

**Federal State Budgetary Educational institution of higher education
"North Ossetian State Medical Academy"
Ministry of Health of the Russian Federation**

**CHAIR OF GENERAL HYGIENE
AND PHYSICAL CULTURE**

**Theoretical course
to methodical and practical classes
in the discipline "Physical culture" and
"Elective courses in physicalculture"**

Study guide
on the organization of independent work and study of the
disciplines "Physical culture and sports" and "Elective course in
physical culture and sports" of the main professional educational
program of higher education specialty – program in the specialty
31.05.03 Dentistry (partially implemented in English)

Vladikavkaz, 2016

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Theoretical course for methodical and practical classes in the disciplines "Physical culture" and "Elective courses in physical culture", teaching aid for students; North Ossetian State Medical Academy: Vladikavkaz, 2016. – 176 p.

This teaching aid contains the necessary information on the theoretical foundations of the methodological section of the physical culture program, which will be useful for students.

The educational-methodical manual for students "Theoretical course for methodical-practical classes in the discipline" Physical culture "and" Elective courses in physical culture "is recommended for students studying in the specialty "Medicine", "Dentistry", "Pediatrics", "Medico -prophylactic business", "Pharmacy".

The teaching aid was prepared in accordance with the Federal State Educational Standard of Higher Education.

UDC 613.71

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*Approved and recommended for publication by the Central
Coordination the educational and methodological council of the
FSBEI HE NOSU Health of Russia
(Protokol No.1 of September 2, 2016)*

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Topic 1. Speed. Development and control methods

PURPOSE OF THE LESSON: teaching students how to develop speed.

A STUDENT SHOULD KNOW:

- physiological characteristics of speed;
- means for the development of speed abilities;
- methods for the development of speed abilities;
- methods of development of speed of motor reactions;
- methodology for the development of single movement speed and movement frequency;
- methodology for the development of complex forms of manifestation of speed abilities.

A STUDENT SHOULD BE ABLE TO:

- use means to develop speed abilities.

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GENERAL CHARACTERISTIC OF SPEED

In accordance with modern concepts, quickness is understood as the specific motor ability of a person for emergency motor reactions and high speed of movements, performed in the absence of significant external resistance, complex coordination of muscle work, and does not require large energy expenditures.

SPEED ABILITIES is a complex of functional properties of a person, which ensure the fulfillment of motor actions in the minimum time interval for these conditions.

There are elementary and complex forms of manifestation of speed abilities.

There are the following elementary forms of speed:

- ✓ **response time to a signal** (the interval between the appearance of the signal and the beginning of the response is measured, for which special devices are used - reflexometers). The average response time to a signal is 0.25 sec. For athletes this indicator is 0.15-0.20 seconds, and for the best sprinters in the world - 0.10-0.12 seconds;
- ✓ **the time of a single movement** (this indicator can only be considered with a biomechanical, dismembered analysis of movement - the speed of repulsion, the speed of the hip extension during running, etc.);
- ✓ **frequency of movement** (determined by the number of movements per unit of time). The frequency of movements or pace for qualified sprinters is 4-5 per 1 second, and the maximum frequency of movements of the hand, which is determined by the speed of drawing points on paper with a pencil, for trained athletes, on average, is 70 points per 10 seconds.

PHYSIOLOGICAL CHARACTERISTICS OF RAPIDITY

From a physiological point of view, the speed of the reaction depends on the speed of the following five phases:

- ✓ the occurrence of excitation in the receptor (visual, auditory, etc.) participating in the perception of the signal;
- ✓ transmission of excitement to the central nervous system;
- ✓ the transition of signal information along the nerve pathways, its analysis and formation of an efferent signal;
- ✓ conduction of an efferent signal from the central nervous system to the muscle;
- ✓ excitation of the muscle and the appearance of a mechanism of activity in it.

The maximum frequency of movements depends on the speed of transition of motor nerve centers from a state of excitement to a state of inhibition and vice versa.

The speed manifested in integral motor actions is influenced by: the frequency of neuromuscular impulses, the speed of muscle transition from the tension phase to the relaxation phase, the rate of alternation of these phases, the degree of

inclusion of rapidly twitching muscle fibers in the movement process and their synchronous work.

From a biochemical point of view, the speed of movement depends on the content of adenosine triphosphoric acid (ATP) in the muscles, the rate of its breakdown and resynthesis (recovery).

The physiological mechanism of the manifestation of speed, associated primarily with the speed characteristics of nervous processes, is presented as a multifunctional property of the **central nervous system (CNS) and peripheral neuromuscular apparatus (NMA)**.

MEANS OF DEVELOPMENT OF SPEED ABILITIES

The means of developing speed abilities are exercises performed at the maximum or near-limit speed. They can be divided into three main groups:

1. *Exercises directed at individual components of speed abilities:*
 - a) *reaction speed;*
 - b) *the speed of performing individual movements;*
 - c) *improving the frequency of movements;*
 - d) *improving the starting speed;*
 - e) *speed endurance;*
 - f) *the speed of performing sequential motor actions as a whole (for example, running, dribbling the ball).*
2. *Exercises of complex impact on all the main components of speed abilities (for example, sports and outdoor games, relay races, etc.).*
3. *Exercises of conjugate impact: a) on speed and all other abilities (speed and power, speed and coordination, speed and endurance); b) speed abilities and improvement of motor actions (in running, sports games, etc.).*

The frequency of movements, and with it the speed of cyclic movements, *is developed with the help of exercises that can be performed at maximum speed, as well as with the help of speed-strength exercises for acyclic movements.* In this case, the exercises must meet the following requirements:

- ✓ *the technique of exercises should ensure the execution of movements on limiting speeds;*
- ✓ *the exercises must be well mastered by the trainees so that volitional effort was not required to fulfill them;*
- ✓ *the duration of the exercise should be such that speed did not decrease due to fatigue - 20-22 sec.*

The main means of practicing distance running is *running at maximum speed.* Such a run is performed *5-6 times, 30-40 meters each.* In training, you can

alternate between running in normal, lightweight (downhill, angle 4-5 degrees) and difficult (uphill or with resistance) conditions.

For the development of *high-speed endurance*, it is recommended to run a long distance (120-150 m), when the next run starts at a heart rate of 120 beats / min.

For training in running 100 meters, you should use crosses (6 km, 30 min), rerun on 200 m segments at 3/4 strength. Sports games (basketball, football) are beneficial in the development of speed.

You can also recommend a simplified methodology that provides the minimum required level of preparedness:

- ✓ *repeated method* - in one lesson 3-4 runs of 20-30 meters with maximum speed and rest intervals for recovery heart rate up to 110-120 beats / min;
- ✓ *variable method* - running 2 segments of 30 meters with maximum speed and subsequent transition to a calm run 150-200 meters. 3-4 approaches are performed.

For a tangible shift in preparedness, it is recommended to carry out such training 3-4 times a week.

DEVELOPMENT METHODS OF SPEED ABILITIES

The main methods of training speed abilities are: methods of strictly regulated exercise; competitive method; game method.

Highly regulated exercise techniques include:

- ✓ methods of repeated performance of actions with setting at maximum speed;
- ✓ methods of variable exercise with varying speed and acceleration according to a given program in specially created conditions.

When using the method of variable exercise, movements with high intensity (for 4 - 5 s) and movements with a lower intensity alternate - first, they increase the speed, then maintain it and slow down the speed. This is repeated several times in a row.

The competitive method is used in the form of various training competitions and final competitions. The effectiveness of this method is very high, since athletes of different fitness are given the opportunity to fight each other on an equal basis, with emotional uplift, showing maximum volitional efforts.

The game method provides for the implementation of a variety of exercises at the highest possible speed in conditions of outdoor and sports games. At the same time, the exercises are performed very emotionally, without undue stress. In addition, this method provides a wide variety of actions, preventing the formation of a "speed barrier".

For students doing physical exercise as part of the educational process, the development of speed is associated mainly with running.

FAST DEVELOPMENT METHOD MOTOR REACTIONS

The speed of motor reactions can be simple or complex.

A *SIMPLE REACTION* is a response with a known movement to a known but suddenly appearing signal (visual, auditory).

The main method for developing reaction speed is the method of repeated exercise. It consists in re-responding to a suddenly arising stimulus with a setting to reduce the response time.

Exercises for speed of reaction are initially performed in light conditions. For example, in track and field athletics (running for short distances), they separately exercise in the speed of reaction to the starting signal with the support of the hands on any objects in the high start position and separately without the starting signal in the speed of the first running steps.

Complex motor reactions are found in sports characterized by constant and sudden changes in the situation of actions (sports games, etc.). Complex reactions are distinguished: a reaction to a moving object (ball, etc.) and a “choice” reaction (when from several possible actions it is required to instantly choose one that is adequate to a given situation).

The period of reaction to a propelling object consists of four elements:

- ✓ a person must see a moving object (ball, player) ;
- ✓ assess the direction and speed of its movement;
- ✓ choose an action plan;
- ✓ start implementing it.

The bulk of this time is spent on visual perception, i.e. on the ability to see an object. To train this ability, exercises are used, during which you should:

- ✓ constantly increase the speed of the object;
- ✓ reduce the distance between the object and the student;
- ✓ reduce the size of a moving object.

To develop speed of reaction with a choice, you should:

- ✓ gradually complicate the nature of the response actions and the conditions for their implementation;
- ✓ develop the ability to anticipate the actions of the enemy.

TECHNIQUE FOR DEVELOPING THE SPEED OF A SINGLE MOTION AND FREQUENCIES

The speed of a single movement is manifested in the ability to perform individual motor acts at high speed. These are, for example, the speed of

movement of the leg when hitting a soccer ball, the speed of movement of the hand when hitting a volleyball.

The greatest speed of a single movement is achieved in the absence of additional external resistance. With an increase in external resistance, an increase in the speed of movements is achieved by increasing the power of the efforts shown in this case. The latter is determined by the explosive abilities of the muscles. In this case, it is advisable to develop the speed of a single movement in conjunction with the development of strength abilities, using exercises with weights.

Along with the complication of conditions, facilitated conditions are also used: a) "reduce" the weight of the body of the student due to the application of external forces; b) limit the resistance of the natural environment (for example, running in the wind, etc.); c) use external conditions that help the trainee to accelerate due to the inertia of his body movement (running downhill, running on an incline, etc.).

An effective method is the contrast (variable) method, which involves the alternation of speed exercises in difficult, normal and light conditions.

DEVELOPMENT METHODOLOGY OF COMPLEX FORMS MANIFESTATIONS OF VELOCITY

Most of the motor actions require the manifestation of all speed abilities (in running, jumping, dribbling and throwing the ball, etc.).

With the development of complex speed abilities, the leading method is the repeated method with the manifestation of maximum speed in the exercises and "full" intervals of rest between them.

No less important is the game and competitive methods, the use of which creates an additional incentive for the maximum manifestation of speed abilities by increasing interest, motivation, and emotional uplift.

An effective method for increasing speed abilities is the variable method, which involves alternating speed exercises in difficult, light and normal conditions.

EXERCISES TO DEVELOP FAST

To develop speed abilities, exercises are used that must meet three main conditions:

- ✓ *the ability to perform at maximum speed, exercise must be well mastered in order to concentrate only for speed;*
- ✓ *during training, there should be no decrease in speed when doing the exercise.*

In educational and training sessions, it is necessary to develop all possible forms of manifestation of speed, necessary for successful professional-applied

training. It should only always be remembered that work on the development of speed and the improvement of speed abilities is not recommended to be carried out in a state of physical, emotional or sensory fatigue.

PROFESSIONALLY - APPLIED VALUE PHYSICAL QUALITY FAST FOR DOCTOR

Physical culture classes held in higher educational institutions greatly contribute to the preparation of students for future professional activities.

The doctors profession is characterized by: high coordination of movements, their automatism, physical strength, high neuropsychic tone, stability of attention. Such qualities as speed of reaction, self-control, a large amount of operational and long-term memory. Formation of elementary professionally important psychophysical qualities - speed and accuracy of movements, all types of sensorimotor reactions, dexterity.

The means for developing speed can be very diverse. For many professions, special electronic training systems have been created, the work on which simultaneously improves the specific forms of manifestation of speed. In the process of applied physical training, a variety of exercises can be used to develop speed and speed of movements. Excellent results are achieved when practicing wrestling (freestyle, classical, judo, sambo), boxing, martial arts, sports games (tennis, table tennis, badminton, volleyball, basketball, handball, hockey), athletics, fencing and many other sports.

THEORETICAL MATERIAL:

1. Matveev L.P. Theory and methodology of physical culture. Introduction to the subject: Textbook for higher specialized physical education institutions, 3rd ed. SPb .: Publishing house "Lan", 2003.
2. Lukyanenko V.P. Physical culture: the basics of knowledge: Educational allowance. M .: Soviet sport. 2003.
3. Kramshin Yu.F. Theory and methodology of physical culture. Textbook M .: Soviet sport, 2003.
4. Kholodov Zh.K., Kuznetsov V.S. Theory and methodology of physical education and sports: Textbook. manual for stud. Higher. Textbook. institutions. M .: Publishing Center "Academy", 2000.

Topic 2. Endurance

PURPOSE OF THE LESSON: teaching students how to develop endurance.

A STUDENT SHOULD KNOW:

- physiological bases of endurance;
- methods for developing endurance.

A STUDENT SHOULD BE ABLE TO:

- maintain the specified load power necessary to ensure professional activity and resist fatigue that occurs in the process of performing work.

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1. The concept of physical qualities

One of the main tasks solved in the process of physical education is to ensure the optimal development of physical qualities inherent in a person. It is customary to call physical qualities innate (genetically inherited) morphological and functional qualities, due to which physical (materially expressed) human activity is possible, which receives its full manifestation in purposeful motor activity. The main physical qualities include muscle strength, speed, endurance, flexibility and agility.

2. General and physiological characteristics of endurance

Endurance is the ability to resist physical fatigue during muscular activity. The measure of endurance is the time during which muscular activity of a certain nature and intensity is carried out. For example, in cyclic types of physical exercises (walking, running, etc.), the minimum time to overcome a given distance is measured. In game types of activity and single combats, the time is measured during which the level of the given efficiency of motor activity is realized. In complex coordination activities related to the implementation of the accuracy of movements, the indicator of endurance is the stability of the technically correct performance of the action.

The physiological basis of general endurance for most modern types of professional activity is aerobic abilities: they are relatively low-specific and depend little on the type of exercises performed. Therefore, for example, if they managed to increase their aerobic capabilities in running, this improvement will also affect the performance of exercises in other types of activities, for example, cycling, etc. The lower the power of the work performed and the greater the number of muscles involved in it, the to a lesser extent, its effectiveness will depend on the perfection of motor skills and more - on aerobic capabilities. The functional capabilities of the bodys autonomic systems will be high when performing all aerobic exercises. That is why endurance to work of this orientation has a general character and is called general endurance.

3. Types of endurance

Distinguish between general and special endurance. General endurance is the ability to perform work of moderate intensity for a long time with the global functioning of the muscular system. In another way, it is also called aerobic endurance. A person who can withstand a long run at a moderate pace for a long time is able to do other work at the same pace. The main components of general endurance are the capabilities of the aerobic energy supply system, functional and biomechanical economization.

General endurance plays an essential role in the optimization of vital activity, acts as an important component of physical health and, in turn, serves as a prerequisite for the development of special endurance.

Special endurance is endurance in relation to a certain motor activity. Special endurance is classified: according to the signs of a motor action, with the help of which a motor task is solved (for example, jumping endurance); by the signs of motor activity, in the conditions of which the motor task is solved (for example, game endurance); by signs of interaction with other physical qualities (abilities) necessary for the successful solution of a motor task (for example, power endurance, speed endurance, coordination endurance, etc.).

Special endurance depends on the capabilities of the neuromuscular apparatus, the speed of expenditure of resources of intramuscular energy sources, on the technique of mastering the motor action and the level of development of other motor abilities.

Different types of endurance are independent or little dependent on each other. For example, you can have high strength endurance, but insufficient speed or low coordination endurance.

The manifestation of endurance in various types of motor activity depends on many factors: bioenergetic, functional and biochemical economization, functional stability, personality-mental, genotype (heredity), environment, etc.

4. Means of training endurance

The means of developing general (aerobic) endurance are exercises that cause maximum performance of the cardiovascular and respiratory systems. Muscular work is provided by a predominantly aerobic source; the intensity of work can be moderate, large, variable; the total duration of the exercise is from several to tens of minutes.

In the practice of physical education, a variety of physical exercises of a cyclic and acyclic nature are used, for example, long running, running on rough terrain (cross), cycling, games and playing exercises, exercises performed according to the method of circular training (including in a circle 7–8 or more exercises performed at an average pace), etc. The main requirements for them are the following: exercises should be performed in areas of moderate and high power work; their duration is from several minutes to 60-90 minutes; work is carried out with the global functioning of muscles.

Most types of special endurance are largely determined by the level of development of the anaerobic capabilities of the body, for which they use any exercises that include the functioning of a large muscle group and allow you to perform work with extreme and near-limit intensity.

An effective means of developing special endurance (speed, strength, coordination, etc.) are specially preparatory exercises that are as close as possible to the competitive ones in form, structure and characteristics of the impact on the functional systems of the body, specific competitive exercises and general preparatory means.

The following exercises are used to increase the anaerobic anaerobic capacity of the body:

1. Exercises, mainly contributing to the increase of alactate anaerobic abilities. The duration of the work is 10–15 s, the intensity is maximum. Exercises are used in repetitive execution mode, in series.
2. Exercises to simultaneously improve the alactate and lactate anaerobic capacity. Duration of work 15–30 s, intensity 90–100% of the maximum available.
3. Exercises to improve lactate anaerobic capacity. Duration of work 30–60 s, intensity 85–90% of the maximum available.
4. Exercises that allow you to simultaneously improve the alactate anaerobic and aerobic capabilities. The duration of the work is 1–5 min, the intensity is 85–90% of the maximum available.

When performing most physical exercises, their total load on the body is quite fully characterized by the following components:

- ✓ the intensity of the exercise;
- ✓ the duration of the exercise;
- ✓ the number of repetitions;
- ✓ the duration of the rest intervals;
- ✓ the nature of the rest.

The intensity of exercise in cyclic exercises is characterized by the speed of movement, and in acyclic exercises by the number of motor actions per unit time (pace). The change in the intensity of the exercise directly affects the functioning of the functional systems of the body and the nature of the energy supply of motor activity. At moderate intensity, when the energy consumption is not yet great, the respiratory and circulatory organs provide the body with the necessary amount of oxygen without much stress. A small oxygen debt, formed at the beginning of the exercise, when the aerobic processes are not yet fully operational, is repaid in the process of performing the work, and then it occurs in a true steady state. This exercise intensity is called subcritical.

With an increase in the intensity of the exercise, the trainee's body reaches a state in which the demand for energy (oxygen demand) will be equal to the maximum aerobic capacity. This exercise intensity is called critical.

Exercise intensity above critical is called supercritical. With such an intensity of exercise, the oxygen demand significantly exceeds the aerobic capabilities of the body, and the work takes place mainly due to anaerobic energy supply, which is accompanied by the accumulation of oxygen debt.

The duration of the exercise has an inverse relationship with the intensity of its implementation. With an increase in the duration of the exercise from 20–25 s to 4–5 minutes, its intensity decreases especially sharply. A further increase in the duration of the exercise leads to a less pronounced, but constant decrease in its intensity. The type of energy supply depends on the duration of the exercise.

The number of repetitions of exercises determines the degree of their effect on the body. When working in aerobic conditions, an increase in the number of repetitions makes it necessary to maintain a high level of activity of the respiratory and circulatory organs for a long time. In the anaerobic regime, an increase in the number of repetitions leads to the depletion of oxygen-free mechanisms or to their blocking of the central nervous system. Then the exercise either stops, or their intensity decreases sharply.

The duration of the rest intervals is of great importance for determining both the magnitude and especially the nature of the body's responses to the training load.

The length of the rest intervals should be planned depending on the tasks and the training method used. For example, in interval training aimed at predominantly increasing the level of aerobic performance, one should focus on the rest intervals, at which the heart rate decreases to 120–130 beats / min. This makes it possible to cause shifts in the activity of the circulatory and respiratory systems, which in the greatest measure contribute to an increase in the functional capabilities of the heart muscle. The planning of rest pauses, based on the subjective feelings of the trainee, his readiness to effectively perform the next exercise, forms the basis of a variant of the interval method, called the repetitive one.

5. Methods of training endurance

The main methods for the development of general endurance are:

- ✓ the method of continuous (continuous) exercise with a load of moderate and variable intensity;
- ✓ the method of repeated interval exercise;
- ✓ the method of circular training;
- ✓ play method;
- ✓ competitive method.

For the development of special endurance, the following are used:

- ✓ methods of continuous exercise (uniform and variable);

- ✓ methods of intermittent exercise (interval and repetitive);
- ✓ competitive and play methods.

The uniform method is characterized by continuous operation with uniform speed or effort. At the same time, the student seeks to maintain a given speed, rhythm, constant pace, amount of effort, range of motion. Exercises can be performed at low, medium and maximum intensity.

The variable method differs from the uniform method by sequential variation of the load during continuous exercise (for example, running) by directional change in speed, tempo, range of motion, amount of effort, etc.

The interval method involves performing exercises with standard and variable loads and with strictly dosed and pre-planned rest intervals. As a rule, the interval of rest between exercises is 1–3 min (sometimes 15–30 s). Thus, the training impact occurs not only and not so much at the time of execution, as during the rest period. Such loads have a predominantly aerobic-anaerobic effect on the body and are effective for the development of special endurance.

The circuit training method provides for the implementation of exercises that affect various muscle groups and functional systems in the form of continuous or interval work. Usually 6-10 exercises ("stations") are included in the circle, which the practitioner goes through from 1 to 3 times.

The competitive method involves performing exercises in the form of a competition.

The game method provides for the development of endurance during the game, where there are constant changes in the situation, emotionality. Using one or another method for training endurance, each time specific parameters of the load are determined.

View endurance	Number repetitions	Load		Relaxation	An exercise (means)	Method
		Duration	Intensity			
Power (anaerobic-aerobic)	10 to 15–30 times	From 10 up to 30 s	Medium to submaximal	Not full, 20–40 s	Circuit training: 20–30 s – work, 20 s–rest	Interval
High-speed, based on anaerobic-creatine phosphate energy source	3–5 times	From 8 up to 45 s	Maximum	Passive	3×100 m, 4×60 m	Repeated
High-speed, based on the anaerobic-glycolytic mechanism of energy supply	1–2 times	From 45 s up to 2 minutes	Submaximal 85–95% of maximum power	Not full, 30–60 s	Tempo run 2×200m	Interval
Speed, based on anaerobic-aerobic mechanism energy supply	1–3 times	2-10 min	Average from 60–65 up to 70–75% from maximum power	Not complete	Run 2–3 minutes, at least 1 minute of active rest	Interval
The coordination	1–3 times	2–10 min	Also	No pauses	Play exercises and games, specially selected gymnastic exercises, etc.	Game

6. Methodology for the development of general endurance

Starting work on the development and improvement of one's endurance, it is necessary to adhere to a certain logic of building a training, since an irrational combination of loads of different physiological orientation in classes may not lead to improvement, but, conversely, to a decrease in fitness.

At the initial stage, it is necessary to focus on the development of aerobic capabilities simultaneously with the improvement of the functions of the cardiovascular and respiratory systems, strengthening the musculoskeletal system, i.e., on the development of general endurance. This task is methodologically not very difficult, but for its solution it requires certain volitional efforts, the gradual increase in the complexity of requirements, the sequence of using the means and the systematic training.

At the second stage, it is necessary to increase the volume of load in a mixed aerobic-anaerobic mode of energy supply, applying for this continuous uniform work in the form of a tempo run, cross-country race, swimming, etc. in a wide range of speeds up to subcritical, inclusive, as well as various continuous variable work, including, and in the form of a circuit training.

At the third stage, in cases where increased requirements are imposed on professionally applied physical training, it is necessary to increase the volume of training loads through the use of more intense exercises performed by the methods of interval and repeated work in mixed aerobic-anaerobic and anaerobic modes, and selectively affecting individual components of specific endurance. If, however, increased requirements for the level of endurance development are not imposed by the conditions of professional activity, then it is only necessary to maintain the level achieved by the earned volumes.

7. Building endurance by influencing human anaerobic capacity

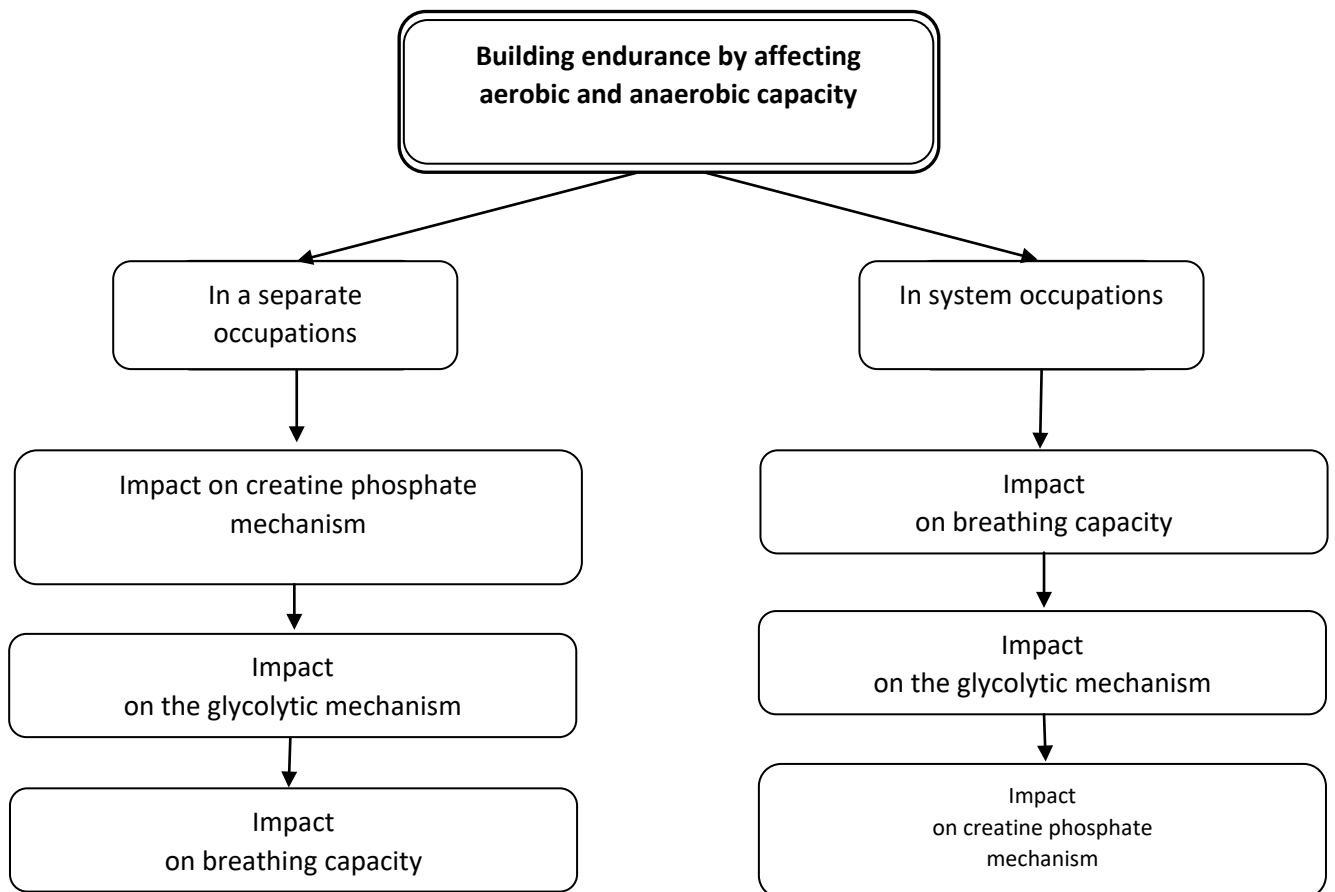
Endurance education by influencing anaerobic capabilities is based on the body's adaptation to work in conditions of accumulation of under-oxidized products of energy supply and is characterized by the solution of two problems:

- ✓ increasing the power of the glycolytic (lactate) mechanism;
- ✓ increasing the power of the creatine phosphate (alactate) mechanism.

