as "dyspepsia" or "dyspeptic syndrome". The manifestations of dyspeptic syndrome traditionally include: heartburn, nausea and vomiting, belching, unpleasant sensations (discomfort or pain) in the epigastric region, flatulence, and bowel disorders. Symptoms of dyspepsia can be observed both together and separately and accompany almost any disease of the gastrointestinal tract. At the same time, each of them has a different origin and different mechanisms of occurrence, and also requires completely different approaches to treatment, which makes it inappropriate to so broadly combine all symptoms with a single term. Clinical manifestations of indigestion are found in 25–41% of the population. Insufficiency of digestion can occur even without obvious clinical manifestations and consist in the weakening of the participation of any organ of the digestive system in the digestion process, which is compensated by the activity of other organs of the digestive system. This is due to the fact that its various departments are functionally a single system. This

unity is due to the commonality of neuro-humoral regulation. E. S. London showed that a dog's life is possible even after the (staged) removal of its stomach, the entire ileum and most of the small intestine, as well as almost the entire colon. In addition, this unity is especially manifested in pathological conditions, when a violation of the functions of some links of the system entails a violation of the functions of others: superior - inferior and vice versa. Insufficiency of digestion can be a consequence of the influence of external alimentary factors (quantitatively or qualitatively unbalanced diet), violations of the mechanisms of regulation of water and food intake (disorders of the feeling of hunger and thirst), violations of the central nervous, endocrine, local neurohumoral-hormonal mechanisms that control the functions of the digestive organs system, various combinations of these factors. Most often, insufficiency of digestion occurs with diseases of the organs of the digestive system.

DISORDER OF DIGESTION IN THE STOMACH

At the heart of digestive disorders in the stomach are partial, and more often combined disorders of the secretory, motor, absorptive, barrier and protective functions of the stomach. In general, secretion disorders cause a discrepancy between the dynamics and/or level of secretion of various components of gastric juice with the current real needs for them.

TYPES OF DISORDERS OF GASTRIC SECRETION

Normally, the amount of gastric juice is 2-2.5 liters per day. Disorders of gastric secretion include hypersecretion, hyposecretion and achillea.

Hypersecretion – an increase in the amount of gastric juice, an increase in its acidity (hyperchlorhydria) and digestive abilities.

The main causes of hypersecretion

- Increase in the mass of secretory cells of the stomach (genetically determined).
- Activation of the effects of the vagus nerve (BN) (for example, in neurotic conditions or constitutional vagotonia): acetylcholine stimulates all types of secretion in the stomach, duodenum, pancreas, as well as gastric motility and intestinal peristalsis.
- Increasing the synthesis and/or effects of gastrin (stimulates the secretion of mucus, bicarbonate, enzymes, hydrochloric acid in the stomach, inhibits evacuation from the stomach, stimulates intestinal peristalsis and insulin secretion, stimulates the proliferation of cells in the mucous membrane).
- Hypertrophy and/or hyperplasia of enterochromaffin (enteroendocrine) cells (for example, with hypertrophic gastritis).
- Overstretching of the antral part of the stomach (pylorostenosis, pylorospasm). • Action of some drugs (for example, acetylsalicylic acid or corticosteroids, insulin). • Smoking, drinking alcohol.
- Rough, spicy, hot (irritating) food.

Possible consequences of hypersecretion: slowing the evacuation of food mass from the stomach, erosion and ulceration of the gastric mucosa, indigestion in the intestines.

Hyposecretion is a decrease in the volume of gastric juice, a decrease in its acidity and splitting efficiency. The main causes of hyposecretion

- Decrease in the mass of secretory cells (for example, in hypo- and atrophic forms of chronic gastritis or disintegration of a stomach tumor).
- Reduction of the effects of BN (for example, with neuroses or constitutional sympathicotonia).
- Reduction of gastrin formation.

- Deficiency of proteins and vitamins in the body.
- Dehydration.
- Action of drugs that reduce or eliminate the effects of BN (for example, cholinergic blockers or cholinesterase activators).

It is also possible to develop an anacid state, or achlorhydria, when there is no free hydrochloric acid in the gastric juice. In the case when not only free hydrochloric acid, but also enzymes are not found in the gastric juice, we speak of achilia (absence of gastric secretion).

Achillia can be functional (due to inhibition of secretion) and organic (associated with atrophy or replacement of the mucous membrane - anadenia). They are distinguished using a histamine test. This is important, because it depends on the tactics of treatment (stimulation of secretion or replacement of gastric juice components).

Achillia is characteristic of late stages of chronic hypoacidic (atrophic) gastritis, stomach cancer, pernicious anemia. Possible consequences of hyposecretion: digestive disorders in the stomach and intestines, appearance of motor disorders (nausea, vomiting), violation of the antiseptic properties of gastric juice, development of fermentation and putrefaction processes, violation of the optimal amount of mucus in the stomach, alkalosis.

TYPES OF MOTOR FUNCTION DISORDERS

Violation of the tone of the stomach muscle: excessive increase (hypertonus), excessive decrease (hypotonus) and atony - lack of muscle tone. Changes in muscle tone lead to violations of peristalsis - coverage of food masses by the stomach wall and the formation of a portion of food for intragastric digestion, as well as its evacuation into the duodenum (DPK). Disorders of the activity of the muscular sphincters of the stomach in the form of a decrease (up to their atony; causes long-term opening - "gaping" of the cardiac and/or pyloric sphincters) and increased tone and spasm of the sphincter muscles (leading to cardiospasm and/or pyloric spasm). Violation of gastric peristalsis in the form of its acceleration (hyperkinesis) and deceleration (hypokinesis). Evacuation disorders. Combined and/or separate disorders of tone and peristalsis of the stomach wall lead to either acceleration or slowing down of the evacuation of food from the stomach.

CAUSES OF DISORDER OF MOTOR FUNCTION

Violation of the nervous regulation of the motor function of the stomach: increasing the influence of the BN stimulates its motor function, and activation of the effects of the sympathetic nervous system suppresses it. Disorders of humoral regulation of the stomach. For example, a high concentration of hydrochloric acid in the stomach cavity, as well as secretin, cholecystokinin inhibits the motility of the stomach. On the contrary, gastrin, motilin, reduced content of hydrochloric acid in the stomach stimulate motility. Pathological processes in the stomach (erosions, ulcers, scars, tumors can weaken or strengthen its motility depending on their localization or severity of the process).

CONSEQUENCES OF DISORDER OF MOTOR FUNCTION

As a result of stomach motility disorders, the development of early satiety syndrome, heartburn, nausea, vomiting and dumping syndrome is possible.

ABSORPTION DISORDERS IN THE STOMACH

Normally, water, alcohol, and electrolytes are absorbed in the stomach. In case of accidental or deliberate intake, toxic agents can be absorbed. In the case of destructive changes in the stomach wall (including when the barrier function is impaired), it is possible for protein to enter the internal environment of the body, which threatens the development of immunopathological processes: allergic reactions and states of immune autoaggression.

DISRUPTION OF THE BARRIER AND PROTECTIVE FUNCTION OF THE STOMACH

The mucous-bicarbonate barrier protects the mucous membrane from acid, pepsin and other potential damaging agents. Components of the stomach barrier (mucus is constantly secreted on the surface of the epithelium).

- Bicarbonate (HCO_3^- ions). It is secreted by superficial mucous cells, providing a neutralizing effect.
- pH. The mucus layer has a pH gradient. On the surface of the mucus layer, the pH is 2.0, and in the pre-membrane part it is more than 7.0.
- H^+ . The permeability of the plasmolemma of mucous cells of the stomach for H^+ is different. It is insignificant in the membrane facing the lumen of the organ (apical), and quite high in the basal part. In case of mechanical damage to the mucous membrane, when it is exposed to oxidation products, alcohol, weak acids or bile, the concentration of H^+ in the cells increases, which leads to their death and destruction of the barrier.
- Dense contacts. Formed between the surface cells of the epithelium. When their integrity is violated, the barrier function is violated.

Regulation of the stomach barrier. The secretion of bicarbonate and mucus is enhanced by glucagon, prostaglandin E, gastrin, and epidermal growth factor (EGF). Antisecretory agents (for example, histamine receptor blockers), P_g, gastrin, sugar analogues (for example, sucralfate) are used to prevent damage and restore the barrier. Under adverse conditions, the barrier breaks down within a few minutes, epithelial cells die, swelling and hemorrhages occur in the own layer of the mucous membrane. Factors adverse to maintaining the barrier. NSAIDs (aspirin, indomethacin), ethanol, salts of bile acids.

- *Helicobacter pylori* is a gram-negative bacterium that survives in the acidic environment of the stomach. *N. pylori* infects the surface epithelium of the stomach and destroys the barrier, contributing to the development of gastritis and ulcerative defects of the stomach wall. This microorganism is isolated in 70% of patients with gastric ulcer and 90% of patients with gastric ulcer or antral gastritis. A decrease in acidity in the stomach creates favorable conditions for the life and reproduction of many microbes, such as cholera vibrio, shigella, and amoeba. Thus, patients with gastric achilles are more likely to suffer from infectious diseases (transmitted through the oral-fecal route), are subject to intoxication, and have a higher risk of developing stomach neoplasms.

DISORDER OF DIGESTION IN THE INTESTINES

Digestive disorders in the intestine are caused by a violation of its main functions: digestive, absorptive, motor and barrier protective.

1. Disruption of the digestive function of the intestine

The main causes of digestive disorders of the intestinal function:

- violation of the exocrine function of the pancreas (PZ);
- violation of bile secretion in the small intestine;
- violation of the secretion of mucus and bicarbonate into the lumen of the small intestine by the own (Brunner's) glands of the wall of the small intestine and mucus by numerous goblet cells of the villi and crypts of the intestine.

2. Disorders of the absorptive function of the intestines

The main causes of intestinal absorptive function disorders:

- insufficient cavity and membrane digestion;
- acceleration of the evacuation of intestinal contents (for example, with diarrhea);
- atrophy of the villi of the intestinal mucosa;
- excess content of exudate on the floor mucosal irritations (for example, with acute intestinal infections, chronic enteritis);
- resection of a large fragment of the small intestine (for example, with tumor damage and/or necrosis);

- disorders of blood and lymph circulation in the intestinal wall;
- disorders of intestinal absorption are a significant component of the pathogenesis of malabsorption syndrome.

3. Violation of the motor function of the intestines.

There are various forms of intestinal motility disorder. Extreme variants of violations are diarrhea and constipation.

ULCER DISEASE

The terms "ulcer", "ulcer disease", "peptic ulcer disease" are used in relation to a group of diseases of the gastrointestinal tract characterized by the formation of areas of destruction of the mucous membrane of the organs of the gastrointestinal tract. Ulcers are more often found in the stomach and the proximal part of the duodenum, sometimes in the distal part of the esophagus and rarely in the small intestine (usually combined with Meckel's diverticulum, which contains fragments of the mucous membrane of the gastric type). Zollinger-Ellison syndrome can also be considered as a type of VT. Damage to the protective barrier of the mucous membrane of the stomach, as well as dysregulation of the acid-forming, acid-neutralizing, evacuation functions of the stomach and gastrointestinal tract, genetic, bacterial and other factors are of primary importance in the ulcer process.

ETIOLOGY OF ULCER DISEASE

The main role in the development of HC is played by *Helicobacter pylori*. Among other causes of the disease, there are nutritional errors (violation of the regime and 10 nature of nutrition: long-term use of rough food, dry food, long breaks between meals, etc.), neuropsychological (stress) factor, increased secretion of gastric juice and decreased activity protective factors (mucoproteins, bicarbonates), the presence of harmful habits (smoking, alcohol abuse), hereditary factors, etc. HC is the result of the action of many mutually potentiating etiological factors.

PATHOGENESIS OF INT

The pathogenesis of gastric ulcer is based on a violation of the dynamic balance between the factors of aggression and protection of the gastric mucosa: the predominant role is played by the decrease in the effectiveness of the factors of protection, and in the development of peptic ulcers of the gastrointestinal tract, the activation of factors of aggression plays a predominant role. As a result, proteolytic tissue destruction by gastric juice and the formation of an ulcer defect are observed. There are three phases of ulcer formation: neurovascular dystrophy; necrobiosis in the submucosal basis and ulcerative destruction of the mucous membrane as a result of proteolysis. General manifestations of ulcer disease. Pain syndrome. Dyspeptic syndrome. Asthenovegetative syndrome. Seasonality of the disease (spring and autumn), period of remission and exacerbation.

COMPLICATION OF ULCER DISEASE

Penetration - the penetration of the ulcer into the adjacent neighboring organs. If the ulcer, which has eaten away the walls, does not meet an organ on its way and opens directly into the abdominal cavity, then such a condition will not be called penetration, but perforation. Perforation of an ulcer is a breakthrough of the wall of the organ in which the ulcer is located. Gatekeeper's stenosis.

MALABSORPTION SYNDROME

Malabsorption syndrome ("malabsorption" literally means "bad absorption") is a complex of disorders that develop as a result of disturbances in the processes of food digestion and absorption of its components. The syndrome of impaired intestinal absorption is nonspecific; it develops with many hereditary and acquired

diseases, not only of the intestines, but also of other organs and systems of the body. Currently, the term "malabsorption syndrome" unites more than 70 diseases and syndromes.

LIVER FAILURE

Liver pathology can be manifested both in the form of independent diseases and liver syndromes (jaundice, cholestasis, cholemia, portal hypertension, etc.), highlighting the clinic of concomitant diseases of other organs and systems, in connection with which primary and secondary liver lesions are distinguished.

Etiology

All liver lesions are divided into hereditary and acquired. Damage to the liver can be caused by: physical factors - ionizing radiation, mechanical trauma; chemical agents with a toxic (hepatotropic) effect. They can be of exogenous origin (alcohol, industrial poisons - carbon tetrachloride, organophosphorus compounds, chloroform, arsenic; drugs - PASK sodium, sulfonamides, cytostatics, some antibiotics; plant poisons - aflatoxin, muscarine, heliotrope alkaloids), and endogenous (tissue decay products during burns, necrosis; toxicosis of pregnant women); infectious agents - viruses (viral hepatitis, infectious mononucleosis), causative agents of tuberculosis, syphilis, protozoa (giardia, amoeba), fungi (actinomycetes), helminths (echinococcus, roundworms); nutritional factors – protein, vitamin starvation, very fatty food; allergic reactions to the introduction of vaccines, serums, food products and medicines; violation of blood circulation in the liver of a local (ischemia, venous hyperemia, thrombosis, embolism) and general (insufficiency of blood circulation) nature; endocrine and metabolic disorders in the body (diabetes, hyperthyroidism, obesity); tumors (hepatocellular cancer) and their metastases in the liver (cancer of the stomach, lungs, breast, leukemia do not proliferate); genetic defects of metabolism (hereditary enzyme diseases), congenital malformations of the liver.

Pathogenesis

Two types of pathological reactions are defined: 1. Direct damage to the liver by an etiological factor. 2. Autoimmune damage due to the appearance of autoantigens (pathologically altered components of hepatocytes) and the development of humoral and cellular autoallergic reactions, which deepen liver damage as a result of microcirculatory disturbances (action of biologically active substances) and immune cytolysis with the participation of T-killers. Damage to the liver is often combined with a violation of the organs of the digestive system, spleen, kidneys, which is determined by their anatomical and functional connections and is manifested by the development of a number of syndromes (hepatolienal, hepatorenal). Pathological processes such as inflammation, disorders of peripheral blood circulation, metabolism, tumors are most often the basis of various liver diseases. Inflammatory lesions are called hepatitis, the primary change in the metabolism of hepatocytes with the development of dystrophy is hepatosis and metabolic diseases of the liver (fatty hepatosis or fatty liver dystrophy; glycogenosis), and diffuse growth of connective tissue against the background of dystrophy, necrosis of the parenchyma and restructuring of the liver structure is cirrhosis. It should be noted a certain interrelationship of pathological processes in the liver: hepatitis and hepatosis usually end with the development of cirrhosis. Cirrhosis of the liver is a chronic, progressive disease characterized by the growth of connective tissue, pathological regeneration of liver tissue and restructuring of the organ structure, which is manifested by signs of liver failure. Cirrhosis is the result of irreversible damage to a large number of liver cells. Depending on the reasons that caused such damage, three pathogenetic variants of liver cirrhosis are distinguished:

- post-necrotic: manifested by signs of hepatocellular liver failure;
- biliary: accompanied by cholestatic liver failure;
- portal: is the structural basis of hepatovascular insufficiency of the liver.

Jaundice

Jaundice (lat. Icterus - yellow) is a syndrome caused by an increase in the level of bilirubin in the blood, manifested by a yellow color of the skin and mucous membranes. There are three types of jaundice:

1. Hemolytic (suprahepatic). It occurs as a result of hemolysis of erythrocytes and increased formation of bilirubin in the cells of the mononuclear phagocyte system.
2. Parenchymatous (hepatic). Its development is associated with liver damage.
3. Mechanical (obturation or subhepatic). It occurs as a result of a violation of the outflow of bile through the biliary tract. Jaundice appears with bilirubinemia over $35 \mu\text{mol/l}$. The skin is most strongly stained (pigments are deposited in the Malpighian layer), mucous membranes, the inner wall of blood vessels (bilirubinophilic tissues), parenchymal organs are less stained, and the cornea, cartilage, muscles, and peritoneum are less stained. Brain tissue and cerebrospinal fluid are almost not stained, as the blood-brain barrier is impassable for bile pigments. Jaundice can be accompanied by the accumulation of bile acids in the blood along with other components of bile (cholemia). Cholemic syndrome (cholestasis syndrome) is caused by the entry of bile components (bile acids, direct bilirubin, cholesterol) into the blood due to impaired formation and outflow of bile.

Aholic is a syndrome caused by the absence of bile in the intestines due to violations of its formation and outflow. Violations of the hemodynamic functions of the liver are manifested by the development of portal hypertension syndrome.

Portal hypertension syndrome

Hemodynamics in the liver depends, first of all, on the pressure gradient in the arterial, portal and hepatic vena cava systems. Normally, the pressure in the own hepatic artery is about 120 mm Hg. art., 13 in the portal vein - 5–10 mm Hg. Art., in the hepatic veins and inferior vena cava - 2–5 mm Hg. Art. The difference in blood pressure is so pronounced that it ensures liver perfusion. The average linear velocity of blood flow in the portal vein is about 15 cm/s. In some types of portal hypertension syndrome, it is significantly reduced. With a significant increase in pressure in the portal vein and its tributaries, portocaval anastomoses expand, which to some extent determines the clinical picture of the disease. Portal hypertension is a syndrome characterized by a number of specific manifestations and occurs in some congenital and acquired diseases of internal organs that lead to impaired blood flow from the portal vein and its branches. Changes affecting both the physical and chemical properties and the cellular composition of blood often develop with liver damage. As a result of violations of the protein-synthesizing function of the liver, hypoproteinemia develops, oncotic blood pressure decreases (hyponkia), and the ratio of albumins and globulins (albumin-globulin ratio) decreases, which is manifested by an increase in ESR. Changes in the cellular composition of the blood include anemia, leukopenia, and thrombocytopenia. The development of anemia may be related with various pathogenetic mechanisms: violation of erythropoiesis (decreased deposition of cyanocobalamin, folic acid, iron in the liver), hemolysis of erythrocytes (hypersplenism, detergent effects of bile acids in cholemic syndrome), blood loss (hemorrhagic syndrome). Leukopenia and thrombocytopenia, as well as anemia, can be caused by a deficiency of some substances necessary for hematopoiesis (cyanocobalamin, folic acid) and the destruction of formed blood elements by macrophages during hypersplenism. Liver damage is often accompanied by hemorrhagic diathesis - coagulopathy. At the basis of their development are violations of synthesis in the liver of prothrombin, factors V, VII, IX, X, fibrinogen; impaired absorption of vitamin K in hypo- and acholia. Disorders of vascular and platelet hemostasis are added to thrombocytopenia.

Gallstone disease

It is characterized by the formation of stones in the gallbladder and bile ducts. They can be of infectious-inflammatory (cholesterol-pigment-salt) and non-inflammatory origin (disorders of metabolism - cholesterol and pigment, bile stasis - bilirubin-calcium). Consequences: pain attacks with irradiation in the right shoulder and shoulder blade; development of mechanical jaundice; traumatization leads to the spread of infection through the bile ducts, its transfer to the liver, damage to hepatocytes and hepatic jaundice.

Literature

Main:

1. Hygiene and ecology // textbook for students of higher medical educational institutions in English. /edited by V.G. Bardova – Vinnytsia: NovaKnyga, 2018.

2. Environmental Health: from Global to Local \ Under Howard Frumkin edition – Third edition. - San Francisco, 2016

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4. Korobchanskiy V.A. Hygiene and Ecology \ Korobchanskiy V.A., Vorontsov V.P., Musulbas A.A. - Kharkov, 2006

PRACTICAL LESSON No. 10

Topic: Hygienic requirements for food products and their examination

Purpose: establishing the safety of goods for the consumer throughout their entire life cycle.

Basic concepts: sanitary and hygienic expertise, chemical safety, radiation safety, sanitary and hygienic safety, objects of sanitary and hygienic expertise, subjects of expertise, state sanitary and epidemiological supervision, hygienic expertise

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

What is a sanitary and hygienic examination?

What is chemical food safety?

Radiation safety of food products

What is the difference between objects and subjects of sanitary examination

How the state sanitary and epidemiological supervision is carried out

Formation of professional skills:

1. To acquire knowledge and ability to determine the properties of food products, which characterize their quality, nutritional value and their harmlessness for human health.

SUBJECT TEXT:

SANITARY AND HYGIENE EXAMINATION

Definition, purpose, task of sanitary and hygienic examination

Sanitary and hygienic examination is one of the most important types of product examination, as its purpose is to confirm the safety of goods for consumers. Its necessity is due to the right of citizens of Ukraine to the safety of goods, which is stipulated by the Law of Ukraine "On the Quality and Safety of Food Products and Food Raw Materials".

The problem of safety becomes especially urgent in connection with the importation of significant volumes of products into Ukraine, with the suppliers' violation of the terms of the concluded agreements concerning the quality and safety of food products and food raw materials.