For this, basic and special preparatory exercises of appropriate intensity are used. In this case, methods of repeated and variable interval exercise are used.

The following requirements are imposed on exercises used as a means of improving the glycolytic mechanism. Work should be performed with an intensity of 90-95% of the maximum power for a given segment of the distance, the duration of work is from 20 to 2 minutes (the length of segments is from 200 to 600 m in running; from 50 to 200 m in swimming). The number of repetitions in

the series for beginners is 2-3, for well-trained 4-6. Rest intervals between repetitions gradually decrease: after the first - 5-6 minutes, after the second - 3-4 minutes, after the third - 2-3 minutes. There should be 15–20 minutes rest between series to eliminate lactate debt.



The following requirements are imposed on exercises used as a means of improving the creatine phosphate mechanism. The intensity of work should be near the limit (95% of the maximum); duration of exercises – 3-8 s (running - 20-70 m, swimming - 10-20 m); rest intervals between repetitions – 2-3 min, between sets (each set consists of 4-5 repetitions) мин 7-10 min. Rest intervals between series are filled with intensity exercises, the number of repetitions is determined based on the fitness of the trainees.

The development of aerobic and anaerobic capabilities is combined with each other. Glycolysis depends on the respiratory capacity and at the same time itself is the basis for the alactate process. Based on this, in the system of classes, it is advisable to plan the predominant development of these capabilities in the following sequence: aerobic - lactate - alactate. In the course of one lesson, the solution of problems for the education of endurance should occur in the reverse order.

8. Features of the upbringing of specific types endurance

Analysis of literary sources shows that at present more than 20 types of special endurance can be named.

Speed endurance is manifested mainly in activities that make increased demands on the speed parameters of movements in the zones of submaximal and maximum work power. Speed endurance in the maximum zone is due to the functional capabilities of the anaerobic creatine phosphate energy source. The maximum operating time does not exceed 15-20 s. An interval method is used to educate her. Often they use the passage of a competitive distance with maximum intensity. In order to increase the margin of safety, they practice passing a longer distance than the competitive one, but again with maximum intensity.

Speed endurance in the zone of submaximal loads is mainly provided due to the anaerobic-glycolytic mechanism of energy supply and often aerobic, therefore, we can say that the work is performed in an aerobic-anaerobic mode. The duration of work does not exceed 2.5 - 3 minutes.

The main criterion for the development of speed endurance is the time during which a given speed or rate of movement is maintained.

Strength endurance reflects the ability to perform strength work for a long time without reducing its effectiveness. In this case, motor activity can be acyclic, cyclic and mixed.

To educate endurance for strength work, a variety of exercises with weights are used, performed by the method of repeated efforts with repeated overcoming of unsatisfactory resistance to significant fatigue or "to failure", as well as by the method of circular training. In those cases when they want to develop endurance for strength work in a static mode of muscle work, the method of static efforts is used. Exercises are selected taking into account the optimal angle in one or another joint, at which maximum effort develops in the specialized exercise.

One of the criteria by which one can judge the development of strength endurance is the number of repetitions of the control exercise performed "to failure" with weights - 30–75% of the maximum.

Coordination endurance. It manifests itself mainly in motor activity, characterized by a variety of complex technical and tactical actions (gymnastics, sports games, figure skating, etc.).

The methodological aspects of increasing coordination endurance are quite diverse. For example, they practice lengthening the combination, shorten the rest intervals, repeat the combinations without resting between them.

To develop endurance in game types, taking into account the characteristics of motor activity inherent in these types, the duration of the main exercises is increased, the intensity is increased, and the rest intervals are reduced. For

example, to achieve a high level of endurance in basketball, you can do the following. The playing time in basketball (2-20 min) is divided into 8 periods of 5 min. Players get the task to play with high intensity. Gradually, with the growth of players' fitness level, the rest time between periods decreases and the number of periods themselves decreases.

9. Control over the level of endurance development

Endurance is measured using two groups of tests: **non-specific and specific**.

Based on the results of nonspecific tests, the potential opportunities of athletes to effectively train and compete in conditions of increasing fatigue are assessed. The results of specific tests indicate the extent to which these potentialities are realized.

Non-specific endurance tests include:

- ✓ running on a treadmill;
- ✓ pedaling on a bicycle ergometer;
- ✓ step test.

The scheme for performing nonspecific tests is standardized: warm-up –7 min; rest 3–5 minutes, during which the operation of sensors of measuring systems is monitored; execution of a stepwise increasing load: the first step is a load of 50 W. Then every 2 minutes the load increases. The athlete performs the task until he is completely tired.

Tests are considered specific, the structure of which is close to the competition (for example, for cyclists testing on a bicycle ergometer is considered as a measurement of endurance in specific tasks). The information content of specific

The most common indicators of endurance are three ergometric criteria: time, volume and intensity of tasks. In the process of monitoring these endurance indicators, one of the three criteria is set as a parameter (for example, an athlete must run for 12 minutes), the second is directly measured (the distance that the athlete ran

When measuring endurance using any of these three indicators and observing the metrological rules, the assessment of its level should be the same: an athlete is offered to run 12 minutes, during this time he runs 3500 m, or is offered to run 3500 m, and he must spend 12 minutes (when taking into account errors). Endurance is characterized using "limit indicators" (for example, to run the longest distance at a given time, while maintaining a given speed as long as possible, etc.). The value of these indicators depends on the ratio of at least 2 components of the test: duration and intensity.

In the control of endurance, in addition to sports, physiological and biochemical tests, as well as biomechanical criteria (for example, such as the

accuracy of throws in basketball, the time of the support phases in running, fluctuations in the general center of mass in motion, etc.) have become widespread, which compare their values at the beginning, middle and end of the exercises. By the magnitude of the differences obtained, the level of endurance is judged: the less the biomechanical indicators change at the end of the exercise, the higher the level of endurance.

Endurance is the most important physical quality that manifests itself in professional, sports activities and in everyday life of people. It reflects the general level of human performance.

Being a multifunctional property of the human body, endurance integrates a large number of processes occurring at various levels: from the cellular to the whole organism. However, as the results of modern scientific research show, in the overwhelming majority of cases, the leading role in the manifestations of endurance belongs to the factors of energy metabolism and autonomic systems for its provision - the cardiovascular and respiratory systems, as well as the central nervous system.

In the theory and methodology of physical culture, endurance is defined as the ability to maintain a given load power necessary to ensure professional activity and to resist fatigue arising in the process of performing work.

Getting started training, it is important to understand the tasks, consistently solving which, you can develop and maintain your professional performance. These tasks consist in the purposeful influence of physical training means on the entire set of factors that provide the necessary level of working capacity development and have specific features in each type of professional activity. They are solved in the process of special and general physical training.

10. Theoretical material:

1. Kholodov Zh.K., Kuznetsov V.S. Theory and methodology of physical education and sports: Textbook. manual for stud. Higher. Textbook. institutions. M.: Publishing Center "Academy", 2003.
2. Matveev L.P. Theory and methodology of physical culture. Introduction to the subject: Textbook for higher specialized physical education institutions, 3rd ed. SPb.: Publishing house "Lan", 2003.
3. Lukyanenko V.P. Physical culture: basics of knowledge: textbook. M.: Soviet sport. 2003.
4. Kuramshin Yu.F. Theory and methodology of physical culture. Textbook M.: Soviet sport, 2003.

Topic 3. Strength. Development and control methods

PURPOSE OF THE LESSON: teaching students how to develop strength.

A STUDENT SHOULD KNOW:

- varieties of strength;
- means of strength development;
- methods for the development of strength abilities.

A STUDENT SHOULD BE ABLE TO:

- apply general developmental, special exercises to develop strength abilities.

TABLE OF CONTENTS:

1. Strength as a physical quality of a person.
2. Varieties of strength.
3. Means of strength development.
4. Methods for the development of strength abilities.
5. Features of strength training for women and girls.
6. Control over the level of development of strength abilities.
7. Theoretical material.

1. STRENGTH AS A PHYSICAL QUALITY OF A HUMAN

Strength is understood as the ability of a person to overcome external resistance or resist it through muscular efforts. One of the most important factors determining muscle strength is the way the muscles work. If there are only two reactions of muscles to stimulation - contractions with decreasing length and isometric tension, the results of the exerted effort turn out to be different depending on the mode in which the muscles work.

2. VARIETIES OF POWER

With the pedagogical characterization of human strength there are the following varieties:

1. Maximum isometric (static) force - an indicator of the force shown when holding for a certain time limit weights or resistances with maximum muscle tension.
2. Slow dynamic (pressing) force, shown, for example, during the time of moving objects of large mass, when the speed is practically irrelevant, and the applied forces reach their maximum values.
3. High-speed dynamic force is characterized by the ability of a person to move in a limited time large (submaximal) weights with acceleration below the maximum.
4. "Explosive" strength - the ability to overcome resistance with maximum muscle tension in the shortest possible time. When "Explosive" nature of muscle efforts, developed accelerations reach the maximum possible values.
5. Damping force is characterized by the development of effort in a short time in a yielding mode of muscle work, for example, when landing on a support in various types of jumps, or when overcoming obstacles, in hand-to-hand combat, etc.
6. Strength endurance is determined by the ability for a long time maintain the necessary strength characteristics of movements. Among varieties of endurance to strength work allocate endurance to dynamic work and static endurance. Endurance to dynamic work is determined by the ability to maintain efficiency in performing professional activities, associated with lifting and moving weights, with a long overcoming external resistance.
7. Static endurance is the ability to maintain static efforts and maintain a sedentary position of the body or prolonged time to be in a room with limited space.

3. MEANS OF POWER DEVELOPMENT

The means of developing muscle strength are various strength exercises, among which three main types can be distinguished:

- ✓ **exercises with external resistance;**
- ✓ **exercises to overcome your own body weight;**
- ✓ **isometric exercises.**

Exercises with external resistance are one of the most effective means of developing strength and are divided into:

- 1) exercises with weights, including on simulators that are comfortable its versatility and selectivity. With their help, you can predominantly affect not only individual muscles, but also individual parts of the muscles;
- 2) exercises with a partner, which can be used not only on training sessions and trainings in gyms, stadiums, arenas, but also in the field. These exercises are beneficial a pleasant emotional impact on students;
- 3) exercises with the resistance of elastic objects (rubber shock absorbers, harnesses, various resistance bands, etc.), which are advisable to use in independent studies, especially in the morning physical exercises. Their advantage lies in low dead weight, small volume, ease of use and transportation, a wide range of effects on various muscle groups;
- 4) exercises in overcoming the resistance of the external environment are effective when training in accelerated movement and strength endurance (for example, running uphill or on sand, snow, water, against the wind, etc.), for special strength training for hand-to-hand combat (on ice , sand, water, etc.).
- 5) exercises in overcoming their own weight are widely used in all forms of physical training. They are classified into:
 - ✓ gymnastic strength exercises: lifting with a coup and strength, pulling up with a different grip on the bar, push-ups on the hands;
 - ✓ athletics jumping exercises: single and "short" jumping exercises, including up to five repetitive take-offs, "long" jumping exercises with multiple take-offs at intervals of 30-50 meters;
 - ✓ exercises in overcoming obstacles.

Gym strength exercises are great for strengthening and developing muscles in your arms, shoulder girdle, abdominals, and back.

Single and "short" jumping exercises (including those with a small run or with a small load) are performed with a powerful concentrated effort when pushing off and provide the predominant development of the starting and explosive "strength, as well as the reactive ability of the muscles. However, their training effect is short-lived and limited, but it significantly increases with a rational combination with other means of speed-strength training.

"Long" jumping exercises, performed with a setting for quick repulsion, help to improve the starting strength of the muscles, and with a large volume and moderate intensity - to improve specific speed endurance for the manifestation of explosive efforts. Therefore, these exercises are an effective means of basic training of athletes, military personnel and representatives of all other professions, the specificity of which makes increased demands on special physical fitness.

The training effect of deep jumps ("shock method") is aimed primarily at the development of absolute, starting and "explosive" strength, force power, as well as the reactivity of muscles, that is, to quickly switch them from an inferior to an overcoming mode of work in conditions of maximum development in this moment of dynamic load. The use of this extremely effective tool for training in accelerated movement, sprinting, jumping, overcoming obstacles requires preliminary preparation. They should be supervised by teachers, trainers or fitness professionals.

Exercises in overcoming obstacles are also an independent section of physical training, and, at the same time, can be used as additional means for the development of strength, strength endurance and dexterity of those involved.

Isometric exercises, like no others, contribute to the simultaneous (synchronous) tension of the maximum possible number of motor units (MU) of working muscles. Exercises in passive tension (holding a load, etc.) and exercises in active muscle tension (for 5-10 seconds in a certain position) differ. Training using isometric exercises is relatively fast and the equipment is simple.

These exercises are especially valuable with prolonged periods of physical inactivity and limited space. However, static exercises should be used with great care, combining them with dynamic exercises, as well as following the principle of regularity and sequence of increasing the load. It is also necessary to consider the power of the effect of these exercises on the nervous and cardiovascular systems. Strong muscle tension compresses the blood vessels and, as a result, causes local disturbance of blood flow.

4.METHODS FOR DEVELOPING STRENGTH ABILITIES

By their nature, all exercises are divided into three main groups: ***general, regional and local effects on muscle groups***. Exercises of general impact include those when at least 2/3 of the total muscle volume is involved in the work, regional - from 1/3 to 2/3, local - less than 1/3 of all muscles.

The direction of the impact of strength exercises is mainly determined by the following components:

- ✓ *the type and nature of the exercise;*
- ✓ *the amount of burden or resistance;*

- ✓ *the number of repetitions of exercises;*
- ✓ *the speed of performing overcoming or yielding movements;*
- ✓ *the pace of the exercise;*
- ✓ *the nature and duration of the rest intervals between;*
- ✓ *approaches.*

The best effort method

The maximum effort method includes exercises with submaximal, maximum and supra-maximum weights or resistances. The training effect of the method is aimed mainly at improving the capabilities of the central motor zone to generate a powerful stream of exciting impulses to motoneurons, as well as increasing the power of the mechanisms of energy supply of muscle contractions. It ensures the development of the muscle's ability to make strong contractions, the manifestation of maximum strength without a significant increase in muscle mass. For the practical implementation of the method, several methodological techniques are used: uniform, "pyramid", maximum.

EXAMPLES:

1. *Methodical reception "uniform"* - the exercise is performed with a weight of 90-95% of the maximum: repeat 2-3 times in 2-4 approaches with rest intervals of 2-5 minutes. The pace of movement is arbitrary.
2. *Methodical reception "pyramid"* - several approaches are performed with an increase in weights and a decrease in the number of repetitions of the exercise in each subsequent approach, for example: 1) weight 85% - lift 5 times; 2) weight 90% - raise 3 times; 3) weight 95% - lift 2 times; 4) weight 97 - 100% - lift 1 time; 5) with a weight of more than 100% - try to perform 1 time. Rest intervals between sets are 2-4 minutes.
3. *Methodical reception "maximum"* - the exercise is performed with the maximum possible burden at a given time: 1 time x 4-5 approaches with arbitrary rest.

Repeated effort method

This is a training method in which the main training factor is not the maximum weight of the resistance (or resistance), but the number of repetitions of the exercise with the optimal or submaximal weight (resistance). This method uses various options build a workout. Depending on the selected components of the exercise, the direction of the method can vary widely.

For its practical implementation, various methodological techniques are used: uniform, super series and combinations of exercises, circular. In this case, it is possible to use both isotonic, isokinetic, and variable modes of muscle work.

Methods for the development of "explosive" and reactive force, dynamic (high-speed) force, and work "to failure" are singled out separately.

Within the "to failure" method, you can apply various methodological techniques.

For example:

- ✓ in each approach to perform exercises "to failure", but the number to limit approaches;
- ✓ in each approach, perform a fixed number of repetitions exercises, and the number of approaches - "to failure";
- ✓ perform "to failure" and the number of repetitions, and the number of approaches.

"Shock" method

The "shock" method is used to develop the amortization and "explosive" strength of various muscle groups. When training leg muscles, the most widely used are push-off after a deep jump from a dosed height. The landing should be firm, with a smooth transition to shock absorption. The depth of the squat is found empirically. Cushioning and subsequent pushing off must be performed as a single, holistic action. The optimal dosage of jumping "shock" exercises should not exceed four series of 10 jumps each for well-trained people, and for less prepared people - 1-3 series of 6-8 jumps. Rest between sets for 3-5 minutes can be filled with light jogging and relaxation and stretching exercises. Depth jumps in the indicated volumes should be performed no more than 1-2 times a week at the stages of preparation for mass competitions or tests in physical fitness. It is possible to use the "shock" method for training other muscle groups with weights or body weight. For example, flexion-extension of the arms in the lying position with a separation from the support. When using external weights on block devices, the load first descends freely, and in the extreme lower position of the trajectory of movement rises sharply with the active switching of muscles to overcoming work. Exercises with weights by the "shock" method, it is recommended to observe the following rules:

- ✓ *they can only be used after a special warm-up of the trainees muscle groups;*
- ✓ *the dosage of "shock" movements should not exceed 5-8 repetitions per one series;*

- ✓ *the magnitude of the "shock" impact is determined by the weight of the load and the value working range of motion. Optimal combinations in each in a particular case are selected empirically, depending on the level preparedness. However, preference is always recommended give the working amplitude, trying to increase it to the maximumpossible level;*
- ✓ *the initial posture is chosen taking into account the correspondence to the position, when which develops the working effort in the training exercise.*

Methods for the development of "explosive" strength and reactive ability of muscles

For the development of "explosive" strength and reactive ability of the neuromuscular apparatus, the entire arsenal of power tools is used preparation, both separately and in combination:

- ✓ exercise with weights;
- ✓ jumping exercises;
- ✓ exercises with a "shock" mode of muscle work;
- ✓ isometric exercises.

In exercises with weights, the repetitive effort method is mainly used. At the same time, it is possible to use the method of maximum efforts, when in the conditions of professionally applied or sports activity it is necessary to overcome significant external resistance. It is only important to follow the rule - as much as possible relax the muscles before performing the "explosive" effort.

It is recommended to use the following training building techniques:

1. Repetitive reception: (5-6 repetitions of an exercise with a weight of 60- 80% of maximum) x 2-4 sets after 6 minutes of rest. Can do 2-4 such series with 5-8 minutes rest between them. Exercises are performed at the maximum speed, the repetition rate is low.
2. "Reverse" reception: weights 60-80% of the maximum at the beginning rises by about 1/3 of the amplitude of the main movement, and then descends quickly and, with possibly quick accented switching to overcoming work, accelerates in opposite direction. 2-3 sets of 3-5 are performed repetitions in each. Rest interval is 4-6 minutes.

Jumping exercises are successfully used for development "Explosive" strength of the leg muscles (jumping) and are performed with single or repeated push-offs with maximum effort.

Single jumps are from a place, from an approach or from a jump. In one series, 4-6 jumps with arbitrary rest are performed. Total you can make 2-4 series.

Multiple jumps include 3 to 10 takeoffs with one or two feet. In one set, 3-4 repetitions are performed, and in a series - 2-3 sets with a rest between them for 3-4 minutes.

Most often in training, complex programs are used using a wide range of means and methods to improve "explosive" strength. The options for her training for preparation, for example, in running short distances (100 meters), may be as follows:

1. *With a weight of 90% of the maximum 2 sets of 2-3 squats with a barbell, then 3 sets of 6-8 jumps from a half-squat with a weight of 30-50% with the fastest effort and mandatory relaxation of the leg muscles in an unsupported position. Rest between sets for 2-3 minutes, before changing weights - 4-6 minutes. In one lesson, you can do 2-3 such series with a rest of 8-10 minutes.*
2. *Squats with a barbell with a weight of 90-95% of the maximum: 1-2 sets of 5-8 reps after 2-4 minutes of rest. Take-off after a deep jump (dismounts from a curbstone 40-60 cm high) 6-8 times x 2 sets after 2-4 minutes of rest. Then a run is performed with an acceleration of 5-6 x 50-60 meters.*

Dynamic (speed) strength development method

Velocity strength is manifested in fast movements against relatively little external resistance. For the development of speed strength, exercises with weights, jumping exercises and complexes of the above training means are used.

Weights are used both for the local development of individual muscle groups and for improving the integral structure of sports exercises or professional actions.

Wherein mainly two ranges of weights are used:

1. *With weight up to 30% of the maximum-in the case when insignificant external resistance is overcome in the trained movement or action and the predominant development of the starting muscle strength is required.*
2. *With a weight of 30-70% of the maximum-when significant external resistance is overcome in the trained movement or action and a higher level of "accelerating" force is required. This range of weights is characterized by a relatively proportional development of strength, speed and "explosive" abilities.*

Resistance exercises for the development of dynamic (speed) strength are used repeatedly in various variations, for example:

1. *Weight 30-70% (depending on the value of the external resistance of the trained movement) x 6-8 repetitions with the maximum possible speed of the movement itself, but at a low pace. 2-3 series of 2-3 approaches are performed each with 3-4 minutes rest between sets, and 6-8 minutes between sets.*

2. *For the predominant development of the starting muscle strength, weights of 60-65% of the maximum are used. A short, "explosive" effort is performed to only transfer the movement to the training weight, but not to accelerate it along the trajectory. Load volume as in the previous example.*

In all the considered examples of the development of speed strength, it is necessary to strive for the maximum possible relaxation of the muscles between each movement in the exercise, and between their series it is necessary to include swinging movements, active rest with exercises on relaxation and shaking of muscles.

Jumping exercises in any variant should be performed with the setting on the speed of take-off, and not on its power.

The greatest increase in the development of speed (dynamic) strength is given by exercises on simulators with an isokinetic mode of muscle work.

Methods for the development of strength endurance

Strength endurance, i.e. the ability to exercise optimal muscular efforts for a long time, is one of the most significant motor qualities in professionally applied physical training and sports. The level of its development largely depends on the success of motor activity.

Strength endurance is a complex, complex physical vegetative functions that provide the necessary oxygen regime of the body, as well as the state of the neuromuscular apparatus. When working with an eye by limiting muscular efforts, the level of its development is determined mainly by maximum strength. With decreasing the value of work efforts, the role of vegetative support factors increases. The border of the transition to work with the predominance of "power" or "vegetative" factors in sports practice is considered to be a load with an effort of 30% of the individual maximum.

Therefore, the development of strength endurance should be carried out in a comprehensive manner, based on the parallel improvement of vegetative systems and strength abilities.

When working with high power, the manifestation of strength endurance is specific and depends on local muscle training in a chosen sport or in professionally applied motor actions, despite the fact that it is provided by the same bioenergetic mechanisms. This is why strength endurance, for example, in gymnasts, swimmers, wrestlers, runners or boxers will vary significantly. It also differs among representatives of different professions.

The main method for developing strength endurance is the method of repeated efforts with the implementation of various methodological techniques.

However, the complexity of the development of this motor quality also lies in the possible negative interaction of the effects of training exercises aimed at improving the factors that ensure the manifestation of this quality.

An increase in the effectiveness of training loads is primarily associated with an analytical approach to their use, that is, with the use of such exercises and their complexes in one training lesson, which have a selective, targeted effect on the "leading" factors, and the combination of which within one training lesson gives positive delayed increase in efficiency.

Local muscular endurance depends primarily on bioenergetic factors. As you know, the high power of muscular activity is associated with the alactate anaerobic mechanism of energy supply. Therefore, the ability to increase the duration of local power work is associated with an increase in power and capacity.

With intense continuous power work lasting more than 10 seconds, there is a significant depletion of intramuscular phosphagenic energy sources. A glycolytic anaerobic mechanism is activated to ensure operation lasting more than 10 seconds. The lactate accumulating in this case in muscles and blood negatively affects both the manifestation of the maximum power of muscle efforts and the duration of work, and, ultimately, the increase in strength abilities. The adaptation of the body to local strength work under conditions of strong acidotic shifts is the second direction of improving strength endurance.

At the same time, lactate accumulating in the muscles during intensive work can be eliminated directly in the working skeletal muscles (in aerobic - "red" muscle fibers), in the liver, as well as in the heart muscle, for which it is an excellent "fuel".

Therefore, it is possible to formulate two main methodological approaches in the analytical improvement of strength endurance.