Therefore, the most important task of the State Sanitary and Hygienic Expertise is to determine the properties that characterize the quality of food products, their nutritional value and their harmlessness for human health.

Safety means the absence of toxic, carcinogenic, mutagenic, allergenic and other adverse effects on the human body when consuming food products within the limits set by the Ministry of Health of Ukraine.

Other types include adverse effects of chemical, radiation, mechanical, electrical, magnetic, electromagnetic, and thermal energy.

When carrying out a sanitary and hygienic examination, chemical, radiation, sanitary and hygienic safety is determined.

Chemical safety is the absence of harmful effects resulting from the action of chemicals.

Substances that lead to the danger of goods are divided into the following groups: toxic elements; mycotoxins; nitrates and nitrites; pesticides, antibiotics; hormonal drugs; higher alcohols and aldehydes; esters; furfural and oxymethylfurfural; monomers; prohibited food additives; dyes for packaging, prohibited polymeric materials.

Toxic elements have a harmful effect on the human body, if they get into the human body, they can cause poisoning; toxic elements include arsenic, mercury, cadmium, lead, copper, zinc, iron. The content of these substances is limited for some by regulatory documentation, and is also taken into account during certification.

Radiation safety is the absence of a negative effect on the health and life of a person, his property. Qualitative indicators of radiation safety are established by the order of the Ministry of Health of Ukraine No. 255 dated August 19, 1997, they are determined by the permissible levels of radionuclides: cesium - 137 and strontium - 90 in food products and drinking water, etc.

In the radiological laboratories of the sanitary and emergency services, the content of cesium - 137 and strontium - 90 in food products and environmental objects is determined, as well as the volumetric and specific activity of beta-emitting nuclides (total), etc.

Sanitary and hygienic safety is the absence of an unacceptable risk that may arise from various biodamages of consumer goods. These include microbiological and zoological damage.

Microbiological damages or diseases are caused by microorganisms, during the development of some of them, food products lose their sanitary and hygienic safety. At the same time, toxic substances accumulate in food products, which cause poisoning, sometimes causing death.

Zoological biodamage is caused by pests, insects, rodents, birds, which cause pollution with the remains of their vital activities. Pests, insects, rodents, birds can be infected with pathogenic microorganisms that cause diseases - plague, foot-and-mouth disease, anthrax, etc.

The objects of sanitary and hygienic examination are:

- - food raw materials, semi-finished products, finished products, goods; auxiliary and packaging materials;
- - additives, contaminants (pollutants);
- - processes: production, technological and those occurring during transportation, sale, storage;
- - equipment: technological, commercial, vehicles;
- - personnel: production and maintenance.

The subjects of the examination are employees of sanitary and epidemiological institutions, as well as scientific research institutes, higher educational institutions, etc. and other institutions and organizations accredited by the Ministry of Health for the right to carry out work on the hygienic regulation of dangerous factors or certified for the right to carry out toxic-hygienic, medical-biological and other studies on the safety of products for human health, acting on the basis of current laws, legislative acts, provisions.

Subjects of the examination are also ministries, departments, organizations, institutions, enterprises, regardless of the form of ownership, private legal entities that are interested in conducting a sanitary and hygienic examination.

Regarding the activity of sanitary and epidemiological services, such characteristic concepts as sanitary and epidemiological well-being are used; norm, rules, hygienic standards, etc.

Sanitary and epidemiological well-being of the population are optimal living conditions of the population that ensure their health. When determining optimal conditions, attention is paid to the presence of harmful environmental factors.

State sanitary standards, rules, and hygienic standards constitute the legal basis used to determine the degree of safety of certain environmental factors.

According to Article 4 of the Law of Ukraine "On the Quality and Safety of Food Products and Food Raw Materials", food products and food raw materials are considered to be of poor quality, dangerous to human health and life, and adulterated under the following conditions:

- • the content of harmful and toxic substances of exogenous or natural origin, dangerous microorganisms, their toxins, hormonal preparations;
- • the content of food additives that have not received the conclusion of the state sanitary-hygienic examination in the prescribed manner and are not allowed to be used as intended, or the conditions, the observance of which guarantees the safe use of food products and food raw materials, have not been determined, an analysis of whether their content exceeds the established maximum permissible levels;
- • the content of any extraneous objects or impurities;
- • use during the production of food raw materials or related materials that are not characteristic of the name and type of food product, spoiled or unsuitable for other reasons food raw materials;
- • use of containers, packaging or related materials, fully or partially made of materials that do not meet safety requirements or are not included in the list of those allowed for contact with food products by the Chief State Sanitary Doctor of Ukraine;

Violation of the formulation, composition of goods, conditions of production or transportation, sale and use defined by regulatory documents;

- • hiding the danger of their consumption or their low quality;
- • violation of storage conditions or expiration date;
- • intentionally providing the appearance and individual properties of a certain food product, for which they are presented, for the purpose of sale to consumers or use in the field of public catering by the manufacturer (seller).

The fact of falsification is established in the process of product identification.

Sanitary and hygienic examination is carried out by the bodies of sanitary and epidemiological supervision.

State sanitary-epidemiological supervision is a system of measures to control the compliance of legal entities and individuals with sanitary legislation, which makes it possible to create optimal conditions for the life of the population and contributes to the minimal impact of dangerous factors on people's health.

In Ukraine, the quality of food products is guaranteed by legislative and regulatory acts, which oblige manufacturers of raw materials and finished products to produce quality products that meet the requirements of standards. The Constitution of Ukraine enshrines the right of citizens to health care, which is ensured by relevant socio-economic, medical and sanitary programs, the right to an environment safe for life and health, free access to information about the state of the environment, the quality of food; products and household items.

According to the Law, food raw materials, food products, as well as materials, equipment and tools used for their production, storage, transportation and sale are subject to certification and must meet the requirements of sanitary standards. Enterprises, institutions, organizations, and individuals that produce, transport, store, and sell food raw materials and food products are responsible for safety for the health and life of the population and compliance with the requirements of sanitary standards.

The Law of Ukraine "On the Quality and Safety of Food Products and Food Raw Materials" (Article 4) prohibits the manufacture, import, sale, and use of low-quality, dangerous to human health and life, or falsified food products, food raw materials, and related materials.

State regulation of the proper quality and safety of food products and food raw materials in accordance with Article 10 of the law is carried out in order to ensure guarantees regarding:

- • safety for human life and health in case of their consumption and use;
- • their production in conditions that meet the established requirements of technology, sanitary norms and rules, safety and preservation of the surrounding natural sulfur livestock;
- • their production using permitted food raw materials and related materials;
- • completeness and reliability of information about their properties;
- • their compliance with the requirements of regulatory documents regarding quality and safety;
- • their implementation in accordance with trade rules.

State regulation of the proper quality and safety of food products and food raw materials is carried out by the Cabinet of Ministers of Ukraine, authorized central bodies of executive power, their bodies in the Autonomous Republic of Crimea, regions and districts, the cities of Kyiv and Sevastopol through (Article 11 of the law):

- • state regulation of quality and safety indicators of food products, food raw materials and related materials;

- • their state registration;
- • mandatory certification and certification of quality systems for the production of these products, food raw materials and related materials;
- • monitoring compliance with the procedure for importing food products, food raw materials and related materials.

The components of state regulation of the quality and safety of food products and food raw materials at all stages of the life cycle are state supervision over compliance with the requirements of standards, norms and rules, state metrological supervision, state sanitary-epidemiological supervision, state veterinary-sanitary supervision, state control over compliance with the legislation of Ukraine on the protection of consumer rights, state supervision of compliance with legislation on plant quarantine.

State registration of food products, food raw materials and related materials is carried out by the Ministry of Health of Ukraine on the basis of a positive conclusion of the state sanitary-hygienic examination, for food raw materials - of the state veterinary-sanitary examination. The procedure for carrying out a sanitary and hygienic examination and entering food products, food raw materials and related materials into the State Register is determined by the Chief State Sanitary Doctor of Ukraine and the Chief State Inspector of Veterinary Medicine of Ukraine.

State registration of manufactured food products is carried out in accordance with the requirements of regulatory documents for the production of food products, food raw materials and related materials and is carried out in accordance with the procedure established by the State Committee of Ukraine for Standardization, Metrology and Certification.

Hygienic examination is an assessment by experts of compliance of raw materials, products and packaging with specified hygienic requirements.

The state sanitary and hygienic examination consists in the comprehensive study and evaluation of the possible negative impact on the health of the population of dangerous factors. Documents (projects, technological regulations, state standards and other regulatory and technical documentation) for products, raw materials, technologies, operating facilities and associated dangerous factors for compliance with the requirements of sanitary standards are subject to study and evaluation.

The main purpose of the hygiene examination is to establish the safety of the goods for the consumer during their entire life cycle.

On the basis of a sanitary and hygienic examination, a conclusion is issued — a document that establishes safety criteria and harmfulness of dangerous factors of a food product (group of products), food raw materials, and related materials.

The most important task of the hygienic examination of food products is to determine the properties that characterize their quality, nutritional value and their harmlessness for human health.

Hygienic examination of food products is carried out in accordance with the rights and obligations assigned to the bodies and institutions of the SES of the Ministry of Health of Ukraine.

Safety requirements for the health and life of the population are mandatory in state standards and other normative documents.

Supervision of compliance with the requirements of sanitary norms in regulatory documentation, standards, compliance of products with the requirements of safety to life and health of the population is carried out by bodies, institutions and institutions of the state sanitary and epidemiological service by conducting tests.

The tests are carried out with the following purpose:

- - determination of changes in the organoleptic properties of food products, their nature and degree, as well as these changes;
- - detection of deviations in the chemical composition of products and determination of their causes;
- - establishing the possibility of transmission of pathogens of food poisoning and infectious diseases through infected products;
- - detection of pesticides, heavy metals, food additives, harmful impurities and other foreign substances in quantities exceeding hygienic standards and natural content in the product;
- - detection of the degree of bacterial contamination of products and the nature of their microflora;
- - establishment of conditions of production and sanitary regime of enterprises, transportation, preservation and sale of food products, the violation of which leads to changes in their organoleptic properties, to bacterial or chemical contamination.

As a result of the hygienic examination, the issues of the possibility and safety of using this batch of food products for public consumption or the need for additional technological heat treatment are resolved these, sorting or sub-sorting, determination of conditions and ways of implementation.

The main task of the sanitary-hygienic examination is to establish the fact of compliance (non-compliance) with sanitary norms and rules through the implementation of state sanitary-epidemiological supervision of:

- - observance of sanitary norms and rules in the manufacture, storage, transportation, sale of food products, especially perishable ones;
- - using new materials for products, containers, packaging, equipment that come into contact with food products;
- - the content of residual amounts of pesticides, salts of heavy metals, antibiotics, harmful impurities;
- - the quality of food products during production, compliance with the recipe, the content of the main substances, which are established by regulatory documentation.

Special sanitary and epidemiological inspections are carried out in the following cases:

- - the occurrence or suspicion of the possibility of food poisoning or acute intestinal infections;
- - suspicions of bacterial, chemical or mechanical contamination of food products, as a result of which they become dangerous for public health;

Violation of food production technology, recipes, standards for the use of pesticides, food additives, etc.;

- violation of sanitary requirements during production, transportation, storage, sale.

The state system of quality and safety control of food raw materials and food products also includes other organizations.

In addition to the bodies and institutions of the sanitary-epidemiological service, the examination of agricultural raw materials and food products is carried out by the state veterinary service, industry organizations for product quality control, and management specialists for standardization, metrology and certification.

Sanitary-epidemiological services specialists conduct sanitary-hygienic examinations together with veterinary service specialists in the event of outbreaks of infectious diseases and food poisoning associated with the consumption of meat from forcibly slaughtered animals, as well as offal, other meat products infected with pathogens of infectious and parasitic diseases common to humans and animals or transmitted by domestic animals.

Specialists of the State Standard carry out certification of food raw materials and food products produced by domestic manufacturers to identify their compliance with the requirements of regulatory documentation, as well as imported food products and food raw materials.

Specialists of the Office for the Protection of Consumer Rights carry out quality control of goods and services. Specialists of trade and industrial examination conduct independent examination of quality, quantity, etc.

In cases of detection during inspections of food products with expired sales dates, signs of spoilage and contamination, the presence of extraneous or harmful impurities, when products with deviations from the provisions of regulatory documentation are detected, the specialists of the Office for the Protection of Consumer Rights may transfer these products to non-standard or outline ways of its implementation. When specialists identify deficiencies that have sanitary-epidemiological significance, the decision on suitability for consumption of food products is submitted for the formulation of the conclusion of the institution that carries out state supervision and conducts a sanitary-hygienic examination.

Literature

Main:

1. Hygiene and ecology // textbook for students of higher medical educational institutions in English. /edited by V.G. Bardova – Vinnytsia: NovaKnyga, 2018.
2. Environmental Health: from Global to Local \ Under Howard Frumkin edition – Third edition. - San Francisco, 2016

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4. Korobchanskiy V.A. Hygiene and Ecology \ Korobchanskiy V.A., Vorontsov V.P., Musulbas A.A. - Kharkov, 2006

PRACTICAL LESSON No. 11

Topic: Diseases of the cardiovascular system and diet therapy

Purpose: to master the skills of developing diets that contribute to the treatment of diseases of the cardiovascular system

Basic concepts: diseases of the cardiovascular system, atherosclerosis, myocardial infarction, stroke, hypertension, diet therapy

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

1. Features of nutrition in atherosclerosis
2. Features of nutrition during myocardial infarction
3. Peculiarities of nutrition during a stroke
4. Peculiarities of nutrition in hypertension

Formation of professional skills:

1. Learn how to develop diets that will contribute to the treatment of diseases related to the cardiovascular system.

SUBJECT TEXT:

Therapeutic nutrition for cardiovascular diseases

Death from cardiovascular diseases takes the sad 1st place in the world. The situation in Ukraine is no exception in this matter. The number of people suffering from diseases of the cardiovascular system in our country has reached 25 million people. This is more than half of the country's population. People die most often suddenly, from hypertension, atherosclerosis, coronary heart disease, myocardial infarction, stroke, aortic dissection, and thrombosis.

"Like food, like health"

One of the main reasons for the wide spread of diseases of the heart and blood vessels is the "good" of civilization. Humanity began to live more calmly and contentedly. A sedentary lifestyle and an abundance of fatty, refined food lead to obesity and problems with blood vessels. Therefore, prevention and treatment of cardiovascular diseases are closely related to lifestyle correction and diet control. The connection between nutrition and human health has been proven for a long time. It is not for nothing that they say "The food is the health."

Sometimes diet therapy and the correct organization of nutrition can not only alleviate the condition of a person with some diseases, but also cure them. A special diet for cardiovascular diseases aims to clean blood vessels, increase blood circulation in the periphery, and eliminate from the diet those substances that have a detrimental effect on the functioning of the heart and the entire body.

From food, the body receives energy, building material for cells, vitamins and trace elements, water and fiber. But sometimes substances that are useful in small quantities become dangerous for human health in large quantities. For many years, a system of medical nutrition was developed for all groups of patients. Nutritionists have developed 15 diet tables, based on which an individual diet is selected, depending on the disease. A correctly chosen diet can significantly improve the patient's quality of life, get rid of diseases in the initial stages, and prolong life.

Risk factors for the development of cardiovascular diseases are as follows:

- 1) Age – 40 years and older.
- 2) Men get sick twice as often.
- 3) The closest relatives have cardiovascular diseases.
- 4) Harmful habits, smoking.
- 5) Hypertension.
- 6) The presence of high cholesterol in the blood.
- 7) Presence of diabetes.
- 8) Presence of constant stress, nervousness, difficult living and working conditions.
- 9) Aggressive character traits.
- 10) Hypodynamia.
- 11) Excess body weight.

General principles of diet for cardiovascular diseases

For diseases of the cardiovascular system, diet No. 10 is indicated. Human nutrition should be frequent, small portions, 5-6 times a day. Eating a large amount of food causes the diaphragm to shift and puts pressure on the heart and blood vessels, creating overload. The diet should be almost without salt, because salt retains fluid in the tissues of the body, creating edema. With fluid retention, the pressure can increase significantly. If you are following a diet, it is very important to maintain reasonable physical activity, perform gymnastic exercises, long walks in the fresh air.

In order not to accidentally oversalt dishes, it is necessary to prepare dishes without salt, and salt the portion already on the plate. Salads can be eaten without salt at all, seasoned only with lemon juice. The diet should include baked or boiled potato dishes - it contains a large amount of potassium, which is necessary for the nutrition of the heart muscle. Potassium is also found in apricots and dried apricots, pumpkin, cabbage, raisins, prunes, rose hips. It is recommended to drink 1-2 glasses of freshly squeezed fruit and vegetable juice in various combinations every day. Magnesium is also necessary for the normal

functioning of the heart and blood vessels. It is found in large quantities in bran, rye bread, porridge - oat, buckwheat, millet, as well as in carrots, beets, green salad, parsley, currants, nuts.

It is necessary to almost completely exclude strong coffee and tea from the diet, replacing these drinks with compotes, juices, decoctions of rose hips, mountain ash. You should avoid drinking a lot of liquid. The total volume of liquid per day, including liquid contained in soups, fruits and vegetables, should not exceed 1-1.2 liters per day, especially for signs of heart failure.

In the diet for patients with cardiovascular diseases, animal fats should be replaced with oils, reducing the total amount of oil. Food is best steamed or baked in the oven. Strong meat and fish broths should be avoided. Instead, consume vegetable or mushroom broths. It is better to eat meat not fried, but boiled. Mostly veal, rabbit, skinless chicken breast, turkey meat. It is necessary to strive for a gradual decrease in body weight, because obesity will only aggravate the course of the disease. It is better to replace sugar and candies with several spoons of honey a day, dried fruits and nuts. You can arrange 1-2 unloading days per week. On these days, you can eat low-fat cheese, kefir, fruits and fresh juices. Legume dishes should be limited in the diet - they increase gas formation, which squeezes blood vessels and raises the diaphragm (increases shortness of breath). Diet for cardiovascular diseases should become a patient's way of life and be followed consistently to improve the body's condition and prolong life.

Atherosclerosis

Atherosclerosis is a chronic progressive disease in which the arteries are affected by atherosclerotic cholesterol plaques. This process is facilitated by: ☑ diabetes, ☑ hypertension, ☑ hypercholesterolemia.

According to WHO, the result of atherosclerosis is 21% of mortality worldwide. In industrialized countries, the consequences of atherosclerosis (mainly myocardial infarction and stroke) are the main cause of mortality. According to the European Society of Cardiology, among all European countries, the highest mortality from the consequences of atherosclerosis (myocardial infarction and stroke)

The main cause of atherosclerosis is a violation of the balance between the intake of cholesterol in the body (with food and due to the synthesis of cholesterol molecules inside the body) and its removal from the body

Atherosclerosis of the vessels may not manifest itself at first, being asymptomatic. However, as atherosclerosis progresses, blood vessels lose elasticity, their lumen narrows, organs and tissues do not receive enough oxygen and nutrients. As a result, such formidable complications may occur as: - ischemic heart disease (angina), - myocardial infarction, - cerebral stroke, - trophic ulcers, etc.

The level of total cholesterol in the blood plasma should not exceed 200 mg / dl (5.2 mmol / l). mild hypercholesterolemia is diagnosed at its level from 200 to 250 mg / dl (5.2-6.5 mmol / l), moderate - at 250-300 mg / dl (6.5-7.8 mmol / l), pronounced - at 300 mg/dl (7.8 mmol/l) and above.

Cholesterol transport: "bad" and "good" cholesterol

High-density lipoproteins are "good cholesterol."

Low-density lipoproteins are "bad cholesterol."

Cholesterol synthesis in the human body can occur from fats and carbohydrates, therefore excess caloric food and lack of physical activity lead to an increase in the level of cholesterol in the blood

Cholesterol is removed only by converting cholesterol in the liver into bile acids, which accumulate there, are released into the digestive tract and leave the body with feces. This is the main way of removing cholesterol from the body

Ways to reduce the level of cholesterol in the blood

1. A low-calorie diet with a reduced content of cholesterol, solid fats and an increased content of antioxidants, as well as plant sterols (a large number of vegetables and fruits). •

2. Increased mobility, which leads to "burning" of excess calories. • 3. Lowering the level of bile acids due to their absorption in the intestine with subsequent excretion. •

4. Increasing the level of antioxidants (fruits and vegetables in the diet). •

5. Replacing solid fats with liquid ones (sunflower and olive oil), as well as replacing meat (especially pork) with fish and seafood.

Therapeutic nutrition for hypertension

An increase in blood pressure can and should be corrected with the help of diet.

☒ In the initial stages of hypertension, diet and an active lifestyle can replace drugs.

☒ The diet will not allow the disease to go too far, will prevent complications.

Recommended:

☒ a slight decrease in energy value due to fats and carbohydrates,

☒ restriction of salt and substances that excite the cardiovascular and nervous systems

Therapeutic nutrition for cardiovascular diseases

Recommended products and dishes:

☒ Bread made yesterday.

☒ Non-butter cookies and sponge cake.

☒ Vegetarian soups.

☒ Low-fat varieties of meat, fish, poultry.

☒ Milk, fermented milk drinks and cheese.

☒ Dishes from different cereals.

☒ Boiled pasta.

☒ Vegetables in boiled and baked form.

☒ Soft ripe fruits and berries, honey, jam.

Exclude products and dishes:

☒ Fresh bread, butter dough products.

☒ Bean soups, meat, fish and mushroom broths.

☒ Fatty varieties of meat, fish, poultry.

☒ Kidneys, smoked meats, sausages.

☒ Salted fish, salty and fatty cheeses.

☒ Beans.

☒ Salted, pickled and fermented vegetables.

☒ Fruits with coarse fiber.

☒ Chocolate, strong tea, coffee and cocoa.

Therapeutic nutrition for hypertension

The first rule: do not salt the food. So, if the diet of a healthy person contains about 10 g of table salt every day, then with hypertension it should be reduced by at least two times, the recommended daily intake should be 4-5 g. •

At the same time, it is necessary to LIMIT LIQUID INTake (no more than 1.3 liters per day, including first meals). •

The second rule: exclude from the diet all those products that can contribute to raising blood pressure. These are strong tea, coffee, spicy and smoked products, strong alcoholic beverages (regular intake of strong alcoholic beverages causes spasm of blood vessels). •

The third rule: a hypertensive person cannot afford to smoke, as smoking contributes to persistent narrowing of blood vessels, which means an increase in blood pressure

The fourth rule: people with high blood pressure should monitor their weight and not allow it to increase. To do this, it is necessary to exclude easily digestible carbohydrates (pastry, cakes, candies, etc.) from food and replace them with healthy carbohydrates from vegetables, fruits and cereals. It is also necessary to limit animal fats, replacing them with 1/3 vegetable fats. Fasting is useful (periodic transition to vegetarian food) •

The fifth rule: since blood stagnation contributes to the increased production of acidic decay products in the body (acidotic shift), the diet of hypertensive patients should contain a sufficient amount of alkalinizing products. These are milk, vegetables, wholemeal bread, rice, eggs, cod. •

Rule six: eat more foods rich in potassium (especially needed by the heart muscle) and magnesium. Potassium is found in bananas, cabbage, dried apricots. Magnesium - in walnuts, carrots, beets, cereals.

Seventh rule: distribute meals correctly throughout the day. It is recommended to eat about 1/3 of the daily amount of food for breakfast, a little less than half for lunch, and no more than 1/10 for dinner. Other meals are distributed in the form of 1-2 snacks.

Body weight control

Normal body weight is judged by the value of BMI and the ratio of the volume of the waist to the volume of the hips. Weight loss is indicated for people with excess body weight (BMI 25-30 kg / m²) and obesity (BMI more than 30 kg / m²). The ratio of the volume of the waist to the volume of the hips should not exceed 1 for men and 0.85 for women. Abdominal obesity (waist circumference greater than 102 cm in men and greater than 88 cm in women) is especially unfavorable. To reduce body weight to normal values, a low-calorie diet and increased physical activity are of primary importance.

Nutrition after myocardial infarction and ischemic heart disease

The most common cause of myocardial infarction is coronary heart disease (CHD). The cause of insufficient blood supply to the heart muscle in most cases is atherosclerosis of the heart vessels and their tendency to long-term spasms. •

In the case of a combination of these diseases, the caloric content of the daily diet should be reduced, because the body's energy expenditure is reduced due to the forced restriction of physical activity. •

It is very important to avoid overeating, which overloads not only the digestive organs, but also the cardiovascular system. •

Therapeutic nutrition for coronary artery disease and atherosclerosis has an anti-atherosclerotic focus

Preference should be given to vegetarian soups: cereal, fruit, and dairy. •

Consumption of meat and fish broths is limited to 1-2 times a week.

Excessively rich meat broths are excluded due to the large amount of extractive substances contained in them. •

Meat dishes are mainly used in boiled form - they contain less extractive substances that stimulate the nervous and cardiovascular systems. •

Strongly brewed tea and coffee are not recommended: they can cause rapid heartbeat and insomnia.

With atherosclerosis and diseases of the cardiovascular system, the consumption of the following nutrients is important:

POTASSIUM - contributes to the removal of excess fluid from the body and improves the activity of the heart muscle; •

MAGNESIUM - has a vasodilating and diuretic effect; •

IODINE - has a beneficial effect on metabolism; •

VITAMIN C - helps strengthen blood vessels; •

Vitamins of group B - contribute to the prevention of atherosclerosis, stimulate metabolism; •

VITAMIN PP (nicotinic acid) - expands small blood vessels, has anticoagulant activity; •

Flavonoids (VITAMIN R) - contribute to the strengthening of capillaries; •

Vitamins A and E are antioxidants; •

DIETARY FIBER - contribute to the removal of excess cholesterol from the body.

Coronary heart disease

Ischemic heart disease (IHD) is a pathological condition characterized by an absolute or relative violation of blood supply to the myocardium due to damage to the coronary arteries of the heart.

CHD is a very common disease, one of the main causes of mortality, as well as temporary and permanent disability of the population in the developed countries of the world. In this regard, the problem of CHD occupies one of the leading places among the most important medical problems of the 20th century.

The main points of primary prevention of CHD:

- increasing physical activity,
- quitting tobacco,
- transition to a healthy food system,
- improvement of the emotional background

Food regime must be 5-6 times. It is recommended to distribute the number of products during meals approximately the same, so as not to overstrain the gastrointestinal tract, as an overflow of the stomach can provoke heart pain.

The caloric content of the food consumed should correspond to energy expenditure, and for people with excessive body weight, it should be somewhat lower than energy expenditure.

It is necessary to LIMIT the consumption of products:

- rich in animal fats (fat, fatty pork, beef and lamb, sausage products, butter, heavy cream and sour cream, creams, etc.),
- cholesterol (egg yolks, kidneys, fish roe, brain, liver, etc.)

Increase in the diet: the share of vegetable products - sources of vegetable fat, fish products rich in polyunsaturated fatty acids

The fat content in the daily diet should not exceed 55-75 g, and the share of vegetable oils in the total amount of fat can be increased to 35-40%. • It is advisable to gradually replace animal fats in the diet with low-calorie margarines with a fat content of up to 60%. • Wider use of fish and fish products in food.

Reduce the proportion of products containing a lot of easily digestible carbohydrates (white sugar, jam, dishes made from semolina and rice groats, wheat bread made from high-grade flour, cookies and other confectionery, ice cream, candies, chocolate)

It is necessary to enrich the diet with dietary fibers (vegetables and not very sweet fruits and berries). When blood circulation is disturbed, swellings are formed, while water and sodium accumulate in the tissues. The use of potassium-containing products (potatoes, dried apricots, raisins, prunes) help remove water and sodium from the body and reduce swelling. In addition, potassium strengthens heart contractions. Assign "potassium days" against the background of a diet poor in salt. Vegetables and fruits contain little nitrogenous substances and a lot of water, which is absorbed more slowly and excreted faster than free liquid. Therefore, when eating vegetables and fruits, the removal of nitrogenous slags with water increases.

It is necessary to reduce the consumption of animal proteins: to a greater extent - meat proteins and to a lesser extent - milk. It has been proven that milk protein - casein - leads to an increase in the cholesterol content in the body. Therefore, after the age of 40, when the risk of atherosclerosis increases especially, dairy products that are casein concentrate (cheese, cheeses) should not be included in the diet, but be satisfied with liquid, mainly sour-milk products. On the contrary, the protein of vegetable products reduces the concentration of cholesterol in blood serum, that is, antisclerotic nutrition should be mostly vegetarian. It is necessary to consume enough vitamins that stimulate oxidation-reduction processes and thus improve the processes of fat and cholesterol processing in the body, preventing their accumulation. These are, first of all, vitamins E, C and P, as well as B6, PP and A.

You should limit the use of table salt, which reduces the activity of lipases - enzymes that contribute to the breakdown and digestion of fats. At the same time, salt increases the permeability of cholesterol through the vessel walls.

It is necessary to consume enough products containing calcium and magnesium, copper, chromium and iodine, which contribute to lowering the level of cholesterol in the blood. Hard spring and well water, rich in calcium and magnesium salts, significantly reduces the morbidity of heart vessels. It was established that in the aorta of people who died from atherosclerotic disorders in the heart muscle, the chromium content was 5 times less than in those who died from an accident. The best dietary sources of chromium are unrefined yellow sugar, millet, beets, and peas. Iodine stimulates the formation of thyroid hormones, which activate the breakdown of cholesterol. Iodine is found in seafood, such as seaweed, sea scallops, mussels, squid, shrimp, trepang. It is desirable to include them in the daily diet.

Taking into account the strengthening of the coagulation and inhibition of the anticoagulation system of blood in people with a high risk of developing coronary artery disease, products containing coumarin substances that reduce blood coagulation should be used in food. These include red, white and golden currants, cherries and cherries, sea buckthorn, blueberries, figs. And in no case do not abuse multivitamin preparations containing vitamin K, which enhances blood clotting, as well as products with a high amount of it (sorrel, spinach, animal liver, egg yolk). Blackcurrant berries should be used with caution if you are prone to thrombosis; black currant is not recommended in the post-infarction period.

Nutrition in chronic heart failure

Diet therapy for chronic heart failure is aimed at -improving heart function, -reducing edema. The diet should ensure sparing of the cardiovascular system.

1. With heart failure, diets No. 10, 10a, 10c, as well as special diets with an increased content of potassium and magnesium salts are indicated.
2. Limit the amount of table salt in the diet. Food is prepared without salt, and 4-6 g of salt is given to the patient per day for salting already prepared food.
3. Reduce the consumption of foods and dishes that stimulate the cardiovascular system (strong tea and coffee), as well as meat, fish, gr and broths and decoctions prepared from them.
4. The amount of free liquid is limited to 0.7-1 l.
5. The food ration is enriched with vitamins (C, group B, etc.), as well as potassium compounds, which contribute to improving the activity of the heart muscle.
6. In the presence of edema, the amount of liquid drunk together with tea, the first course, compote should not exceed 800 ml, and salt - 3-4 g per day.
7. Salty snacks and spicy dishes are completely excluded from the diet.

Strict adherence to the water and salt regimen helps prevent swelling

Literature

Main:

1. Hygiene and ecology // textbook for students of higher medical educational institutions in English. /edited by V.G. Bardova – Vinnytsia: NovaKnyga, 2018.
2. Environmental Health: from Global to Local \ Under Howard Frumkin edition – Third edition. - San Francisco, 2016

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3. General hygiene. Hygiene propaedeutics/Textbook for foreign students. / E.I. Honcharuk, Yu.I. Kundiev, V.G. bardo otter - K.: Higher school, 2000.
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PRACTICAL LESSON No. 12

Topic: Diseases of the kidneys, urinary tract and diet therapy

Purpose: To master the method of developing diets for patients with diseases of the kidneys and urinary tract

Basic concepts: diet, kidney disease, urinary tract disease, CKD, kidney stones, bladder stones, urates, oxalates, phosphates

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

1. Diet for pyelonephritis
2. Diet for glomerulonephritis
3. Diet for CKD
4. Diet for urethritis
5. Diet for cystitis

Formation of professional skills:

1. To acquire knowledge regarding the prescription of dietary nutrition for patients with various types of kidney and urinary tract diseases.

SUBJECT TEXT:

NUTRITION FOR URETHRITIS

Inflammation of the walls of the urethra is considered one of the most common urological pathologies. This ailment can be equally prone to women and men. Anyone can get urethritis, but as a rule, infection occurs during sexual contact with an infected partner. The course and development of the disease depends on the state of the patient's immune system. The duration of the incubation period can be several months. To determine the etiology of the disease, a swab is taken from the urethra and urine and blood tests are prescribed

The main goal of medical nutrition in urethritis is to minimize irritation of the inflamed urethra. The diet should have a diuretic and antimicrobial effect. The patient's diet should consist of the maximum amount of products of natural origin. Since the human urinary system functions more intensively in the first half of the day, the greater part of the daily diet should be eaten before and during lunch. In the evening, it is necessary to give preference to light food, in this case, the urinary organs will feel a small load. The daily rate of liquid consumption in patients with urethritis should be at least 2-2.5 liters. As for drinks, it is better to give preference to morsas, dried fruit compote, homemade juices, weak tea, cranberry or lingonberry compotes. For urethritis, products are indicated that promote urination, prevent constipation, and improve the general condition of the patient, namely:

- 1 in the warm season: fresh carrots, zucchini, which are rich in fiber, as well as cucumbers and watermelons as a powerful diuretic;

- 2 lean meat and lean fish, steamed;
- 3 high-quality fermented milk products;
- 4 honey;
- 5 buckwheat and oat porridge, which normalize intestinal peristalsis;
- 6 garlic and onions;
- 7 cabbage dishes;
- 8 pine nuts;
- 9 asparagus and celery;
- 10 olive oil;
- 11 stew and puree from fresh vegetables

Dangerous and harmful products for urethritis:

To achieve the maximum therapeutic effect, patients with urethritis should avoid the following products:

- sour fruits such as lemons, peaches, apples, oranges. They irritate the inflamed mucous membrane and slow down the healing process;
- alcoholic beverages - contribute to dehydration, as a result of which urine becomes more concentrated and irritates the inflamed urethra;
- store-bought sauces, as they contain a lot of fat, salt and preservatives;
- frequent sugar, pastry, chocolate and candies. This is excellent food for microbacteria that multiply quickly, release toxins and slow down recovery;
- sorrel, radish, tomatoes - have an irritating effect on the inflamed mucous membranes of the urethra.

NUTRITION FOR CYSTITIS

Cystitis is an inflammation of the mucous membrane of the bladder. It is accompanied by constant urges to go to the toilet, pain in the lower abdomen, itching and burning in the genital area. Inflammation occurs when a bacterial, viral or fungal infection enters the urethra.

What is the diet for cystitis aimed at:

- Reduce irritation of the inflamed mucous membrane of the bladder
- prevent the spread of disease-causing organisms
- reduce the risk of urolithiasis

The main rules of the diet:

Food should consist of light dishes and drinks - this helps to clean the bladder and remove pathogenic organisms from it.

Spicy, fried and salty foods can worsen the condition and slow down recovery.

Food that is difficult to digest can cause bowel disorders. Due to this, toxic substances can get into the blood, increasing the irritation of the urinary system.

During the period of acute cystitis or chronic exacerbation, it is not recommended to experiment with the introduction of unfamiliar products into the menu. Unusual food can have a negative effect on health.

Products recommended for cystitis:

– Milk, low-fat cheese and unsalted cheeses, kefir, ryazhenka

- Steamed dishes from lean meat, chicken, turkey, fish

- Eggs

– Vegetables and fruits with a diuretic effect: watermelon and melon, zucchini, beetroot, cucumber, pumpkin

- Baked apples in the oven

- Wheat, buckwheat, rice, millet porridge and bran

Sample menu:

- Breakfast: rice porridge with pumpkin, egg, herbal tea
- Snack: baked apples, cranberry juice
- Lunch: vegetable soup without frying, buckwheat, steamed meatballs, vinaigrette, broth yarrow
- Dinner: boiled potatoes and chicken, vegetable salad, jelly
- Before going to bed: low-fat kefir

What can not be eaten with cystitis:

- Onion, garlic, radish, parsley, sorrel, spinach

– Spicy seasonings and sauces

- Fat broths from meat and fish

- Canned food

– Acidic fruits and vegetables, such as tomatoes and citrus fruits

- Spicy, salty, smoked, fried and marinated dishes

- Sweet

- Carbonated, sweet drinks

NUTRITION FOR PYELONEPHRITIS

Pyelonephritis is a non-specific inflammatory process with a predominant defeat of the tubular system of the kidney, mainly of bacterial etiology, characterized by damage to the renal pelvis (pyelitis), cups and parenchyma of the kidney (mainly its interstitial tissue). On the basis of puncture and excisional biopsy of kidney tissue, three main options for the course of the disease are revealed:

acute;

chronic;

chronic with exacerbation.

Diet for pyelonephritis is primarily necessary to relieve the kidneys and restore their work, namely:

- reduce or prevent swelling;
- normalize blood pressure
- reduce susceptibility to inflammatory processes.

This is achieved, first of all, by reducing protein in the diet, by removing meat and offal. And almost complete exclusion of salt from the diet (no more than 3 g per day)

The diet is based on two principles: less protein and less salt. Because sodium contributes to water retention in the body, and damaged kidneys cannot cope with its removal. In addition, according to the latest research, the increased amount of salt in the diet contributes to the violation of the hormonal balance: there is little aldosterone, and there is a lot of glucocorticoids. Such a discrepancy provokes a decrease in immunity, which increases the risk of aggravation of various inflammatory diseases.

The kidneys remove the final products of protein breakdown: those that are not suitable for "building" muscles or skin. Therefore, the more protein comes in, the harder the kidneys work. And in a weakened state it is quite difficult.

Regarding fats and carbohydrates, the diet does not provide for restrictions (within physiological needs)

Nutrition for pyelonephritis completely excludes:

- sausage, sausages, anchovies;
- smoked meats and pickles;
- carbonated drinks, snacks, fast food;
- fish, caviar:
- rich broths, especially meat broths.
- mushrooms
- alcohol
- baking
- cheeses

Products recommended for cystitis:

- Vegetable soups
- Baking (without salt)
- Lean baked beef or chicken
- Turkey, tongue, rabbit (not every day)
- All dairy and fermented milk products, except cheeses.
- Cereals and vegetables
- Salads (without salt)
- Berries and fruits.

- Tea or weak coffee.

NUTRITION FOR GLOMERULONEPHRITIS

Glomerulonephritis (also glomerular nephritis) is a kidney disease characterized by damage to the glomeruli (kidney glomeruli). This condition may be represented by isolated hematuria and/or proteinuria; or as nephritic syndrome (not to be confused with nephrotic syndrome); acute renal failure; or chronic kidney disease. They are collected in different groups - non-proliferative or proliferative types.

Medical diet No. 7 is prescribed for such a disease as glomerulonephritis.

Therapeutic diet No. 7A is shown:

- after unloading days with a severe form of acute glomerulonephritis accompanied by symptoms of renal failure;
- from the first days of acute glomerulonephritis of moderate severity with symptoms of kidney failure;
- with chronic glomerulonephritis with pronounced renal failure.

Goals of diet No. 7A:

- maximum sparing of renal function;
- promotion of the process of removal of metabolic products from the body;
- weakening of arterial hypertension;
- reduction of swelling.

Therapeutic diet No. 7A is mainly a plant-based food system, in which the content of proteins and salt in the patient's diet is sharply limited. A moderate reduction in the amount of fats and carbohydrates is also recommended during the diet. Consumption of products containing a large amount of extractive substances, essential oils, and oxalic acid is prohibited. Culinary processing is carried out without mechanical sparing, the food is boiled, baked, lightly fried. Dishes are prepared without adding salt, only salt-free bread is allowed. A 5-6 feeding regime is recommended.

Chemical composition of therapeutic diet No. 7A

20 g of proteins, 50-50% of which are of animal origin, in case of chronic kidney failure, this figure increases to 70%;

80 g of fats, 15% of which are of vegetable origin;

350 g of carbohydrates, of which 80 g is sugar:

the amount of liquid consumed is equal to the total amount of urine per day or exceeds the amount of urine for the previous day by no more than 300-400 ml.

The caloric content of the medical diet No. 7A is 2100-2200 calories.

Product recommendations

Bread, flour products

It is allowed to consume 100 g of protein-free bread without salt on corn starch or 50 g of wheat bread without salt. In case of their absence in the diet, you can eat other flours that are prepared on yeast without adding salt.

Plain bread and flour products to which salt is added are prohibited.

Soups

When using soups, the amount of liquid allowed should be taken into account. Allowed soups with add avanam sago, vegetables, potatoes, fruits. Soups can be topped with sour cream, boiled, sautéed onions, and greens.

Consumption of meat, fish and mushroom broths, dairy, cereal (except sago) and bean soups is prohibited.

Meat, poultry, fish

As part of medical diet No. 7 A, you can consume up to 50-60 g of gross lean beef, veal, meat and trimmed pork, rabbit, chicken, turkey, fish. Meat, poultry, fish should be pre-boiled, after which it can be baked or slightly fried in chopped form or in pieces.

It is forbidden to eat meat in quantities exceeding the established limits. Food and fish products are not allowed.

Dairy products

You can eat up to 60 g of milk, sour cream, cream. With a corresponding reduction in the number of meat dishes, a small increase in the content of dairy products in the diet is allowed. If meat and fish are completely excluded from the diet, you can eat cheese.

No cheese.

Eggs

You can add 1/4 - 1/2 eggs to meals in one day or 2-3 times a week as part of an omelette or cooked uncooked.

Groats

It is allowed to consume sago, in limited quantities - rice, protein-free pasta. They are prepared on water and milk as part of porridges, casseroles, puddings, pilaf and cutlets.

Any other cereals, pasta and legumes are prohibited.

Vegetables

You can eat 200-250 g of potatoes and 400-450 g of gross fresh vegetables as part of various dishes. Boiled and fried onions can be added to the dish. Dill and parsley are allowed.

Salted, pickled, pickled vegetables, legumes, spinach, sorrel, cauliflower, mushrooms, radish, garlic are not allowed.

Appetizer

Consumption of vegetable salads and vinaigrettes dressed with oil is allowed.

Fruits, sweet

Various fruits and berries are allowed to be eaten raw, dried, baked. They can be used to make compotes, jellies, and jellies. Consumption of sugar, honey, jam, non-chocolate candies is allowed.

Chocolate products, milk jelly, ice cream are prohibited.

Sauces, spices

For the purpose of some "masking" of salt-free diets, medical diet No. 7A allows the consumption of sweet and sour sauces: tomato, sour cream, vegetable and fruit sauces. It is also allowed to add vanillin, cinnamon, citric acid, boiled, fried onions to dishes.

Consumption of meat, fish, mushroom sauces, pepper, mustard, horseradish is not allowed.

Drinks

We recommend weak tea with the addition of lemon, fruit and berry juices, tomato juice, rosehip decoction.

Cocoa, natural coffee, mineral water with significant sodium content are prohibited.

Fats

You can use butter, cow ghee, vegetable oils.

All other fats are prohibited.

An example of a medical diet menu No. 7A

The first breakfast consists of carrot-apple patties baked in oil, sago milk porridge, tea.

For the second breakfast, you can eat fresh fruit.

As a lunch, it is recommended to eat half a portion of vegetarian soup made from mixed vegetables, boiled meat with tomato sauce, boiled potatoes, jelly.

Lunch includes a decoction of wheat bran with added sugar.

For dinner, you can eat pilaf made of sago with the addition of fruit, vegetable salad dressed with oil and tea.

You can drink fruit juice before going to bed.

If necessary, the content of free liquid in the diet (tea, jelly) is reduced

NUTRITION FOR URINE STONE DISEASE

Urolithiasis (urolithiasis, MKL) is a disease manifested by the formation of concretions in the organs of the urinary system. Urolithiasis can be registered in the form of fine-grained, powdery urinary sand, coarse-grained, as well as stones that reach a significant size.

What are the general dietary principles for treating kidney stones?