1. The first approach is to improve phosphagenic power supply systems due to:
 - ✓ *increasing the power of the anaerobic alactate process;*
 - ✓ *expansion of anaerobic alactate capacity (increase in volume intramuscular energy sources);*
 - ✓ *increasing the efficiency of the implementation of the available energy potential by improving the technique of working movements.*
2. The second approach to the development of strength endurance during muscular work under conditions of anaerobic glycolysis is to improve the mechanisms of compensation for adverse acidotic shifts due to:
 - ✓ *increasing the buffer capacity of blood;*
 - ✓ *increasing the oxidative capabilities of the body, that is, aerobic capacity.*

Examples:

1. To increase the maximum anaerobic power, exercises with weights of 30-70% of the maximum are used with the number of repetitions from 5 to 12 times. They are performed at arbitrary intervals of rest, until recovery. The number of approaches is determined empirically - until the power of the work performed is reduced. Wherein usually up to 6 approaches are planned.
2. To increase the anaerobic alactate capacity and increase the efficiency of using the energy potential, exercises with weights up to 60% of the maximum are used with the number of repetitions from 15 to 30 times. 2-4 approaches are performed with a rest of 3-5 minutes. In the process of work, constant monitoring of the equipment is required exercise.
3. To improve compensatory mechanisms and adapt to work in conditions of strong acidotic shifts in the body, no more than 4 approaches are performed at a high pace with weights from 20 to 70% of the limit with the number of repetitions to failure. At long intervals of rest (5-10 minutes), the work will be aimed primarily at improving anaerobic glycolytic performance, and at relatively small intervals of 1-3 minutes) - at depleting anaerobic intramuscular resources and improving anaerobic glycolytic capacity.
4. Increasing the oxidative capacity of the neuromuscular apparatus is improved in aerobic exercises aimed at improving overall endurance: in uniform long run, interval run, jogging, etc.

Training for the development and improvement of strength endurance can be organized either in the form of sequential application of a series of each selected exercise, or in the form of "circuit training", when one approach of selected exercises is performed in each circle in succession. In total, there can be several such "circles" in a training session with strictly regulated exercise parameters. The number and composition of exercises, as well as the number of "circles" depends on the level of preparedness and training goals. The most effective is "circular" training at the stages of basic (general physical) training among athletes, or, at the stages of using general developmental exercises in vocational training.

Isometric method

The isometric method is characterized by short-term muscle tension without changing their length. The exercises performed by this method are recommended to be used as additional means.

Muscle tension should be increased smoothly to maximum or specified, and held for several seconds, depending on developed effort.

It is advisable to perform isometric tension in positions and postures adequate to the moment of manifestation of maximum effort in the exercise being trained.

The combination of isometric tensions with exercises of a dynamic nature, as well as with stretching and relaxation exercises.

Examples:

Perform in one series 2-3 sets of 5-6 tensions in each for 4-6 seconds and rest between sets for at least 1 minute. You can do 1-2 such series with 3-5 minutes rest. After the isometric exercises, you need to do relaxation exercises, followed by dynamic exercises of moderate intensity.

5. FEATURES OF THE ORGANIZATION OF POWER TRAINING OF GIRLS, WOMEN

Properly organized strength development classes have a beneficial effect on the health and physical development of not only adult men, but also girls and women. The myths about the dangers of strength exercises are completely unfounded for them - harm can only be caused by excessive, improperly planned loads. Experimental studies have established that even six-year-old children, doing weightlifting exercises, progress in their development, sportsmanship and have no deviations in their health status with a rationally structured training process. At the same time, it is necessary to take into account the age and sex characteristics of the body of people engaged in strength exercises to strengthen health and professional and applied training.

Features of strength training for women are associated with the physiological characteristics of their body, objective differences between women and men:

- ✓ *women are on average smaller and lighter than men;*
- ✓ *the hormonal structure of the female body limits growth muscle mass;*
- ✓ *the proportion of muscles in the total body weight in women is much less and makes up only 30-35% compared to 40-47% for men;*
- ✓ *the center of mass of the body in women is lower than in men due to body features - women have a longer torso and shorter legs;*
- ✓ *women, due to the faster maturation of their body, for 2-4 years faster than men reach their physical, including strength, condition;*
- ✓ *women are characterized by an increase in body fat by thighs and buttocks ("pears"), in men - on the stomach ("apples");*
- ✓ *women, on average, are more flexible than men;*
- ✓ *women usually have a higher pain tolerance (i.e., they are more "Patient") than men.*

Scientific research and practical experience show that strength training, taking into account the physiological characteristics of the female body, helps to improve health, strengthens the muscles and ligaments of the pelvic bottom, improves the figure.

The musculoskeletal system of women tolerates large power loads much worse. When training, they should avoid working with extreme and close weights. Preference should be given to exercises that do not "overload" the spine, ie, performed in a sitting or lying position. The female body is much better able to tolerate the loads aimed at developing endurance. Therefore, in the training of women, methods for the development of strength endurance are widely used: they are associated with small weights, quickly reduce the fat component of body weight, help solve problems aesthetic body correction.

To effectively solve such problems, women, like men, need to pay increased attention to the development of aerobic endurance, flexibility and coordination of movements.

Basic rules for organizing strength training for girls, women:

1. Engaging in strength exercises, strictly observe the general methodological principles of building the training process.
2. General physical training is the basis for success in strength development. Therefore, it is necessary to include exercises for the development of endurance, speed, flexibility, coordination and accuracy of movements, sports and outdoor games in the training.
3. Training should not be monotonous.
4. Do not perform strength exercises with maximum weights until the age of 16. Apply lighter weights with the ability to perform each training exercise 10-15 times.
5. Pay attention to strengthening the abdominal muscles and back.
6. Prevent injuries - they are the result of improper training.
7. Do not perform deep squats with large weights and deadlifts of the barbell, press of a heavy barbell in a standing position. When doing exercises with the bar, make sure that your back is straight.
8. Do not get carried away with exercises with inferior (eccentric) operating mod.
9. Stop exercising if pain occurs.
10. Get regular check-ups with a doctor.

6. CONTROL OF THE LEVEL OF POWER DEVELOPMENT ABILITIES

In the practice of physical education, strength capabilities are quantitatively assessed in two ways:

- ✓ with the help of measuring devices - dynamometers, dynamographs, strain-gauge force-measuring devices;
- ✓ with the help of special control exercises, strength tests.

Modern measuring devices allow you to measure the strength of almost all muscle groups in standard tasks (flexion and extension of body segments), as well as in static and dynamic efforts (measuring the strength of an athlete's action in motion).

In mass practice, special control exercises (tests) are most often used to assess the level of development of strength qualities. Their implementation does not require any special expensive inventory and equipment. To determine the maximum strength, exercises that are simple in technique are used, for example, bench press, squat with a bar, etc. The result in these exercises depends very little on the level of technical skill. Maximum strength is determined by the greatest weight that the student can lift.

To determine the level of development of speed - strength abilities and strength endurance, the following control exercises are used: jumping rope, pull-ups, push-ups from the floor or from a bench, lifting the torso from a prone position with bent knees, hanging on bent and bent arms, lifting a coup on a high bar, long jump from a place with two legs, raising and lowering straight legs to the limiter, throwing a medicine ball (1 - 3 kg) from various starting positions with two and one hands, etc. The criteria for assessing speed-strength abilities and strength endurance are the number of pull-ups, push-ups, the time of holding a certain position of the body, the distance of throwing, jumping, etc.

Physical culture classes held in higher educational institutions greatly contribute to the preparation of students for future professional activities.

The doctors profession is characterized by: high coordination of movements, their automatism, endurance, high neuropsychic tone, stability of attention.

Such qualities as endurance (both general and static), to walk on floors and stand for hours at the operating table are professionally significant; force (both dynamic and static) to move the patient or lift him to keep his muscular system in good shape, etc.

THEORETICAL MATERIAL:

1. Kholodov Zh.K., Kuznetsov V.S. Theory and methodology of physical education and sports: Textbook. manual for stud. Higher. Textbook. institutions. M .: Publishing Center "Academy", 2003.
2. Matveev L.P. Theory and methodology of physical culture. Introduction to the subject: Textbook for higher specialized physical education institutions, 3rd ed. SPb .: Publishing house "Lan", 2003.
3. Lukyanenko V.P. Physical culture: basics of knowledge: textbook. M .: Soviet sport. 2003.
4. Kuramshin Yu.F. Theory and methodology of physical culture. Textbook M.: Soviet sport, 2003.

Topic 4. Flexibility.

Development and control methods

PURPOSE OF THE LESSON: teaching students how to develop flexibility.

A STUDENT SHOULD KNOW:

- forms of flexibility;
- types of flexibility;
- methods for developing flexibility;
- methodology for developing flexibility.

A STUDENT SHOULD BE ABLE TO:

- correctly determine the optimal proportions in the use of flexibility exercises, as well as the correct dosage of loads.

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1. FLEXIBILITY AS A PHYSICAL QUALITY

The effectiveness of sports training, and especially in the technical component in me, is associated with an important property of the musculoskeletal system, the ability to muscle relaxation - flexibility.

In professional physical training and sports, flexibility is necessary to perform movements with a large and extreme amplitude. Lack of mobility in the joints can limit the manifestation of such physical qualities as strength, speed of reaction and speed of movement, endurance, while increasing energy consumption and, reducing the efficiency of the body, and often leads to serious injuries to muscles and ligaments.

The term "flexibility" itself is usually used for an integral assessment of the mobility of body links, i.e. this term is used in cases when it comes to mobility in the joint of the whole body. If the range of motion in individual joints is assessed, then it is customary to speak of "mobility" in them.

In the theory and methodology of physical education, flexibility is considered as a morfunctional property of the human musculoskeletal system, which determines the limits of movement of body links.

There are two forms of flexibility.

Active, characterized by the magnitude of the range of motion during independent exercise due to its own muscular efforts.

Passive, characterized by the maximum value of the amplitude of movement achieved by the action of external forces, for example, with the help of a partner, or weights, etc.

In passive exercises for flexibility, a greater range of motion is achieved than in active exercises. The difference between active and passive flexibility is called reserve strength or "flexibility margin".

A distinction is also made between general and special flexibility.

General flexibility characterizes mobility in all joints of the body and allows a variety of movements with a large amplitude.

Special flexibility - maximum mobility in individual joints, which determines the effectiveness of sports and professional activities.

2. DEVELOPMENT OF FLEXIBILITY

Develop flexibility with muscle and ligament stretching exercises. There are **dynamic, static, and mixed static-dynamic stretching exercises**. The manifestation of flexibility depends on many factors and, above all, on the structure of the joints, the elasticity of the properties of the ligaments, muscle

tendons, muscle strength, the shape of the joints, the size of the bones, as well as on the nervous regulation of muscle tone. With the growth of muscles and ligaments, flexibility increases. The anatomical features of the ligamentous apparatus reflect the mobility. Moreover, muscles are a brake on active movement. Muscles plus a ligamentous apparatus and an articular bag, which encloses the ends of bones and ligaments, are brakes for passive movement and, finally, bones are a movement limiter. The thicker the ligaments and the articular bag, the more limited the mobility of the articulating body segments.

In addition, the range of motion is limited by the tension of the antagonist muscles. Therefore, the manifestation of flexibility depends not only on the elasticity of muscles, ligaments, the shape and characteristics of the articulating articular surfaces, but also on the person's ability to combine arbitrary relaxation of the stretched muscles with the tension of the muscles that produce movement, i.e. from the perfection of muscle coordination.

The higher the ability of the antagonist muscles to stretch, the less resistance they exert when performing movements, and the "easier" these movements are performed. Insufficient mobility in the joints, associated with the incoherent work of the muscles, causes "strengthening" of movements, which complicates the process of mastering motor skills.

Systematic, or at certain stages of preparation, the use of strength exercises can lead to a decrease in flexibility, if stretching exercises are included in the training process.

The manifestation of flexibility to one degree or another depends on the general functional state of the body, and on the external conditions of the time of day, the temperature of muscles and the environment, and the degree of fatigue. Flexibility is usually slightly reduced until 8-9 am. However, exercising in the morning is very effective. In cold weather and when the body cools, flexibility decreases as the temperature of the environment and body rises - it increases. Fatigue also limits the range of active movements and the extensibility of the musculo-ligamentous apparatus.

Concerning the age aspect of flexibility, it can be noted that flexibility depends on age. Usually, the mobility of large parts of the body gradually increases up to 13-14 years old, due to the fact that at this age the musculo-ligamentous apparatus is more elastic and stretchable.

At the age of 13-14 years, there is a stabilization of the development of flexibility, and, as a rule, by the age of 16-17, stabilization ends, development stops, and then has a steady downward trend. At the same time, if after 13-14 years

of age you do not perform stretching exercises, then flexibility will begin to decline already in adolescence. And vice versa, practice shows that even at the age of 40-50, regular exercises using a variety of means and methods increase flexibility. Even higher level than in his youth.

Flexibility also depends on gender. So the mobility in the joints of girls is higher than that of boys by about 20-30%. The process of developing flexibility is individualized. Flexibility needs to be developed and maintained constantly.

3. TECHNIQUE FOR DEVELOPMENT OF FLEXIBILITY

Exercises aimed at developing flexibility are based on performing a variety of movements: flexion-extension, bends and turns, rotations and swings. Such exercises can be performed independently or with a partner, with various weights or the simplest training devices: with cuffs, weights, pads, at the gymnastic wall, as well as with gymnastic sticks, ropes, skipping ropes. Complexes of such exercises can be aimed at developing mobility in all joints to improve overall flexibility without taking into account the specifics of your motor activity.

When improving special flexibility, complexes of special preparatory exercises are used, which are logically selected for a targeted impact on the joints, the mobility in which to the greatest extent determines the success of professional or sports activities. For example, for faster jogging and skiing, the flexibility of the spine and mobility in the hip and ankle joints are important. Swimming and throwing of shells, in addition, require high mobility in the shoulder and wrist joints. Mastering the effective technique of martial arts and hand-to-hand combat requires high mobility in all joints, but primarily in the shoulder and hip joints.

Through the targeted execution of special sets of exercises, you can achieve much greater flexibility than is required in the process of professional or sports activities. This creates a certain "margin of flexibility". If you do not have such a reserve and the existing level of mobility in the joints is used "to the limit", then it is difficult to achieve maximum accuracy, strength, speed and economy. movements, their "ease".

The exercises performed can be active, passive and mixed, as well as performed in a dynamic, static or mixed static-dynamic mode.

The development of active flexibility is facilitated by self-performed exercises with their own body weight and with external weights. Such exercises include, first of all, a variety of swinging movements, repeated springy movements in the trained joints. The use of small weights allows, through the use of inertia, to briefly overcome the usual limits of mobility in the joints and increase the range of motion.

Doing stretching exercises with relatively large weights increases passive flexibility. The most effective for improving passive flexibility are smoothly performed forced movements with a gradual increase in their working amplitude with inferior muscle work. It is not recommended to perform fast movements at the same time due to the fact that the protective reflex of limiting stretching arising in the muscles causes "enslavement" of the stretched muscles. Passive flexibility develops 1.5-2.0 times faster than active flexibility.

If your goal is to increase flexibility, then stretching should be done daily. To maintain flexibility at the level already achieved, you can reduce the number of classes to 2-3 per week. At the same time, it is possible to reduce the volume of stretching exercises in each training session. Stretching usually takes 15 to 60 minutes a day.

Flexibility exercises are performed in all parts of the training session.

In the preparatory part of the class, they are used during warm-up, usually after dynamic exercises, gradually increasing the amplitude movements and the complexity of the exercises themselves.

In the main part, such exercises should be performed in series, alternating with the work of the main orientation, or simultaneously with the performance of strength exercises. If, however, the development of flexibility is one of the main tasks of a training session, then sometimes it is advisable to concentrate stretching exercises in the second half of the main part of the lesson, highlighting them as an independent "block" of load.

In the final part, stretching exercises are combined with relaxation exercises and self-massage.

At the same time, the effectiveness of the applied stretching exercises depends on the orientation of the training work performed in this lesson.

Before speed-strength work, it is advisable to include active dynamic stretching exercises, self-massage and shaking of the working body links in the warm-up, as well as perform a series of 1-2 special preparatory stretching exercises in the process of performing the work itself. For example, such a methodological technique is justified when training a start and a starting acceleration or maximum speed in a 100 m run. In this case, after warm-up, a series of running from the start and on the move is performed on intervals from 10 to 60 meters, and before each series of speed exercises, active dynamic exercises for stretching and relaxing the muscles of the legs and pelvis: various inclinations, swinging legs, shaking the muscles, etc. A similar methodological method of using stretching exercises is recommended when performing jumping exercises, in training in hand-to-hand combat.

Particular attention should be paid to stretching muscles and ligaments when performing strength exercises, given their possible negative effect on flexibility. An undesirable decrease in muscle contractility from strength exercises can be overcome with three methodological techniques:

1. *Consistent use of strength and flexibility exercises.*

Here, both the direct sequence of the use of a complex of exercises [strength + flexibility] and the reverse [flexibility + strength] are possible, that is, first - stretching, and only then - strength.

In the first case, under the influence of a series of strength exercises, the mobility in the working joints gradually decreases by 20-25%, and after completing a set of stretching exercises, it increases by 50-70% of the reduced level.

The reverse sequence of exercises is preferred when strength training is required with maximum range of motion.

2. *Alternate use of strength and flexibility exercises* (strength + flexibility + strength + ...) during one training session.

With this variant of the construction of the lesson, a stepwise change in the mobility of the working body links occurs. After each strength exercise, flexibility decreases, and after stretching, it increases again with a general tendency to increase it by the end of the session to 30-35% of the initial level.

3. *Simultaneous* (combined) development of strength and flexibility in the process of strength exercises.

In case of severe fatigue after performing large volumes of loads of technical, power, speed-power orientation, it is recommended to use "passive" dynamic stretching exercises. This is due to the fact that in conditions of severe muscle fatigue, such exercises are not only more effective, but also less traumatic. Complexes of "passive" dynamic exercises are best used at the end of the main or final part of the lesson, as well as in the form of a separate "recovery" training. After a large amount of endurance training load, for example, after a long or tempo cross, a large amount of repetitive or interval work in segments, it is best to perform 5-6 light active dynamic stretching exercises, while being careful not to injure fatigued muscles.

At the same time, it was noticed that, even after an intense warm-up with the use of predominantly dynamic exercises, despite an increase in muscle temperature and a general increase in the range of motion, the ligaments are not always prepared for maximum speed-strength work in terms of range of movements.

Therefore, sometimes a higher effect is achieved when building a warm-up based on static stretching exercises. This warm-up is recommended when improving hand-to-hand combat techniques.

Self-study, without a partner, somewhat limits the possibilities of using all known means and methods of developing flexibility. Therefore, further complexes of exercises for the development of flexibility are proposed both for independent use and with a partner.

The following methods of developing flexibility and the sets of exercises developed on their basis can be performed anywhere: in the gym, on the school playground, in the forest clearing, in the park, at home on the rug.

It is only necessary to always remember that you can stretch only after a good warm-up, and you should not have any strong pain, but only a feeling of slightly "stretched" muscles and ligaments.

4. FLEXIBILITY DEVELOPMENT METHODS

Multiple stretch method

This method is based on the property of muscles to stretch significantly more with multiple repetitions of the exercise with a gradual increase in the range of motion.

Exercises begin with a relatively small range of motion and gradually increase it to 8-12 repetitions to the maximum or close to it. Highly qualified athletes, for example, manage to continuously perform exercises with maximum or close to it amplitude up to 40 times.

The limit of the optimal number of repetitions of the exercise is the beginning of a decrease in the range of movements or the occurrence of pain that must be avoided. The number of repetitions of the exercises varies depending on the nature and focus of the exercise on the development of mobility in a particular joint, the pace of movement, the age and gender of the participants. Active dynamic exercises are usually performed at a higher pace than all others, and their dosage is highly dependent on the joint being developed and the training objectives. Passive dynamic exercise with a partner is performed at a slower pace at the same dosage.

But the most effective is the use of complexes of several active dynamic stretching exercises for 8-15 repetitions of each of them. During one training lesson, there can be several such series of exercises performed with little rest or interspersed with exercises of a different orientation (usually technical, strength or speed-strength). In this case, it is necessary to ensure that the muscles do not "freeze".

Static stretch method

The static stretching method is based on the dependence of the amount of stretching on its duration. First you need to relax, and then perform the exercise, holding the final position from 10-15 seconds to several minutes. For this purpose, a variety of exercises from hatha yoga, which have passed centuries of testing, are most acceptable. These exercises are usually performed in separate series in the preparatory and final parts of the session, or separate exercises are used in any part of the session.

But the greatest effect is given by the daily performance of a set of such exercises in the form of a separate training session. If the main workout is done in the morning, then static stretching should be done in the afternoon or evening. This workout usually takes up to 30-50 minutes. If the main training session is held in the evening, then a set of static stretching exercises can be performed in the morning.

These exercises must be used in the preparatory part of the lesson, starting with them a warm-up, after which dynamic special preparatory exercises are performed, with a gradual increase in their intensity. With such a warm-up, as a result of performing static exercises, muscles and ligaments are well stretched, limiting mobility in the joints. Then, when performing dynamic special preparatory exercises, the muscles are warmed up and prepared for intensive work.

Complexes of static stretching exercises can be performed with a partner, overcoming with his help the limits of flexibility, exceeding those that can be achieved with independent exercise.

In each holistic action, individual muscle groups not only contract and stretch, but also relax. The most advantageous mode of muscle work, in which the system of processes of excitation and inhibition determines the work of the motor apparatus with the lowest energy costs. This is possible only if during the work in a state of active excitement there are only muscles that really should participate in the performance of this movement (posture). The rest of the muscles relax during this time.

With the help of relaxation exercises, trainees will learn to consciously and voluntarily relax individual muscle groups and will be able to master the exercise technique more quickly.

The process of inhibition and the associated muscle relaxation favor the course of recovery processes. Therefore, relaxation exercises are also used to improve blood circulation in the muscles or as distraction exercises, especially after strong static tensions.

5. SOME POINTS IN THE DEVELOPMENT OF FLEXIBILITY

For the development of mobility in different parts of the musculoskeletal system, the forms of exposure are not the same.

The most effective are the following.

For fingers:

- ✓ massage and extension of fingers by pressing the other hand - first with light, and then with strong springy movements and static holding in an extended position.

For the wrist:

- ✓ massage, flexion and extension, rotation, static holding in an extended position due to pressure with the other hand or with an emphasis on a stationary object (floor, wall).

For the shoulder joints:

- ✓ rotations, swinging movements in different directions and planes, hanging on apparatus, hanging squats while standing behind, swinging in the hanging, hanging from behind, hanging with a reverse grip, bending forward with a grip on the gymnastic wall rail or other support; on their own or with a partner: leaning back on the horse, spring hand abductions; flexion in a handstand with additional leg support; gymnastic bridge, twisted with a gymnastic stick, etc.

For the torso:

- ✓ arching, bending back: kneeling or kneeling in support; bridge, slopes forward;

For ankle joints:

- ✓ massage, pulling the socks, static retention of the drawn-out socks, sitting on the heels with the drawn-out toes; the same with the support of the hands and swaying in this position, lifting up and transferring the weight of the body to the drawn toes; when performing gray-haired socks, the socks should be not only pulled, but also relaxed.

For the hip joints:

- ✓ deep squats on a full foot with legs apart;
- ✓ deep squats in the position of a wide lunge forward and in parties;
- ✓ in a squat position on one leg, the other to the side, without raising the pelvis, moving to the other leg, bending it and straightening the supporting leg.
- ✓ bends forward in the position of the legs apart;
- ✓ bends forward in the sitting position;
- ✓ bends forward, standing on a high support;
- ✓ standing at the gymnastic wall (with a grip on the rail or the same at another support), swing your legs forward, backward and to the side;
- ✓ the same with a weight of up to 2 kg in the lower leg;

- ✓ transverse twine;
- ✓ longitudinal twine;
- ✓ leaning with the back surfaces of the thighs on a high support and catching the toes of the legs on the rail of the gymnastic wall, bending backward and swinging in this position or holding;
- ✓ the same, leaning on the front surfaces of the thighs;
- ✓ in a standing position, raise your leg high forward, to the side, backward with the help of a partner;
- ✓ the same yourself;
- ✓ standing at the support, keeping the legs in positions forward, backward, sideways in for 3-4 s followed by an upward swing;
- ✓ standing at the support, swinging the leg in a forward-upward, backward-up, to the side-up at a near-limit height;
- ✓ the same with weights up to 1 kg;
- ✓ slow raising the leg to the side, forward, backward, standing at the support;
- ✓ the same with a weight of up to 2 kg;
- ✓ swings in support on horseback with handles, and then without handles, without taking away hands from the support.

6. CONTROL OF FLEXIBILITY DEVELOPMENT

In physical education, the most accessible and widespread method is to measure flexibility with the help of a mechanical goniometer - angle gauge, to one of the legs of which a protractor is attached. The legs of the goniometer are attached to the longitudinal axes of the segments that make up this or that joint. When performing flexion, extension or rotation, the angle between the axes of the joint segments is determined.

The basic pedagogical tests for assessing the mobility of various joints are the simplest control exercises:

1. Mobility in the shoulder joint. The subject, holding the ends of a gymnastic stick (rope), performs a twist of straight arms back. The mobility of the shoulder joint is assessed by the distance between the hands during twisting: the smaller the distance, the higher the flexibility of this joint, and vice versa. In addition, the smallest distance between the hands is compared with the width of the subject's shoulder girdle. Active abduction of straight arms up from a supine position, arms forward. The distance from the floor to the fingertips is measured.
2. The mobility of the spinal column. Determined by the degree of forward inclination of the trunk. The subject in a standing position on a bench (or

sitting on the floor) bends forward to the limit, without bending the knees. The flexibility of the spine is assessed using a ruler or tape according to the distance in centimeters from the zero mark to the third finger of the hand. If the fingers do not reach the zero mark, then the measured distance is indicated by a minus sign (-), and if it falls below the zero mark, it is indicated by a plus (+) sign.

"Bridge". The result (in cm) is measured from the subject's heels to the fingertips. The shorter the distance, the higher the level of flexibility, and vice versa.

3. Mobility in the hip joint. The subject seeks to spread his legs as wide as possible: 1) to the sides and 2) forward and backward with support on his hands. The level of mobility in a given joint is assessed by the distance from the floor to the pelvis (coccyx): the shorter the distance, the higher the level of flexibility, and vice versa.
4. Mobility in the knee joints. The subject performs a squat with arms extended forward or arms behind the head. Full squatting testifies to high mobility in these joints.
5. Mobility in the ankle, joints. Measurement of various parameters of movements in the joints should be based on compliance with standard testing conditions: 1) identical initial positions of body links; 2) the same (standard) warm-up; 3) repeat measurements of flexibility to be carried out at the same time, since these conditions in one way or another affect the mobility in the joints.

Passive flexibility is defined by the greatest amplitude that can be achieved due to external influences. It is determined by the largest amplitude that can be achieved due to an external force, the magnitude of which must be the same for all measurements, otherwise it is impossible to obtain an objective assessment of passive flexibility. Measurement of passive flexibility is suspended when an external force produces a painful sensation.