One, but very important: enough water to drink. Ideally, 2-2.5 liters daily, preference is given to pure non-mineral water, juices and soft drinks are allowed, but not tea, coffee, cocoa, beer or wine. The process of stone formation begins with an increased concentration of ions in the urine, accordingly, the more water passes through the urine, the lower this concentration will be.

The diet for urolithiasis must be balanced in composition and have sufficient energy value - because it will have to be followed for many years.

If there are any diseases of the gastrointestinal tract, this must be taken into account: exacerbation of cholecystitis or pancreatitis, intestinal dysbacteriosis inevitably leads to impaired absorption of vitamins and trace elements, and ultimately contributes to stone formation.

In what cases is the diet effective?

Amino acid stones - cysteine and xanthine, are formed against the background of genetic abnormalities, they cannot be corrected by diet, but there is hope to get rid of urate stones by following certain recommendations.

You should not rely on the dissolution of oxalates or calcium phosphate stones and calcium carbonates, but a diet is necessary to prevent the formation of new calculi.

Magnesium salts of phosphoric acid (struvites) are formed most often due to metabolic disorders, but against the background of urinary tract infection. But even in this case, some dietary recommendations will not be superfluous them

So, to choose a diet for urolithiasis, you need to know the chemical composition of the stone.

Hurry up

They are formed when there is an excessive amount of urine, the end product of purine metabolism - uric acid.

Purines are found in large quantities in meat, especially young animals (chicken, veal), by-products, and their concentration is high in cold meats and rich broths. Excess purines in mushrooms and legumes. The diet allows you to eat boiled meat or fish no more than 3 times a week.

Alcoholic beverages, especially beer and red wine, sharply reduce the excretion of uric acid by the kidneys. The content of these products in the diet should be reduced.

Vegetables, cereals and dairy products contain few purines. That is, with urate nephrolithiasis, it is desirable to follow a dairy-vegetable diet. Potatoes, tomatoes, sweet peppers, eggplants; buckwheat, millet, barley groats and pasta; nuts and seeds; milk and fermented milk products, cheese and mild cheeses; eggs, any berries and fruits can be eaten in unlimited quantities.

Uric acid crystallizes in an acidic environment, therefore, with uric acid diathesis, urine should be alkalinized. Alkaline mineral waters (Borjomi, Jermuk, Obukhivska), lemon juice and citrate mixtures (blemaren) are suitable for this.

Decoctions of clover, blackcurrant leaves, cornflower flowers, burdock roots, and dandelions can be used as phytotherapy.

Oxalates

An excess of oxalates can be formed with increased consumption of products containing oxalic acid or vitamin C, which is metabolized to it in the body, as well as with increased absorption of oxalic acid, which is associated with a deficiency of calcium and vitamin B6.

Therefore, first of all, foods rich in oxalic acid are excluded from the diet: salad, spinach, beetroot, celery, parsley, tea and coffee, chocolate and cocoa, jelly and jelly.

Limit carrots, tomatoes, green beans, chicken and beef.

Potatoes and cabbage, pumpkin, peas, pears, apricots, bananas and watermelons, all cereals, dairy products are allowed, preferably in the first half of the day.

You can't take vitamin C as a food supplement, products where ascorbic acid acts as a preservative are excluded from the diet. Limit products containing a lot of vitamin C: citrus fruits, currants, rose hips, sour apples.

Foods rich in vitamin B6, calcium and magnesium (potatoes, nuts, whole grains) are necessary.

The effect of alkaline drinking is small, but phytotherapy - piv-palu, madder, birch leaves and violet roots - are highly recommended.

Phosphates

Calcium salts of phosphoric acid (apatites) are formed against the background of disorders of phosphorus-calcium metabolism (hypervitaminosis D, excess of parathyroid hormone, renal tubular acidosis), therefore, for this type of urolithiasis, it is important to reduce the excretion of calcium by the kidneys.

The condition for the formation of magnesium compounds (struvites) is an infection of the urinary tract, so good immunity is necessary for their prevention. But both of them crystallize in an alkaline environment, so one of the main goals of the diet for phosphaturia is to acidify the urine.

Sharply reduce vegetables and fruits in the diet, except for pumpkin, beans, peas, asparagus and Brussels sprouts (they are low in calcium and alkalizing components), and sour berries - cranberries, currants, lingonberries.

Milk and dairy products (cheese, cottage cheese), which have an alkaline effect and are rich in calcium, are limited

Exclude products that increase the secretion of gastric juice, and therefore lead to the loss of acid radicals: alcohol, coffee, spices and spicy snacks, carbonated drinks.

An excess of table salt increases the excretion of calcium, therefore, in the presence of apatites, salty products are also undesirable.

You can eat meat and fish, pasta and bread, cereals and soups, butter and vegetable oil. In particular, you should not neglect butter, which, along with liver and egg yolk, is rich in vitamin A. It has been established that retinol helps prevent infection and reduces stone formation.

Against the background of a constantly observed diet, it is necessary to periodically arrange "calcium" days - there is cheese, nuts - this prevents the unpleasant consequences of hypocalcemia and will not lead to the growth of calculi.

As with any variant of urolithiasis, with phosphaturia you need to drink a lot, and it is better to choose acidic drinks - cranberry and lingonberry juice, juice from acidic varieties of apples and grapes, mineral waters such as Arzni, Dolomitna, Truskavetska, Sairm.

You can also pay attention to herbal teas, especially with the use of herbs that increase the solubility of phosphates: burdock root, madder, wormwood, lovage, goldenseal.

Thus, dietary recommendations are possible if the nature of the stone is established, in other cases it is not necessary to act at random. It is enough to drink more - ordinary fresh water or neutral mineral waters of Zaliznovodsk, decoctions of herbs with a diuretic effect, but without a pronounced alkalizing or acidifying effect, eat food rich in vitamins A and B, empty the bladder more often and move more.

Literature

Main:

1. Hygiene and ecology // textbook for students of higher medical educational institutions in English. /edited by V.G. Bardova – Vinnytsia: NovaKnyga, 2018.
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PRACTICAL LESSON No. 13

Topic: Diseases of the endocrine system, metabolic disorders and diet therapy

Purpose: To master the methods of developing diets for patients with diseases of the endocrine system

Basic concepts: prediabetes, hypothyroidism, kidney failure, diabetes, thyrotoxicosis, hypercorticism, Diet

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

1. Principles of nutrition in patients with prediabetes.
2. Principles in patients with hypothyroidism syndrome.
4. Principles of nutrition in patients with diabetes.
5. Principles of nutrition in patients with thyrotoxicosis syndrome.
6. Principles of nutrition for patients with hypercorticism.
7. Principles of nutrition for patients with combined disorders of carbohydrate metabolism

CT pathology.

8. Principles of nutrition for patients with a combination of thyroid function disorders

CT pathology.

9. Peculiarities of nutrition of patients with adrenal gland pathology.

Formation of professional skills:

SUBJECT TEXT:

Hormonal disorders, or endocrine diseases, are a class of diseases that occur when the function of the glands of internal secretion is disturbed. Glands can secrete hormones in excess, which is accompanied by their hyperfunction (above the norm). In other cases, the glands can produce few hormones, then their insufficiency in the body is revealed - hypofunction (less than the norm). Hyper- and hypofunction lead to a violation of the vital activity of the body, the occurrence of diseases.

PRE-DIABETES DIET: FORBIDDEN AND ALLOWED PRODUCTS

Prediabetes is a condition in which blood sugar levels are slightly higher than normal, but not high enough to be diagnosed as diabetes.

Products that should be consumed in prediabetes

The best foods for controlling glucose levels are those with a low glycemic index. They saturate the body with fiber, proteins, and healthy fats.

An example of a menu for patients with prediabetes is as follows:

- Oatmeal
- Whole grain bread
- Non-starchy vegetables, such as carrots or green beans
- Beans and beans
- Jerusalem artichoke
- Whole grain pasta
- Skinless chicken
- Fish
- Natural yogurt
- Egg whites
- Fruits
- Quinoa or buckwheat

Prohibited products in prediabetes

To keep blood sugar levels normal, it's best to avoid any foods that can raise glucose levels.

The following food and drinks are prohibited:

- Sweets and pastries
- Ice cream and chocolate
- Carbonated drinks and energy drinks
- Fruit juices with added sugar
- Prunes and dates
- Food with a high sugar content (figs, bananas, fruit syrup)
- Fast food and fast food
- Margarine and harmful fats
- Fat dairy products
- Animal fat

- Canned foods or foods high in sodium

- Alcohol

Menu for patients with prediabetes

When a patient is diagnosed with prediabetes, the doctor usually suggests dietary changes to prevent diabetes. Certain aspects, such as age, weight, or other disorders – such as gestational diabetes – are also taken into account.

The menu can be selected individually, according to the needs of each patient. Below are options for dishes that can be included in your diet.

Breakfast

- Tea, a slice of whole grain bread, low-fat cottage cheese, and yogurt
- Tea, salad, egg
- Grapefruit juice, whole grain crackers, avocado or tomatoes

Second breakfast

- Orange juice with whole grain crackers
- Fruit tea
- Oatmeal or almond milk

Dinner

- Carrot salad, tuna and brown rice
- Lean meat, green salad, fruit
- Grilled chicken breast, brown rice, sautéed vegetables

Afternoon

- Greek yogurt with blueberries
- Whole grain toast, as well as a piece of turkey meat
- Green smoothie

Dinner

- Grilled fish with steamed vegetables
- Vegetable soup with grilled chicken
- Pumpkin puree, dark rice, jelly or fruit

DIET IN HYPOTHYROIDISM

Hypothyroidism is a disease of the thyroid gland in which the production of thyroid hormones is disturbed. There are many reasons for organ dysfunction. Most often, this is a failure of the hormonal background, heredity or the influence of harmful factors

Treatment of hypothyroidism with diet

Treatment of hypothyroidism with diet is one of the methods of therapy of this disease. It is carried out along with medical treatment, and then as a method of prevention and correction.

In the early stages, the disease is treated with diet. The endocrinologist conducts a comprehensive examination and selects a suitable diet for the patient. The therapeutic diet is necessary to restore a weakened body and depends on the form and type of hypothyroidism. With its help, you can eliminate the causes that caused the disorder.

When choosing a diet, the endocrinologist determines all nutrition issues with the patient, clarifying and explaining its purpose and importance. And also finds out what result the patient is counting on. For example, there are nutritional recommendations aimed at reducing weight, since one of the symptoms of the disease is weight gain overweight. In addition, the doctor tries to take into account the financial capabilities of the patient.

Diet No. 8 for hypothyroidism

Diet No. 8 is prescribed by a doctor to restore metabolic processes in the body. Therapeutic nutrition allows you to normalize weight and restore the normal functioning of the body. With the help of a diet, doctors try to limit the caloric content of the diet. The body undergoes stress, which contributes to weight loss by getting rid of excess fat from the body's reserves. Carbohydrates are reduced by a sharp restriction of bakery products and simple carbohydrates.

Products that stimulate the production of gastric juice are removed from the diet. You need to eat several times a day, 5-6 meals will be enough. It is forbidden to starve during treatment. Raw vegetables and fruits have useful properties, in addition, they are low in calories. It is necessary to avoid the feeling of hunger, because very often it pushes to break the diet. Products can be boiled, stewed, baked.

Restrictions also apply to liquids, you need to drink no more than 1.5 liters of purified water per day. Since metabolic functions are impaired in the body, water is retained in the tissues, forming edema. It is recommended to reduce the portions of the first dishes and give up salt. Alcoholic beverages and condiments that stimulate the appetite are excluded from the menu. Once every 7-10 days, you can spend unloading days on fresh fruits and juices.

Diet for autoimmune hypothyroidism

Diet for autoimmune hypothyroidism is aimed at restoring the body. The disease is a lesion of the thyroid gland, when the body begins to produce antibodies against its own organ. That is, the body rejects the cells of the thyroid gland, destroying it. The causes of the disorder are not fully understood. Many doctors believe that the disease is the result of autoimmune processes, but it can be radiation exposure or oversaturation of the body with iodine.

It is necessary to treat autoimmune hypothyroidism comprehensively, both with medication and with nutrition. The diet involves giving up fried, smoked, spicy, canned foods, as well as sweets and bakery products. It will not be superfluous to reduce the amount of fluid consumed due to the risk of swelling.

Diet for subclinical hypothyroidism

Diet for subclinical hypothyroidism is a healthy diet. The disease proceeds without pronounced symptoms and is most often detected during laboratory tests. If, after passing the tests, the level of TSH is increased, and the level of T4 is normal, then this indicates this type of thyroid damage. If necessary, drug therapy is prescribed. But most often the doctor offers diet therapy and vitamin therapy. Vitamins are needed to restore the immune system and other body systems.

The diet is based on the consumption of fresh vegetables and fruits. The diet should include non-fatty types of meat and seafood (chicken, rabbit, turkey, shrimp, mussels). Seafood is very important, as it is a natural source of iodine, which restores the thyroid gland. Products containing cocoa beans and coffee will be

useful, as they are rich in B vitamins and magnesium. The diet must be divided into several meals, limit your drinking to 700 - 1500 ml per day.

Diet menu for hypothyroidism

The diet menu should be varied. It is a mistake to think that a diet is tasteless food. This is far from the case, medical, healthier food is the basis of recovery. Do not forget that much depends on the method of cooking and, of course, the mood for recovery. Consider a sample menu for the day:

Breakfast:

- A glass of yogurt, kefir or green tea without sugar.
- 2 boiled eggs or 1 green apple.

Dinner:

- Vegetable broth or light chicken soup.
- Porridge (buckwheat, pearl barley, barley).
- Sea salad (sea cabbage salad mix).

Noon:

- Cheese and cereal casserole.
- An apple or any 2 fruits of your choice.

Dinner:

- Fresh greens salad.
- Baked fish fillet.
- A glass of any juice.

Second dinner:

- Bran bread.
- A glass of kefir or milk.

NUTRITION IN THYROID DISEASE

Nutrition for thyroid disease will depend on its function. Depending on the functional state, euthyroid goiter (without functional impairment), hyperthyroid (increased function) and hypothyroid goiter (decreased function) are distinguished. To clarify the function of the gland, patients are recommended to examine its hormones.

Most patients with nodules are in a euthyroid state, but over time, especially when a large amount of iodine with supplements enters the body, the production of hormones by autonomous formations (nodules) increases.

Most often, with an enlarged thyroid gland (diffuse toxic goiter) or with nodes of its tissue, increased production of hormones and the phenomenon of thyrotoxicosis are noted. At the same time, the level of basic metabolism increases in patients, and increased catabolism can cause muscle weakness and atrophy. Patients develop an insatiable appetite, they consume a large amount of food, but they look thin and exhausted. There is a loss of calcium and increased bone resorption, calcium appears in the urine, occurs as

well as a deficiency of vitamins, potassium and phosphorus. Patients experience irritability, increased excitability, increased blood pressure, disturbed sleep.

Therefore, nutrition in the course of a disease with thyrotoxicosis should be aimed at covering energy expenditure and restoring metabolic disorders. Patients with diffuse toxic goiter are shown increased nutrition and a diet of increased energy value is recommended due to an increase in the main nutrients - proteins, fats and carbohydrates. The main principles of nutrition are:

- Sufficient intake of vitamins and trace elements (thiamine, retinol, calcium and phosphorus, potassium). The diet can be supplemented with vitamin and mineral complexes.
- Getting enough protein. Its average rate is 100 g for men and 90 g for women. But it is more correct to calculate the required amount of protein based on the weight deficit, and it can be 1.2-1.5 g per kg of weight.
- Increasing the energy value of food due to the increase in protein, carbohydrates and fats.
- A high-calorie diet is indicated for individuals with significant weight loss. Caloric content can reach 3000-3700 kcal, carbohydrate content increases to 400-550 g, fat - up to 120-130 g.
- Eating foods rich in calcium and phosphorus (dairy products).
- Small meals in small portions, preventing feelings of hunger.
- Steam cooking, avoiding fried, spicy foods.
- Limiting the use of salt (5 g), as these patients are prone to high blood pressure.
- Exclusion of foods that stimulate the central nervous system (spices, strong broths, alcohol).
- To reduce extractive substances, meat and fish should be boiled and then subjected to further processing (quenching, frying).
- Products with a high caffeine content (coffee, strong tea, chocolate, cocoa) are also excluded.
- Restriction of products that cause fermentation (grapes, plums, kvass, apricots, peaches).
- For any form of nodular goiter, patients should eat more fresh fruits and vegetables (containing potassium), cereals.

It is recommended to switch to seafood (salmon, sea bass, saury, tuna, mussels, flounder, algae, shrimp, cod), lean beef and eggs. All marine fish, especially fatty varieties, contain omega-3 fatty acids, vitamins A, D and B, easily digestible proteins and essential amino acids. Marine fish fills the deficiency of calcium, magnesium, phosphorus and iron.

Dairy products should be increased in the diet, as a source of easily digestible fats, proteins and calcium.

On the other hand, the diet for thyroid disease, which is accompanied by a decrease in its function (hypothyroidism), should contain fewer calories and fats. It is aimed at reducing weight and maintaining it at the same level, since with hypothyroidism, the lack of hormones entails a slowdown in metabolism and weight gain. To lose weight, you need to limit: simple carbohydrates (baking from white flour, pasta, honey, sweets, sugar, jam, confectionery); animal fats and introduce vegetable oils (linseed, corn, sunflower, sesame, olive) into the menu. Exclude from the diet all fatty products, including dairy products and products with hidden fats (sausages, pates, meat semi-finished products). Fried foods should be avoided.

Cooking foods without fat (steamed or baked) will help you lose weight, as the total calorie content of such dishes decreases. The use of salt, spices and alcohol, which stimulate the appetite, as well as tea and coffee are limited. With hypothyroidism, a diet containing 70 g of protein and fat and 300 g of carbohydrates is indicated.

Diet:

Indication:

obesity as the main disease or concomitant with other diseases that do not require special diets.

Purpose of appointment:

the effect of metabolism to eliminate excess fat deposits.

General characteristics:

reducing the caloric content of the diet with the help of carbohydrates, especially easily digestible ones. and to a lesser extent - fats (mainly animal) with a normal or slightly increased protein content. Restriction of free fluid, sodium chloride and appetite-stimulating products and dishes. Increase in dietary fiber content. Dishes are prepared boiled, stewed, baked. Fried, mashed and chopped products are undesirable. Sugar substitutes are used for sweet dishes and drinks (xylitol and sorbitol are taken into account in the caloric content of the diet). Food temperature is simple.

Chemical composition and calorie content:

carbohydrates - 300 g;

proteins - 70-110 g (60% animal),

fats -70-85 g (30% vegetable),

calories - 1700-1800 kcal;

sodium chloride (salt) - 5-6 g;

free liquid - 1-1.2 l.

Diet mode:

5-6 times a day with sufficient volume to feel full.

Recommended and excluded products and dishes:

soups

Up to 250-300 g of reception. From various vegetables with a small addition of potatoes or cereals; shchi, borscht, okroshka, beetroot. 2-3 times a week, soups based on low-fat meat or fish broths with vegetables, meatballs.

Excludes: dairy, potato, cereal, legume, pasta products;

bread and flour products

Rye and wheat bread from coarsely ground flour, protein-wheat and protein-bran bread - 100-150 g per day.

Exclude: products from wheat flour of the highest and 1st grade, butter and puff pastry;

meat and poultry

Up to 150 g per day. Low fattening beef, veal, rabbit, chickens. turkey, limited - lean pork and lamb - mostly boiled, as well as stewed; baked in large and small pieces. The meat is fried after boiling. Beef cold meat. Beef anchovies.

Fatty varieties of meat, goose, duck, ham, sausages, boiled and smoked sausages, canned goods are excluded;

fish

Low-fat types up to 150-200 g per day. Boiled, baked, fried. Sea products.

Exclude: fatty types, salted, smoked, canned fish in oil, caviar;

dairy products

Milk and low-fat fermented milk drinks. Sour cream - for dishes. Low-fat cheese and 9% fat content (100-200 g per day) - natural and in the form of cheesecakes and puddings. Low-fat varieties of cheese - limited.

Exclude: fatty cheese, sweet curds, cream, sweet yogurt, ryazhanka, melted milk, fatty and salty cheeses;

eggs

1-2 pieces per day. Difficult, protein omelets, omelets with vegetables.

Excludes: fried;

cereals

Limited to adding to vegetable soups. Loose porridge from buckwheat, pearl barley, barley groats due to the reduction of bread.

Excludes: other cereals, especially rice, semolina and oatmeal, pasta, legumes;

vegetables

They are used widely, in all kinds, often necessarily raw. All types of cabbage, fresh cucumbers, radishes, lettuce, zucchini, pumpkin, tomatoes, and turnips are desirable. Sauerkraut - after washing.

Limit: dishes from potatoes, beets, green peas, carrots, turnips (in total up to 200 g per day), as well as salted and pickled vegetables;

appetizer

Salads from raw and pickled vegetables, vinaigrettes, vegetable salads with boiled meat and fish, seafood. Fish or meat filling. Lean ham.

Exclude: fatty and spicy snacks;

fruits, sweet dishes, sweets

Fruits and berries of sweet and sour varieties, raw and cooked. Jellies and mousses on methylcellulose, xylitol, sorbitol. Unsweetened compotes.

Excludes: grapes, raisins, bananas, figs, dates, very sweet varieties of other fruits, sugar, confectionery, jam, honey, ice cream, jelly;

sauces and spices

Tomato, red, white with vegetables, weak mushroom; vinegar.

Exclude: fatty and spicy sauces, mayonnaise, all spices

drinks

Tea, black coffee and coffee with milk. Low-sweet fruit, berry, vegetable juices.

Excludes: grape and other sweet juices, cocoa;

fats

Butter (limited) and vegetable oils - in dishes.

Excludes: meat and cooking fats.

Sample menu.

First breakfast: vegetable salad with oil, low-fat cheese, tea.

Second breakfast: fresh apples.

Lunch: vegetarian borscht with sour cream (half portions), boiled meat, stewed cabbage with oil, dried fruit compote without sugar (on xylitol).

Noon: low-fat cottage cheese with milk.

Dinner: boiled fish, vegetable stew, tea.