An informative indicator of the state of the articular and muscular apparatus of the subject (in centimeters or angular degrees) is the difference between the values of active and passive flexibility. This difference is called active flexibility deficit.

7. THEORETICAL MATERIAL:

1. Kuramshin Yu.F. Theory and methodology of physical culture. Textbook .: Soviet sport, 2003.
2. Matveev L.P. Theory and methodology of physical culture. Introduction to the subject: Textbook for higher special physical education institutions. 3rd ed. SPb.: Publishing house "Lan", 2003.
3. Kholodov Zh. K. Theory and methodology of physical education and sports 2nd ed., Revised. and additional / Zh.K. Kholodov, N.A. Kuznetsov, M: ACADEMA, 2003.
4. Lukyanenko V.P. Physical culture: basics of knowledge: textbook. M.: Soviet sport. 2003.

Topic 5. Stretching

PURPOSE OF THE LESSON: Methodology and recommendations for regulating the load during stretching.

A STUDENT SHOULD KNOW:

- training methods;
- physiological mechanism of the effect of stretching on the human body;
- complexes of exercises;
- indications and contraindications for stretching.

A STUDENT SHOULD BE ABLE TO:

- evaluate the effectiveness and control of flexibility in class stretching;
- control your body, strengthen the nervous system, maintain muscle tone at a good level with the help of generally quite simple and quite affordable exercises.

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1. Introduction
2. Stretching: rules and effects.
3. Methods of training stretching.
4. A set of exercises:
 - upper body;
 - the lower body.
5. Indications and contraindications for stretching.
7. Theoretical material.

Introduction

One of the most important areas of gymnastics is stretching (stretching gymnastics). Stretching exercises are designed to engage the entire body, including the psyche, to relax, tune and restore muscle function.

As a result, muscle tissue is better supplied with oxygen, metabolic processes in it proceed faster, therefore, decay products are also removed faster.

The feeling of greater mobility, flexibility, control of your body, and also pleasant psychologically. With regular stretching, the general condition of the joints improves, the deposition of salts in them decreases, the movements become more coordinated, smooth, dexterity and plasticity appear. Stretching also has a positive effect on the nervous system: the brain receives more oxygen, due to which you feel fresh, full of strength and mental energy. And finally, the stretching complex does not require much effort, time and equipment.

Stretching (from the English. To stretch - to stretch, pull), or stretching is a set of exercises aimed at developing flexibility.

The undoubted advantages of stretching are its simplicity and affordability - in order to achieve success in stretching, you do not need to purchase special equipment or equipment, as well as make time to go to the gym.

The physiological mechanism of stretching exercises

Flexibility is the ability of a person to perform movements with greater amplitude. Flexibility as a physical quality needs to be improved not only to improve sports performance, but also to maintain health, better adapt to physical activity, and also to save energy in any physical work. The properties of the musculo-ligamentous apparatus are individual for all people, however, even very tight muscles can be made more elastic, and passive organs (tendons, ligaments) more flexible. All stretching techniques target specific muscles. The main effect of stretching techniques is aimed at the muscles and the nervous system that controls them. The muscle reacts most strongly to stretching, which is explained by its anatomical structure and the most complex mechanism of its control by the nervous system. At the first stage of muscle irritation by stretching, it reacts with a protective contraction, which is a protective reaction of the body. Then this tension goes into a relaxation phase. That is why the first to respond to stretching exercises are tendons, ligaments, and then only muscles. By increasing the elasticity of the tendons, ligaments, bursae and fascia muscles, it is possible to improve joint mobility. Stretching exercises are included in all health-improving gymnastics complexes for diseases of the musculoskeletal system. Control of all stretching processes in muscles, ligaments, joints occurs due to the coordinated work of the

sensitive nervous system, which transfers information to the central nervous system and regulates the body's responses, determining the degree of tension in the tissues. Even millimeter changes in movement and posture are recorded and cause the corresponding coordinating regulation of muscles from receptors to organ and from organ to central nervous system.

The physiological mechanism of the effect of stretching is the activation of muscle fibers due to their contraction at the time of stretching. When the skin, muscles, ligaments are stretched, the corresponding mechanoreceptors are excited. Excitation in the form of centripetal impulses reaches the cerebral cortex and causes a response in the body: increased blood supply to the muscle, increased metabolism and sweating. When a muscle relaxes, its oxygen demand decreases, and the flow of impulses from the receptors of muscles, ligaments, joints and the central nervous system decreases. The transition of muscles from tension to relaxation and again to tension contributes to a kind of gymnastics of the nerve centers.

Thus, muscle relaxation has a beneficial effect on the body, helping to regulate nervous processes. The ability to differentially relax is the best way to get rid of unnecessary tension when restorative processes are intensively occurring in resting cells. Relaxation helps to suspend unnecessary energy expenditure, quickly neutralizes fatigue, relieves nervous excitement, and gives a feeling of peace and concentration.

Stretching and its application

Stretching exercises are currently used in many types of physical activity. Health improvement classes primarily address the issues of preventive medicine, that is, they are engaged in strengthening all body systems in order to prevent hereditary and occupational diseases. Stretching is necessary to maintain the level of mobility of the spine and joints, the elasticity of the muscles, thanks to which we move. These exercises are used in recreational walking, jogging, swimming, aerobics and other sports. They can be used both at the beginning of the lesson and at the end.

Lets dwell on aerobics classes, which remain a very popular means of physical activity. As a result of regular exercise, there are a number of positive changes in health:

- ✓ strengthening of the cardiovascular and respiratory systems;
- ✓ strengthening of the musculoskeletal system;
- ✓ regulation of body weight with the correct alternation of physical activity and balanced nutrition;
- ✓ regulation of the psychological state (release from stress), etc.

Wellness aerobics has many advantages over other types physical activity, one of which is performing exercises with music. Due to the high emotional background of the lessons, the trainees achieve good results in maintaining their physical condition. At the same time, this type of physical activity places high demands on qualities such as endurance, strength and flexibility. The specificity of aerobics classes lies in the fact that in one lesson a large number of various and complex movements in coordination are performed, which can be of a dance, power nature, and also be performed at a different pace.

Stretching in wellness aerobics is a necessary part of part of the class. The use of stretching exercises is an excellent means of preparing the muscular system for physical activity, helps to restore the musculo-ligamentous apparatus after exercise, and is also an excellent means of strengthening the ligaments, increasing their elasticity, which helps to get rid of the risk of injury.

Due to the availability of exercises, you can and should do stretching yourself before or after any physical load.

Stretching rules

Like every complex, stretching involves adherence to certain rules:

- ✓ exercise slowly and smoothly;
- ✓ warming up before exercise - this will improve blood circulation and will increase the supply of oxygen to the muscles;
- ✓ the muscles should be relaxed, since the tense muscle is very difficult to stretch;
- ✓ stretch regularly, smoothly and gradually;
- ✓ when performing exercises, the back should be flat; breathe evenly calmly; take measures to reduce injuries;
- ✓ the maximum effect is achieved if the complex is performed every a day for 30-60 minutes.

Stretching effects

- ✓ STRETCHING has a stimulating effect on blood and lymph circulation in the body.
- ✓ STRETCHING exercises, included in the final part of the training session, help the muscles to recover by returning from the contracted state to the previous length (at rest).
- ✓ STRETCHING exercises have a relaxing effect on muscles and relieve various pains caused by stress and tension of the nervous system.
- ✓ STRETCHING slows down and makes gradual some of the processes in our body associated with aging.

- ✓ Muscles that are regularly trained in stretching maintain their elasticity and are well supplied with blood and nutrients.
- ✓ Stretching exercises are effective in reducing mental stress as they tone the muscles but relax the brain.

Training methods

Stretching has 5 main training methods:

- ✓ **active stretching** implies that the practitioner himself applies efforts to stretch a particular part of the body.
- ✓ **passive stretching** - when the practitioner is at rest, and his partner helps him stretch the body parts.
- ✓ **dynamic stretching** is performed until a feeling of slight tension, when one movement smoothly turns into another (an example would be alternating bends in different directions at a slow pace).
- ✓ **ballistic stretching** is characterized by jerking and springy movements (for example, high-amplitude leg swings). This type of stretching is prohibited in health-improving aerobics and is mainly used in elite sports.
- ✓ **static stretching** is the holding of a certain stretching posture for some time (from 5-60 seconds). The most popular and less traumatic is static stretching.

The effectiveness of stretching classes is very individual, but the majority of the results become noticeable after a couple of weeks.

When doing stretching exercises, you must:

- ✓ before starting to warm up to light perspiration (any aerobic exercise) ; perform all movements softly, smoothly, without jerks, slowly and evenly;
- ✓ do exercises until you feel mild soreness,
- ✓ which serves as a signal to stop work;
- ✓ keep the muscles in a stretched state, depending on the complexity exercise for 5 to 60 seconds.

A set of exercises

Most stretching exercises are shown on the right leg, arm, or side, assuming that most right-handers have the right side stronger, and therefore less stretched, than the left.

Remember a simple rule: the more the muscle is stretched, the longer it needs to be held in the stretched position. One way or another, when working with any muscle group, large or small, it will be necessary to increase the time the muscles are under load (add at least 5 seconds every week). If it is difficult for you

to be in a fixed position for a long time, increase the number of sets for each muscle group, for example, instead of one set of 15 seconds, do two of the same, and then three. Or combine both concepts, increasing both the number of seconds and the number of sets. The sequence of exercises is calculated in such a way that you need to do the exercises in order. Each subsequent exercise will feel more and more accessible due to the effect of the previous exercise.

Stretching exercises fall into two categories:

1. Upper body.

Before strength training "shoulder girdle" perform this set of six exercises, hold each position for 5-60 seconds.

MAHI HANDS:

Rotate your hands in turn, first 10 times forward, and then 10 times back. The pace is moderate, you don't need to swing like a fan.

STRETCH NECK:

Standing in the usual way or kneeling down, tilt your head to the right, helping yourself with your right hand. Repeat the other way. A more aggressive way would be to try to press your right ear not to your shoulder, but to your chest, and then touch the same point on your chest with your other ear.

STRETCH SHOULDER JOINTS:

1. Raise your right hand above your head, bend it with your left hand, gently pull your right hand by the elbow to the side. Repeat on the other hand. This exercise, in addition to affecting the shoulder joint, also stretches the long head of the triceps.
2. Press your straight arm against the opposite shoulder, helping yourself with your free hand. Stretch your arms over the shoulder just above the elbow joint and do not lift the shoulder of the working arm up.
3. Place the bent arm behind your back so that the fingers of the extended hand are directed towards the head. With your free hand, press on the elbow and try to raise the extended arm higher. Repeat on the other hand.

STRETCH LATEST MUSCLES:

1. Stand under the crossbar and grasp it with your right hand (your feet should touch the floor). Gently begin to bend your knees and turn your pelvis to the left. Repeat on the other hand.

2. Stand in front of a vertical wall and lean forward, leaning against the wall with your hand, your body should be parallel to the floor. Rotate the pelvis to the left to feel the lats stretch.

WRIST STRETCH:

Extend your arm in front of you and do these three exercises.

1. Directing the right palm forward, pull the fingers of the right hand toward you with your left hand, without bending it at the elbow.
2. Directing the right palm towards you, with your left hand pull the entire hand towards you, without bending your right hand at the elbow.
3. Extend your right hand in front of you, palm down. With the left hand, turn the right hand to the side and up. Repeat all three exercises for the left hand.

CHEST STRETCH:

Stand against a wall, doorway, or any other vertical support. Now do the 4 following exercises:

1. Place your right forearm on the wall, keeping your shoulder parallel to the floor. Rotate the body to the left and hold for the required number of seconds.
2. Move slightly away from the support and straighten your arm almost to the end. Now the palm should rest against the wall, directed away from itself. Turn the body to the left again.
3. Move further away from the wall and fully straighten the extended arm. Leave everything else as before: palm into the wall, turn left.
4. Without bending your right hand, turn the hand with the palm back. Turn the body back to the left and feel the load on the muscles of the forearm in parallel with stretching the chest. Repeat all four exercises with your left hand.

2. Lower body

Flexibility exercises, most of them, are recommended to be done on a special mat to protect the knees and back from unnecessary damage. Also, some exercises may require a towel, rope, or any other similar object. Hold each stretch for 15-90 seconds.

STRETCH SHINS:

1. Stand in front of the wall and put the toe of your left foot on it, keep the heel of the same foot on the floor. Without bending the front leg, push the pelvis forward, bringing the lower leg to the wall. Do not forget to rest the foot of your supporting leg on the floor with your entire surface and, just in case, lean your hands on the wall for better control of the intensity of the stretching force.

2. Take the same starting position, but now noticeably bend the leg in front, without lifting its heels off the floor. Keeping a stable knee angle, push your pelvis forward, bringing your knee closer to the wall. Repeat both exercises on the other leg.

Lumbar STRETCH:

Do all three exercises while lying on the floor. The second and third are permissible only if there are no back problems. Walk out of each position slowly and carefully so as not to get injured.

1. To group, hugging your knees with your hands and pulling your chin to your chest. Sway a little back and forth on your back.
2. Straighten your legs and, spreading your arms to the sides for better balance, bring them back behind your head.
3. If both previous exercises did not cause problems, bend both legs and place them on the floor at the sides of the head.

REAR THIGH STRETCH:

1. Lie on the floor with your left leg straightened and laid on the floor. Grasp the right foot with a towel or a belt and, straightening it above you, pull it towards you.
2. Throw away the towel, slightly bend the stretched leg and grab it with both hands by the ankle. Bring your knee to your chest. Try not to lift your left leg off the floor.
3. Take the thigh of the right leg into the lock just under the knee, bend the working leg even more. Pull your thigh towards you, without lifting your lower back from the floor and without lifting your left leg. Repeat all three exercises on the other leg. These exercises are designed to stretch exclusively the hip extensors so that there should be no sensation in the lower back.

STRETCH OF THE gluteal muscles:

1. Lying on your back, bend your right leg at the knee and pull it to your chest, directing your lower leg across your body. Taking the knee, bend your legs to the side, pull the heel of your right leg up with your left hand.
2. Place the right foot on the floor to the left of the left knee. Without lifting your back from the floor and without turning your body to the left, pull the knee of your bent leg towards the opposite shoulder.
3. Now bend the left leg, put the right foot on the left thigh next to the knee. Pass your right hand into the resulting ring between the legs and grab the thigh of

the left leg with both hands. Pull the entire resulting structure towards you, trying not to round your back. Repeat all three exercises for the left leg.

REAR CHAIN STRETCH:

Calves, hamstrings, glutes, and extensors of the spine can be stretched individually, but they are best trained as part of a single chain. Both of these exercises stretch all of these muscles.

1. Lie with your back on the floor and spread your arms out to the sides at right angles to the body, palms facing the floor. Raise your right leg up and lower it to the left and side to the floor. The final position of the foot will depend on the operational level of flexibility, but over time it will be necessary to try to place it as close to the head as possible.
2. Bend your right leg and push it with your left hand, pressing the knee to the floor. It is forbidden and ugly to tear the loin off the floor. Repeat the same for the left leg.

HIP STRETCH / SQUARES:

1. Get on one knee next to the bench, put the instep of the right foot on the bench (the knee of the right foot can be placed on a mat or something softer than a regular floor), put your hands on your belt. Taking the pelvis back, try to touch the heel of the right leg with your buttocks.
2. Move aside and clasp your hands behind the back of your head. Without leaning forward, try to lower your pelvis as close to the floor as possible. Repeat both exercises on the other leg.

Indications and contraindications

Stretching has no serious contraindications. Those people who have had injuries, sprains of joints, ligaments and spine, before starting to engage in this set of exercises, you should consult with an experienced instructor. As a prophylaxis for such injuries, stretching is ideal, as well as during the rehabilitation period after operations and diseases.

Theoretical material:

1. Stretching for everyone: Stretching. Nussio E. Ed.: Dilya. 2007 year.
2. Stretching: Deep stretching method. Putkisto M. Publishing house: Sofia. 2004 r.
3. Active stretching. Author: Milen Schenk. Publ.: Fair.
4. Stretching for health and longevity. Vanessa Thompson. Publ.: Phoenix. 2004 r.

Topic 6. Assessment of the functional state of students of a special educational department

PURPOSE OF THE LESSON: teaching students the methodology for assessing the functional state of students of a special educational department.

A STUDENT SHOULD KNOW:

- functional tests to assess the state of the cardiovascular systems;
- functional tests to assess the state of the autonomic nervous systems;
- functional tests to assess external respiration;
- functional tests to assess the psycho-emotional state;
- functional tests to assess the neuromuscular system;
- functional tests to assess the state of the vestibular apparatus;
- methodology for determining biological age.

A STUDENT SHOULD BE ABLE TO:

- determine the functional state using functional tests and tests.

ABOUT CHAPTER L E N I E:

1. Functional test.
2. Control over the functional state of the cardiovascular systems:
 - heart rate monitoring;
 - martines test.
3. Functional tests to assess the state of the autonomic nervous systems:
 - skin - vascular reaction;
 - kerdo technique;
 - orthostatic test;
 - clinostatic test.
4. Functional tests for assessing external respiration:
 - shtange test;
 - genchi test;
 - vital capacity of the lungs.
5. Psycho-emotional state:
 - scale of depression E.R. Akhmedzhanov.
6. Assessment of the neuromuscular apparatus:
 - tapping - test;
 - hand dynamometry.
7. Assessment of the functional state of the vestibular apparatus:
 - romberg test.
8. Biological age:
 - assessment of individual values of biological age;
 - assessment of the functional class.
9. Self-control diary.
10. Table of assessments of indicators of functional state and physical development of students of a special educational department.

1. FUNCTIONAL TEST

The functional state and fitness level of those involved in physical exercises and sports can be determined using functional tests and tests.

Functional test - a way to determine the degree of influence on the body of dosed physical activity. The test is important for assessing the functional state of the body's systems, the degree of adaptability of the body to physical activity to determine their optimal volume and intensity, as well as to identify deviations associated with a violation of the methodology of the educational and training process.

2. CONTROL OF FUNCTIONAL THE STATE OF THE CARDIOVASCULAR SYSTEM

Blood circulation is one of the most important physiological processes that maintain homeostasis, ensuring continuous delivery of nutrients and oxygen necessary for life to all organs and cells of the body, removal of carbon dioxide and other metabolic products, processes of immunological protection and humoral (fluid) regulation of physiological functions. It is possible to assess the level of the functional state of the cardiovascular system using various functional tests.

PULSOMETRY

Pulse study is one of the main and most accessible methods for studying heart function. A pulse is a periodic jerky oscillation of the walls of the arteries caused by the flow of blood ejected by the heart into the aorta with each contraction.

Pulse rate (HR) is usually measured by palpation, by placing four fingers of the right hand on the left wrist in the area of the radial artery. Measurements can be made in the area of the carotid and temporal arteries. When calculating the frequency of occurrence, the stopwatch should be turned on at the moment the pulse wave begins to propagate, and the count should be started from the next pulse push. The counting is carried out for 10 or 15 seconds. In order not to lose count, especially after exercise, it is recommended to count in tens. The total number of strikes in 10 or 15 s is multiplied by 6 or 4. The resulting product determines the emergency in 1 min.

For students, the zone of optimal loads is the heart rate from 150 to 175 beats / min.

The value of blood pressure (BP) also serves as an important characteristic of the activity of the cardiovascular system.

Blood pressure measurement is usually performed on the brachial artery using a special device - a tonometer. Normally, in an adult, the systolic pressure is 110 - 125 mm. rt. Art., minimum - 60 - 85 mm. rt. Art. Blood pressure is constant under normal conditions. During physical work, an increase in systolic pressure is observed, during sleep - a decrease. In diseases associated with circulatory disorders, the blood pressure changes. In some cases, it turns out to be increased - hypertension, in others - decreased - hypotension. The reasons for lowering blood pressure can be a decrease in the number and strength of heart contractions, dilatation of arteries, especially small ones, and large blood loss. Stable increase in maximum pressure up to 140 - 150 mm. rt. Art. and more indicates hypertension, which is almost always a consequence of a decrease in the elasticity of the walls of blood vessels. Hypertension occurs more often in obese people than in people with normal body weight. When smoking, the systolic pressure may increase by 10 - 20 mm. rt. Art. With an increase in blood pressure, the load on the heart increases.

SAMPLE MARTINE

The subject performs 20 squats at a slow pace in 30 seconds. Heart rate is calculated before and after exercise for 10 seconds. The assessment of the pulse response to physical activity is determined by comparing the data of the heart rate at rest (before exercise) and after exercise, i.e. the percentage of heart rate increase is determined. The resting heart rate is taken as 100%, the difference in frequency before and after exercise - for X. We make the proportion and derive the formula: % gain = ((HR2-HR1) x100) / HR1

For example, the pulse before the start of the load was 12 beats in 10 seconds, and after - 20 beats
 $12-100\% = X = (8 \times 100) / 12$
 $8 - X\%$

The gain %CC after exercise is 66.6%.

In order to calculate the percentage of the increase, the heart rate must be in the cabin of crossing the heart rate in 10 s. at rest, with a pulse rate of 10 s. after the load, find the % increase. The score is determined from the table.

Martinet Sample Evaluation Table

% growth	appraisal	% growth	appraisal	% growth	Appraisal
<25	«5,0»	50,0-55,9	«3,8»	80,0-84,9	«2,6»
25,1-29,9	«4,8»	56,0-60,9	«3,6»	85,0-89,9	«2,4»
25,1-34,9	«4,6»	61,0-65,9	«3,4»	90,0-94,9	«2,2»
35,0-39,9	«4,4»	66,0-70,9	«3,2»	95,0-99,9	«2,0»
40,0-44,9	«4,2»	71,0-74,9	«3,0»	100,0-104,9	«1,8»
45,0-49,9	«4,0»	75,0-79,9	«2,8»	105-109,9	«1,6»

SINGLE TEST

Before performing a one-stage test, rest while standing, without movement for 3 minutes. Then the heart rate is measured in one minute. Next, 20 deep squats are performed in 30 seconds from the starting position of the legs shoulder-width apart, arms along the body. When squatting, the arms are brought forward, and when straightened, they are returned to their original position. After doing the squats, the heart rate is calculated for one minute. The assessment determines the rate of increase in heart rate after exercise in percent. A value of up to 20% means an excellent response of the cardiovascular system to stress, from 21 to 40% - good; from 41 to 65% - satisfactory; from 66 to 75% - bad; from 76 and more - very bad.

RUFFIER INDEX

To assess the activity of the cardiovascular system, you can use the Ruffier test. After a 5-minute resting state in a sitting position, count the pulse in 10 s (P1), then perform 30 squats for 45 s. Immediately after squatting, calculate the pulse for the first 10 s (P2) and one minute (P3) after the load. The test is not recommended for people with cardiovascular diseases.

3. FUNCTIONAL ASSESSMENT TRIALS STATES OF THE VEGETATIVE NERVOUS SYSTEM

An idea of the function of the nervous autonomic system can be obtained from the skin-vascular reaction. It is defined as follows: several strips are drawn along the skin with some non-sharp object (unrefined end of a pencil) with light pressure. If a pink color appears at the place of pressure on the skin, the skin-vascular reaction is normal, white - the excitability of the sympathetic innervation of the skin vessels is increased, the red or convex-red excitability of the sympathetic innervation of the skin vessels is high. A white or red demograph can be observed with deviations in the activity of the vegetative nervous system (with overwork, during illness, with incomplete recovery).

Assessment of the functioning of the autonomic nervous system is carried out according to the method of determining the vegetative index (VI) KERDO. The subject in a sitting position measures the heart rate in 1 minute and blood pressure. The measurement results are substituted into the formula:

$$\text{"VI"} = (1 - \text{ADP} / \text{HR}) \times 100, \text{ where:}$$

BPP - diastolic blood pressure (mm Hg);

HR - heart rate in 1 minute (beats / min).

Determination of the tone of the autonomic nervous system

Indicators	The predominance of the tone of parasympathetic innervation		Relative equilibrium	The predominance of the tone of sympathetic innervation	
IN AND (ue)	-31 and below	-30 to -16	- 17 to 15	16 to 30	31 and up

ORTHOSTATIC TEST is based on the fact that the tone of the sympathetic part of the autonomic nervous system and, accordingly, the heart rate increases when moving from a horizontal position (clinostatics) to a vertical one (orthostatics).

The test is carried out as follows. The examinee lies down on the couch, after 3 - 4 minutes, his pulse is counted for 15 seconds. Then he gets up and 15 seconds after the transition to an upright position, his pulse is again determined. The results are recalculated for 1 min. With normal tone and excitability of the sympathetic part of the autonomic nervous system, the increase in pulse rate should not exceed 12 - 18 beats / min. A decrease in the pulse rate by less than 12 beats / min or an increase in the pulse rate by more than 18 beats / min indicates, respectively, a decrease or increase in the excitability and tone of the sympathetic part of the autonomic nervous system. If the difference is more than 20 bpm, the body cannot cope with the proposed load, that is, there is residual fatigue.

The **CLINOSTATIC TEST** is based on the fact that during the transition from a vertical to a horizontal position, the tone of the parasympathetic division of the autonomic nervous system increases, which is expressed in the hardening of the pulse rate.

The clinostatic test is carried out in the reverse order compared to the previous one. Normal excitability of the parasympathetic division of the autonomic nervous system is expressed in pulse hardening by 3 - 12 beats / min; a more significant increase in pulse rate indicates an increased excitability of this part of the autonomic nervous system.

4. FUNCTIONAL TRIALS FOR EXTERNAL RESPIRATION ASSESSMENT

Breathing is the process that ensures the consumption of oxygen and the release of carbon dioxide by the tissues of a living organism. This process is carried out through a complex interaction of the respiratory, circulatory and blood

Distinguish between external (pulmonary) and intracellular (tissue) respiration. External respiration is called the exchange of air between the environment and the lungs, intracellular - the exchange of oxygen and carbon dioxide between blood and body cells. To determine the state of the respiratory system and the ability of the internal environment of the body to be saturated with oxygen, the following samples are used:

This test characterizes the body's resistance to oxygen deficiency.

TEST BAR - holding the breath while inhaling. The examinee, after 5 - 7 minutes of rest in a sitting position, makes a full inhalation and exhalation, and then inhales again (80 - 90% of the maximum) and closes his nose and mouth. The time from the moment of holding the breath to the termination of the test is recorded. Usually, healthy untrained people hold their breath while inhaling for 40 - 50 s, and trained athletes - from 1 to 2.5 minutes. With the improvement of the state of fitness, the time for holding the breath increases, and with fatigue it decreases.