At night: low-fat kefir.

DIET FOR DIABETES:

Nutrition for type 1 diabetes

It is important to get all the essential nutrients in the same amount as the average person. If there is no tendency to fullness, then the daily caloric content of dishes should not differ from the norm. The only thing that is important to know is the amount of carbohydrates in food. On average, 1 unit of insulin is calculated for 15 g of carbohydrates, the dose of insulin is adjusted before meals, taking into account the number of bread units of the upcoming meal. According to modern recommendations, the most suitable foods for type 1 diabetes are contained in the Mediterranean diet.

Nutrition for diabetes mellitus 2 types

There are no special differences in the diet, the diet should also be saturated with non-starchy vegetables, complex carbohydrates and whole grain products. If you are overweight, your doctor may recommend a low-calorie or low-carbohydrate diet. Also, type 2 diabetics need to drink at least 1.5 liters of water per day.

The basis of maintaining the optimal concentration of glucose is a healthy lifestyle and a properly prepared diet for diabetes. It usually includes:

- Avoiding alcohol
- Reducing the amount of sugar and sweeteners

- Replacing fast food with homemade dishes
- Change of flour products from soft varieties of wheat to hard varieties
- Eating strictly according to schedule (avoid snacking)
- Replacing unhealthy food with healthy food (for example, you can eat whipped frozen bananas instead of ice cream)
- Avoid overeating

Basic rules of the diet

Exclude sweets from the diet

The calorie content of each meal should be approximately the same

Eat carbohydrates in the first half of the day

What can not be eaten with diabetes

The list of prohibited foods for diabetes is honorably opened by alcohol - at the same time, the stronger the drink, the more caloric it is. It should be completely abandoned.

In second place are easily digestible carbohydrates. They create a jump in the level of glucose in the blood, which is dangerous in case of insulin deficiency. This includes all flour products (buns, white bread, cakes, pastries), soft wheat pasta, sweets with the addition of candy (sodas, chocolates, candies), sausages and sausages, cards by the way, fast food. If it is not possible to exclude all these products from the diet, it is necessary to at least minimize their consumption.

It is also worth limiting:

- Trans fats (margarine, store-bought pastries)
- Cholesterol - optimally no more than 200 mg per day (approximately this much is contained in 1 medium chicken egg)
- Salt - about 1 teaspoon per day
- Saturated fats - products of animal origin, fatty dairy products, coconut and palm oils

What can you eat with diabetes

- Unsweetened berries, fruits
- Low-fat dairy products
- Beans
- Whole grain bread

- Vegetables
- Lean fish/meat
- Eggs

What cereals can be eaten

- Barley (pearl, barley groats)
- Oat groats
- Greek
- Wheat
- Quinoa
- Rice (only long-grain brown rice)

Meat and fish are excellent sources of protein. But it is important to use them in moderation. It is impossible to say unequivocally what should prevail in the diet, it is important not to abuse fatty varieties of meat/fish and to include them in the menu in a measured manner.

What foods reduce the amount of sugar in the blood

- Fresh vegetables and herbs
- Unsweetened fruits, berries
- Seafood, sea fish
- Avocado
- Nuts of various varieties (almonds are the most useful)
- Whole grain products

Literature

Main:

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2. Environmental Health: from Global to Local \ Under Howard Frumkin edition – Third edition. - San Francisco, 2016

Additional:

3. General hygiene. Hygiene propaedeutics/Textbook for foreign students. / E.I. Honcharuk, Yu.I. Kundiev, V.G. bardo otter - K.: Higher school, 2000.
4. Korobchanskiy V.A. Hygiene and Ecology \ Korobchanskiy V.A., Vorontsov V.P., Musulbas A.A. - Kharkov, 2006

PRACTICAL LESSON No. 14

Topic: Respiratory diseases and diet therapy

Purpose: To learn how to make diets for patients with respiratory diseases

Basic concepts: diet, pneumonia, tuberculosis, chronic purulent diseases, exudative pleurisy, bronchial asthma

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

- Diet therapy for pneumonia
- Diet therapy for tuberculosis
- Diet therapy for chronic purulent lung diseases
- Diet therapy for exudative pleurisy
- Diet therapy for bronchial asthma

Formation of professional skills:

- Learn to develop diets for patients with various diseases of the respiratory system

SUBJECT TEXT:

NUTRITION FOR LUNG DISEASES

Dietary nutrition plays an important role in the comprehensive therapy of respiratory diseases. It is built individually taking into account the nature of the main process and its pathogenetic mechanisms, complications and associated diseases. It is necessary to remember the possible involvement in the pathological process of the cardiovascular system with the development of the pulmonary heart and insufficiency of blood circulation according to the right ventricular type. In particular, with emphysema of the lungs, medical nutrition is mainly prescribed based on the functional state of the cardiovascular system.

NUTRITION FOR TREATMENT OF PNEUMONIA

In acute pneumonia, the basic metabolism increases during the febrile period. There is intoxication of the human body with the products of the vital activity of microorganisms and tissue decay. The load on the cardiovascular system increases, as a result of which, in severe cases, blood circulation insufficiency may develop. The functional activity of the digestive organs decreases. Therapeutic nutrition should contribute to the fastest resolution of the inflammatory process, detoxification of the body, increase of its immune properties and general reactivity, sparing of the organs of the cardiovascular and digestive systems, prevention of possible negative effects of pharmacotherapy. The anti-inflammatory effect is provided by limiting the amount of carbohydrates (up to 200-250 g), salt (up to 6-7 g) and increasing the content of calcium salts in the diet.

In order to detoxify the body, it is indicated to introduce a sufficient amount of vitamins (especially ascorbic acid) and liquid (up to 1400-1700 ml); it is natural that the use of such a quantity of liquid is allowed only in the absence of cardiac decompensation.

The total caloric content of the diet is recommended at the beginning of the disease (in the acute febrile period) to be significantly reduced (to 1500-1800 kcal) by limiting, in addition to carbohydrates, the amount of consumed proteins (50-60 g), fats (30-40 g), which in combination with fractional nutrition (eating up to 6-7 times a day) and the use of mostly liquid and finely ground food helps to spare the activity of the digestive organs.

During the recovery period, it is necessary to significantly increase the caloric content of the daily diet (up to 2500-3000 kcal), mainly by increasing the content of proteins (up to 130-150 g), fats (80-190 g) and, to a lesser extent, carbohydrates (up to 300-350 g). Enrichment of the diet with protein contributes to the replenishment of its losses during the breakdown of tissues, stimulation of reparative processes, production of antibodies, prevents leukopenia against the background of the use of sulfonamide drugs. It is allowed to increase the amount of salt (up to 10-12 g), it is necessary for the production of hydrochloric acid by the stomach, it helps increase appetite. In this regard, the use of products that stimulate gastric secretion and exocrine activity of the pancreas (meat and fish broths, bread kvass, sauces, spices and seasonings, coffee, cocoa, fruit and vegetable juices, etc.) is indicated. As you recover, the number of meals can be reduced to 4-5 times a day.

Diet therapy for exacerbations of chronic pneumonia is the same as for acute pneumonia.

CHRONIC PURULOUS DISEASES OF THE LUNGS AND THEIR DIET

Lung abscesses and bronchiectasis are characterized by a combination of a purulent inflammatory process with the destruction of lung tissue. Stagnation of purulent content leads to intoxication of the body. A large amount of protein is lost with purulent sputum. With large lesions, pulmonary and cardiac failure may develop. A long purulent process can be accompanied by exhaustion of the body and lead to amyloidosis.

Therapeutic nutrition is necessary to increase the body's immunobiological defenses, replenish protein losses with sputum; it should contribute to the detoxification of the body, reduce the phenomena of inflammatory exudation, stimulate reparative processes, and protect the activity of the cardiovascular system.

To improve the general nutrition of the patient, it is necessary to ensure a sufficient caloric content of the daily diet (2600-3000 kcal) due to the introduction of an increased amount of proteins (130-160 g), - a moderate amount of carbohydrates (350-400 g) and reduced - fats (70-80 g).

The use of an increased amount of proteins contributes to the increase of the body's protective forces and immune processes, the replenishment of protein that is consumed with purulent wet it stimulates reparative processes. Excessive protein nutrition prevents and delays the development of amyloidosis. Care should be taken to include in the diet a sufficient amount of complete proteins of animal origin (meat, fish, cheese, eggs, etc.). In case of exacerbation of the process, it is advisable to reduce the amount of carbohydrates (to 200-250 g), which in combination with limiting salt (6- 8 g) and the introduction of calcium salts aimed at reducing inflammatory exudation.

The need for a small restriction of fats in the diet is explained by their ability to suppress the already reduced appetite in long-term febrile patients.

A hypochlorite diet has an anti-inflammatory effect due to the fixation of calcium salts in tissues and reduces fluid retention in the body, which is one of the measures to prevent blood circulation insufficiency.

Limiting the amount of free fluid (up to 700-800 ml) is indicated to reduce the amount of sputum and facilitate the activity of the cardiovascular system. In order to stimulate the defense forces, reparative processes and fill the deficiency of vitamins in the body, increased intake of them with food (especially retinol, ascorbic acid, vitamins of group B) is indicated. In particular, ascorbic acid contributes to the detoxification of the body, together with thiamine and riboflavin, it has a positive effect on oxidative processes in the body and protein metabolism. Retinol improves the regeneration of the mucous membrane of the respiratory tract. To enrich the body with vitamins, it is recommended to use products rich in them (yeast, rosehip decoction, vegetables, fruits).

The improvement of appetite is facilitated by the inclusion in the diet of products that stimulate gastric secretion (meat and fish stews, kvass, vegetable and fruit juices, strong tea, coffee, etc.)

In the absence of heart failure phenomena, it is advisable to take diet No. 5 as a basis for building a dietary regime. In the presence of circulatory insufficiency, the construction of medical nutrition should be based on diets No. 10 or 10a.

DIET THERAPY FOR EXUDATIVE PLEURITIS AND BRONCHIAL ASTHMA

The disease more often has a tuberculous and less often another etiology (pneumococcus, staphylococcus, streptococcus, etc.) - It is characterized by an inflammatory lesion of the pleura. Pleural cavities are filled with inflammatory exudate, rich in protein.

Therapeutic nutrition is aimed at reducing inflammatory exudation, reducing increased reactivity. This is ensured by limiting carbohydrates (200-250 g), salt (up to 3-5 g) and increasing the content of calcium salts in the diet (up to 5 g); some restriction of the use of free liquid (500 - 700 ml) is shown.

Care should be taken to introduce a sufficient amount of vitamins (especially retinol, ascorbic acid, vitamin P, vitamin B). Excluded: food products that cause thirst (salted, smoked, canned food, extracts, etc.)

When prescribing medical nutrition at the beginning of the disease, diets No. 7a, 7b, 7c should be the main ones. In the future, taking into account the tuberculosis etiology of the disease, it is advisable to transfer patients to medical diet No. 11.

Bronchial asthma has an allergic nature and is characterized by periodic bronchospasm. With a long and persistent course, bronchial asthma leads to the development of emphysema of the lungs and pulmonary heart, which can be complicated by insufficiency of blood circulation of the right ventricular type.

Therapeutic nutrition is primarily aimed at reducing hyperergy and vegetative dystonia. For this purpose, restriction of carbohydrates, salt and the introduction of an increased amount of calcium are indicated.

It is recommended to include in the diet products rich in calcium (cheese, milk, cottage cheese, etc.)

You should not use pickles, marinades, herring, easily digestible carbohydrates (honey, jam, sugar, semolina, potatoes, etc.) Foods that excite the nervous system should be limited (strong coffee, cocoa, meat and fish broths, spicy snacks, spices etc.) Foods rich in oxalic acid (sorrel, spinach, lettuce) are excluded, as it helps to remove calcium salts from the body.

When a food allergy is detected, products to which there is increased sensitivity should be excluded from the diet, or specific desensitization can be carried out by consuming small amounts of allergenic products 1 hour before taking their main mass.

If the disease is complicated by pulmonary heart failure, appropriate adjustments to the diet are necessary (exclusion of salt, enrichment with potassium salts, fluid restriction, etc.).

THERAPEUTIC NUTRITION FOR TUBERCULOSIS

The disease is caused by mycobacterium tuberculosis. Various organs and systems can be affected (lungs, intestines, bones and joints, kidneys, serous membranes, larynx and nasopharynx, skin, liver, cardiovascular system, etc.).

Pathogenetic mechanisms determine the important role of medical nutrition in the complex therapy of tuberculosis.

Diet therapy is aimed at increasing the body's defenses, stimulating reparative processes, normalizing metabolic disorders, restoring impaired functions, and reducing body hyperergy.

Therapeutic nutrition should be built taking into account the localization, the nature of the process, the degree of activity, the body's reactivity, the state of the digestive organs, fatness and the patient's lifestyle, concomitant diseases and complications, the functional state of the affected organs.

When calculating the total caloric content, along with taking into account the patient's height, body weight, sex, and lifestyle (regime), it is necessary to keep in mind the frequent presence of increased energy expenditure in tuberculosis associated with infection and febrile state. M. V. Pevzner recommends prescribing on each kilogram of body weight;

- a) at complete rest - 35 kcal;
- b) in a mode of relative rest (lying down - 5-6 hours during the day) with small walks - 40 kcal;
- c) during the training mode (lying for 3.5 hours during the day, active games and labor processes) - 45 kcal;
- d) with a working regime with a 2-hour rest during the day and work for 3-6 hours - 50 kcal.

When the patient's body weight is below the norm and progressive weight loss, the purpose of enhanced nutrition is shown, which involves increasing the calorie content by 1/3 compared to the proper one. You should not resort to enhanced nutrition in case of severe disturbances in the activity of the stomach, intestines, liver and cardiovascular system.

The more significant increase in caloric content, the so-called "excessive" nutrition, which was practiced earlier, did not justify itself; it leads to overloading of digestive organs, intermediary metabolism, overstrain of regulatory mechanisms, weakening of protective forces and increased allergy of the body. The beneficial effect of increased nutrition is evidenced not so much by an increase in body weight, but by an improvement in appetite, mood, and the appearance of cheerfulness. At the same time, if the patient's body weight does not increase with increased nutrition, it is necessary to review the qualitative composition of the food.

In connection with increased protein breakdown, it is indicated to include an increased amount of protein in the diet (up to 2.5 g during an outbreak and up to 1.5-2 g per 1 kg of body weight during an outbreak of the tuberculosis process), which contributes to increasing the body's resistance to tuberculosis infections; at least half of the appropriate amount of proteins should be of animal origin (meat, fish, eggs, milk, cheese, etc.)

There are data on the possible formation of substances with an antibiotic effect in the process of metabolism in the body of such amino acids as arginine, tryptophan, phenylalanine. Therefore, it is advisable to recommend the inclusion in the diet of food products containing these amino acids (milk, cheese, pike perch, cod, beef, chicken, lamb, pork, oat and buckwheat groats, millet, rice, soybeans, beans, barley, peas, carrots, potatoes, cabbage, etc.)

Outside the outbreak of the tuberculosis process, the body should be provided with a normal amount of carbohydrates (7 g per 1 kg of body weight). When activating the process, it is recommended to reduce their content in the diet (up to 4-5 g per 1 kg of body weight), which has an anti-inflammatory effect. Limitation of carbohydrates, especially easily digestible ones (sugar, honey, jam, etc.), is indicated for disorders of nervous regulation, which are manifested by the lability of the autonomic nervous system (erased symptoms of hypo- and hyperglycemia), hypersensitivity of the body.

Previously, the use of a large amount of fat was not recommended, as it has a negative effect on the body. An excess of fats in the diet contributes to an acidotic shift, complicates the activity of the digestive organs, causes diarrhea, fatty infiltration of the liver, suppresses the already often reduced gastric secretion and appetite. Rapid satiety leads to insufficient intake of proteins, vitamins and minerals into the body. Currently, the expediency of limiting the amount of fats in the diet during the period of activation of the tuberculosis process (up to 1 g per 1 kg of body weight) and the normal amount of fats (1.5 g per 1 kg of body weight) in the phase of remission is substantiated. Preference should be given to butter and vegetable fats. The latter are the main source of essential fatty acids.

With tuberculosis, there is an increased need for vitamins (retinol, ascorbic acid, vitamin O, thiamine, riboflavin, pyridoxine, nicotinic acid), especially in the presence of lesions of the digestive organs (enterocolitis, gastritis, hepatitis, etc.), which complicate the absorption of vitamins. The deficiency of some vitamins (pyridoxine, ascorbic acid, etc.) can be caused by the use of a number of antibacterial agents (PASK-sodium, ftivazid, isoniazid, larusai, etc.). In an experiment on animals, an increased susceptibility to tuberculosis was proven in the absence of vitamins in the diet (I. I'm Goldberg). Providing the body with a sufficient amount of vitamins has a beneficial effect on the course of tuberculosis.

Depletion of the body with calcium, its anti-inflammatory and desensitizing effect determines the need to enrich the diet with calcium salts at the expense of products rich in them (milk, cheese, cottage cheese, cabbage, lettuce, legumes, raisins, etc.). Better assimilation of calcium is facilitated by its introduction in optimal ratios with phosphorus (1: 1 or 2: 1) and providing the body with a sufficient amount of vitamin b. Limiting the amount of salt contributes to the fixation of calcium in the tissues. It is recommended to use it during the outbreak of the tuberculosis process up to 8 g and in the inactive phase up to 12 g per day. The presence of fluid in the cavities (exudative pleurisy, empyema, transudate) serves as an indication for a sharper restriction of salt intake (2-4 g per day), which promotes fluid absorption. However, after large blood losses, profuse diarrhea, frequent vomiting, it is necessary to introduce an increased amount of salt (20-25 g per day).

To increase the often reduced appetite, it is recommended to diversify the menu, include in it, taking into account possible contraindications, stimulants of gastric secretion (meat broth, fish soup, herring, etc.), take care of high taste qualities and good presentation of dishes, develop an individual diet with regular intake food and eating the main amount of it during the decrease in temperature. It is important to create a favorable external environment during meals (a clean and well-ventilated room, absence of excessive noise, a pleasant neighborhood, etc.), in case of overtiredness - a short rest before and after lunch, to

eliminate the possible negative effects of some medicines, to provide the body with a sufficient amount of vitamins, to carry out active treatment of the tuberculosis process

In the case of tubercular lesions of the intestine, it is necessary to bear in mind possible disturbances in the assimilation of the most important nutrients (proteins, vitamins, calcium, phosphorus, iron, etc.), which leads to a pronounced deficiency of them in the body and requires the inclusion of a significantly increased amount in the diet. Retinol plays an important role in the epithelialization of intestinal ulcers. Profuse diarrhea determines the need to introduce an increased amount of salt (up to 20 g). Due to poor tolerance, it is advisable to reduce the amount of fat in the diet. If fermentation processes prevail, the content of carbohydrates in the diet should be limited (bread, cereals, vegetables, etc.).

Excluded: whole milk, spicy dishes, smoked meats, brown bread, carbonated drinks, cold dishes, kvass, raw vegetables, fatty meat, canned goods, marinades, lard, raw eggs.

The use of slimy and pureed soups, weak broths, boiled fish, souffles, steam cutlets, meatballs, meatballs from low-fat varieties of meat, various porridges, white crackers, non-acidic cheese, non-sharp cheese, jelly, jelly, soaked low-fat herring, protein omelet is allowed, pudding, butter, jam and pureed vegetables (carrots, pumpkin, potatoes, zucchini, etc.), raw vegetable and fruit juices, rosehip decoction.

In case of tubercular damage to the kidneys, irritating products (pepper, mustard, horseradish, radish, alcohol, smoked meats, canned food) should be excluded from use.

In case of exudative pleurisy, it is necessary to make the corrections outlined in the corresponding section (see "Exudative pleurisy"). With tuberculous damage to the larynx and nasopharynx, it is especially important to provide the body with an increased amount of retinol, as it helps restore the damaged mucosal epithelium. It is recommended to eat food slowly in liquid, jelly-like, well-purified and mushy form.

It is recommended to use slimy soups, weak congealed broths, filtered jelly, liquid milk porridges, milk, weak coffee, weak mashed potatoes, tea with milk. With tuberculosis of the bones and joints, special care should be taken to provide the body with an increased amount of calcium and phosphorus. For better assimilation of calcium salts, a sufficient content of vitamin B in the diet is shown, which can, in particular, be provided through the use of fish oil.

In case of tuberculous lesions of the skin (lupus), a moderate restriction of carbohydrates, salt (up to 3-5 g) and the introduction of an increased amount of vitamins (retinol, ascorbic acid) are recommended.

Damage to the liver determines the expediency of excluding egg yolks, fatty meat, fish and vegetables, butter dough, smoked meats, spicy dishes, strong coffee, and alcoholic beverages.

With hemoptysis, it is important to provide the body with an increased amount of vitamins (ascorbic acid, vikalol), calcium salts, and with large blood loss - with an increased amount of salt (up to 20-30 g per day). Chilled sour, fruit and berry jellies, grated cheese with milk, cream, egg, liquid semolina porridge, cool drinks (tomato juice, lemon water, etc.) are recommended.

When pulmonary tuberculosis is complicated by pulmonary heart failure, it is indicated to limit fluids, salt, enrich the diet with potassium salts, and spend unloading days.

When tuberculosis is complicated by amyloidosis in the albuminuric stage without edema, the daily ration should contain up to 2 g of protein per 1 kg of the patient's weight, the amount of fats and carbohydrates according to the nature of the main process. The presence of edema requires a sharp restriction of salt (2-4 g).

Literature

Main:

1. Hygiene and ecology // textbook for students of higher medical educational institutions in English. /edited by V.G. Bardova – Vinnytsia: NovaKnyga, 2018.

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PRACTICAL LESSON No. 15

Topic: Nutrition for some surgical diseases

Purpose: To learn how to make a menu for patients with certain surgical diseases

Basic concepts: diet, enteral nutrition, parenteral nutrition, combined nutrition, sounding, gastrostomy, nutritional enema

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

- What is natural nutrition. In which surgical diseases is it allowed?
- What is artificial nutrition. What surgical diseases are indicated?
- What does parenteral nutrition consist of? What diseases is it used for?
- In which diseases is probed nutrition indicated?
- In which diseases is probed nutrition contraindicated?
- What foods are used to prepare the formula for tube feeding?

Formation of professional skills:

- To master the skills of prescription and composition of diets for surgical patients.

SUBJECT TEXT:

ORGANIZATION OF FOOD FOR SURGICAL PATIENTS.

GENERAL ISSUES OF THE ROLE OF NUTRITION OF PATIENTS IN THE POSTOPERATIVE PERIOD, METHODS OF FEEDING.

The absolute majority of operative interventions, especially planned ones, are performed in patients on an empty stomach. This is required not only by the specifics of the interventions themselves, but also by the

possibility of complications associated with possible regurgitation of food residues during surgery and in the immediate postoperative period in patients operated on under general anesthesia (anesthesia), due to the effects of the narcotic drugs themselves. In cases of emergency surgical interventions, if less than 3 hours have passed after eating, gastric lavage is performed.

In the postoperative period, the final result of the treatment depends on a rational diet - the timely recovery of the patient. Nutrient deficiencies significantly slow down wound healing and can lead to a worsening of the patient's condition. In turn, a sufficient diet serves as a guarantee of high tolerance to surgical trauma, an increase in the level of immune reactions and adequate reparative processes. Satisfaction of the energy and plastic needs of the body of a surgical patient is provided by a balanced diet. This is understood as the intake of a sufficient amount of proteins, fats and carbohydrates to the body in accordance with energy expenditure, which increases in a pathological condition due to an increase in basic metabolism. Their optimal ratio is the daily intake of proteins - 13-17%, fats - 30-35%, carbohydrates - 50-55% (approximately 1:2:4).

In a surgical patient, protein is the most important plastic material for wound regeneration. Enzymes and other biologically active substances are formed from protein structures, proteins form the basis of immune complexes, which are vital for fighting infection. During the disease, catabolism processes prevail in the body, the greatest manifestation of which is manifested in the loss, first of all, of proteins with a short half-life (liver proteins and enzymes of the gastrointestinal tract). The resulting amino acid imbalance often leads to toxic reactions. The most pronounced changes caused by protein deficiency are manifested in patients with burns, when hypoproteinemia becomes the main component of the burn disease.

Lipids have a high energy value. They can be replaced by other nutrients, for example, carbohydrates. However, some fatty acids are essential. They participate in the formation of phospholipids - the most important component of the membrane of all cell structures. Therefore, the inclusion of fats in the diet becomes mandatory.

Carbohydrates are one of the main sources of energy. The lack of carbohydrates leads to the rapid utilization of fats and proteins to obtain the necessary energy material. Such a situation can cause irreversible changes in the body's metabolism, which can lead to the death of the patient.

In addition to proteins, fats and carbohydrates, the diet must include vitamins, trace elements and water. Their number is taken into account when creating appropriate diets. The daily energy requirement of a healthy person, depending on various circumstances (age, body weight, constitution, type of professional activity) is 2550-4300 Kcal. In patients, it is significantly reduced (1900 - 2300 Kcal), especially in those who are on bed rest or strict bed rest. The daily need for water is 2.5 liters, a significant part of it comes with food products and 1.5 liters is filled with liquid (tea, compote, other drinks).

In the postoperative period, there are several means of feeding the patient:

1. Natural - usual enteral nutrition, food intake is carried out through the mouth;
2. Artificial - food intake is carried out through special devices, or with the use of specially selected mixtures, which are necessary to maintain the body's energy balance:

A) Enteral (through the gastrointestinal tract):

- through a gastric, intestinal probe;
- through artificially formed connections (fistulas) - kerosene trostoma (connection with the stomach), enterostomy (connection with the small intestine);
- with the help of enemas;

B) Parenteral (bypassing the gastrointestinal tract):

- through blood vessels - intravenously, intraarterially, endolymphatic;

- subcutaneously, intramuscularly;

3. Combined - using a combination of natural and artificial ways of introducing food substances, depending on the patient's condition and special indications.

Natural enteral nutrition is carried out taking into account dietary indications for each patient individually.

Enteral tube feeding is carried out through a tube inserted into the stomach or small intestine. It is shown at:

- loss of consciousness due to brain injury or severe intoxication;
- the presence of mechanical barriers in the oral cavity, pharynx and esophagus (tumors and strictures);
- conditions accompanied by increased catabolism (sepsis, burn disease, polytrauma);
- anorexia of any origin.

Tube feeding is contraindicated in:

- violations of passage and absorption in the small intestine;
- acute bleeding from the upper parts of the gastrointestinal tract;
- intractable vomiting and diarrhea;
- dynamic intestinal obstruction;
- intestinal paresis after surgical interventions;
- anomalies of the development of the gastrointestinal tract;
- intestinal ischemia, failure of intestinal anastomosis.

If the probe is installed in the stomach, then its implementation does not differ technically from the technique described for washing the stomach. Only for the purpose of nutrition, a probe with a smaller diameter - 0.3 - 0.5 cm is installed, in contrast to a thick (1.0 cm) probe for washing the stomach. Intestinal probes can be installed only intraoperatively, although the literature describes the methods of conducting such a probe using esophagogastroduodenoscopy.

For feeding through probes, mixtures prepared from liquid products (cream, milk, broths, eggs, juices) are used in combination with easily soluble (milk powder, sugar, starch) or chopped (meat, fish, cheese) components. High-calorie and convenient mixtures of baby food products, special enteral food products (protein, fat-free), canned homogenizing mixtures from natural products, as well as industrially produced special pharmaceutical fast-dissolving mixtures of proteins, fats and carbohydrates, for example, "Berlamin", the company "Berlin Chemie".

With tube feeding, 50% of the daily caloric intake is administered on the first day to get used to the new conditions of food intake. Then the dose is gradually increased, and from the fourth day the full estimated volume is given. Uniform intake of food during the day is achieved with the help of special pumps, or by a clear hourly schedule of its introduction. Thus, nausea, vomiting, dumping syndrome and diarrhea are prevented at the same time.

Feeding through a gastrostomy begins on the second day after the operation. 100-150 ml of the mixture is injected into the stomach at one time using a Jeanette syringe or by gravity through a funnel connected to a tube every 2-3 hours. After feeding, the tube is washed with water and a clamp is placed on it. After 5-7 days, you can introduce 400-500 ml of porridge-like food 4-5 times a day. For the preparation of mixtures, the same food substrates that are used for tube feeding are recommended.

In connection with the fact that sometimes between the tube and the wall of the artificial fistula passage there is leakage of gastric contents along the tube, and the skin around it macerates, careful care of the

skin near the gastrostomy is necessary. After each feeding, the skin is cleaned in the area of the stoma, wiping it with a cotton or gauze swab moistened with a 0.1-0.5% solution of potassium permanganate or a 1:5000 solution of furacilin. After thoroughly drying the skin, apply a layer of Lassar's paste, sudokrem or zinc paste to its surface and apply an aseptic bandage.

In some diseases of the stomach (tumor damage, chemical burn), an enterostomy is applied for nutrition - an artificial fistula with a small intestine (most often - a jejunostomy). Through a tube, food mixtures are introduced into the intestine, the chemical composition of which is close to the chyme of a healthy person. First, they use a saline solution with the addition of glucose, which stimulates the absorption of these substances. After 3-4 days, add protein solutions (hydrolysin, aminopeptide). And, finally, the last stage of the adaptive nutrition program is the connection of fat emulsions (liposins) and multicomponent mixtures ("Berlamin", children's food mixtures).

Care for an enterostomy is carried out in the same way as for a gastrostomy. The greatest danger is the failure of the sutures that fix the wall of the stomach or intestines to the parietal peritoneum. In this case, their departure from the front abdominal wall and the flow of gastric or intestinal contents into the abdominal cavity with the development of peritonitis. Treat such a complication only operatively.

Rarely, but additionally, it is possible to use another enteral method for some patients - feeding with the help of nutritional enemas. With this tool, nutrients are introduced into the rectum. 1 hour before the nutritional enema, it is recommended to perform a cleansing enema. The introduction into the rectum can be carried out using rubber microclyses with a capacity of 100 - 150 ml with the slow introduction of food solutions or by drip introduction using a dropper connected to a rubber tube inserted into the rectum. 500-1000 ml of food solutions can be administered drop by drop at a rate of 30-40 drops per minute. For nutritional enemas, solutions of 5% glucose, 0.9% sodium chloride solution (physiological sodium chloride solution), amino acid mixtures are used. To improve absorption, it is recommended to bring the temperature of the mixtures to 37-40 °C.

If it is impossible to feed naturally or through a probe, or if it is necessary to supplement the natural ways of food intake, parenteral nutrition is used as the easiest way to supply the body with nutrients during surgery and in the postoperative period. For this, individual food substances are made into solutions, which include proteins, fats, carbohydrates, water and electrolytes, ensuring full satisfaction of the body's energy and plastic needs. If necessary, such a complete high-calorie diet (up to 3000 Kcal per day) can be used for a long time (years). For parenteral administration of nutrients, main vessels, most often veins, are catheterized. It is very rare, but it is possible to use other vessels (arteries, lymphatics) for this purpose, as well as to introduce solutions slowly subcutaneously, intramuscularly, and in modern medical practice these ways are almost not used.

Modern preparations for parenteral nutrition are most often represented by amino acid preparations and their mixtures with other food components. Amino acids, unlike proteins, have neither species nor tissue specificity. Their solutions in pure form, as well as hydrolysates of proteins with a sufficient degree of hydrolysis and purification, should not cause side effects caused by sensitization. At the same time, they fully provide the body's need for proteins. For complete protein nutrition, it is necessary that the obtained preparations contain a set of amino acids, in particular, essential amino acids, including tryptophan.

The drugs that exist today for parenteral protein nutrition are represented by hydrolysates obtained from blood proteins of cattle (hydrolysin solution, fibrinosol) and humans (aminoblood, infusamine), from casein and other proteins (casein hydrolyzate, aminotroph, amikin), as well as preparations, mixtures of "pure" amino acids (polyamine, alvesin and others). Sometimes amino acids are used in combination with glucose solutions, fat emulsions, and vitamins. Blood products, primarily plasma, are also sometimes used for parenteral nutrition, but this is too expensive.

DIETARY NATURAL ENTERAL NUTRITION OF THE SURGICAL PATIENT.

A diet is a diet of a healthy and sick person, which determines the qualitative composition of food, its quantity (in particular, the main constituent parts), as well as the time and frequency of intake.

Diet therapy is medical nutrition, which is a necessary component of the entire medical process.

With natural nutrition, the treating doctor prescribes an appropriate diet or table. In our country for many years there has been a single system of dietary nutrition according to N.I. Pevzner, which includes 15 basic diets. In the general surgical department, diets N0-a, N0-b, N0-c, N1-a, N1, Meilengracht, N5-a, N9, N11, N15 are most often used.

A zero diet is indicated after operations on the organs of the gastrointestinal tract, in a semi-unconscious state (craniocerebral injury). This diet provides minimal chemical, mechanical and thermal irritation of the digestive organs, prevents flatulence and provides nutrients when it is difficult or impossible to take regular food.

The N0 diet is prescribed for 2-3 days, includes jelly-like and liquid dishes, the total volume of liquid is 1.8-2.2 liters, their temperature is not higher than 45°C. Food is consumed 7-8 times a day in a volume of no more than 300 g per reception. Fat-free meat broth, rice broth with butter, berry jelly, strained compote, rosehip infusion, fresh fruit and berry juices, tea with lemon are allowed. After 2-3 days, when the condition improves, add a boiled egg, 50 ml of cream. Dense and mashed dishes, carbonated drinks, whole milk are prohibited.

Diet N0-b is prescribed for 2-4 days after N0-a. It includes liquid pureed porridge from Hercules, buckwheat and rice cooked in meat broth or water, slimy cereal soups in vegetable broth, steamed protein omelet, steamed souffle or puree of lean fish or meat. Food is given no more than 350-400 g per reception 6 times a day.

The N0 diet is a continuation of the previous diet and serves for a smooth transition to a physiological full meal. This diet includes soups-creams and pureed soups, steamed dishes made from pureed boiled meat, chicken or fish, fresh cheese, fermented milk drinks, vegetable and fruit purees, 50-75 g of white crackers. Milk is added to the porridge. Food is given 6 times day.

The N1 diet is prescribed 6 to 7 days after gastric surgery in order to minimize irritation of the digestive tract when bed rest is observed. Food is prepared in liquid and semi-liquid form and taken every 2-3 hours. Low-fat fish and meat are used to prepare dishes (steamed souffle or puree). Souffle from fresh cheese is limited. Allowed milk, cream, unsalted butter, milk porridge made from mashed cereals or baby food, homogenizing vegetables, milk soup, slime decoction on milk, jelly, non-acidic berry jelly, weak tea, rosehip decoction. Exclude substances that stimulate gastric secretion, hot and cold dishes, sour cream, plain cheese, bread, flour and confectionery products, raw fruits and berries, sauces, spices, coffee, cocoa, carbonated drinks.

The N1 diet is indicated after operations on the stomach as a transitional diet from the N1 diet to physiologically complete food. It is intended to reduce the inflammatory reaction and healing of the mucous membrane of the gastrointestinal tract by limiting thermal, chemical and mechanical stimuli.

In terms of chemical composition and energy value, this diet is physiological. Dishes are prepared mainly in pureed form, boiled in water or steamed, using low-fat varieties of meat and fish. It is allowed to use steam cutlets, batters, souffle, puree, filling in vegetable broth. From dairy products, we recommend non-acidic grated cheese, sour cream, mild cheese, dumplings, cheesecakes, semi-viscous porridge with milk, pudding, steamed scrambled eggs or an omelet. You can use dried wheat bread or yesterday's pastries, boiled potatoes, carrots, beets, pureed vegetable soups, sugar, honey, fresh ripe berries and fruits, weak cocoa, coffee with milk, fruit and berry juices. Hot and cold dishes, almost all sausage products, spicy and salty food, strong broths, smoked meats, sour and unripe berries and fruits, chocolate, ice cream, kvass, black coffee cannot be used.

Close to the N1 diet is the Meilengracht diet, which is used for bleeding from the upper parts of the gastrointestinal tract. The food has a puree-like consistency, contains an omelette, oatmeal, sour cream, mashed potatoes, egg whites, steam cutlets, as well as fresh bread. Together with medicines, these dishes suppress the acidic reaction of the stomach contents. Food temperature does not exceed 40°C.

Diet N5 is used for acute cholecystitis 3-7 days after the onset of the disease, 5-6 days after operations on the biliary tract and acute pancreatitis. Mechanically and chemically gentle food is used, which supports the functional peace of all digestive organs. Dishes are prepared boiled or pureed, served warm. Food is taken 5-6 times a day. To prepare dishes, lean meat and fish are used in the form of cutlet mass products, low-fat cheese, non-acidic sour cream and cheese. It is possible to use a steamed omelette, porridge with half milk and water, boiled vermicelli, wheat bread, cookies, mashed potatoes, milk jelly, mashed dried fruits, honey, sugar, tea with milk, lemon, sweet fruit and berry juices, tomato juice, rosehip decoction. Exclude from food products that are rich in extractive substances, coarse fiber, fatty and fried dishes, smoked meat, fresh and rye bread, butter and puff pastry, mushrooms, cold snacks, chocolate, ice cream, spices, cocoa, black coffee, carbonated and cold drinks.

The N9 diet is indicated for diabetes. It contributes to the normalization of carbohydrate metabolism. With this diet, the energy value is moderately reduced due to the reduced content of carbohydrates and fats in the food. Instead of sugar and sweets, substitutes and moderately limited table salt are used. Among the excluded products are fatty meat and fish, salty cheeses, rice, semolina and pasta, products made of butter and puff pastry, salted and pickled vegetables, grapes, raisins, bananas, sugar, honey, stew, candies, ice cream, sweet juices.

Diet N11 is prescribed when the body is exhausted after surgery or injury in the absence of diseases of the digestive system. It is aimed at increasing the body's defenses and improving the state of metabolism. The products used in this case contain an increased amount of proteins, vitamins, and minerals. Cooking and food temperature is normal. Feeding is carried out 5 times a day with the use of ordinary liquid up to 1.5 liters. The recommended list of products is very diverse, starting from meat and fish dishes and ending with various flour products. Exceptions are very fatty meat and poultry, mutton, beef and cooking fats, spicy and fatty sauces, cakes and pastries with a lot of cream.

The N15 diet is used for various diseases that do not require a special therapeutic nutritional regimen, as well as in the transition stage to regular nutrition after using other diets. It provides physiologically complete nutrition. Proteins, fats and carbohydrates are contained in the amount necessary for a healthy person who does not have physical exertion, and vitamins are in an increased amount. Temperature cheers for food, its culinary processing is ordinary. The amount of liquid is not limited. Food is consumed 4-5 times a day. Daily use of fermented milk products, fresh vegetables and fruits, juices, rosehip decoction is recommended. With this diet, restrictions apply to spices, fatty meats, beef, lamb, pork and cooking fats are excluded.

Literature

Main:

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PRACTICAL LESSON No. 16

Topic: Diet therapy for concomitant lung diseases

Purpose: To learn how to develop diet therapy for patients with concomitant lung diseases.

Basic concepts: lungs, diseases, COPD, diet, indications for COPD, concomitant lung diseases

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

What is COPD?

What is the basis of diet therapy for patients with COPD?

What foods are indicated for COPD?

What foods are contraindicated in COPD?

Formation of professional skills:

SUBJECT TEXT:

NUTRITION AND DIET FOR COPD

COPD is a chronic obstructive lung disease, which is characterized by a violation of the functions of the respiratory organs. This pathology is considered incurable. But with the right approach, it is possible to significantly improve the patient's quality of life and prolong it. Patients with COPD spend more energy on inhalation and exhalation than healthy people. With improper nutrition, the weight of such a patient can quickly decrease, leading to serious complications. Diet for COPD in elderly people weighs a lot, because the body of these patients is already excessively weakened. A diet plan is developed by a pulmonologist together with a nutritionist.

Frequency of meals

Patients with chronic lung diseases get tired quickly. Even when taking food, a person can feel tired and weak. In this case, doctors recommend not eating three times a day, but six times. But the portions in this case should be small. This way of eating has several advantages:

- The patient does not get tired while eating. Breathing remains absolutely normal.
- Small portions are absorbed faster by the body.

- Congestion in the digestive organs, which can worsen the course of respiratory pathologies, is excluded.
- The general well-being of the patient improves.

Food for COPD should be balanced. It is unacceptable to include semi-finished products and harmful products in the diet, which contain a lot of preservatives and dyes.

With pathologies of the respiratory organs, it is recommended to rest for about half an hour before each meal.

Breakfast:

Patients with pathology of the respiratory organs are very tired by the middle of the day. Therefore, with chronic obstructive pulmonary disease, the most important meal is breakfast. It is in the morning that the patient should eat enough caloric food. Do not forget that with COPD, a person should eat at least 30 grams of fiber per day, so you can start the morning with cereals and bread.

Oatmeal is a good option for breakfast. Such a product is especially relevant when the patient is overweight. Oatmeal can be cooked both in milk and in water. A little fresh berries or dried fruits are added to the finished product. It is undesirable for a patient to abuse sugar.

You can end the breakfast with a cup of hot tea with a sandwich made of bread, butter and cheese. In addition to tea, you can prepare a coffee drink from chicory.

By consuming foods rich in fiber, a person feels full after consuming very few calories.

Dinner

When choosing products for dinner, you need to take into account their nutritional value and benefits. For lunch, the patient should eat a small plate of fresh soup or borscht, as well as a piece of meat or fish with a side dish. Meat can be steamed or baked, and the same applies to fish.

Boiled vegetables or cereals can be used as a side dish. In small quantities, the patient can also eat pasta. The approximate menu for lunch looks like this:

- Soup with meatballs.
- Chicken meatballs with mashed potatoes and sauerkraut.
- Jelly made from natural berries.

There should always be bread on the table of a COPD patient. It is better to give preference to bran or rye. You should not abuse confectionery and pastry, as it contributes to weight gain.

The weight of people with pathologies of the respiratory organs should always be normal. When gaining extra pounds, it becomes very difficult for the patient to breathe.

Dinner

For dinner, you can eat dairy products and baked vegetables. You can prepare rice milk porridge, which is considered very nutritious and at the same time well absorbed. Along with such porridge, you can eat a piece of bran bread with butter and cheese.

Immediately before going to bed, it is useful to drink herbal tea with rose hips and mint. Such a drink fills the body with vitamins. Mint in tea promotes relaxation and improves sleep quality.

You should not eat meat or fish dishes for dinner. The stomach does not have time to digest these products before sleep, and stagnation occurs.

What is between the main meals

With adherence to diet therapy, the condition of a COPD patient improves significantly. It should be remembered that a full stomach puts some pressure on the respiratory organs, which can cause shortness of breath. In this regard, fractional nutrition is recommended for the patient.

Portions of main meals should not be too large. The patient should have a snack between breakfast, lunch and dinner. Snacks can consist of the following products:

- Sour milk products.
- Boiled meat with bread.
- egg
- Cheese casserole.
- Baked vegetables.
- Fresh fruits.

If a patient with COPD really wants sausages, it is allowed to make a small sandwich with this product a couple of times a week.

There should be a lot of fresh juices in the diet, not only from fruits and berries, but also from vegetables.

What foods are recommended for the patient to eat

The diet for COPD should include nutritious and useful products. All food must be freshly prepared, so it is advisable to prepare meals for a couple of meals.

The diet of a person with chronic obstructive pulmonary disease must include the following foods:

- Cheese — this product can increase the calorie content of any dish. Cheese contains a lot of calcium, which reduces bone fragility.
- Dairy products. It is useful for a person with COPD to drink several glasses of milk during the day.
- Eggs are a useful and nutritious product, but they should not be eaten raw, as you can get poisoned.
- Bananas - these fruits contain a lot of potassium, which supports the work of the heart. Potassium deficiency is especially noticeable in the elderly.

The patient is recommended to eat soup with peas and lentils, but these products should not be abused, as they increase gas formation.

A person with COPD is recommended to keep a food diary. It should note the body's reactions to this or that product. Thanks to observations, you can create an optimal diet.