If you are able to hold your breath for less than 50 s, then you have poor functional readiness, at 65 - 75 s - average and more than 80 s - good functional readiness.

During this test, intrathoracic pressure increases, which leads to obstruction of blood flow through the lungs. The blood flow to the left ventricle of the heart decreases, while the right ventricle does a great deal of work associated with overcoming the increased intrathoracic pressure. At this time, the rhythm of the heart contractions is disrupted, the pulse becomes more frequent, the venous pressure rises, and the systolic pressure first increases and then decreases. This test is mainly a load on the right heart. Usually, in healthy people, after 1 - 2 minutes after the test, all indicators are normalized. For people with heart disease, this test is undesirable.

TEST GENCHI - holding the breath while exhaling. This test is a load mainly for the left heart. The examinee, after full exhalation and inhalation, exhales again and holds his breath. Here, the average indicator is the ability to hold the breath while exhaling for untrained people for 25-30 seconds, for trained people for 40-60 seconds or more. With an increase in fitness, the duration of holding the breath in trainees increases, with fatigue it decreases.

The assessment of the functional state in this test is as follows:

Evaluation of the Genchi sample

Assessment	Indicators (c)	
	men	women
«5»	58 and above	38 and up
«4»	50-57	32-37
«3»	35-49	21-31
«2»	27-34	15-20
«1»	18 and below	8 and below

VITAL CAPACITY OF THE LUNGS (VC, ml) is determined at rest, in a standing position: the examinee, after maximum inhalation, takes the tip of the spirometer into his mouth and exhales slowly into the tube to failure. VC determines the body's ability to adapt to physical activity, to a lack of oxygen in the inhaled air. The value of VC depends on the state of health, age, sex, height, body weight, as well as the position of the body (in the supine position the VC is lower than standing or sitting). After determining the VC, the vital index is determined.

The LIFE INDEX is calculated by the formula:

$$LI = VC (ml) / body weight (kg)$$

Life index score

Assessment	Indicators (ml / kg)	
	men	women
«5»	>66	>56
«4»	61-65	51-56
«3»	56-60	46-50
«2»	51-55	41-45
«1»	<50	<40

5. PSYCHOEMOTIONAL STATE

To assess the psycho-emotional state, the scale of depression is used (E.R. Akhmedzhanov, 1995). Testing includes 20 questions. The subject needs to choose the appropriate answer option. The total number of points is calculated.

Depression scale

№	Question	Occasio nally	Someti mes	Often	Always
1.	I feel depressed	1	2	3	4
2.	I feel best in the morning.	4	3	2	1
3.	I have periods of crying	1	2	3	4
4.	I have a bad night's sleep.	1	2	3	4
5.	My appetite is no worse than usual	4	3	2	1
6.	I am pleased to look at attractive women (men)	4	3	2	1
7.	I notice that I am losing weight	1	2	3	4
8.	I am concerned about constipation	1	2	3	4
9.	Heart beats faster than usual	1	2	3	4
10.	I get tired for no reason	1	2	3	4
11.	I think as clearly as ever.	4	3	2	1
12.	It's easy for me to do what I can.	4	3	2	1
13.	I feel anxious and cannot sit still	1	2	3	4
14.	I have hopes for the future	4	3	2	1
15.	I'm more irritable than usual	1	2	3	4
16.	I find it easy to make decisions	4	3	2	1
17.	I feel useful and necessary	4	3	2	1
18.	I live a fairly full life	4	3	2	1
19.	I feel that other people will be better off if I die.	1	2	3	4
20.	I am still happy with what has always pleased me	4	3	2	1

Assessment of the level of depression

<i>appraisal</i>	<i>points</i>
«5»	20-30
«4»	31-41
«3»	42-59
«2»	60-70
«1»	71-80

6. ASSESSMENT OF THE NERVO-MUSCULAR APPARATUS

TEPPING - TEST (TT)

To perform this test, a sheet of paper is taken, on which four adjacent 10x10 cm squares are drawn. The subject, sitting at the table, must, in 20 seconds, use a pencil to draw the maximum number of points. At the command, dots are first put in one square, then every 5 s. on a signal without a pause, dots are placed in the next squares. The number of points placed in each square is estimated. For accurate counting of points, draw a line with a pencil from one point to another. The average indicator of the speed of movement is the ability to put 30 ... 35 points in each square in 5 seconds. A decrease in the number of points from square to square indicates insufficient functional stability of the neuromuscular apparatus.

BRUSSAL DYNAMOMETRY, measuring the strength of the flexor muscles of the fingers is carried out with a hand dynamometer. The examinee in a standing position grabs the dynamometer with the dial to the palm with his hand, then, without tension in the shoulder, raises his hand to the side and squeezes the dynamometer with maximum force (it is not allowed to bend the arm at the elbow and leave the place),

If the indicator of hand strength after the lesson remained unchanged or changed significantly, then the load was small, if it decreased by 3 - 5 kg, then the average, if by 6 - 10 kg or more, the load is large.

The average strength of the right hand for left-handers - left-handed in men - 35 - 50 kg, for women - 25 - 33 kg, the average strength of the left hand is usually 5 - 10 kg less. The average indicators of the relative strength of the flexor muscles of the hand are 60 - 70% of the body weight, in women - 45 - 50%.

7. EVALUATION OF FUNCTIONAL CONDITIONS OF THE VESTIBULAR APPARATUS

Assessment of the functional state of the vestibular apparatus is carried out using a modified ROMBERG TEST.

A simple test, when the subject is standing with shifted feet, hands forward, fingers apart, eyes closed. Complicated test is more informative. The examinee, taking off his shoes, takes the initial position of a stand on one leg, the other leg is bent with the knee forward and touches the plantar surface of the knee joint of the supporting leg, hands forward, fingers are spread, eyes are closed.

When evaluating the Romberg test, attention is paid to the degree of stability (standing still, swaying), trembling of the eyelids and fingers (tremor) and, most importantly, the duration of balance.

Maintaining a stable posture for more than 15 s without tremor is assessed as good; slight tremor of the eyelids and fingers when holding the position for 15 s - satisfactory; the posture is held for less than 15 seconds - unsatisfactory.

8. BIOLOGICAL AGE

The development of the Kiev Research Institute of Gerontology (1990) is used as a method for determining biological age (BV).

When determining the integral indicator of biological age, the degree of aging of an individual is assessed by the most important indicators of the activity of the cardiovascular and respiratory systems of the body, since their condition significantly limits life expectancy and makes a significant contribution to the overall assessment of the risk of death (V.A. R. Gritsenger, B.P. Shirokov, 2000).

Determination of biological age is carried out according to the formulas:

$$BV (women) = - 1.463 + 0.415 \times ADP - 0.140 \times SB + 0.248 \times MT + 0.694 \times SOZ;$$

$$BV (man) = 26.985 + 0.215 \times ADS - 0.149 \times ZDV - 0.151 \times SB + 0.723 \times SOZ,$$

Where:

APP - pulse blood pressure (mm Hg);

ADS - systolic blood pressure (mm Hg);

SB - static balancing (s); is determined when the subject is on the left leg, without shoes, eyes are closed, arms are lowered along the body (without preliminary training).

HFA - breath holding on inspiration (s);

MT - body weight (kg);

POPs - subjective health assessment - questionnaire (points).

Subjective health assessment is carried out using a questionnaire that includes 29 questions (Appendix 4). After completing the questionnaire, the total number of unfavorable answers (number of points) is calculated.

Answers "Yes" to questions No. 1-8, 10-12, 14-18, 20-28 and answers "No" to questions No. 9, 13, 19 are considered unfavorable. One of the last two answers is considered unfavorable to question no. 29.

QUESTIONNAIRE
"Subjective assessment of health"

1. Do you have headaches: Yes No
2. Can we say that you easily wake up from any noise: Yes No
3. Are you worried about pain in the heart area: Yes No
4. Do you think that your eyesight has deteriorated in recent years:
Well no
5. Do you think that your hearing has deteriorated in recent years: Yes No
6. Do you try to drink only boiled water: Yes No
7. Do juniors give way to you on the bus, tram, trolleybus
growing: Yes No
8. Are you concerned about joint pain: Yes No
9. Do you go to the beach: Yes No
10. Does the weather change affect your well-being: Yes No
11. Do you have such periods when because of anxiety you lose sleep:
Well no
12. Are you worried about constipation: Yes No
13. Do you think that you are as efficient now as before:
Well no
14. Are you worried about pain in the liver area: Yes No
15. Do you have dizziness: Yes No
16. Do you think that it has become more difficult to concentrate now than in
past years: Yes No
17. Are you worried about weakening of memory, forgetfulness: Yes No
18. Do you feel in different parts of the body a burning sensation, tingling, "crawling
goosebumps ": Yes No
19. Do you have periods when you feel happy?
excited, happy: Yes No
20. Do you have noise or ringing in your ears: Yes No
21. Do you keep one of the following copper in your first aid kit for yourself?
kamentov: validol, nitroglycerin, heart drops: Yes No
22. Do you have swelling in your legs: Yes No
23. Do you have to refuse some dishes: Yes No
24. Do you have shortness of breath when walking fast: Yes No
25. Are you worried about lower back pain: Yes No
26. Do you have to use any mineral for medicinal purposes?
fresh water: Yes No
27. Are you worried about an unpleasant taste in the mouth: Yes No
28. Can we say that you began to cry easily: Yes No
29. How do you assess your state of health: "good", "satisfy
corporeal ", " bad ", " very bad "

Assessment of individual values of biological age

Using the above formulas, the BV value is calculated for each subject. In order to judge the extent to which the degree of "aging" corresponds to the calendar age of the subject, the individual value of biological age is compared with the proper biological age (ABA), which characterizes the average population standard of "aging rate".

The DBV value is calculated by the formulas:

$$\text{Men DBV} = 0.629 \times KV + 18.56$$

$$\text{Women FAB} = 0.581 \times KV + 17.24, \text{ where}$$

KB - calendar age (number of full years).

After determining the biological age and the proper biological age, the "aging rate" of the organism is determined.

"Aging rate" = $BV - DBV$, where:

BV - biological age;

DBV is the proper biological age.

If $BV - DBV > 0$, then the subject has an "accelerated rate of aging" of the organism. If $BV - DBV < 0$ - "slowed aging rate" of the organism.

Depending on the severity of changes in the "rate of biological aging" of the organism, the subjects are divided into five functional classes.

EVALUATION OF THE FUNCTIONAL CLASS (V.A.RESHETNIKOV, 2000)

Functional class	Deviations of BV from the population standard (BV-DBV) (cond. years)	Assessment
I	From –15,0 to –9,0 years	«5»
II	From –8,9 to –3,0 years	«4»
III	From –2,9 to +2,9 years	«3»
IV	From +3,0 to +8,9 years	«2»
V	From +9,0 to +15,0 years	«1»

9. SELF-CONTROL DIARY

For a self-control diary, it is enough to use a small notebook. Self-control readings and dates are entered in the columns.

The diary is divided into two parts. In one of them, the content and nature of educational and training work should be noted (volume and intensity, pulse rate during its implementation, duration of recovery after exercise). In another, the magnitude of the load of the previous training and the accompanying state of health during wakefulness and sleep, appetite, and working capacity are noted.

Self-control is essential for all students, teachers, and exercise staff, but it is especially important for those with disabilities. Self-control data help the teacher to control and regulate the correct selection of means and methods of carrying out physical culture, health-improving and educational-training sessions, to control these processes in a certain way.

The following is proposed as a form of keeping a diary. The state of health is assessed as "good", "satisfactory" and "bad"; at the same time, the nature of unusual sensations is recorded. Sleep is assessed by the duration of the depth, its disturbances are noted (difficult falling asleep, restless sleep, insomnia, lack of sleep, etc.). Appetite is characterized as good, fair, decreased, and poor. Pain sensations are recorded at the place of their localization, character (acute, dull, cutting) and the strength of manifestation.

10. Table of assessments of indicators of functional state and physical development of students of a special educational department

Indicators		Score in points				
		1	2	3	4	5
Orthostatic test, beats / min		23-20	19-16	15-12	11-8	7-0
Life index, ml / kg	M	<50	51-55	56-60	64-65	>66
	W	<40	41-45	46-50	51-56	>56
Genchi test, s	M	<26	27-34	35-49	50-57	>58
	W	<14	15-20	21-31	32-36	>37
PWC 150 kgm / min / kg	M	<13,5	13,6-14,6	14,7-15,7	15,8-16,8	>16,8
	W	<9,5	9,6-10,5	10,6-11,5	11,6-12,5	>12,5
Biological age, conv. Years (methodology of the Kiev Research Institute of Gerontology)		from +9,0 to +15	from +8,9 to +3,0	from +2,9 to -2,9	from -3,0 to -8,9	from -9,0 to -15,0
UFS according to E.A. Pirogova, conventional units		<0,375	0,376-0,525	0,526-0,675	0,679-0,825	>0,825
Romberg test, s		<9	10-15	16-29	30-40	>41
Tapping test, number of beats / s	M	<5,2	5,3-5,8	5,9-6,9	7,0-7,5	>7,5
	W	<4,8	4,9-5,2	5,3-5,9	6,0-6,4	>6,4
Martinet test, %		>100	99,9-74,9	74,8-49,9	49,8-25,0	<25

Functional tests and tests make it possible to track changes in the functional state of the body, depending on the means of physical education used, allow you to control the adequacy of physical activity to the possibilities of those involved in physical culture and sports in order not to allow them to overload and overstrain, usually resulting from irrational activities. Therefore, the task of the Department of Physical Education is to familiarize students with the methods for the functional state of the body. This knowledge will allow them to exercise control in the process of training, using the simplest and most accessible tests and tests.

Theoretical material:

1. Maksimenko A.M. Theory and methodology of physical culture. Textbook, Moscow: FiS, 2005.
2. Kholodov Zh.K., Kuznetsov V.S. Workshop on the theory and methodology of physical education and sports. - 2nd ed. - M.: Publishing Center "Academy", 2005.
3. Volkova L.M. Assessment and control of the physical condition of students of a special educational department.
4. L.M. Volkova, V.F. Volkov. Modern scientific and methodological developments in the physical education of students with deviations in health: Abstracts. report Vseros. scientific method. conf. - SPb., 2002.
5. Aghajanyan M.G. "Sports heart" from the standpoint of assessing the degree left ventricular hypertrophy. Human physiology. 2001.
6. Gotovtsev P.I., Dubrovsky V.L. Self-control when doing physical education.
7. Demin D.F. Medical supervision during physical training.
8. Dimova A.L. Psychoregulation as an important component of mental health of students with poor health. A.L. Dimova, L.G. Ulyayeva. Abstracts. report Vseros. scientific method. conf. - SPb., 2002.
9. Zagrevskaya A.I. Determination of the health level of students with impaired health. A.I. Zagrevskaya, S.B. Narzulaev. Abstracts. int. scientific-practical conf. -M., 1999.
10. Kalinichenko A.V. The state of health of students of a medical university, as a medical and social problem, taking into account the incidence rates. A.V. Kalinichenko, V.A. Bortsov, O. N. Zhogol. Materials of the X Int. symposium. - M., 2001.
11. Mandrikov V. B. On the problems of assessing the functional state of students of a special educational department. V.B. Mandrikov, L.V. Salaznikova, M.P. Mitsulina // Abstracts. report Vseros. scientific method. conf. - SPb., 2002.

12. Milodan V.A. Means and methods for assessing the levels of physical and functional state of students of special medical groups. V.A. Milodan, A.I. Shabanov, S.A. Malysheva. Abstracts. report Vseros. scientific method. conf. - SPb., 2002.
13. Platonova V.A. Means and methods of monitoring the physical fitness of students involved in a special medical group. V.A. Platonova, E.V. Zefirova, Yu.N. Shchedrin. Abstracts. report Vseros. scientific method. conf. - SPb., 2002.

Topic 7. Operational control in physical culture lessons

PURPOSE OF THE LESSON: Teaching students the methodology for assessing load tolerance in physical culture lessons.

A STUDENT SHOULD KNOW:

- regularities of changes in working capacity in the process of training physical exercise;
- principles of dosing of physical activity.

A STUDENT SHOULD BE ABLE TO:

- practically assess the state of your physical and functional preparedness;
- dose the load according to the level of health and physical performance.

TABLE OF CONTENTS:

1. Determination of the load.
2. Types of reactions to physical activity.
3. Determination of the value of the load on the pulse.
4. Determination of the value of the load by blood pressure (BP).
5. Determination of the value of the load by the respiratory rate (RR).
6. Determination of the value of the load on the vital capacity of the lungs (VC).
7. Determination of the magnitude of the load by the change in body weight (weight).
8. Determination of the magnitude of the load by subjective indicators of the state of the body.
9. Methodology for determining the energy cost of a lesson.
10. Theoretical material.

1. Determination of load

The process of managing exercise sessions involves dosing physical activity in the classroom. Under the load it is customary to understand a certain value of the impact of physical exercises on the body of those involved. Exercise is associated with energy expenditure and causes fatigue. It, in turn, stimulates the restoration processes in the body. There is a direct relationship between the load and the response of the body: the higher the load, the more significant the changes in the body. However, as the fitness of the body increases, the same load leads to a gradual decrease in the response in the body, i.e. there is a corresponding adaptation to it.

Being at first developing, the load can then become simply supportive. Therefore, in classes, especially in sports, you have to constantly increase the load. Moreover, the nature of the load will always determine the specifics of acquisitions. A person gets tired in the process of power loads, he develops mainly strength abilities, performs high-speed physical work - improves speed abilities, etc.

There are two structural components in the load - volume and intensity. The volume of the load is understood as the total amount of physical work performed for a certain period of time (for 1 lesson, week, year, etc.). For example, in cyclic sports - the total mileage of distances covered, in weightlifting - the total weight of weights, in single combats - the number of fights, in gymnastics - the number of combinations or elements. Intensity is the power and intensity of the exercise over time. The measure of intensity in cyclic sports will be the speed of distances covered, in weightlifting - the amount of weights, in team sports, martial arts - the duration, psychological tension of the game or fight, in gymnastics - the complexity of the combination, etc. There is an inverse relationship between volume and intensity. A person can perform a large amount of work at a low intensity and, conversely, the higher the intensity, the lower the total amount of work will be.

2. Types of reactions to physical activity

*When engaging in physical exercises, there are 3 types of control: **operational** - carried out during the exercise or immediately after it; **current** - after one, two weeks of classes; **stage** - at the end of the training cycle or its periods, but, as a rule, as part of the annual preventive examination.*

When carrying out operational control, taking into account subjective sensations in health-improving training, there are 3 types of reactions to physical activity (according to G.L. Apanasenko, 2000): physiological; "Borderline" and pathological.

The physiological response is characterized by the following:

- ✓ *during training* - the feeling of the possibility of increasing the intensity of the load remains; The heart rate is within the limits established for this individual; free rhythmic breathing is maintained (for example, while running, inhale for 3 steps, exhale for 3 steps); there is a desire to continue the lesson;
- ✓ *immediately after training* - good health, accompanied by a feeling of "muscle joy", heart rate for 3 minutes below 100 bpm;
- ✓ *between training sessions* - a feeling of general fatigue lasts no more than 2 hours after training; desire to exercise; 2 hours after training and water procedures, heart rate is below 80 beats / min; local fatigue (feeling tired) lasts no more than 12 hours.

Border reaction:

- ✓ *during training* - a feeling of extreme load, an increase in the usual pace of breathing with an acceleration of its phases (for example, when running - 2 steps per inhalation, 2 - for exhalation); the appearance of various unpleasant sensations or pain behind the sternum, disappearing with a decrease in the intensity of the load (pace of running);
- ✓ *immediately after training* - a feeling of depression, after 3 minutes, the heart rate is more than 100 beats / min, the appearance of various kinds of pain and discomfort that occurs even with low intensity loads;
- ✓ *between training sessions* - the feeling of fatigue persists for more than 2 hours after the session, interest in classes decreases, sleep is disturbed (difficulty falling asleep, waking up at night), appetite decreases. A heart rate of more than 80 bpm is maintained up to 12 hours after a training session, local fatigue persists up to 24 hours after a training session.

Pathological reaction:

- ✓ *during training* - impaired coordination, pallor, chest pain, heart rhythm disturbances;
- ✓ *immediately after training* - heart rate within 3 minutes after the end of the lesson exceeds 120 beats / min, chest pain persists, a feeling of severe fatigue, malaise, dizziness, etc.;

- ✓ between training sessions - aversion to training, malaise, impaired appetite, sleep; feeling of general fatigue for more than 12 hours after exercise, while heart rate exceeds 80 beats / min; reduced resistance to habitual physical activity (for example, climbing stairs).

The most informative indicator of the intensity of the load, especially in cyclic sports, is the heart rate (HR).

3. Determination of the value of the load on the pulse

PULSE. Currently, heart rate is considered one of the main and most accessible indicators characterizing the state of the cardiovascular system and its response to physical activity. The heart rate of a healthy untrained person at rest usually fluctuates between 75-80 beats / min in women, and 65-70 beats / min for men. In athletes, the pulse rate decreases to 50-60 beats / min, and this decrease is observed with an increase in fitness. The heart rate is determined by palpation on the carotid or radial arteries after 3 minutes of rest, in 10, 15 or 30 seconds, after which the values obtained are recalculated per minute. The heart rate is measured immediately in the first 10 seconds after work. For control, it is important how the pulse reacts to exercise and whether it quickly decreases after exercise. The trainee must follow this indicator by comparing the heart rate at rest and after the load. At low and medium loads, it is considered normal to restore the heart rate after 10-15 minutes. If a student's heart rate at rest in the morning or before each lesson is constant, then we can talk about a good recovery of the body after the previous lesson. If the heart rate is higher, then the body has not recovered.

With a light load, the pulse rate reaches 130 beats / min, with a moderate load - 130 - 150 beats / min.

The maximum load in terms of heart rate can be determined with acceptable accuracy by the formula:

$$\text{HR} = 220 - A, \text{ where } A \text{ is age in years.}$$

For example, for people in 20 years, the maximum heart rate is 200 beats / min.

You can determine the amount of load by how long it takes to restore the pulse.

So, with a low load, this happens 5-7 minutes after the end of classes, with an average one - after 10 - 15 minutes, and with a high load, the pulse is restored only after 40-50 minutes.

4. Determination of the value of the load on the arterial pressure (BP)

BP - blood pressure in the arteries of the systemic circulation. The value of blood pressure is determined mainly by the strength of the heart contractions, the amount of blood that is thrown out with each contraction, the resistance offered to the blood flow by the walls of the blood vessels.

Various devices (sphygmomanometers, tonometers) are used to measure blood pressure. To obtain more accurate data, a number of rules must be followed. The subject is in the initial sitting position. The artery should be at the level of the heart, and the zero point of the manometer should be at the level of the artery being examined. On the exposed shoulder of the subject, above the elbow (2 cm above the antecubital area), a special cuff connected to a tonometer and a rubber bulb is tightly and evenly applied. In the deflated state, the cuff should not squeeze the underlying tissue. When inflated, a pressure of 20-30 mm. rt. Art. higher than that at which there is an obliteration of the radial pulse. A phonendoscope is placed close to the place where the pulse of the brachial artery is felt, below the cuff. With a speed of 2-3 mm. rt. Art. for 1 pulsation in the cuff, the pressure is released. At the moment of the appearance of the first distinct sounds (beats) in the brachial artery (they are called Korotkov tones), systolic pressure is noted on the manometer. As more air is released from the cuff of the apparatus, the pressure continues to decrease until the blows disappear. At this moment, diastolic pressure is recorded.

Measure blood pressure before and after exercise. At the beginning of loads, the maximum pressure rises, then stabilizes at a certain level. After stopping work (the first 10-15 minutes), it decreases below the initial level, and then comes to its initial state. The minimum the pressure does not change under light to moderate load, and slightly increases during strenuous hard work.

At rest, in an adult, the value of the maximum blood pressure ranges from 100 ... 120 mm. rt. Art., minimum - 60 ... 80 mm. rt. Art. BP greater than 129/70 is defined as hypertension and BP less than 100/60 is defined as hypotension.

It is known that the values of the pulse and the minimum blood pressure in the norm are numerically the same. Kerdo suggested calculating the index using the formula:

$$IR = D / P,$$

where D is the minimum pressure, P is the pulse.

In healthy people, this index is close to one. When the nervous regulation of the cardiovascular system is disturbed, it becomes larger or smaller than one.

Recommendations for registration of work:

- ✓ record the research results in the protocol;
- ✓ draw the type of response;
- ✓ give an opinion on the functional state of the cardiovascular systems and recommendations for improving load adaptation.

RESEARCH PROTOCOL ADAPTATION OF THE CARDIOVASCULAR SYSTEM TO LOAD

- I. 1. Full name _____
2. Age _____
3. Main sport, category _____
4. Training period and its features _____
5. Well-being, complaints _____

II.

Indicators	Initial data	rest time, min											
		20 squats			15sec.Maxim.run				3 minute run				
		1	2	3	1	2	3	4	1	2	3	4	5
hs													
hell max													
hell min													

5. Determination of the magnitude of the load by the respiratory rate (RR.)

1. *Respiratory rate (RR). Resting breathing should be rhythmic and deep. Normally, the respiratory rate in an adult is 14-18 times per minute. After light work, the respiration rate is 20 - 25 times per minute, after medium - 25 - 40, after heavy work - more than 40 breaths per minute.*
2. Still there is one rather simple method of self-control "with the help of breathing" - the so-called Stange test. Inhale, then exhale deeply, inhale again, hold your breath, using a stopwatch to record the breath holding time.
As training increases, the breath holding time increases. Well-trained people can hold their breath for 60-120 seconds. But if you have just exercised, then you cannot hold your breath for a long time.
3. For operational control over the intensity of the load, you can also use the indicators of respiration, which can be determined directly during running. These include the nasal breathing test. If, while running, breathing is easily carried through the nose, this indicates an aerobic training regime. If there is not enough air and you have to switch to a mixed nasal-oral type of breathing, then the intensity of running corresponds to a mixed aerobic-anaerobic energy supply zone and the speed should be slightly reduced.
4. Conversation test can also be used successfully. If during the run the trainee can easily maintain a casual conversation with a partner, then the pace is optimal. If he begins to choke and answer questions in monosyllabic words, this is a signal to go to the mixed zone.

6. Determination of the magnitude of the load on the vital capacity lungs (VC)

If after exercise the vital capacity of the lungs (VC) remained unchanged or slightly increased, it means that you were doing light work, if it decreased by 100 - 200 cm - medium, by 300 - 500 and more - heavy.