What you need to give up

Medical nutrition should not contain a number of products that overload the stomach and can cause irritation of the respiratory organs. With chronic obstructive pulmonary disease, it is not recommended to use the following products:

- Coffee and other products that contain caffeine.
- Fried and smoked products.
- Too spicy and fatty dishes.
- Confectionery, which may contain dyes and preservatives.
- Semi-finished products of dubious quality.

- Canned products.
- Any carbonated drinks.

Patients with chronic obstructive pulmonary diseases should not consume a lot of salt. It is worth remembering that it is salt that contributes to fluid retention in the body, which leads to severe swelling and makes breathing even more difficult. You can replace salt with various seasonings, but in this case you should consult a nutritionist, as some seasonings are more harmful than salt.

With COPD, you should not use foods that contain too much salt. It is necessary that the amount of salt in one portion does not exceed 300 mg.

A patient with COPD should eat a lot of protein food. To fill this element in the body, you can not only eat a lot of dairy products, meat and eggs, but also add skimmed milk powder to drinks and dishes. People with chronic obstructive pulmonary disease should consume protein products with each meal. But do not forget about fiber, it should also be quite a lot in the diet.

PRACTICAL LESSON No. 17

Topic: Diseases of digestive organs and diet therapy

Purpose: To study the composition of certain types of dietary food for various diseases of the digestive organs

Basic concepts: gastrointestinal tract. Chemical composition of food. diet. Diet number 1. Diet No. 1a. Diet number 1. Diet number 2. Diet No. 3. Diet No. 4. Diet No. 4a. Diet No. 4b. Diet No. 4c

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

1. The most common diseases of the digestive system
2. The influence of food on the functions of the gastrointestinal tract
3. Chemical composition of food and diet
4. Diet No. 1 - for which diseases is it prescribed, and its composition?

5. Diet No. 1a - for which diseases is it prescribed, and its composition?
6. Diet No. 16 - for which diseases is it prescribed, and its composition?
7. Diet No. 2 – for which diseases is it prescribed, and its composition?
8. Diet No. 3 - for which diseases is it prescribed, and its composition?
9. Diet No. 4 – for which diseases is it prescribed, and its composition?
10. Diet No. 4a – for which diseases is it prescribed, and its composition?
11. Diet No. 4b – for which diseases is it prescribed, and its composition?
12. Diet N4c – for which diseases is it prescribed, and its composition?

Formation of professional skills:

SUBJECT TEXT:

The most common diseases of the digestive system

GASTRITIS. 50-80% of the entire adult population suffers from gastritis; with age, the probability of gastritis increases. •

STOMACH ULCER DISEASE. It is observed in 5-10% of the adult population; urban residents suffer from peptic ulcers more often than rural residents. •

GALLSTONE DISEASE. Up to 10% of the adult population of our country suffers from gallstone disease, and after the age of 70 it occurs in every third person. •

PANCREATITIS. The incidence of chronic pancreatitis averages 0.05% of the total population. •

COLON CANCER. Mortality from malignant neoplasms of the large intestine is about 2,500 people per year - this is 12% of the total number of deaths from cancer.

PREVENTIVE NUTRITION

Diet: often, but in smaller portions, mandatory breakfast, without skipping meals.

- Proper nutrition. Reducing the consumption of fatty, smoked, fried, salted food, smoked products, carbonated drinks. On the contrary, an increase in the proportion of fiber in the diet (cereals, bread with bran, vegetables, fruits), fresh salads, rough fiber food, the right combination of products.
- Moderation in food. You can't eat until you feel full. (Starving and overeating, a standard portion does not exceed 400 ml (300 ml for women) of food, if you imagine it in liquid form). Overeating contributes to the consumption of cooked and refined food. It is necessary to eat as much food as possible (mainly fruits and vegetables) in raw and minimally processed form.
- It is very important to observe seasonality in food. This means that certain foods should be eaten at certain times of the year. For example, in winter and autumn, you should eat more foods rich in proteins and fats. These primarily include legumes, whole grains, fresh vegetables and fruits, cabbage, pumpkin, greens. These products, firstly, serve as sources of minerals and vitamin C. Secondly, their proteins play an important role in the formation of healthy blood cells.

DIET #1

Indications: Peptic ulcer disease of the stomach and duodenum in the period of subsidence of exacerbation and at least six months after it, mild exacerbation of chronic gastritis with preserved and increased secretion, acute gastritis in the period of exacerbation.

- Cooking technology: Food should be boiled in water or steamed, rubbed, and fish and meat can be eaten in pieces if the teeth are preserved. Bake separate dishes, but without a crust. Take food 4-5 times a day at the same hours. Avoid very hot and cold foods.

Food is prepared in boiled or steamed form, liquid or mushy;

- Frequency of meals - 6 times a day.
- Meals are prepared for patients in the form of mucous decoctions from cereals, steamed soufflés, meatballs, cutlets from meat and fish (without onions), liquid porridge, jelly, milk, cream, cheese

List of recommended products and dishes:

- Stale white wheat bread, mucilage soups with the addition of pureed boiled vegetables and cereals, egg-milk mixture, cream, low-fat varieties of meat, poultry, fish, cleaned of fascia, tendons, skin, steamed or boiled in water, it is possible with further baking in the oven;
- Vegetables in boiled and pureed form (puree, steamed souffle) - potatoes, zucchini, pumpkin, carrots, beets, cauliflower, if tolerated in a small amount, green peas, ripe tomatoes (up to 100 g per day); grated porridge (except millet) with the addition of milk, cream; mashed steamed puddings, boiled vermicelli and noodles;
- Eggs, steam omelets, dishes made from beaten egg whites (snowballs, meringues);
- Tarts, jellies, mousses, pureed compotes from sweet varieties of berries and fruits (fresh and dried), baked apples and pears.

The following are EXCLUDED from the diet of a patient with this pathology:

- ☒ pickling, smoking, marinades, fried food, canned food, meat and fish broths, carbonated drinks, vegetable broths;
- ☒ seasonings (pepper, onion, etc.), cucumbers, cabbage, gooseberries, currants, lean meat (that is, products that contain a large amount of coarse fiber and are slowly evacuated from the stomach).

DIET No. 1A

Indications: Exacerbation of peptic ulcer disease and chronic gastritis with increased acidity.

Storage:

- Milk (4-5 glasses), mucilaginous cereals, such as semolina, milk or wheat bran soups with butter.
- Steamed soufflés from lean types of fish and meat.
- Liquid, pureed, milk porridges.
- Soft-boiled eggs (2-3 times a day) or in the form of steam omelets. Unsalted cream (70-80 g per day) or olive oil (add to dishes), cream. • Sour berries, fruit (non-acid) and milk.
- Drinks - carrot, fruit juices, rosehip decoction, weak tea with milk (sugar up to 50 g per day).

- Limit table salt to 5-8 g (including 3-5 g of salt). No more than 1.5 liters of free liquid. Taking food (warm) in bed every 2-3 hours in liquid and semi-liquid form.
- If milk is poorly tolerated, it is recommended to give it in small quantities, diluting it with weak tea.

DIET #16

Indications: Alleviation of peptic ulcer exacerbation and chronic gastritis with increased acidity.

Storage:

- Milk (4-5 glasses), mucilaginous cereals, such as semolina, milk or wheat bran soups with butter.
- Liquid, pureed, milk porridge.
- Soft-boiled eggs (2-3 times a day) or in the form of steam omelets.
- Steamed soufflés and cutlets from lean types of fish and meat.
- Unsalted cream (70-80 g per day) or olive oil (add to dishes), cream. - Sour berries, fruit (non-acid) and milk.
- Drinks - carrot, fruit juices, rosehip decoction, weak tea with milk (sugar up to 50 g per day).
- Soups - pureed milk from rice, barley, pearl barley with pureed vegetables.
- Wheat crackers up to 100 g.
- Table salt is limited to 8 g.
- Six meals a day in semi-liquid and pureed form.

DIET #2

Indications: Chronic gastritis with or without secretory insufficiency, chronic colitis (except for exacerbation).

Recommended:

- Bread products. White and gray wheat bread of yesterday's baking, butter varieties of bakery products and cookies, dry biscuit.
- Milk and dairy products. Milk or cream with tea and other drinks and as part of various dishes, dry milk in drinks and dishes, sour milk, kefir, acidophilic milk and other sour milk drinks, fresh cheese in its natural form and in dishes (souffle, pudding, cheesecakes, dumplings) , grated cheese, sour cream up to 25 g per dish.
- Meat and fish dishes. Various products in the form of cutlets from lean beef, veal, pork, lamb, poultry, chopped fish products can be fried without breading with breadcrumbs, meat and fish can be boiled in pieces.
- Cereal and pasta products. Mashed porridge, semi-viscous, baked puddings, cutlets made of groats, fried so that a rough crust does not form, chopped macaroni, finely boiled, boiled vermicelli, porridge is cooked in water or with the addition of milk.

The following are excluded:

- Products from warm buttery dough, fried meat and fish salted in breadcrumbs, fatty varieties of meat and fish, salting, smoking, marinades, meat and fish, etc. Canned snacks, cold drinks, ice cream, lard and cooking fats, mustard, horseradish, chocolate, cream products, figs, dates, berries with coarse grains (raspberries, red currants) or coarse skins (gooseberries), grape juice, kvass, onions, radish, radish, cucumbers, rutabaga, garlic, mushrooms, sweet pepper,
- Meals five times a day at the same time, mostly in pureed form.

DIET #3

Purpose: for constipation

A delay in bowel movement for more than 32-48 hours, accompanied by difficulty in the act of defecation, is considered as constipation. Functional constipation is usually associated with a violation of the formation and promotion of intestinal contents (alimentary constipation).

Basic principles of medical nutrition for constipation

Food for constipation should be balanced, aimed at improving intestinal transit.

The qualitative and quantitative content of proteins should correspond to age needs, the abuse of proteins leads to the formation of dense fecal masses, the transit of which is disturbed.

An excess of fats leads to the formation of a large number of alkaline earth soaps, which, due to their insolubility, cause compaction of the intestinal contents, which also leads to constipation.

☒ The amount of easily digestible, refined carbohydrates should be limited.

☒ Foods should be included in the diet:

- contain fiber,
- pectin substances,
- have a detoxifying effect,
- suppress putrefactive flora in the intestines,
- stimulate peristalsis.

☒ Insufficient fluid intake can be the cause of chronic constipation. ☒ Normally, feces should contain at least 72% water. Reduction of water content in it to 60-40%; causes persistent constipation, coprostasis develops at 25% water.

☒ In order to revive the motor function of the intestines, it is recommended to take cool (room temperature) liquids on an empty stomach (boiled water, juices, ompots) 1/3-1 cup depending on age

The basis of the treatment of chronic constipation, the cause of which is the alimentary factor, is the correction of nutrition. Foods that delay bowel movements are excluded from the diet of patients of any age: strong tea, natural coffee, cocoa, chocolate, pomegranate, dogwood, pears, as well as mucous soups, rice, semolina, flour products (white bread, pies, pancakes, cookies, pasta). Products that cause increased gas formation (legumes, sorrel, spinach, grape juice) are not recommended.

In case of alimentary constipation, it is necessary to include vegetables and fruits rich in vegetable fiber in the diet: cabbage (fresh and pickled), carrots, turnips, rutabagas, beets, pumpkins, zucchini, squash, plums, apples, peaches, apricots, melons, tomatoes, cucumbers, dried fruits (prunes, figs, dried apricots). It is

recommended to use a mixture of dried fruits: 250 g of prunes, 250 g of dried apricots, 250 g of figs. Pass the pure fruit through a meat grinder, add 100 g of honey to the mixture. Use from 1 teaspoon to 1 tablespoon, depending on age, 2-3 times a day.

A good effect is given by regular intake of lactic acid products: kefir, sour cream, acidophilin, buttermilk, kumis. These products contain many organic acids that stimulate the activity of the intestines. Moderate consumption of sour cream and cream is allowed. It is better to use vegetable oils before meals for 1 teaspoon 3 times a day or add to salads and vinaigrettes

DIET #3

Purpose: for constipation

Storage:

Cereal and pasta products, legumes. Loose and semi-viscous cereals, puddings, casseroles.

- Pasta products are boiled and in the form of casseroles, buckwheat dishes are especially recommended.
- From legumes - green peas, soy.
- Eggs. No more than one egg per day, preferably only in dishes
- Fats. Butter, vegetable oils for dishes.
- Soups. Mostly from vegetables in meat broth, cold fruit and vegetable soups, borscht, borscht, shchi from fresh cabbage.
- Snacks. Salads from raw vegetables, vinaigrettes with vegetable oil, vegetable caviar, fruit salads, mild cheese, low-fat ham, soaked herring, marinated meat and fish.
- Sauces. Milk, sour cream, vegetable broth, fruit and berry sauces. Vegetables and greens. Various types of vegetables and greens, non-acidic sauerkraut, beets are especially recommended.
- Fruits and berries, sweet dishes and products. We recommend melons, plums, figs, apricots, prunes, sugar, jam, especially rowan jam, honey, compotes (especially rhubarb), mousses, fruit candies.
- Juices. Fruit and vegetable (from plums, apricots, carrots, tomatoes).
- Drinks. Tea, coffee from substitutes, broth from rose hips and wheat bran.

The following are excluded:

- Bread made from high-grade flour, puff and butter dough, fatty meat and fish, duck, goose, smoked meat and fish, canned fish and meat, hard-boiled and fried eggs (limit rice and semolina), radish, radish, garlic, onion, turnip, mushrooms, jelly, blueberries, quince, dogwood, chocolate, products with cream, hot and fatty sauces, horseradish, mustard, pepper, cocoa, black coffee, strong tea, animal and culinary fats, alcohol. With spastic constipation associated with increased motor excitability of the intestines, sharply limit products rich in vegetable fiber (a little vegetables - boiled and raw mashed) are acceptable.

DIET #4

Purpose: Acute diseases and sharp exacerbation of chronic intestinal diseases with severe diarrhea

Since frequent bowel movements deprive the body of vital elements, it is necessary to restore their balance. Diet therapy. Limitation of products that cause mechanical and chemical irritation of the mucous

membrane, that increase the processes of fermentation and decay - cabbage, cucumbers, legumes, beets, tomatoes, cucumbers.

Excluded: fried, smoked, marinated products. Since intestinal infections are often accompanied by secondary lactase deficiency (temporary intolerance to milk protein), whole milk is excluded from the diet during the acute period.

Meals include porridge on the water (from rice, buckwheat groats). Decoctions of dry and fresh apples, blueberries, cherries are allowed. Infants should be fed more often, but in small portions: on the first day of treatment, reduce the amount of food by no more than 50% and increase the frequency of feedings to 8-10 times a day. Within 4-5 days, the age-old amount of nutrition should be restored.

Cooking technology: Dishes are liquid and semi-liquid, pureed, boiled in water and steamed. It is normal to salt food. Recommended: Bread products. White and gray wheat bread from yesterday's baking, buttery varieties of bakery products and cookies, white croutons from a loaf. Milk and dairy products. Milk and dairy products - low-fat freshly prepared cheese, steamed soufflé, three-day kefir, acidophilic milk, sour cream in a small amount as a seasoning. Meat and fish dishes. Various products made from lean beef, veal, lean fish, passed through a meat grinder, are best steamed, DO NOT crumble into breadcrumbs when fried, boiled meat soufflé, minced meat. Cereal and pasta products. Mashed porridge in water or fat-free broth - rice, oatmeal, gr chan, from groat flour, in the form of baked puddings and cutlets from groats without a coarse crust, boiled pasta and vermicelli.

Eggs Boiled eggs up to one a day, omelets and Fats in dishes. Fresh butter 5 grams per dish, melted, olive. Soups On defatted weak meat and fish broth with the addition of mucilaginous decoctions of cereals (semolina, rice), boiled and mashed meat, steamed dumplings and meatballs, egg flakes, homemade noodles, vermicelli.

Appetizer. Mild cheese, low-fat herring, homemade meat pate. Vegetables and greens. Puree from various vegetables, puddings, vegetable cutlets, baked or fried without a rough crust, boiled cauliflower with butter, early zucchini, stewed pumpkin. Add finely chopped early greens (dill and parsley) to various dishes.

Fruits and berries, sweet dishes and products. Purees, jellies, mousses, jams from fresh and dry fruits and berries. Sugar, candies.

Juices Raw fruit, berry and vegetable juices, warm, half diluted with water or tea, in limited quantities. Decoction of rose hips and wheat bran.

Drinks Tea without milk, cocoa on water with a small amount of milk. Excluded: Buttery and warm dough products, fatty varieties of meat and fish, salting, smoking, marinades, canned meat, fish and other snacks, sausages, cold drinks, ice cream, vegetables and fruits in their natural form, millet, pearl barley, barley groats, coffee with milk, carbonated drinks, mustard, horseradish, pepper, mushrooms, chocolate, products with cream, legumes.

It is recommended to eat four times a day, at the same times

DIET N 4A

Indications: Colitis with predominance of fermentation processes.

Ingredients: Strong tea, cocoa, strong coffee on water, stale white breadcrumbs, grated fresh cheese, one egg a day, slimy soups on water, mashed rice, semolina porridge on water, boiled meat, fish, steamed in chopped form with adding rice to the minced meat instead of bread, low-fat three-day kefir, decoction of dried black currants, blueberries, jelly, blueberry jelly. Increase the content of proteins due to meat dishes, grated cheese and other products containing proteins.

Strictly limit: products and dishes containing a large amount of carbohydrates (cereals; bread no more than 100 g per day; sugar no more than 20 g per day).

DIET No. 4B

Indications: Chronic colitis in the stage of fading exacerbation

Ingredients: white bread, baked yesterday, butterless cookies, dry biscuit; Cereal soups on a weak fish or meat broth, broth with meatballs, pureed cereals, except for millet, on water with the addition of 1/3 milk, boiled and steamed vegetables, mild cheese, sour cream, kefir, sour milk, compotes, jelly made from sweet berries, pureed fruit, tea, coffee with milk, butter (to be added to ready meals); table salt 8-10 g

It is recommended to eat food 4-6 times a day in warm form

DIET N4B

Indications: Acute intestinal diseases during the recovery period as a transition to rational nutrition; chronic intestinal diseases in the period of attenuation of the exacerbation, as well as outside the exacerbation with accompanying impressions of other digestive organs.

Cooking technology: Dishes are prepared unground, steamed, boiled in water or baked.

Chemical composition and energy value of the daily diet: proteins - 100-120 g (60% animal), fats - 100 g (15-20% vegetable), carbohydrates - 400-420 g, table salt - 10 g, free liquid - 1, 5 l; ? calorie content - 2900-3000 kcal. • Composition: the diet is designed to provide adequate nutrition in case of some insufficiency of intestinal function, which will help to restore the activity of other digestive organs. This is a physiologically complete diet with a slight increase in protein content and a moderate restriction of table salt, mechanical and chemical irritants of the intestine, which excludes products and dishes that increase fermentation and putrefaction in the intestine, sharply increase its secretory and motor functions, secretion of the stomach, pancreas, bile secretion

It is recommended to eat 5 times a day

Literature

Main:

1. Hygiene and ecology // textbook for students of higher medical educational institutions in English. /edited by V.G. Bardova – Vinnytsia: NovaKnyga, 2018.
2. Environmental Health: from Global to Local \ Under Howard Frumkin edition – Third edition. - San Francisco, 2016

Additional:

3. General hygiene. Hygiene propaedeutics/Textbook for foreign students. / E.I. Honcharuk, Yu.I. Kundiev, V.G. bardo otter - K.: Higher school, 2000.
4. Korobchanskiy V.A. Hygiene and Ecology \ Korobchanskiy V.A., Vorontsov V.P., Musulbas A.A. - Kharkov, 2006

PRACTICAL LESSON No. 18

Topic: Nutrition of pregnant and lactating women

Purpose: To acquaint applicants with the peculiarities of dietary nutrition for pregnant and lactating women

Basic concepts: nutrition, pregnant women, nursing women, rational nutrition, complete nutrition, fetal development, pregnant women's menu, nursing menu

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

What are the peculiarities of nutrition in pregnant women?

What are the peculiarities of nutrition in nursing mothers?

Peculiarities of nutrition in the first trimester of pregnancy

Peculiarities of nutrition in II-III trimesters of pregnancy

Special restrictions in the diet of pregnant and lactating women

Food allergies in pregnant and lactating women

Formation of professional skills:

SUBJECT TEXT:

Full nutrition of future parents under conditions of moderate physical exertion and rejection of bad habits creates a positive metabolic background for ovulation, fertilization and implantation, the physiological course of pregnancy and the birth of a healthy child. Daily provision of the female body with an adequate amount of macronutrients (proteins, fats and carbohydrates - 1:1:3) and micronutrients (vitamins, minerals, phytonutrients) allows efficient functioning not only of the reproductive system, but also provides energy, vitamins and trace elements to other systems that are a necessary condition for the full development of the fetus.

Rational nutrition is one of the most important conditions for a favorable course of pregnancy, childbirth, and fetal development. It plays an important role in the prevention of anemia, delayed fetal development, and birth defects.

The diet should not be monotonous or consist of unusual products, as this can lead to loss of appetite, which significantly affects the absorption of food. For this reason, it is important that the dish is tasty. If the concentration of minerals, vitamins and other elements in the mother's body is insufficient, the fetus will experience their deficiency.

During pregnancy, the total weight gain of a woman is 8-12 kg. These indicators are individual for each pregnant woman, but it is important to monitor your weight. Excessive or insufficient weight of a woman can lead to abnormalities in the development of the fetus. In the second half of pregnancy, a woman's weight gain should not exceed 250-300 times a week. An increase in the body weight of a pregnant woman occurs due to the growth of the fetus (3.5 kg), the placenta (650 g), an increase in the weight of the uterus (970 g), amniotic fluid (800 g), mammary glands (400-700 g), an increase in the volume of circulating blood (1450 ml), extracellular fluid (1480 g), adipose tissue (2360 g).

The first half of pregnancy: nutritional features

In the first half of pregnancy, a woman's diet should not differ significantly from her diet before pregnancy. In the first 12 weeks of pregnancy, it is important to have enough proteins, vitamins, and minerals in the pregnant woman's body.