7. Determination of the magnitude of the load on the change in body weight (weight)

The amount of load can be determined by the change in body weight before and after exercise (with a low load, the body weight can decrease by 300 g, with an average load by 400-700 g, with a heavy load, the weight loss will be 800 g or more), as well as by the change in strength the flexor muscles of the hand (hand dynamometry) and the extensors of the back (back dynamometry).

If the indicator of hand strength after the lesson remained unchanged or changed slightly, then the load was small, if it decreased by 3-5 kg, then the average, if 6-10 kg or more, the load is large.

According to the deadweight dynamometry: if the indicator has changed little, then the load was light, with an average load it decreases by 5 - 15 kg, with a heavy load - by 16 - 20 kg or more.

8. Determination of the magnitude of the load by subjective indicators of the state of the body

No less important are subjective indicators of the state of the body (sleep, well-being, mood, desire train). Sound sleep, good health and high working capacity during the day, desire to train testify to the adequacy of training loads. Poor sleep, lethargy and drowsiness during the day, and unwillingness to exercise are sure signs of overwork. Appetite after moderate exercise should also be good. It is not recommended to eat right after class, it is better to wait 30-60 minutes. To quench your thirst, you should drink a glass of mineral water or tea.

9. Methodology for determining the energy cost of a lesson

The energy value of the performed physical exercises is estimated using the developed table, where the definition of heart rate values corresponds to specific energy expenditures (in kilocalories).

Energy cost of performed physical exercise (by heart rate)

Heart rate beats / min	kcal	Heart rate beats / min	kcal	Heart rate beats / min	kcal	Heart rate beats / min	kcal	Heart rate beats / min	kcal
80	2,5	104	5,5	128	8,5	152	11,7	176	14,5
82	2,8	106	5,7	130	8,7	154	12,0	178	14,8
84	3,0	108	5,9	132	9,0	156	12,2	180	15,0
86	3,2	110	6,1	134	9,2	158	12,4	78	2,3
88	3,5	112	6,3	136	9,5	160	12,5	76	2,0
90	3,8	114	6,6	138	9,7	162	12,8	74	1,7
92	4,0	116	6,8	140	10,0	164	13,0	72	1,5
94	4,2	118	7,1	142	10,5	166	13,3	70	1,3
96	4,5	120	7,5	144	10,7	168	13,5	68	1,0
98	4,7	122	7,7	146	11,0	170	13,7	66	0,8
100	5,0	124	8,0	148	11,2	172	14,0	64	0,5
102	5,2	126	8,2	150	11,5	174	14,2	62	0,3

Exercise Calorie Expenditure Chart

Your weight	50	52,5	55	57,5	60	62,5	65	67,5	70	72,5	75
Bicycle (10 km / h)	160	168	176	184	192	200	208	216	224	232	240
Bicycle (20 km /h)	273	287	301	314	328	342	355	369	383	396	410
Skiing	467	490	513	537	560	583	607	630	653	677	700
Jogging (9 km /h)	493	518	543	567	592	617	641	666	691	715	740
Jogging (11 km /h)	613	644	675	705	736	767	797	828	859	889	920
Jumping rope	464	487	510	534	557	580	603	626	650	673	696
Running in place	433	455	477	498	520	542	563	585	607	628	650
Running (16 km /h)	853	896	939	981	1,024	1,067	1,109	1,152	1,195	1,237	1,280
Swimming (25 m / min)	183	193	202	211	220	229	238	248	257	266	275
Swimming (50 m / min)	333	350	367	383	400	417	433	450	467	483	500
Tennis	267	280	293	307	320	333	347	360	373	387	400
Aerobics	284	298	312	327	341	355	369	383	398	412	426
Walking (5 km /h)	213	224	235	245	256	267	277	288	299	309	320
Walking (8 km /h)	293	308	323	337	352	367	381	396	411	425	440
Skates	360	378	396	414	432	450	468	486	504	522	540
Spinning (high intensity)	460	483	506	529	552	575	598	621	644	667	690
Stepper	284	298	312	327	341	355	369	383	398	412	426
Yoga	160	168	176	184	192	200	208	216	224	232	240
Circular weight training	380	399	418	437	456	475	494	513	532	551	570
Standing position	61	64	67	71	74	77	80	83	86	89	92
Work in the vegetable garden / garden	216	227	238	248	259	270	281	292	302	313	324
Shopping trip (3 km / h)	160	168	176	184	192	200	208	216	224	232	240
Office work / putting things in order	160	168	176	184	192	200	208	216	224	232	240
Dancing	228	239	251	262	274	285	296	308	319	331	342
Food	72	76	79	83	86	90	94	97	101	104	108

The numbers in the vertical columns represent the hourly calorie expenditure for a particular sport. The numbers do not include calorie expenditure for less than an hour of exercise, divide the workout time in minutes by a factor of 60 and multiply the result by the number of calories you find at the intersection of your weight and type of physical activity. This will give you the number you want. Let's say you weigh 72.5 kg and have been jogging at a speed of about 10 km / h for 45

minutes. The following math needs to be done: $45 \text{ minutes} : 60 = 0.75 \times 889 = 667$ calories.

Operational control helps to solve the following tasks:

- ✓ to teach the simplest methods of analysis of load tolerance during physical exercises;
- ✓ to teach to register and evaluate the received data;
- ✓ to teach how to use observation data to determine the degree of physical development, fitness level and health status.

10. Theoretical material:

1. Students physical culture and life: textbook / V.I. Ilyinich. - M.: Gardariki, 2007.
2. Mandrikov V.B., M.P. Mitsulina. Methods for assessing the physical and functional state of students of a special educational department Teaching aid. - Volgograd: VolGMU Publishing House, 2006.
3. Physical culture of a student: Textbook / Edited by V.I. Ilyinich. M.: Gardariki, 2003.
4. Physical culture. Theoretical course: Study guide / A.O. Egorychev, M.G. Matsuk, S.P. Meshcheryakov, B.N. Pentsik; Under total. ed. B.N. Pentsik. - M.: Russian State University of Oil and Gas named after. I.M. Gubkina, 2001.
5. Dubrovsky V.I. Sports medicine. M.: Vldos, 2001.
6. <http://cnit.ssau.ru/kadis/ocnov> set - Student's physical culture. Electronic textbook.
7. Universal search engines:
www.yandex.ru;
www.google.com;
www.mail.ru.

Topic 8. Fasting technique according to P. Bragg

PURPOSE OF THE LESSON: teaching students the method of fasting according to P. Bragg.

A STUDENT SHOULD KNOW:

- basics of fasting;
- the effect of hunger on the psyche and mental abilities;
- rules for fasting;
- effects of fasting.

A STUDENT SHOULD BE ABLE TO:

- apply the fasting technique.

TABLE OF CONTENTS:

1. Introduction.
2. P. Bragg and his definition of fasting.
3. Removal of toxins from the body.
4. The effect of hunger on the psyche and mental abilities.
5. Fasting options.
6. Rules for fasting.
7. How to carry out a 24 - hour fast.
8. How to carry out a three-day, seven and ten-day fast.
9. Effects of fasting.
10. How dangerous it is.
11. Ten Commandments of Health.
12. Method of dry fasting.
13. Theoretical material.

1. Introduction

The best propaganda of P. Braggs health system is himself. At the age of 90, he was strong, mobile, resilient and flexible as a young man. He jogged many kilometers every day, swam, played tennis, went to the mountains, danced, dumbbells and kettlebells, and was fond of surfing. His working day lasted 12 hours, he did not know the pains of fatigue, he was always full of optimism, vigor and desire to help people.

He believed that by observing certain hygienic and dietary rules, each person can and must significantly prolong his life. "I believe that everyone has the right and obligation to live up to 120 years or more. I myself have earned health with my life. I am healthy 365 days a year, I do not have any pain, fatigue, decrepitude of the body. And you can achieve the same results! "- he wrote in his famous book "The Miracle of Fasting" more than 35 years ago. Throughout his life, Paul Bragg encouraged people to improve their physical capabilities and explained ways to improve their health.

Paul Bragg died in 1976 at the age of 95 in an accident when a giant wave hit him while riding a board off the coast of Florida. The pathologist stated that the heart, blood vessels and all internal organs of this man were in excellent condition.

2. P. Bragg and his definition of fasting

Bragg assigned a very important role in his system to healthy fasting. According to Bragg, fasting is, first of all, an opportunity to avoid self-poisoning of the body by harmful substances accumulating in it, the sources of which are improper nutrition, as well as water and air pollution, and drug abuse.

In most cases, the blockage of the body occurs due to mucus. This poisonous mucus is formed from the remains of undigested unnatural food accumulated from the moment of birth. Our ordinary food is never completely digested, and the accumulated residues are never completely removed.

Thus, our system is slowly but inevitably clogging up. This is the cause of many diseases. The body is full of mucus. It remains in it, concentrating in a large mass.

3. Removal of toxins from the body

After the stage of excitation of the brain from the center of hunger, the reverse process begins - inhibition, as a result of which a strong relaxation of the body occurs - this is the most important technique of ancient healers before carrying out any cleansing procedures. The additional energy generated during

biosynthesis - reduction of carbon, allows to significantly increase the process of removing foreign substances. So, ammonia is excreted 1000 times stronger than usual during hunger.

The release of previously deposited toxins into the blood, naturally, adversely affects the state of health. A person becomes ill, everything hurts, general malaise and weakness. These are signs of a cleansing work within you.

Long periods of fasting cannot be applied immediately, because the release of toxins is so powerful that the excretory organs cannot cope and poisoning occurs - a rash on the skin and more serious disorders.

4. The effect of hunger on the psyche and mental abilities

Slagged blood can stop in the capillary bed of the brain and cause disturbances in breathing and nutrition of a certain part of the brain, varying in degree. The altered chemistry of this area has a completely different effect on a person. This can manifest itself in the form of apathy, aggressiveness, obsessive thoughts, mania, fears and a whole range of other complexes, up to crime with perverse cruelty. It has been established that hunger restores the pyramidal cells of the brain and even increases them. In some cases, fasting helps with mental disorders: various types of schizophrenia, depression.

5. Fasting options

1. Without food and water - dry.
2. With the use of water inside and in the form of enemas - usual.
3. With the use of enemas only - a kind of usual.
4. Without taking water inside, but with pouring the body, taking baths - semi-dry.
5. Using your own urine - urine.

6. Rules for fasting

The phased implementation of hunger.

- I. *Pre-hunger period:* 2-3 weeks before the onset of hunger. At this time, a person mentally sets himself up for the upcoming hunger, as a result of which a strong motivation and attitude is gradually created in his subconscious. Before fasting, it is advisable to change your diet in the direction of increasing raw plant foods.

II. Entering fasting. This means the first 2-4 days of hunger. The first task is to suppress hunger. As a rule, not everyone can successfully overcome it with one volitional effort, but if you clear the gastrointestinal tract of food debris, then the feeling of hunger disappears much faster.

Drinking regime during hunger. In order to remove excess sodium from the body, which has "preserved" in the cells toxins during the first days of hunger, it is advised to drink up to 1 liter of water. Further, increase the drinking regime to 2 liters per day. To reduce the phenomena of acidotic crisis, from 3-4 days you can drink mineral or carbonated water.

III. The very process of fasting. After the feeling of hunger has disappeared, a number of successive rearrangements occur in the body:

Acidosis. On hunger, the body begins to produce from its own fat and proteins, acidic products of incomplete breakdown of fat, slags, protein "debris", toxins, etc. accumulate in the blood. Alkaline blood reserves decrease and this affects the state of health, headache, weakness, general malaise appear.

Compensated acidosis. An acidotic crisis sets in, after which a person immediately (sometimes within one hour) becomes better. In order for the above processes to proceed more successfully, a mandatory motor regime is required, which will supply the body with free electrons and enhance redox processes.

IV. A way out of hunger. In the first days of restorative nutrition, in no case should you overload yourself with food. She simply will not be able to assimilate. In order for the effect of fasting to continue fully on a restorative diet, do not consume dairy products, eggs and meat.

7. How to do a 24-hour fast

Bregg recommends starting with a 24 hour distilled water fast. Fasting is the absence of anything in the stomach other than distilled water.

Only one exception is permissible in a 24 hour fast. If you want, you can add to a glass of distilled water, one third of a spoonful of natural honey, or one teaspoon of lemon juice. These additives act as solvents for toxic substances and mucus. This is not done to "maintain strength", but to make the water tastier and to dissolve mucus and toxic substances so that they can be easily passed through the body's natural filter - the kidneys. Each of the two kidneys in our body has a million efficiently working filters, and when the body is starving, the kidneys are actively removing toxins. The kidneys play the most important role in this one-day

fast, as well as in the 36-hour and seventy-day fast. This is why it is very important to drink plenty of distilled water during any fast.

As long as the toxins remain in the body, a person does not feel very well during fasting. But as the vitality flushes these poisons from the body through the kidneys, the state of health will improve. During fasting, one should lead a normal life, not paying attention to possible stomach discomfort.

After the end of the 24 hour fast, the very first food should be a fresh vegetable salad based on grated carrots and chopped cabbage. You can use lemon or orange juice as a seasoning. This salad will act like a broom in the intestines. It will give work to the muscles of the stomach and intestines. For a salad, you can have a dish of boiled vegetables. These can be stewed tomatoes. They are not acidifying foods when consumed without white bread. Bregg notes that fasting should not be interrupted with foods such as meat, milk, cheese, butter, fish, nuts. The second method of writing can be meat or any other.

After fasting, it is good to consume sprouted grains of wheat; fasting of 3 days or more should be carried out under ideal conditions. It is necessary to provide yourself with the opportunity to rest at any time when you feel that the poisons are leaving the body. During this period, you need to go to bed, relax and lie quietly until the poisons leave the body. Better not to read, watch TV, listen to the radio, or communicate with someone. The period of discomfort will pass as soon as the poisons are gone from the body. Bed rest is vital, since all forces should be used for detoxification and internal cleansing, but if you want to take a walk in the fresh air or sunbathe, do it only if you feel strong enough. The more a starving person sleeps, the better.

8. How to carry out a three-day, seven and ten-day fast

A fast of three days or more should be done in ideal conditions. You must ensure that you are able to rest whenever you feel the poisons are leaving your body. During this period, you may feel unwell and should be able to lie down. In bed, you need to relax and lie quietly until the poisons leave the body. Better not to read, watch TV, listen to the radio, and even less talk with anyone. You must go to the bedroom and remain there in complete peace. This period of discomfort will go away once the poisons are gone from your body.

During prolonged fasting, you should not spread about what you are doing, as other peoples negative emotions can disrupt your optimistic mood and thoughts about the miracle that happens in your body during fasting.

Bed rest is vital, as all of your vitality must be used for detoxification and internal cleansing. If you feel like taking a walk in the fresh air or sunbathing, do so only if you feel strong enough. Don't do anything to waste your energy. The more a starving person sleeps, the better. If you can't sleep, then just relax. It is good for this period to completely withdraw from business. Do not think about your problems, completely free yourself from unnecessary thoughts.

People who are starving for 3 to 10 days are worried about bowel function. After the end of fasting, the intestines will resume work again. *Bragg is against violence against nature, therefore against enemas.*

During a 7-day fast, Bragg advises you to do the following: on the seventh day of fasting at about 5 pm you need to peel 4-5 tomatoes, cut them, throw them into boiling water, immediately remove from heat, cool and eat how appetite appears. On the morning of the eighth day, prepare a salad of grated carrots and cabbage, squeeze half an orange. After that, you can eat a small plate of stewed greens, with it you can eat 2 toasts of wheat bread. This first meal should be eaten in the morning. During the day, you can drink as much water as you like. For lunch, you can eat a salad of grated carrots, chopped celery and cabbage, seasoned with orange juice. In the afternoon, you can eat a salad of grated carrots, celery cabbage, one hot vegetable dish, and a toast. In the evening, you can have a dinner of lettuce and tomato leaves and two other vegetable dishes. From day 10, you can eat as usual.

The method of completing a 10-day fast does not differ significantly from the method of a 7-day fast. On the tenth day, around 5:00 noon, eat your tomatoes, then follow the same schedule as above. Do not eat more than you want: remember that you have lived without food for 7 to 10 days and by this time you have lost your appetite. The fact that you started to eat does not mean that a burst of energy has come. It takes time for the body to move from detoxification to a satiety program.

9. Effects of fasting

- ✓ fasting helps to lose weight;
- ✓ fasting helps to lose weight;
- ✓ fasting helps keep our arteries young;
- ✓ fasting awakens the mind;
- ✓ fasting helps to remove drug residues from the body;
- ✓ Fasting can save you from smoking, alcohol, drugs.

10. How dangerous is it

Some people are afraid of medical fasting for fear that the stomach may atrophy and "forget how to work." This is not true. Of course, if, after a long fast, you immediately eat a three-course meal, your stomach will not understand you and, most likely, will reject the food with indignation. If you come out of fasting gradually, you can eat quickly enough as before.

Many fear that if not eaten, the acid can eat away at the stomach lining. This is not true. Under normal conditions, gastric juice is secreted not in proportion to the amount of incoming food, but in proportion to its chemical composition. For example, the stomach requires more acid to digest protein, eggs, or meat than it does to digest starches. During starvation, gastric juice is produced minimally.

These fears are from the realm of fantasy. But there is also a real danger. It is important to start and end fasting correctly. In addition, you need to prepare yourself gradually for prolonged fasting. Otherwise, the intoxication of the body is provided.

Plus, fasting isn't for everyone. You cannot use this method of treatment for active pulmonary tuberculosis, malignant diseases, cirrhosis, diseases of the nervous system, parasitic diseases, dementia. If you do not want to develop stomach ulcers, smoking is strictly prohibited during treatment. Naturally, there can be no talk of any alcohol either. Ideally, hunger treatment, especially long-term treatment, should take place in a hospital under the supervision of a specialist. Fasting is like a scalpel, a tool that can both save a person and harm him. Therefore, it is necessary to accustom the body to it very carefully, gradually.

11. Ten Commandments of Health

- ✓ to honor your body as the greatest manifestation of life;
- ✓ give up all unnatural, inanimate food and stimulating drinks;
- ✓ nourish your body only with natural, unprocessed, alive products;
- ✓ to devote years of devoted and selfless service to your health;
- ✓ restore your body through the correct balance of activities and recreation;
- ✓ cleanse your cells, tissues and blood with clean fresh air and sunlight;
- ✓ give up any food when your mind or body doesn't care about itself feel;
- ✓ keep your thoughts, words and emotions clean, calm and sublime;
- ✓ constantly replenish your knowledge of the laws of nature, making it a thing your life, and enjoy your work;
- ✓ obey the laws of nature. Health is your right, use this right!

12. Method of dry fasting

The dry fasting technique has been successfully used to treat a wide variety of diseases. The advantage of dry fasting over the standard method of water fasting is that in more severe conditions the body has to more actively break down its own fats and destroy pathological tissues. It should be understood that dry fasting is a more severe procedure, which greatly burdens the human psyche. Therefore, it is dangerous to starve dry at home for more than 2-3 days.

With short periods of dry fasting, the body does not completely switch to internal nutrition, therefore, it is most often used at the initial stage of ordinary fasting.

Dry fasting can be used at the first symptoms of colds, but you should monitor your overall health.

It is not recommended to use dry fasting for weakened patients, patients with renal pathology, liver diseases and at the initial stages of mastering the practice of fasting.

14. Theoretical material

1. Classics of natural healing. Complete encyclopedia. - Ed.: Krylov, 2008.
2. Kazimirchik N.M. Paul Bregg: Fasting for Health. - M.: AST, 2006.
3. Paul Bragg. The miracle of starvation. M., 2001.

Topic 9. Wellness motor C.Coopers system.

PURPOSE OF THE LESSON: teaching students the methodology of the health-improving motor system of K. Cooper.

A STUDENT SHOULD KNOW:

- basics of aerobic exercise;
- scoring methodology;
- methods of constructing lessons;
- methodology of the 12 - minute test.

A STUDENT SHOULD BE ABLE TO:

- determine the degree of physical fitness using a test K. Cooper.

TABLE OF CONTENTS:

1. Introduction.
2. Aerobic exercise.
3. Scoring system.
4. What to do before starting classes.
5. Methodology for constructing lessons.
6. Optimal exercise regimen.
7. Coopers test.
8. Rational nutrition.
9. Theoretical material.

1. INTRODUCTION

Nowadays, most people are inactive. They walk from the car park or bus stop to their establishment, from the work desk to the buffet or cafeteria. Even young people do not really indulge themselves with physical activity. And the lack of movement has a bad effect on the state of health and on the capabilities of a person in all spheres of life.

For the normal functioning of all systems of the body, first of all, an optimal level of development of muscle strength is necessary. Harmoniously developed muscles of the trunk are of primary importance in the formation of correct posture.

Scientists claim that the strongest muscles in the human body (relative to their mass) are the chewing muscles. Why? The answer is clear: we do not forget to exercise them daily (and several times a day). If we were just as attentive to other muscles in our body, we would be much stronger and healthier. Just as we enjoy eating, so we must learn to enjoy exercise.

2. AEROBIC PHYSICAL LOAD

Kenneth Cooper, a renowned American physician, developed a system of wellness exercises for the general public, which he called "aerobics." For several years, aerobics has gained great popularity in many countries, including Russia.

There is a definition of the word "aerobics": it is "active pastime associated with oxygen consumption." Cooper extended the term to the physical exercise required to promote health.

The essence of Coopers aerobics lies in the predominant development of the cardiovascular system through walking, running, swimming, cycling. When determining the physical state of a person, such an important indicator characterizing the state of the heart and blood vessels as the ability of a person to absorb a certain amount of oxygen per unit of time, i.e. strengthening and development of those organs and systems that are involved in the development of oxygen - the heart, lungs, blood vessels.

Coopers idea is that the effectiveness of each person's breathing depends on the systematic exposure to certain physical exercises. Those who do these exercises breathe so efficiently that they deliver sufficient oxygen to the body. As a result, the energy yield is very high. Others who do not exercise cannot get oxygen quickly enough and in the right amount. They get tired easily, suffer from shortness of breath with a slight increase in the rate of movement.

3. SCORING SYSTEM

Back in the early 60s, K. Cooper invented and formulated aerobics glasses system, which has been used by millions of people since then. The main challenge in designing different exercise programs is finding a way to compare the aerobic value of different types of exercise. He decided that the best way to compare physical exercise would be the one in which it would be possible to determine the energy cost of each type of exercise.

K.Cooper developed a system of glasses for comparing the energy cost of walking, running and other types of aerobic physical activity, based on the mathematical relationship between oxygen consumption for various types of load of a given intensity and duration. Thus, it was found that running a mile in 8 minutes requires an oxygen consumption equivalent to 5 points on the Cooper's scale.

How many points can you get for several runs for a certain number of miles? At first, they were calculated points according to a strictly linear rule: for a certain number of miles - a certain number of points. So, if you run 3 miles in 24 minutes, which is 8 minutes for each mile, then this gives 3 times 5 points, i.e. - 15 points. But Cooper later found that running 3 miles without stopping spent more energy than running a mile, then resting for a few minutes, running a mile again, resting and running again. Therefore, for continuous work, he began to give additional points - points for endurance: instead of 15 points, 17 were counted.

To determine the amount of exercise and the number of points needed to achieve physical fitness, Cooper used this method. The control group of subjects, which consisted of physically fit people, was given the task to record in a diary all daily and weekly types of their physical activity.

The main group was engaged in a progressive training program. Using this method, it was found that most men reach the level of the control group, gaining 30 points per week, while women need to gain 24 points weekly for this. These points can be gained by various physical exercises, regardless of their specific type. Cooper found that such a level of physical fitness can be considered satisfactory, at which the body is able to absorb 42 ml of oxygen per 1 kg of body weight in 1 min.

The task of optimizing health is reduced to the norm of 30 and 24 points. These glasses indicate a good safety margin of the body. However, it is not so easy to type them! Although all aerobics programs recommend gaining 30 points in a week, in no case should you strive to score those 30 points in the first week. Cooper warns that a 4-6 week preliminary workout is required to test the fitness level on the proposed tests.

Health jogging is recommended to be carried out on the basis of Coopers aerobics - gaining 30 health points weekly for men, 24 points for women.

4. WHAT YOU SHOULD DO BEFORE STARTING THE LESSON

Before starting classes, you need to undergo a serious medical examination using an exercise test. The examination will not be enough if it does not include a stress test with simultaneous recording of an ECG that will show how the heart behaves under physical stress.

5. METHODOLOGY OF CONSTRUCTION OF LESSONS

Each wellness workout consists of 4 phases: warm-up, aerobic phase, cool-down and power load. Lets take a look at each of these components.

1. Warm up. This phase is very important, but it is often ignored, which often leads to strains or even muscle tears. Warm-up should pursue two goals: first, to stretch and warm up the muscles of the back and limbs; and secondly, to cause some increase in heart rate, so that the body can more smoothly increase its pulse to values corresponding to the aerobic phase. His research shows that even people with serious heart conditions such as angina can do quite a lot of aerobic work without feeling chest pain if they warm up. The warm-up should consist of a light load lasting 2-3 minutes. It should include flexibility exercises. Exercises that require a lot of stress are undesirable.

2. Aerobic phase. This phase in health-improving activities is the main one. The main load volumes are carried out here. And naturally, the question arises about the volume of aerobic exercise. It depends on the type of load and on its intensity. The desired healing effect will be obtained if the workout lasts at least 20 minutes 4 times a week.

3. Cooling down. This phase of aerobic exercise takes a minimum of 5 minutes. During this time, you should continue to move, but at a slow pace, in order to gradually decrease the heart rate. For example, if you trained in running, then walk another 400 m, if the distance is not measured, then walk 5 minutes. If you are walking, then jog for 5 minutes, if you are swimming, then walk for 5 minutes on the shallow part of the pool. The most important thing is that after aerobic exercise, you need to move for a while, otherwise nausea, dizziness, or even fainting may appear. It must be remembered that serious cardiac abnormalities occur not during physical activity, but after it.

4. Power load. This phase of training should last at least 10 minutes. It should include exercises that strengthen muscles / push-ups, pull-ups, squats, etc. / and develop flexibility. If this structure of the lesson is observed, injuries can be

excluded. With strict adherence to the recommended time, an aerobic workout takes 40 minutes.

6. OPTIMUM TRAINING MODE

Heart rate self-monitoring is widely known. Everyone involved in health-improving physical exercises knows that an excessively high heart rate indicates an intolerance to the load and this is fraught with a serious breakdown in the CVS. As soon as it is found that the heart rate is higher than the permissible, in order to avoid a heart attack, it is necessary to immediately reduce the load. But too low heart rate indicates insufficient training efficiency. To get the maximum benefit from aerobic exercise, it is necessary to have a fairly high heart rate during exercise, which provides a training effect, which will consist in favorable changes in the CVS. Here we must be guided by the "concept" of the optimal pulse. This is the minimum heart rate at which an optimal health-improving effect is achieved.

K.Cooper suggests the following method for determining the optimal heart rate. "It is necessary to subtract half the age of the occupant from 205 / in women from 220 to subtract the age /. For example, the maximum calculated heart rate for 50 year old men will be $205 - 25 = 180$ beats per minute. For women: $220 - 50 = 170$. Then the optimal heart rate is determined, which will be 80% of these figures. 80% of 180 = 144 beats per minute. " If you bring your heart rate to 144 beats. in min. and hold it for at least 20 minutes / at classes 4 times a week / , which means you get a good aerobic effect. The same effect can be achieved if the pulse is maintained at 130 beats per minute for 30 minutes and 150 for 10 minutes. To determine the pulse during exercise / after all, it usually takes at least 20 seconds to measure the pulse after exercise / K. Cooper advises to do this: count the pulse during the first 20 seconds after the end of the load, and then add to the result obtained 10% of it. For example, if you counted 160 beats per minute, then during the load it was 10% higher, i.e. - 176 beats in min.

The main achievement of this system is that it allows you to select the appropriate load in different sports, in accordance with individual tastes and conditions. It correctly orientates people to struggle to reduce the heart rate at rest. For this, the heart rate must increase significantly during exercise. Cooper's system is well-grounded physiologically. At the same time, it does not require excessive loads. This is the only scientifically based preventive physical education system. Cooper logically argues that it takes not so much time to maintain the proper level of fitness, although many explain their inertia by the lack of time: they cover up their unwillingness to go to the stadium, park, sports ground, justify their laziness. Some systems that are promoted on radio and television, in popular science magazines, put the number of motion at the forefront. The main thing is the pace.

An indicator of the sufficiency of the pace is the increase in heart rate and respiration. Cooper believes that it is enough to run only 12 minutes a day, but at a good pace.

7. COOPERS TEST

Health running, as one of the components of aerobics, is a system of physical exercises that allows you to increase the overall endurance and performance of the body, to strengthen its most vulnerable links - the heart, blood vessels and lungs. Oxygen consumption increases up to the levels from which the healing effect begins.

Of course, depending on your age and health condition, there is a limit, which is called the maximum heart rate. This is the level at which the heart works to its fullest potential. Based on several thousand experiments with men and women of various ages, Cooper established the norms by which it can be predicted.

One of the defining features of Coopers Wellness System is fitness tests. Cooper does not consider these tests a training tool, they serve only to monitor physical condition. "If you are under 30 years old, if you have undergone a medical examination within the last year that did not reveal any abnormalities in your health condition," Cooper writes only in this case, if you wish, you can start aerobics classes with tests. In any other case, you should start with a beginners program. Only after completing it, you can (again, if you wish) take tests to determine the level of your preparedness, your belonging to one of the categories".

Coopers 12-minute running test is to run (or run and walk, depending on your physical ability) as much distance as possible in 12 minutes. During this test, in no case should you overexert yourself. If you feel short of breath, you need to go to walking. When breathing is restored, you can run again.

According to Cooper, the main rule of aerobics is not to overexert yourself and thus not harm your health. "Haste," he affirms, "cannot bring any benefit. It will only bring trouble. Go to your goal gradually. A person who has undermined his health for many years by the wrong way of life should not expect that he will be able to put himself in order in a couple of weeks".

A set of tables and formulas for aerobics will help you perform your chosen physical activity program designed for a lifetime.

The tables are scientifically based according to the aerobics scoring system and are compiled by age.

Walking program

Table 1

Untrained beginners

a week	distance km	time min	frequency per week	glasses per week
1	1,6	17,30	5	5
2	1,6	15,30	5	5
3	1,6	14,15	5	10
4	1,6	14,00	5	10
5	2,4	21,40	5	15
6	2,4	21,15	5	15

After completing this program, do the 1st degree program.

12-minute test

Table 2

Preparedness level 1

(less than 1.5 km in a 12 minute test)

a week	distance km	time min	frequency per week	glasses per week
7	2,4	21,00	5	15
8	3,2	28,45	5	20
9	3,2	28,30	5	20
10	3,2	28,00	5	20
11	3,2 или 4,0	28,00 или 35,30	3 или 2	22
12	4,0 или 4,8	35,00 или 43,15	3 или 2	27
13	4,0 и 4,8	34,45 и 42,30	3 и 2	27
14	4,0 и 4,8	34,30 и 42,30	3 и 2	27
15	4,8	42,30	5	30
16	6,4	56,30	3	37

After completing the walking program, begin the walking-running program.

Walking-running program

Table 3

Untrained beginners

a week	distance km	time min	frequency per week	glasses per week
1	1,6	17,30	5	5
2	1,6	15,30	5	5
3	1,6	14,15	5	10
4	1,6	13,30	5	10
5	1,6	11,45	5	15
6	1,6	11,45	5	15

After completing the Untrained Beginner Program, continue with the Grade 1 program.

Running program in place

Table 4

Untrained beginners

a week	distance km	time min	frequency per week	glasses per week
1	2,30	70-80	5	4
2	2,30	70-80	5	4
3	5,00	70-80	5	7,5
4	5,00	70-80	5	7,5
5	7,30	70-80	5	11,25
6	7,30	70-80	5	11,25

After completing the program for unprepared beginners, continue classes according to the program provided for the 1st degree of readiness (table 5).

Table 5

Preparedness level 1

(less than 1.5 km in a 12 minute test)

a week	distance km	time min	frequency per week	glasses per week
walking	3,2 или 4,8 6,4	24,00-29,00	8	32
		36,00-43,00	5	30
		58,00-79,59	5	35
		48,00-58,00	3	33
run	1,6 или 2,4 2,4 или 3,2 3,2	6,30-7,59	6	30
		12,00-14,50	5	30
		9,45-11,59	4	30
		16,00-19,59	4	36
		13,00-15,95	3	36
running in place	10,00 утром 10,00 вечером или 15 или 15 или 20,00	70-80	5	30
		70-80	7	30
		70-80	5	30
		80-90	5	30
		70-80	4	32

8. RATIONAL Eating

No physical activity or proper rest will improve your health without a balanced diet. Good nutrition is the first key to health and wellness. So, the balance in the body that leads to health begins with the food we eat.

Basic nutritional principles:

1. Maintain a constant ratio between the main components of the proportions 50:20:30. Daily calorie intake should be broken down as follows: 50% carbohydrates; 20% for proteins; 30% - for fats.

2. Follow the rule "25-50-25", which allows you to regulate body weight by controlling the amount of food consumed by breakfast, lunch and dinner; 25% - for breakfast; 50% - for lunch; 25% - for dinner (for nutritionists, this formula looks like this: "30-40-30").

3. Exercise at the end of the day, before dinner, to lose your appetite. Losing weight through a combination of exercise and calorie restriction primarily reduces fat, while restricting non-exercise diets leads to significant muscle loss.

4. Cultivating a healthy fear of obesity. Avoid dietary imbalances caused by eating too few calories. This mistake can cost your life, especially if you engage in strenuous and prolonged exercise.

5. It is not very helpful to follow a diet for a month and then quit.

With an inconsistent approach to diet, the following happens: a person's weight jumps up and down as they start or stop using the diet. About 90% of people who decide to follow a weight restriction program will definitely abandon it and return to the level at which they started.

To complicate matters further, after a low-calorie diet, weight gains more quickly, even if you consume fewer calories, than before the diet, since the body restructures its metabolism in such a way as to maintain the same weight with a lower number of calories. Today's people, exposed to stress and anxiety, need a way to solve many emotional problems. K. Cooper sees it in physical exercise, in particular aerobic.

According to the research results, people who regularly engage in aerobics and changed their diet have increased self-esteem, a sense of well-being, life satisfaction, developed the desire and ability to cope with stress, which once again proves the positive effect of aerobic exercise on the emotional and psychological balance of the individual.

Each student has great opportunities to strengthen and maintain their health, to maintain their ability to work, physical activity and vigor to a ripe old age. Statistics, research, observations, and just common sense testify to the invaluable positive influence of health jogging on the student's body and, consequently, on the duration of human life.

9. THEORETICAL MATERIAL:

1. Cooper K., Bloomfield G.H. Gaining energy and relieving tension. - M.: Potpourri, 2003.
2. Cooper K., Bloomfield G.H. How to keep your weight under control. - M.: Potpourri, 2003.
3. Mayorov V.V. Diseases of the cardiovascular system and exercise therapy. M., 2001.
4. Cooper K., Bloomfield G.H. Gaining energy and relieving tension. - M.: Potpourri, 2003.
5. Stepanyan A.F. Therapeutic exercises for diseases of the cardiovascular system. M., 2001.

Topic 10. Exercise therapy for diseases of the musculoskeletal system

PURPOSE OF THE LESSON: study of the effect of physical activity on strengthening the musculoskeletal system (spine).

A STUDENT SHOULD KNOW:

- physiological changes occurring in the human body during various diseases and injuries of the musculoskeletal system (ODA).

A STUDENT SHOULD BE ABLE TO:

- apply remedial gymnastics for various diseases and injuries of the musculoskeletal system.

TABLE OF CONTENTS:

1. Introduction.
2. Spine and posture. Exercise therapy for posture disorders.
3. Scoliosis. Exercise therapy for scoliosis.
4. Kyphosis. Exercise therapy for kyphosis.
5. Lordosis. Exercise therapy for lordosis.
6. Flat feet. Exercise therapy for flat feet.
7. Theoretical material.

1. INTRODUCTION

Therapeutic physical culture (LFK) is a scientific and practical, medical and pedagogical discipline that studies the theoretical foundations and methods of using physical culture means for the treatment, recovery and prevention of various diseases. The specificity of exercise therapy in comparison with other methods of treatment lies in the fact that it uses physical exercise as the main therapeutic agent - a significant stimulator of the vital functions of the human body. One of the most characteristic features of this method is the use of physical exercises for patients in conditions of active and conscious participation in the treatment process themselves.

Physiotherapy is an indispensable component of complex treatment, as it helps to restore the functions of the musculoskeletal system, has a beneficial effect on various body systems according to the principle of motor-visceral reflexes.

The musculoskeletal system consists of the bone skeleton and muscles. Human muscles are divided into three types: smooth muscles of internal organs and blood vessels, characterized by slow contractions and great endurance; the striated musculature of the heart, whose work does not depend on the will of a person, and, finally, the main muscle mass is the striated skeletal musculature, which is under volitional control and provides us with the function of movement.

Performing their work, the muscles of our body, at the same time improve the functions of almost all internal organs, in the first place it concerns the cardiovascular and respiratory systems.

The muscular system does not function in isolation. All muscle groups are attached to the bone apparatus of the skeleton through tendons and ligaments.

Skeletal muscles are the main apparatus through which physical exercise is performed. Well-developed musculature is a reliable support for the skeleton. For example, with pathological curvatures of the spine, deformities of the chest (and the reason for this is the weakness of the muscles of the back and shoulder girdle), the work of the lungs and the heart becomes difficult, the blood supply to the brain deteriorates, etc. themselves, prevent "prolapse" of intervertebral discs, slipping of the vertebrae.

Exercise also helps develop and strengthen bones, tendons, and ligaments. Bones become stronger and more massive, tendons and ligaments are stronger and more elastic. The thickness of the tubular bones increases due to new layers of bone tissue produced by the periosteum, the production of which increases with increasing physical activity. Bones accumulate more calcium, phosphorus and nutrients. But the stronger the skeleton, the more reliably the internal organs are protected from external damage.

The main purpose of this work is to study the influence of physical culture on the development and strengthening of the musculoskeletal system (spine).

2. SPINE AND POSTURE

The human spine has four natural curvatures: lordosis (anterior bending in the lumbar and cervical regions) and kyphosis (posterior bending in the thoracic and sacral regions). These curves are formed in early childhood. At birth, the spine of the newborn has the shape of an arc with one posterior bend, after the child begins to raise his head, cervical lordosis forms, after he begins to sit down and walk, lumbar lordosis and compensating thoracic and sacral kyphosis are formed. A correctly and moderately curved spinal column acts like a "spring" and can bear a lot of stress. The formation of the curvatures of the spine ends at 6-7 years old and is fixed at the age of 14-17, it is up to this age that the prevention of spinal curvatures is of particular importance.

A properly formed spine has physiological curves in the sagittal plane (viewed from the side) in the form of cervical and lumbar lordosis and kyphosis in the thoracic and sacral regions. These bends, along with the elastic properties of the intervertebral discs, determine the shock-absorbing characteristics of the spine. Deviations of these indicators from the norm indicate the presence of posture disorders.

Posture is a familiar upright posture, an upright position of the body at rest and during movement. "Habitual position of the body" is the position of the body that is regulated unconsciously, at the level of unconditioned reflexes, the so-called motor stereotype. Each person has only one habitual posture inherent only to him. Posture is usually associated with bearing, habitual posture, demeanor.

Poor posture is a violation of the natural position of the body - accompanied by a displacement of the heart, lungs and other internal organs, in connection with which they perform their functions worse. Muscles also become less efficient, the blood supply to the brain deteriorates and, as a result, mental performance decreases, attention decreases, and memory deteriorates.

Posture defects can be conditionally divided as follows: posture disorders in the frontal (vertical), sagittal (horizontal) plane and both planes simultaneously. Each type of posture disorder is characterized by its own position of the spine, shoulder blades, pelvis and lower extremities. Preservation of pathological posture is possible due to a certain condition of the ligaments and muscles.

The causes of the curvature of the spine can be both congenital and acquired.

The congenital causes of spinal curvature include violations of normal intrauterine development, which leads to underdevelopment of the vertebrae, the formation of wedge-shaped and additional vertebrae and other pathologies.

The acquired causes of curvature of the spine are as follows: any disease (rickets, poliomyelitis, tuberculosis, pleurisy, sciatica), as well as injuries (fractures of the spine). Incorrect body position due to the physiological characteristics of a person (flat feet, different leg lengths or the absence of one of them, strabismus or myopia due to which a person is forced to take the wrong posture when working) is also the cause of the development of curvature of the spine.

Also, the cause of the curvature of the spine may be a person's professional activity, in which he constantly arrives in one position (working at a table with his head constantly tilted, just not the correct posture on the chair, the usual incorrect posture). It is worth noting that with a curvature of the spine, the uniform traction of the muscles is disturbed, which leads to even greater curvature. Muscles are another cause of spinal curvature. The spine can be curved due to different muscle development, and this may be due to any disease (one-sided paralysis, rheumatic diseases). The contributing factors for the development of curvature of the spine are malnutrition, poor physical development.

Slouching is a violation of posture, which is based on an increase in thoracic kyphosis (forward bending of the spine) with a simultaneous decrease in lumbar lordosis (backward bending of the spine). The shoulder girdle is raised. The shoulder joints are shown. Slouching is often associated with pterygoid scapulae, when the lower corners or inner edges of the scapulae lag behind the chest wall. The abdomen protrudes.

Round back is a violation of posture associated with a significant increase in thoracic kyphosis and the absence of lumbar lordosis. To compensate for the deviation of the projection of the common center of mass posteriorly, children stand and walk on slightly bent legs. The angle of inclination of the pelvis is reduced and this also contributes to the flexion position of the hip relative to the midline of the body. The head is tilted forward, the shoulder girdles are raised, the shoulder joints are brought, the chest sinks, the arms hang slightly in front of the body. The round back is often combined with pterygoid scapulae. The abdomen protrudes.

The hunched and round back can be non-fixed and relatively fixed. The task of exercise therapy is to increase the mobility of the spine with the help of special exercises, strengthen the muscles of the shoulder girdle and back, increase the angle of inclination of the pelvis, by strengthening the muscles involved in the extension of the spine, which contributes to the formation of lumbar lordosis. Apply the initial positions - lying, knee-wrist, lying on an inclined plane.

A rounded back is a violation of posture consisting in an increase in all physiological curves of the spine. The legs are slightly bent or in a position of slight hyperextension at the knees. The belly protrudes, or even hangs down. The shoulder girdle is raised, the shoulder joints are brought, the head is pushed forward from the midline of the body. The rounded back is often combined with pterygoid scapulae. *With a round-concave back, the main focus is on reducing the curvature of the spine (thoracic kyphosis and lumbar lordosis). To this end, include exercises that increase the mobility of the spine (especially in the thoracic region), strengthen the abdominal muscles, and help reduce the angle of inclination of the pelvis. Apply the initial positions - lying, knee-wrist, lying on an inclined plane.*

A flat back is a violation of posture, characterized by a decrease in all bends of the spine, primarily lumbar lordosis and a decrease in the angle of inclination of the pelvis. The chest is displaced forward. The lower abdomen will hold up. The shoulder blades are often pterygoid. This violation of posture adversely affects the state of the central nervous system during running, jumping and other sudden movements, causing it to shake and microtraumatize. *With the development of a flat back, the main task of remedial gymnastics is to harmoniously strengthen the entire musculature of the trunk, first from the initial lying position. Activities include exercises for the deep muscles of the back, exercises for muscles that increase the tilt of the pelvis, exercises for the muscles that hold the shoulder blades in the correct position.*

A flat concave back is a violation of posture, consisting in a decrease in thoracic kyphosis with normal or increased lumbar lordosis. Cervical lordosis is often flattened too. The pelvis is displaced posteriorly. The legs may be slightly bent or overextended at the knee joints. Often combined with pterygoid scapula.

In the process of treating all these types of posture disorders, it is necessary:

- ✓ creation of favorable general physiological conditions for the restoration of the correct body position;
- ✓ correction of existing defects by various means of exercise therapy;
- ✓ education and consolidation of correct posture.

3. SCOLIOSIS

The causes of scoliosis

Scoliosis is a lateral curvature of the spine in the frontal plane. The costal hump, which is observed in this case, forms a deformation with a bulge laterally and posteriorly - kyphoscoliosis.

Etiologically, congenital scoliosis is distinguished (according to V.D. Chaklin, they occur in 23.0%), which are based on various vertebral deformities:

- ✓ underdevelopment;
- ✓ their wedge-shaped form;
- ✓ additional vertebrae, etc.

Acquired scoliosis includes:

- ✓ **rheumatic**, usually arising suddenly and caused by muscle contracture on the healthy side in the presence of symptoms of myositis or spondyloarthritis;
- ✓ **rickety**, which are very early manifested by various deformations of the musculoskeletal system. Bone softness and muscle weakness, carrying a child in your arms (mainly on the left), prolonged sitting, especially at school - all this favors the manifestation and progression of scoliosis;
- ✓ **paralytic**, often occurring after infantile paralysis, with unilateral muscle damage, but can also be observed in other nervous diseases;
- ✓ **habitual**, on the basis of habitual bad posture (they are often called "school", since at this age they get the greatest expression). Their immediate cause may be improperly arranged desks, seating schoolchildren without taking into account their height and number of desks, carrying school bags from the first grades, holding a child by one hand while walking, etc.

Of course, this list does not cover all types of scoliosis, but only the main ones.

The process of posture formation begins from a very early age and occurs on the basis of the same physiological laws of higher nervous activity that are characteristic of the formation of conditioned motor connections. This creates an opportunity for active intervention in the process of formation of posture in children, ensuring its correct development.

The causes that can lead to poor posture (scoliosis) are numerous. Adverse environmental conditions, social and hygienic factors, in particular, the child's prolonged stay in the wrong body position, have a negative impact on the formation of posture. As a result of incorrect body position, the skill of incorrect body position is formed. In some cases, this skill of incorrect body positioning is formed in the absence of functional and structural changes on the part of the

musculoskeletal system, and in others - against the background of pathological changes in the musculoskeletal system of a congenital or acquired nature. Poor physical activity of children (physical inactivity) or irrational hobby for monotonous physical exercises, improper physical education are often the cornerstones of posture disorders.

Scoliosis can also be caused by irrational clothing, diseases of internal organs, decreased vision, hearing loss, insufficient illumination of the workplace, furniture inappropriate for the child's height, etc.

Posture disorders worsen the appearance of a person, contribute to the development of early degenerative changes in the intervertebral discs and create unfavorable conditions for the functioning of the organs of the chest and abdominal cavity. Posture disorders, as a rule, are not accompanied by gross changes in the spine.

Gross changes in the spine develop with scoliotic disease. They are more pronounced at 2-3-4 degrees of severity of scoliosis.

Scoliosis develops mainly during periods of intensive skeletal growth, i.e. at 6-7 years old, 12-15 years old. With the end of the growth of the spine, the increase in deformity, as a rule, stops, with the exception of paralytic scoliosis, in which deformity can progress throughout life.

Acquired scoliosis continues to progress without treatment.

Treatment of scoliosis is reduced to mobilizing the spine, correcting deformity and maintaining the correction. All this is achieved with the help of exercise therapy or by using redressing corsets, plaster beds, special rods, or by combined methods, which include all of the above means. The main method of treating scoliosis is currently considered a combined one.

Physical exercises that increase the flexibility of the spine and lead to overstretching are contraindicated. The complex of remedies for exercise therapy used in the conservative treatment of scoliosis includes:

- ✓ remedial gymnastics;
- ✓ exercise in water;
- ✓ massage;
- ✓ position correction;
- ✓ elements of sports.

Exercise therapy is combined with a mode of reduced static load on the spine. Exercise therapy is carried out in the form of group sessions, individual procedures (mainly shown to patients with an unfavorable course of the disease), as well as individual tasks performed by patients independently. The exercise therapy

technique is also determined by the degree of scoliosis: with scoliosis of I, III, IV degrees, it is aimed at increasing the stability of the spine (stabilization of the pathological process), and while in scoliosis of II degree, it is also aimed at correcting deformity.

Correction of scoliosis during exercise is achieved by changing the position of the shoulder, pelvic girdle and the patient's torso. Exercises should be aimed at correcting the curvature of the spine in the frontal plane. With great care, for the purpose of correction, exercises that stretch the spine are used, for example, at a gymnastic wall.

Exercises of remedial gymnastics should serve to strengthen the main muscle groups that support the spine - muscles that straighten the spine, oblique muscles of the abdomen, square muscles of the lower back, iliopsoas muscles, etc. increased visual control, etc.

One of the means of exercise therapy is the use of elements of sport: swimming with the "BRASS" style after a preliminary course of training. Volleyball elements are shown with a compensated course of scoliosis.

Prevention of scoliosis involves maintaining correct posture. When sitting for a long time, the following rules must be observed:

- ✓ sit still for no longer than 20 minutes;
- ✓ try to get up as often as possible, minimum duration such a "break" - 10 seconds;
- ✓ while sitting, change the position of the legs as often as possible: feet forward, backward, put they are near, then, on the contrary, spread and. etc;
- ✓ try to sit "correctly": sit on the edge of the chair so that your knees are bent at exactly right angles, ideally straighten your back and, if possible, take some of the load off the spine, putting your straight elbows on the armrests;
- ✓ periodically do special compensatory exercises number of times;
- ✓ take a stand on your knees and outstretched arms on the floor, try bend your back up as much as possible, and then bend it as much as possible down.

Morning gymnastics, health-improving workouts, active rest - the motor minimum necessary for every person and it consists of walking, running, gymnastics and swimming. In addition to general strengthening, health-improving exercises, there are many special ones, for example, for strengthening the muscles of the abdominal press, chest, improving posture ... These exercises allow to some extent correct figure flaws, allow you to better control your body. You can perform them at any convenient time.

Exercises for scoliosis

In the combined treatment of scoliotic disease, corrective, asymmetric and symmetrical exercises are used.

Corrective exercises are based on the maximum mobilization of the spine, against which the curvature arc is corrected with the help of special anti-bending exercises.

Asymmetric exercises are also aimed at correcting the spine. They have an optimal effect on its curvature, moderately stretch the muscles and ligaments on the concave side of the curvature, and help to strengthen the weakened muscles on the convex side. Symmetrical exercises are based on the minimal biomechanical effect of special exercises on the curvature of the spine.

Symmetrical exercises have an uneven effect on symmetrically located trunk muscles. Thus, increased functional requirements are imposed on the weak muscles of the trunk with each symmetrical movement, as a result of which they train more intensively than the stronger muscles. Correction of the neuromuscular apparatus and the creation of a balanced muscular "corset" are based on this principle.

Respiratory exercises for scoliosis increase the functionality of the respiratory and cardiovascular systems, promote active correction of the spine and chest. Detorsion exercises are aimed at stretching the contracted and strengthening the stretched muscles in the lumbar and thoracic regions. Detorsion exercises are performed from and. n. lying, standing on all fours, on an inclined plane, hanging on a gymnastic wall, after muscle relaxation. Unloading the spine in the treatment of scoliosis allows more effective impact on the area of bone deformity, improve blood and lymph circulation in the surrounding muscles and ligaments. Unloading is often combined with inclined traction. Passive traction includes prolonged lying on a functional bed with a raised end (longitudinal and lateral traction are used).

Active traction is carried out using special exercises.

Exercise 1: and. n. standing on socks, the back is straightened, the hands are located on the wings of the iliac bones. Self-stretching.

Exercise 2: and. n. lying on the stomach, arms extended along the body. The chin touches the ball in front. Extend the spine by pushing the ball off with the chin.

Exercise 3: and. etc. standing on a gymnastic stick, hands are clasped in the lock, raised above the head. Pull up.

In the treatment of scoliosis, the correction of the curvature of the spine and the effect on certain altered muscle groups are used. Active correction is based on active corrective movements with elements of volitional influence. Passive correction consists in the use of traction, massage, orthopedic corsets, rollers, etc.

With scoliosis of the first degree, various types of physical culture can be used: swimming, tennis, skiing, skating, volleyball, basketball, etc.

It is recommended to pay great attention to hardening. They carry out symmetrical training of all muscle groups, use dynamic and static exercises, exercises with resistance and weights. For breathing training, dynamic and static breathing exercises are shown. Exercises are performed from and. n. lying on your back and on your stomach.

In case of scoliosis of the II degree, self-correction, asymmetric correction, detorsion exercises are used against the background of general strengthening exercises. Breathing exercises are mandatory.

Corrective exercise on the spine in patients with grade I-II scoliosis: I. p. - lying on the back, the leg on the side of the concavity of the curvature, bent at an angle of 90 °, overcomes the resistance of the load, which is attached at the foot end of the bed. With dynamic exercise, the weight of the load is 5-15 kg, the number of repetitions is 10-50. Under a static load, the weight varies from 10-40 kg, and the holding time is 10-30 s. This exercise is designed to contract mainly the iliopsoas muscle, reducing the scoliotic curve, torsion and lordosis.