Starting from the early stages and during the first half of pregnancy, the caloric content of the daily diet (depending on the woman's height and body weight) should correspond to 2000-3000 kcal. The daily diet of the first trimester of pregnancy should include: 110 grams of fat, 75 grams of fat and 350 carbohydrates, with a total calorie content of 2500-2700 kcal.

The main source of protein is cooked meat. Poultry, fish, eggs, legumes, nuts, and seeds are also rich sources of protein. Every day you need to eat cheese, sour cream, cottage cheese, milk. 50% of the total amount of proteins should be proteins of animal origin. Proteins are used almost exclusively for the formation of fetal tissues. Out of every three grams of protein eaten by a pregnant woman, one gram is used to build the tissues of the fetus.

Fats also serve as a source of energy, participate in the formation of prostaglandins - substances that affect the work of the cardiovascular system, digestive system, and reproductive activity. Most fats are found in vegetable oils. A pregnant woman's diet should contain 40% vegetable fats. From animal fats, cow butter is recommended.

Carbohydrates are the main source of energy in the body, used in metabolism. With a lack of carbohydrates, proteins begin to be used as a source of energy. Consequently, less of them reaches the fetus, its development deteriorates, the body's resistance decreases, and the work of the nervous system deteriorates. Carbohydrates are obtained from foods rich in fiber: bread, fruits, vegetables. The amount of sugar in the diet should be 40-50 grams per day.

In this period, the most rational mode of four meals a day.

Sample menu of a pregnant woman in the first half of pregnancy:

The first breakfast (900 - 30% of the daily ration): milk porridge with butter or boiled egg (scrambled eggs), bread with butter and cheese, tea or coffee with milk.

Second breakfast (1200 - 20% of the daily ration): cheese with sour cream, fruit, tea.

Lunch (1500 - 40% of the daily ration): salad or vinaigrette, vermicelli soup on chicken broth, boiled chicken with rice and stewed carrots, fresh or dried fruit compote.

Dinner (1900 - 10% of the daily ration): boiled or fried fish with mashed potatoes, salad from beets with prunes, tea with cookies or waffles.

At night: a glass of kefir, sour milk, ryazhenka or yogurt.

Between meals - fresh vegetables and fruits, light dairy desserts, kefir, yogurt.

Nutrition in the II and III trimesters of pregnancy

In the II and III trimesters of pregnancy, the daily diet should be approximately 2,800-3,000 kcal per day and include: 120 grams of fat, 85 grams of fat, and 400 carbohydrates. At this time, overeating should not be allowed, the amount of food eaten should be monitored. It is necessary to eat 5-6 times a day. Foods rich in proteins cause an increase in metabolism, remain in the stomach for a long time, and increase the tone of the nervous system. In this regard, meat, fish, cereals should be part of the breakfast and lunch menu.

It is recommended to eat dairy products for dinner. The share of milk and lactic acid products should be 0.8-1 l. This amount is able to provide the body of a pregnant woman with phosphorus and calcium. It is recommended to replace butter with sour cream.

Protein is found in products of animal and plant origin. The diet should include 60% of protein of animal origin (fish, meat - 30%, dairy products - 25%, eggs - 5%) and 40% - of plant origin (bread, cereals, vegetables, fruits). It is better to use meat and fish dishes in combination with sweet and sour sauces. The amount of lean meat per day should be approximately - 120 - 200 g, fish - 150 - 260 g (up to 2 grams of protein and 1.5 g of fat per 1 kg of body weight, and up to 2 grams of calcium per day). It is better to consume animal proteins in the first half of the day, and dairy products in the afternoon. Milk, kefir, cottage cheese, mild cheese, boiled lean meat, fish contain complete, easily digestible proteins, essential amino acids, which are in optimal ratios.

You don't need to fry anything: meat and fish are better digested in a grated form (meatballs, meatballs, pates, souffles). Eggs contain balanced amino acids, cholesterol, lecithin. These substances are necessary for the normal functioning of cells, assimilation of fat-soluble vitamins A, D, E, K, prevention of liver and nervous system disorders.

Consumption of vegetable fats (sunflower, olive, corn oil) containing unsaturated fatty acids and vitamin E is recommended up to 40% (25-30 g) of their total amount. There should be a preventive dose of omega-3 fatty acids (1-2 g a day - linseed oil, sea fish, walnuts), which are responsible for the normal formation of the child's brain and have anti-inflammatory properties. Of the animal fats, butter and sour cream are preferred. Refractory lamb and beef lard, as well as some other types of animal fats and margarine are excluded from the diet

Fats protect cells from viruses and bacteria, inflammation and mutations, help absorb vitamins A, D, E, calcium and magnesium. In their composition, they contain phospholipids and lecithin, which are responsible for the correct formation of the child's nervous system.

The need for carbohydrates (350-450 g) is met by foods rich in fiber, vitamins, mineral salts, trace elements (wholemeal bread, vegetables, fruits, berries, honey, cereals).

During pregnancy, 80% of women experience constipation and diarrhea. The main causes of digestion deterioration during pregnancy are dysbacteriosis, compression of the abdominal organs due to the increase in the size of the pregnant uterus, and the action of the pregnancy hormone progesterone. Laxatives should not be used when constipation occurs. This problem should be solved only with the help of diet. Women are recommended to drink sour milk (200 ml) at night, eat fruits and raw (stewed, baked) vegetables (carrots, prunes, apples) and juices from them on an empty stomach in the morning, and have breakfast 20-30 minutes later. Daily consumption of 30 grams (2 teaspoons) of bran will help the intestines to get rid of all the excess. Taking one glass of boiled water on an empty stomach also contributes to normal stool.

From the 32nd week of pregnancy, a woman's physical activity decreases, and the caloric content of food must be reduced, but not at the expense of protein. Reducing the caloric content of food due to protein leads to asthenia of the woman, hypotrophy of the fetus and delay in intrauterine development of the fetus.

Dishes containing extractive substances (broths, spices, smoked meats), salty and spicy food (pepper, mustard, vinegar, horseradish) should be excluded. The intake of table salt is limited to 6 grams per day.

Fluid intake (water, soups, compotes, tea) is not limited. For each kilogram of body weight, 40 ml of liquid should be consumed per day. This does not mean that every day you need to drink 2.5-3 liters of water in its pure form. We get half of this volume of liquid with food, vegetables, and fruits, which consist of 80–95% water. Juices (apple, plum, tomato), compotes from dried fruits and jelly from fresh frozen berries are recommended. The amount of sugar should not exceed 40-50 grams per day. It can be replaced with bee honey (at the rate of 1.25 g of honey instead of 1 g of sugar).

About 50% of diseases develop due to a lack of water in the body, including joint inflammation, kidney stones, skin peeling, and others. Lack of fluid contributes to premature birth, so it is necessary to ensure its sufficient intake with food and drinking water. The lack of fluid is indicated by the pronounced smell of morning urine, the unbearable smell of sweat, a feeling of fatigue, irritability, loss of working capacity, headache and muscle spasms.

Special restrictions

In the second half of pregnancy, it is especially important to limit as much sweets, products containing tartrazine (colored carbonated and sweet drinks, smoked products, colored creams, chewing gum and chewing candies, caramel), hot sauces, spices and seasonings, horseradish, pepper, mustard, canned food, vinegar, strong black tea and strong coffee. The use of alcoholic beverages, beer, vinegar, and smoking is strictly prohibited due to their rapid penetration through the placenta and negative impact on the formation of the fetus. Each cigarette makes its "contribution" to the development of fetal hypotrophy. The more cigarettes, the stronger the hypotrophy.

Drinking strong coffee and tea can have a negative effect on the health of the fetus, it causes stress, and caffeine causes significant changes in its functioning, the development of addiction. The relationship between coffee consumption and low birth weight and miscarriage cases was also revealed. You should stop drinking coffee or strong tea gradually, not suddenly. Abruptly stopping the supply of these substances causes negative consequences, causes the emergence of a stressful state. In addition, tea and coffee have a diuretic effect, so you cannot put an "equals" sign between a glass of water and a glass of tea. Drinking tea that is not strongly brewed is quite acceptable. You need to drink plain clean or filtered water.

Vitamins are essential nutrients.

Vitamin molecules play the same role in all forms of life. It should be borne in mind that nicotinic acid, vitamin D, biotin, vitamin K, folic acid are synthesized in insufficient quantities and a person must receive them with food.

Vitamins have exceptionally high biological activity and are needed by the body in very small amounts (from a few micrograms to tens of milligrams). Unlike other essential nutrients (essential amino acids, polyunsaturated fatty acids), vitamins are not a building material or a source of energy and participate in metabolism mainly as biocatalysts and regulators.

The need for vitamins in pregnant women increases by 2 times and is satisfied by products of vegetable and animal origin (wholemeal bread, cereals, vegetables, legumes, berries, fruits, meat, dairy products).

Meat and meat products are an important source of vitamin B1, B2, B6, B12; milk and dairy products supply the body with vitamins: A (up to 50% of the daily requirement), vitamin B2, vegetable oils (vitamin E), animal fats (vitamins A, D).

Foods rich in vitamin A are eggs, beef liver and cod liver, and red, yellow, orange, green vegetables and fruits are rich in carotene.

Fresh vegetables, fruits, and natural juices are a source of vitamins C, K, carotenoids, and folic acid. In addition, the bioavailability of various vitamins from various products ranges from 5 to 80% of their total

content. The cause of hypovitaminosis is the high consumption of refined, but vitamin-poor food products (white bread, pasta and confectionery, sugar), irrational nutrition (national characteristics, religious prohibitions, vegetarianism, diets, monotony in the choice of products).

Additional intake of 400 µg of folic acid (folate) by pregnant women reduces the frequency of premature babies by 50%, the occurrence of neural tube defects to a minimum, the frequency of heart and blood vessel anomalies by 2 times, urinary system, limbs and esophagus by 4-5 times. The maximum amount of it is contained in beans, peas, lentils, but in order for these products to be well absorbed, they need to be pre-soaked, boiled well and consumed in a mashed form.

Iron during pregnancy requires 120-150 mg per day. Food sources of iron are meat and liver. But if hemoglobin is less than 100 g/l, it is necessary to take iron preparations.

Iodine deficiency leads to a violation of the formation of thyroid hormones and causes a violation of its formation in the fetus, and a decrease in its function subsequently leads to dementia. Therefore, additional intake of multivitamins, trace elements and minerals is necessary.

Calcium is responsible for the formation of the child's skeleton, the condition of his bones and teeth. A pregnant woman gets it from milk, fermented milk products and fish. The daily need for calcium is 1200 mg.

Multivitamins should be taken throughout pregnancy, and both spouses should start taking them a few months before the planned conception of the child.

A properly selected diet will help you bear and give birth to a healthy and strong child. Unbalanced nutrition is associated with defects in the cellular immunity system (insufficiency of phagocytic cells and T-lymphocytes), with a low level of formed antibodies to viruses, and hypovitaminosis leads to impaired differentiation of lymphocytes, inhibition of DNA and protein synthesis in the child's lymphoid apparatus, and subsequently contributes to the manifestation in a child with immunodeficiency conditions.

Rational nutrition is nourishing her mother

Rational nutrition is important for a nursing mother, as a child receives substances necessary for its development with mother's milk. Their first breakfast should be hearty, the second should be light, lunch should be plentiful, and dinner should not be too burdensome. The energy value of the diet should be 3500-4000 kcal, protein -130 g, fat -130 g, carbohydrates -500 g per day. This need can be satisfied with the daily intake of 50 g syru, 180 -200 g myasa, 50 g masla, 20 g syru, 3 glasses of milk, 1 egg, 500 g hliba, 800 g syru vegetables (fruits, greens, berries for the purpose of vitaminizing the body), 25 - 30 grams of vegetable oil.

Liquid consumption should be no more than two liters per day, including milk, tea, soups. To increase the secretion of milk, it is recommended to consume a small amount of easily digestible carbohydrates - fruits, berries, sweet tea with honey - 30 minutes before feeding.

A sample of the daily menu of a pregnant woman in the second half of pregnancy, while breastfeeding:

The first breakfast (700 - 30% of the daily ration): omelette, fresh cabbage salad with greens, green tea with lemon and a spoonful of honey.

Second breakfast (1100– 15% of the daily ration): coffee with sugar and milk, a piece of whole grain bread, low-fat cottage cheese with walnuts and flax seeds, berries.

Lunch (1400 - 40% of the daily ration): soup with various vegetables, steamed chicken cutlets, buckwheat, green vegetable salad with olive oil, fruit or berries.

Breakfast (5% of the daily ration): cheese casserole with sour cream, fruit juice.

Dinner (1900 - 10% of the daily ration): boiled fish, puree of boiled vegetables with greens.

You can drink a glass of kefir 2-3 hours before bedtime (5% of the daily ration).

Between meals - fresh vegetables and fruits, light dairy desserts, kefir, yogurt.

It is useful to consume products containing inulin, which improves the composition of intestinal microflora and strengthens immunity: Jerusalem artichoke, chicory (leaves, roots, coffee drink), garlic, onions (in small quantities).

When they talk about replenishment in the family, thoughts about the birth of offspring with good health come to mind, which leads to a certain association: in order to build a strong house, only high-quality building materials are chosen. Our building materials are our food, the strength of our health and the health of our children depends on it.

Literature

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PRACTICAL LESSON No. 19

Topic: Food allergy and intolerance of some food components

Purpose: To acquaint applicants with the types and causes of the development of food allergies and food intolerances to certain food components, as well as methods of combating them

Basic concepts: allergy, food products, food intolerance, provocateur products, FODMAPs

Equipment: Laptop, projector

Plan:

Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

Control of the reference level of knowledge:

Question:

The concept of food allergy. Causes and symptoms

The concept of food intolerance. Causes and symptoms

What are FODMAPs? What components are included in them

What are provocative products. Examples

Formation of professional skills:

SUBJECT TEXT:

FOOD ALLERGY OR FOOD INTOLERANCE

Most people get not only energy from food, but also pleasure. However, there are also those for whom some products are on the black list. In recent years, complaints about both food allergies and food intolerance have been increasingly recorded in both children and adults.

These pathological conditions are characteristic of both children and adults and are rapidly spreading throughout the world. With food intolerance, unlike food allergy, there are no changes in the immune system, and the reasons for the development of the reaction are often associated with the presence of various concomitant diseases in a person, most often the stomach, liver, and less often the nervous and endocrine systems. In addition, food allergy (FA) persists throughout a person's life, and food intolerance (or food hypersensitivity) can disappear after the problems that provoked it are resolved. HA has a more severe course, the pathological reaction occurs faster - within an hour after eating. As a rule, HA is combined with skin, gastroenterological manifestations, respiratory disorders. Peanuts, hazelnuts, eggs, milk, fish, shellfish are considered the most aggressive food allergens. It has been proven that HA, which is the first link of the atopic march in children, is observed already in the first months of life. Currently, food allergy has been laboratory confirmed in 1-2% of adults and 5-8% of children in the world.

Making a diagnosis of food intolerance is much more difficult than a diagnosis of food allergy. However, according to various sources, it is observed in 45% of the population, that is, almost every second person. As for our country, we do not have accurate statistics, but the problem, according to doctors' observations, has a significant scale.

Food intolerance: symptoms, diagnosis, provocative products

The concept of food intolerance is much broader than HA and occurs much more often. It is often caused not only by classic food allergies, but can be related to pathologies of the digestive tract, impaired functioning of enzymes (enzymopathies), be provoked by psychogenic factors, food products and their individual components. It often manifests itself from the first sample of the product. The reaction is dose-dependent and always related to the amount consumed.

Food hypersensitivity is not always easy to diagnose. The problem is further complicated by the fact that we have stopped eating simple food, and intolerance can occur to individual components of the meal. As a rule, these are products of deep processing. Therefore, both adults and children with such problems need to keep a food diary, which will allow the doctor to conduct a nutrition analysis and draw up a further plan of action.

The course of food intolerance often resembles irritable bowel syndrome. Most often, patients complain and pay attention to the appearance of the following symptoms:

- flatulence;
- bloating;
- intoxication;
- headache;
- increased fatigue;
- bad mood;
- weight gain.

That is, the symptoms are not specific, but they should suggest the presence of food intolerance.

Most often, food intolerance is caused by products that contain gluten, and the use of fruits, vegetables, and milk can also cause a pathological reaction.

If there is a suspicion of gluten intolerance, it is necessary to conduct a study for the presence of antibodies to tissue transglutaminase IgA and IgG. Only by excluding celiac disease and allergies, for example, to wheat, while maintaining a reaction to gluten-containing products, can we talk about gluten intolerance without celiac disease.

Carbohydrate intolerance is very often the basis of food intolerance due to impaired absorption. Carbohydrates that can cause a pathological reaction are combined in the FODMAPs group.

Sources of FODMAPs:

- Free fructose: apples, cherries, mangoes, pears, watermelon, asparagus, artichokes, peas, honey.
- Lactose: milk, yogurt, ice cream, soft cheeses, custard.
- Fructans: peach, persimmon, watermelon, artichoke, fennel, garlic, wheat, pistachios, legumes, chickpeas, inulin.
- Galacto-oligosaccharides: legumes, chickpeas.
- Polyols: apple, apricot, pear, avocado, broccoli, mushrooms, sorbitol, mannitol.

By adding FODMAPs components of the diet to the basic diet, it is possible to determine what causes a pathological reaction and carry out differential diagnosis.

It is most difficult to diagnose a reaction to individual components and food products. Most often, pathological symptoms are caused by salicylates, which are found in avocados, cherries, citrus fruits, kiwi, pineapples, pickled vegetables, mushrooms, greens, spices, breakfast cereals, milk and yogurt with the taste of banana, strawberries, chocolate, smoked sausages. Amines included in avocados, red and black currants, breakfast cereals, muesli, cakes, brie cheese, parmesan, surimi, soy sauce, smoked meat products, jams, marmalades can also provoke a painful reaction. As well as glutamates, which are often added to smoked meats and pates, breakfast cereals, muesli, bread, potato chips, strawberry and chocolate-flavored milk and yogurts, bouillon cubes.

The diagnosis of food intolerance (hypersensitivity) is made all over the world by means of a provocative test. The doctor's action algorithm for food intolerance complaints should be as shown in the diagram.

Food allergy: areas of special attention

We are used to talking about food allergy as a disease that has skin or respiratory manifestations. And very rarely do we say that products can cause allergic inflammation in the gastrointestinal tract. But do not forget that XA is considered a systemic pathology.

The prevalence of food allergies is increasing all over the world. It is the starting mechanism of atopic dermatitis, allergic and eosinophilic gastrointestinal disorders.

In children, a pathological reaction is most often noted to milk and eggs. Recently, the proportion of cases of allergies to soy and wheat has increased, and in older people, reactions to fish, shellfish, and peanuts appear.

Often, HA has combined clinical manifestations, with digestive organs affected in two thirds of patients. The gastrointestinal form of XA (GIA) is observed in approximately 50–60% of XA patients. Most often, this form of the disease develops in younger children, sometimes it occurs immediately after birth, in the first days of life (present in 68% of babies under the age of 12 months). Gastrointestinal allergy (GIA), and not atopic dermatitis (AD), as previously believed, is the first step of the allergic "march", while its occurrence significantly reduces the age of onset of AD.

The key link in the pathogenesis of GIA is a combination of different types of immunological reactions — IgE-mediated, immune complex, cell-mediated. It is most often combined with skin manifestations, less often with damage to the respiratory tract, in some cases with anaphylactic reactions. However, GIA may not be accompanied by skin or respiratory manifestations, but only by isolated gastrointestinal symptoms. This is the most difficult case for diagnosis, and the number of such patients is increasing.

The prevalence of food allergy today is such that a third of children with gastroesophageal reflux have an allergic etiology. That is, there is allergic inflammation of the esophagus, and it is very important to remember this.

Clinical symptoms of GIA:

- aphthous stomatitis, "geographical" tongue;
- impurities of mucus and/or blood in the stools of children under 12 months;
- malabsorption through the mucous membrane of the small intestine (malabsorption syndrome)
- enteropathy with protein loss;
- chronic diarrhea;

- chronic vomiting;
- swallowing disorder (dysphagia);
- delay in physical development (growth);
- diffuse neurodermatitis;
- children's intestinal colic resistant to traditional therapy, chronic constipation.

Food allergy, including GIA, is the most common cause of anaphylaxis and the fatal consequences caused by this condition.

Diagnosis of GIA includes:

- collection of allergy anamnesis;
- assessment of clinical manifestations (respiratory, skin, abdominal);
- effectiveness of dietary diagnostics;
- conducting endoscopic studies and their analysis;
- prick tests with food allergens.

Treatment: modern trends in therapy

Specific therapy includes:

- elimination of food allergens (dietotherapy);
- allergen-specific immunotherapy (ASIT) with food allergens (currently being actively studied and gaining experience).

Non-specific treatment:

- pharmacotherapy with the use of H1-antihistamine drugs;
- anti-inflammatory therapy;
- correction of deficiency states (iron preparations, vitamins, minerals);
- enzymes;
- enterosorbents;
- pro- and prebiotics.

Unfortunately, today we practically do not control the growth of atopic reactions, such patients are becoming more and more, despite all the protocols for the treatment of allergic diseases. In this context, studies on the correction of microbiota as a factor that prevents the occurrence of food allergies and other atopic diseases are very promising. The formation of the microbiota depends on a number of factors and lasts approximately 1000 days, including the prenatal period. During this time, the microbiota helps to establish a functional immune phenotype, ensuring immune tolerance. The development of immune tolerance depends on early exposure to potential food allergens, a process underlying metabolic programming. Bacteria found in the intestines are the first antigens that activate the body's defense mechanisms, contribute to the formation of the intestinal barrier, contribute to the formation immune tolerance, and also determine the body's reaction to potential allergens. A decisive factor for the formation of a child's microbiocenosis is childbirth, which occurs naturally (per vagina), on time, as well as breastfeeding. All this contributes to the formation of the microbiome, has a positive effect on the development and formation of the gastrointestinal tract, reducing the risks of the appearance of immunopathological conditions in the future.

Literature

Main:

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