4. KYPHOSIS

Kyphosis is a curvature of the spine with a bulge back. There are physiological kyphosis, which is normally observed in adults (thoracic kyphosis and sacral kyphosis), and pathological kyphosis, which appears as a result of diseases or injuries of the spine, as well as in case of posture disorders.

Kyphosis leads to the formation of a "round back" - the shoulders "hang down", the angle of inclination of the pelvis decreases, the stomach sticks out. Curvature of the thoracic spine leads to the formation of a "round back".

In the pathogenesis of kyphosis, one should take into account the congenital feature of the structure of the spine, weakness of the muscles of the entire trunk, some diseases of the spine: rickets, tuberculous spondylitis, ankylosing spondylosis, with traumatic injuries of the spine, paralysis of the back muscles, with muscular dystrophy, etc.

There are the following types of kyphosis: congenital, genotypic, compression, mobile, rickets, senile, total, tuberculous, angular, physiological. Treatment of diseases of the spine with the development of kyphosis should be aimed at preventing the progression of kyphosis; correction or reduction of the existing deformation; elimination of accompanying symptoms; prevention of late symptoms.

In exercise therapy exercises, exercises aimed at extending the spine are widely used, mobilizing the spine in the thoracic region, stretching the spine, crawling and breathing exercises.

Exercises aimed at extending the spine help correct kyphosis and strengthen the muscles of the back. In addition to active extension of the trunk (extension exercises) from the initial lying position (arms on the waist, to the shoulders, on the back of the head), tense extension of the trunk in the thoracic region is used (with isometric muscle tension for 5-7 s). Strengthening the muscles that bring the shoulder blades together and stretching the contracted large pectoral muscles are of certain importance. For this purpose, it is recommended to spread the arms to the sides from the starting position (ip) - lying on the back on a gymnastic bench and circular movements of the arms and shoulder joints from the starting position - lying on the stomach. The most rational for performing the listed exercises "unloading the spine", etc. lying on your stomach and standing on all fours.

Exercises that mobilize the spine in the thoracic region. Easy mobilization of the thoracic region is achieved with the help of exercise and i.p. standing on all fours (flexion of the spine, exercises such as "crawling", etc.).

Exercises that stretch the spine. These exercises include hanging exercises on a gymnastic wall (mixed hanging), accompanied by extension of the trunk, extension of the trunk on an inclined plane, etc.

The combined effect on the deformed spine is exerted by crawling exercises, during which the arching of the trunk is combined with an increase in the mobility of the spine. Correction of kyphosis and expansion of the chest are facilitated by swimming, skiing, ball games.

The functional state of the stretched back muscles is improved by massage. Massage the muscles of the back (along the spine), interscapular region. At the same time, techniques are used to strengthen the muscles: kneading, deep rubbing, tapping, intense planar stroking.

5. LORDOSIS

Lordosis is a congenital or acquired curvature of the spine. Lordosis is the curvature of the spine facing forward with a bulge.

Types of lordosis:

Physiological lordosis is formed in the cervical and lumbar spine in the first year of life, providing compensation for physiological kyphosis.

Pathological lordosis is more often formed at the same level as physiological, and much less often at the level of thoracic kyphosis.

Distinguish between primary and secondary pathological lordosis:

Primary is due to pathology of the spine (spondylolisthesis, malformations, tumors or inflammation), as well as contracture of the iliopsoas muscle or torsion spasm of the back muscles.

Secondary pathological (compensatory) is usually a symptom of congenital or pathological hip dislocation, flexion contracture or ankylosis of the hip joint in a vicious position.

Causes of pathological lordosis

The cause of lordosis is usually a dislocation in the hip joints, since the vertical position of the body leads to a shift of the center of gravity forward - keeping balance, the torso bends in the lower back. Being overweight, in particular excessive fat deposition in the abdomen, can be another factor.

Symptoms of pathological lordosis

In lordic posture, the head is pushed forward, the chest is flat, turning into a prominent abdomen, the shoulders are pushed forward, and the legs are pushed apart at the knee joints. Because of this, there is an overstrain of the spine, stretching of its muscles and ligaments, which is accompanied by pain and limited mobility. In addition, this disease hinders the normal functioning of the heart, lungs, and gastrointestinal tract. In patients suffering from lordosis, metabolic disorders and general deterioration of the condition, rapid fatigue are observed.

Treatment of pathological lordosis

Lordosis requires complex treatment, which may include wearing a bandage, special massage, and gymnastic exercises. The main means of correcting posture are gymnastic exercises (if necessary, physiotherapy exercises) and regular classes in publicly available sports.

Treatment of pathological lordosis

Lordosis requires complex treatment, which may include wearing a bandage, special massage, and gymnastic exercises. It is also necessary to take into account concomitant diseases, since they could cause the development of curvature of the spine. The main means of correcting posture are gymnastic exercises (if necessary, physiotherapy exercises) and regular classes in publicly available sports.

First of all, one should imagine what the correct, natural position of the body should be. To do this, you need to stand with your back to the wall and press your head against it, shoulder blades, buttocks, calf muscles and heels, and keep your head straight. Then move away from the wall, maintaining the accepted pose, and try to remember it. To this end, reproduce this body position at every opportunity,

not only in a standing position, but also while walking, in the process of performing exercises. This will consolidate the skill of correct posture.

Do not forget about her and working at the table. Check if the size and shape of the furniture matches the parameters of your body. Here are some guidelines: The chair should be positioned so that the front of the seat is 4 centimeters under the edge of the table top. A person with a height of 170-180 centimeters needs a desktop 80 centimeters high, and a chair 48 centimeters, the depth of the seat is at least 36 centimeters.

Hygienists recommend that a seated person keep the torso straight, only slightly tilting the head and leaning on the back of the chair with the lumbosacral part of the body. Let your legs be bent at the knee and hip joints at right angles, and put your forearms on the table. Do not lean on his chest, sit from the edge of the table at a distance of 3-4 centimeters.

Posture is often disturbed if you constantly carry a heavy load in one hand, such as a jam-packed shopping bag. This habit leads to a decrease in altitude. The desire to maintain correct posture in different conditions is not enough. We also need strong muscles of the trunk and neck that can keep the body upright for a long time.

To maintain the correct posture or correct an already broken one, then do the exercises daily. Also try to find time for swimming, walking and slow jogging, skiing. Skiing not only trains your back and abdominal muscles, but also makes your spine flexible. During swimming, the load on it decreases, it straightens to some extent, and the intervertebral discs restore normal height. Finally, a running person, among other things, gradually learns to keep the body in the most correct position. To strengthen the muscles and ligaments that contribute to maintaining and maintaining posture, the following approximate set of exercises can be recommended.

6. FLAT FEET

Flat feet is a deformity of the foot, characterized by a fixed compaction of the longitudinal arch, valgation of the posterior and abduction of its anterior sections. Longitudinal flat feet according to the severity of deformation has three degrees.

Grade 1 - leg fatigue and pain in the calf muscles after a long walk.

2 degree - pain syndrome, signs of foot deformity appear.

Grade 3 - pronounced flat feet: deformity of the foot with the expansion of its middle part and pronation of the posterior section, while the anterior section is retracted outward and supinated in relation to the posterior one.

With bilateral flat feet, the socks are turned to the sides. The gait is awkward, running is difficult.

Distinguish between congenital and acquired flat feet.

Acquired flat feet are subdivided into statistical, rickets, traumatic and paralytic.

Statistical flat feet develops as a result of chronic overload of the feet, leading to a weakening of muscle strength and stretching of the ligamentous apparatus of the foot joints, as a result of which the longitudinal arch of the foot is flattened. More often occurs in persons performing work associated with prolonged standing or lifting and carrying weights.

Pain is felt after exercise in various parts of the foot, in the calf muscles, knee and hip joints, in the lower back. To determine the degree of flat feet, they resort to plantography, podometry, and radiography.

Plantography is the acquisition of a footprint. The resulting plantogram is divided by a straight line passing through the center of the heel and between the bases of the phalanges of the 3rd and 4th toes. With a normal foot, the shaded part in the middle section does not extend to the dissecting line.

Friedlan podometry - the height of the foot is measured, the length of the foot. The height of the foot is multiplied by 100 and divided by the length of the foot.

Treatment of foot deformities begins with the prevention of flat feet in children: dosed physical exercises are recommended, prevention of excessive overload, wearing rational shoes.

Surgical intervention is performed on the soft or on the osteoarticular apparatus of the foot.

With flat feet of 2-3 degrees, the deformity of the foot is eliminated by modeling correction, but soon the foot returns to its previous position, and then the operation is performed on the soft tissues.

A plaster cast up to mid-thigh is applied for 4-5 weeks. After physical therapy and massage, it is necessary to wear instep supports or orthopedic shoes.

Exercises for the prevention and correction of flat feet.

1. I. p. - sitting on a gymnastic bench, right leg forward, turning the foot inward with pulling the toe. Repeat 10 times with each leg. Initial position.
2. The same standing.
3. I. p. – standing on the outer arches of the feet, rise on toes, the starting position (6-8 times).
4. I. p. - standing on the outer arches of the stop-half-squat (6-8 times).

5. I. p. - standing, turn the feet inward; rise on toes-slowly bend your knees-slowly straighten your knees-starting position (6-8 times).
6. I. p. - standing to raise the left (right) leg - turn the foot outward, turn the foot inward. Repeat 4-6 times.
7. I. p. - the same. Circular foot movements.
8. I. p. - the main stand, toes inward. Walking combined with toe-walking and jumping.
9. I. p. - lying on your back, legs bent at the knees, feet together, rest on the floor. Active dilution of the heels with a return to the starting position.
10. I. p. - lying on your back, legs bent at the knee joints and rest on the floor. Alternately lifting the heels off the floor.
11. Lying on your stomach, hands on the floor; the socks are turned inward. Raising the head and trunk (as in exercises for the back muscles) with supination of the feet.
12. I. p. Sitting on the bench longitudinally, feet parallel to the width of the palm. Bringing the socks together until they touch the fingers and spreading them (do not lift the heels off the floor).
13. I. p. Sitting on a bench longitudinally, legs bent. Flexion and extension of the fingers.
14. I. p. - sitting on the floor, grab a crumpled piece of paper with your toes and shift it to the left, then to the right.
15. I. p. Sitting on a bench, legs crossed. Turn the outer edge of the foot downward, lift the inner edge upward in a circular motion with the foot.

In the first lessons, it is enough to include 3-4 special exercises, according to the principle of load dispersion. In the future, you can increase them to 6. Each exercise is repeated 4-6 times with a gradual increase to 10 repetitions.

Only in the case of systematic and regular physical education can one expect the maximum positive effect. In this case, it is necessary to take into account your capabilities, state of health, level of fitness and recommendations of the attending physician. Exercise has a positive effect on all parts of the locomotor system, preventing the development of degenerative changes associated with age and physical inactivity. Bone mineralization and calcium content in the body increase, which prevents the development of osteoporosis. The flow of lymph to the articular cartilage and intervertebral discs increases, which is the best way to prevent arthrosis and osteochondrosis. All these data testify to the invaluable positive impact of health related physical culture on the human body.

5. ТЕОРЕТИЧЕСКИЙ МАТЕРИАЛ:

1. Popov. Healing Fitness. Moscow, 2004.
2. Edited by VA Kovalenko, Physical culture: Textbook - Publishing house ASV, 2000.
3. Matveeva L.P., Novikova A.D. Theory and methodology of physical education: Textbook. for institutes of physical culture / Under total. ed. L.P. Matveeva - T.1. General foundations of the theory and methods of physical education. - М.: Physical culture and sport, 1993.

Topic 11. Exercise therapy for diseases of the organs of vision

PURPOSE OF THE LESSON: Study of the methodology for carrying out a complex of exercise therapy for diseases of the organs of vision.

A STUDENT SHOULD KNOW:

- the structure, anatomical features of the eye;
- changes occurring in the body with impaired visual acuity;
- causes of vision loss;
- symptoms of hyperopia. Complexes of exercise therapy;
- symptoms of myopia. Complexes of exercise therapy;
- astigmatism. Complexes of exercise therapy;
- indications for the use of exercise therapy;
- contraindications to the use of exercise therapy.

A STUDENT SHOULD BE ABLE TO:

- apply a complex of exercise therapy for diseases of the organs of vision.

TABLE OF CONTENTS:

1. The eye and its functions.
2. Visual acuity.
3. Causes of vision loss.
4. Symptoms of hyperopia. Exercise therapy.
5. Symptoms of myopia. Exercise therapy:
 - the method of conducting complexes of exercises for persons suffering from myopia;
 - method of training exercises for the ciliary muscle using lenses;
 - special exercises for myopia;
 - the basic principles of eye relaxation by Margaret D. Corbett:
 - method of solarization;
 - palming;
 - breathing exercises.
6. Astigmatism. Exercise therapy.
7. Indications for the use of exercise therapy.
8. Contraindications to the appointment of exercise therapy.
9. Theoretical material.

1. EYE AND ITS FUNCTIONS

The eye is an organ of perception of light stimulation. The eye, or the eyeball, has an irregular spherical shape and is placed in the bone funnel - the orbit. Behind and from the sides, it is protected from external influences by the bony walls of the orbit, and in front - by eyelids. The inner surface of the eyelids and the anterior part of the eyeball, with the exception of the cornea, is covered with a mucous membrane - the conjunctiva.

The movements of the eyeball are carried out with the help of the external eye muscles. There are six of them in each eye. At one end they attach to the posterior part of the orbit, and at the other end to the surface layers of the eyeball.

The outer dense membrane of the eye is called the sclera - a dense, opaque white tissue. On the front, open side of the eye, the sclera passes into a thin and transparent cornea.

The choroid is located under the sclera. In the anterior part of the eyeball, the choroid passes into the ciliary (ciliary) body and the iris (iris).

In the ciliary body there is a muscle connected with the lens and regulating its curvature. The lens is a transparent elastic body shaped like a biconvex lens. In the center of the iris there is a round hole - the pupil.

The iris tissue contains a special dye - melanin. Depending on the amount of this pigment, the color of the iris ranges from gray and blue to brown, almost black.

Between the cornea and the iris, as well as between the iris and the lens, there are small spaces called the anterior and posterior chambers of the eye, respectively. They contain a clear liquid - aqueous humor. The cavity of the eye behind the lens is filled with a transparent jelly-like mass of the vitreous body.

The inner surface of the eye is lined with a thin, very complex in structure reticular membrane - the retina, or retina. It contains light-sensitive cells. The nerve fibers from these cells come together to form the optic nerve, which travels to the brain.

2. VISUAL ACUITY

The ability of different people to see larger or smaller details of an object from the same distance with the same shape of the eyeball and the same refractive power of the dioptric eye system is due to the difference in the distance between the sensitive elements of the retina and is called visual acuity.

To judge the ability of the eye to distinguish between the shape and size of the object in question, use the concept of visual acuity. The measure of visual

acuity is the angle at which the object is seen. The smaller this angle, the higher the visual acuity. For most people, the minimum angle of view is 1 minute. To determine visual acuity, special tables are used, on which test signs of various sizes are applied - letters, rings, pictures.

To assess the state of peripheral vision on special devices - perimeters, the boundaries of the field of vision are determined, i.e. that part of the space that the eye sees in a stationary position. Normal joint vision with both eyes, which is called binocular or stereoscopic, provides a single perception of the object in question and the correct determination of its location in space. Typically, one eye, called the dominant eye, sees slightly better than the other and takes a more active part in the act of binocular vision.

3. CAUSES OF LOSS OF VISION

The reason for the deterioration of vision or its complete loss can be:

- ✓ congenital underdevelopment of the eye or its parts occurs hereditarily or as a result of the influence of various harmful factors on the fetus;
- ✓ as a result of direct exposure to various microorganisms, physical and chemical agents on the outer parts of the eye inflammation of the edge of the eyelids (blepharitis), mucous membrane (conjunctivitis), cornea (keratitis) may develop;
- ✓ the membranes of the eye can be affected and inflammation of the sclera - (scleritis), the choroid - (chorionitis), the iris and the ciliary body - (iridocyclitis), the retina - (retinitis);
- ✓ an increase in changes and general diseases sometimes lead to clouding of the lens - cataract;
- ✓ if the normal process of fluid circulation in the eye is disturbed, intraocular pressure may increase and glaucoma may develop;
- ✓ changes in the eyes can be observed in diseases of the nervous system, cardiovascular system, poisoning, metabolic disorders, etc.;
- ✓ eye injuries can also cause visual impairment.

By far the most common eye disease is myopia or myopia. On a global scale, over 30% of people suffer from it. And among residents of developed countries, this percentage is much higher. The most unpleasant thing is that every year the army of the myopic is replenished with more and more young people, students and even schoolchildren - the most active computer users.

Another of the eye diseases, in the emergence and progression of which the most direct role can be played by prolonged work on the computer - hyperopia. It

is believed that farsightedness affects mainly the elderly. This is not entirely true. Disturbances of the visual apparatus, leading to farsightedness, are often laid down in youth, in childhood, and congenital are also found. It's just that in young people, as a rule, the eyes have a good accommodative ability, which gradually decreases with age.

4. SYMPTOMS OF FAR VISION. TREATMENT

Farsightedness is a refractive error in which rays of light entering the eye are focused not on the retina, but behind it. In mild forms of eyes with a good supply of accommodation, it compensates for the visual impairment by increasing the curvature of the lens by the ciliary muscle.

Farsighted people usually have poor near vision, but vision may be blurry when looking at distant objects. Young people, and even more so young people with weak or medium farsightedness, often do not have vision problems, since their natural lens can adapt or accommodate to increase the optical power of the eye. However, with age, accommodation is gradually lost, and patients notice a progressive deterioration in near vision.

So, the main signs of hyperopia:

- ✓ poor near vision;
- ✓ poor distance vision (with high degrees of hyperopia);
- ✓ increased eye fatigue when reading;
- ✓ eye strain during work (headaches, burning eyes);
- ✓ squint and "lazy" eyes in children (amblyopia);
- ✓ frequent inflammatory eye diseases (blepharitis, barley, chalazion, conjunctivitis).

With farsightedness, glasses are prescribed for reading or constant wear. For glasses, collecting lenses are selected (moving the focus forward to the retina), when using which the patient's vision becomes the best.

Somewhat different from hyperopia is presbyopia, or senile hyperopia. Presbyopia develops due to the loss of elasticity of the lens (which is a normal result of its development). This process begins at school age, but a person usually notices a weakening of near vision after 40 years. (Although at 10 years old, children-emmetropes can read at a distance of 7 cm, at 20 years old - at least 10 cm, and at 30-14 cm, and so on.) Senile hyperopia develops gradually, and by the age of 65-70 a person already completely loses ability to accommodate, development of presbyopia is complete.

THE COMPLEX OF EXERCISES ON THE SYSTEM OF W. BATES

W. Bates has developed a set of exercises for hyperopia, which is based on the assertion that the cause of this visual impairment is an effort, an intense attempt to consider an object located close to the eyes. Therefore, all his exercises are aimed at relaxation.

- Exercise 1. Daily reading for 10-15 minutes of a hand-formatted test chart or any book with small print at a distance of 25-30 cm from the eyes, in good and dim lighting. The exercise should be done without effort. When doing it, you need to give up glasses, which will slow down the appearance of a positive effect. But if at first it is impossible to perform this exercise without glasses, then they can be used. Dim light helps to relax the eyes. If during the exercise you feel tension in the eyes, you need to stop and apply relaxing techniques (central fixation, palming).
- Exercise 2. While reading a book or checklist, look at the white space of blank paper between the lines of letters.
- Exercise 3. Hang a large Sivtsev test card in a dark place with dim lighting, but so that at a distance of 5 m one can distinguish the letters, although with some difficulty. This exercise is performed with little effort on the eyes. Standing 5 m from the large test chart, hold the manual test chart in hand. format and create good lighting conditions. First, you need to read a large table, as many lines as possible, and then move your gaze to the manual format table and slide your gaze along the white stripes between its lines, blinking gently regularly. Repeat reading the far and near tables several times. If you do this exercise regularly, your vision can be fully restored. Exercise is also useful for hyperopia (presbyopia).
- Exercise 4. Performed in the open air or by an open window. Alternate looking at uniform surrounding surfaces (sky, grass, wall, ground) and reading the hand-formatted checklist.
- Exercise 5. For hyperopia, observation of flying birds, watching movies, tracking other moving objects are useful.
- Exercise 6. In hyperopia and presbyopia, it is useful to alternate large turns with a concentration of gaze on the candle flame. Large turns are performed as follows. It is necessary to stand directly facing the window, on which it is desirable to have a lattice with vertical bars or at least vertical beams of the frame.

The soles of your feet should be about 30 cm apart if you are of medium height, and if you are tall, then more than 30 cm. The back should be straight, arms freely lowered along the body.

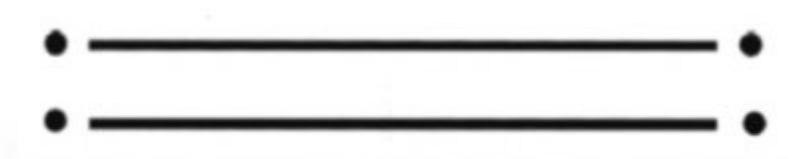
Then smoothly turn the body to the left, so that the line of the shoulders is parallel to the left wall. To make a full turn, you can lift your right heel off the floor and turn your toe to the left. Then make the same turn to the right. As a result, the body will rotate a total of 180 °.

The turns should be continuous, smooth and gentle. When turning, the head, shoulders and eyes should move together, as a whole, that is, the gaze should always be directed in front of you. At the same time, to fulfill this condition, you do not need to make efforts, strain your muscles. When making turns, objects that are "in the path" of the gaze at each moment appear blurry, and the closer they are to the eyes, the stronger this blur.

Objects that are far away will appear to be moving in the same direction as your gaze when you turn, and close ones will slip away from your gaze, and this apparent movement is an indicator that the eyes have reached a state of relaxation. Thus, the vertical bars of the window lattice will go in the direction opposite to the view, and the objects outside the window - in the same direction as the turn.

In addition, during the exercise, one should not pay attention to any external movements, otherwise the gaze will concentrate on them, and the exercise will be performed incorrectly. When performing the exercise, one should not think about extraneous things or problems, ideally the head should be completely free of thoughts, which is necessary to achieve full relaxation. The usual pace for this exercise is about 16 full turns per minute.

Exercise 7. Perform the exercise with the "debko" table.



Debko table

Performing small turns of the head, you need to slide the tip of the nose and gaze along these lines from one point to another. You need to perform these turns until you get the feeling that the lines are sliding in the direction opposite to the direction of your gaze at the moment. Then the same exercise should be done for the bottom of the table.

Next, you should close your eyes and perform the same turns of the head, sliding your mental gaze along the lines represented. After that, you need to open your eyes and slide your gaze over the white space between the two lines at the top and then the bottom of the table. This technique will help you better distinguish letters when reading at any distance.

5. SYMPTOMS OF MYSIGHTEDNESS. TREATMENT

Nearsightedness is an anomaly of eye refraction, in which the focus moves forward, and an already defocused image falls on the retina. With myopia, the further point of clear vision lies within 5 meters (normally it lies at infinity).

For myopic, it is characteristic to squint their eyes when examining objects. This is due to the fact that the retina with myopia is located behind the focus of the rays of light entering the eye, therefore, each point of the object in question is depicted on the retina as a small blurred circle, and not a point. Layering, on top of each other, these circles reduce the clarity of the boundaries of the object, which leads to a decrease in visual acuity. Such a decrease in vision is called "vision in circles of light scattering." Squinting the eyes decreases the size of the pupil, the circles of light scattering become smaller, and the visual acuity increases slightly, while the visual load on both rectus internal muscles, turning each eye inside (towards the nose), increases. This causes muscle fatigue, discomfort and pain in the eye and forehead area.

In most cases with myopia, lengthening of the eyeball is moderate and visual acuity decreases if a person looks into the distance. This defect is eliminated with the help of glasses, which restore the clarity of the image of distant objects, transferring them to the retina.

With uncomplicated myopia, even a high degree, glasses often restore full visual acuity. However, the progression of myopia can lead to serious, irreversible in the eye and significant loss of vision, which, under the influence of glasses, improves only slightly or does not improve at all. These changes are mainly observed in the posterior part of the eye, which is undergoing stretching. Partial death (atrophy) of the elements of the choroid occurs. As a result, the nutrition of the eye, especially the retina, is sharply disrupted. Its vessels often rupture, which is accompanied by retinal hemorrhages.

In some cases, the vitreous body is liquefied, filling the cavity of the eye, which lies behind the lens.

Under the influence of sudden shaking of the body, eye injury and a number of other unfavorable factors, the altered and weakened retina can rupture.

Three factors are mainly responsible for the occurrence of myopia.

Two of them - hereditary predisposition and intense visual work at close range with weakened accommodation - serve as a trigger for myopia and interact in a complex way already at the initial stage of its development. The third factor - the changed outer membrane of the eye (sclera) - usually begins to manifest itself when myopia has already arisen. It is mainly associated with the progression of myopia.

On the basis of new ideas about the role of weakened accommodation (a phenomenon in which the lens can change its shape, become more or less convex) in the development of myopia and its progression by influencing the accommodative apparatus of the eye with the help of medications and physical exercises. A special training system has been developed for the ciliary muscle of the eye.

Prevention of myopia helps to strengthen the body (correct daily regimen, good nutrition, sufficient exposure to the air, physical education and sports), as well as prevention and active treatment of common diseases, especially rickets, rheumatism, tonsillitis and tuberculosis.

If myopia has arisen, then the main task is to suspend or slow down its further development.

With myopia, it is especially important to carefully observe all the hygiene measures already mentioned. Visual workload that is not related to school or professional activities should be reduced within reasonable limits. With the progression of myopia, it is necessary that for every 20 - 25 minutes of visual work there should be at least 5 minutes of rest. With a high degree of myopia, it is advisable to reduce the time of continuous visual work to 10 - 15 minutes, and to increase the rest time to 10 minutes.

Persons with a high degree of myopia are contraindicated in work associated with lifting weights, examining and collecting small parts, or requiring a long stay in a bent position with the head tilted down.

Of great benefit in the treatment of myopia are medications that improve the nutrition of the tissues of the eye and strengthen its walls. The use of vitamins A, B2, C, K, PP, calcium chloride, glucose, iodine and tissue preparations is especially beneficial. Such a course of treatment for progressive myopia, as directed by a doctor, is carried out 2-3 times a year.

People who are nearsighted often have headaches. They experience increased visual fatigue when driving or playing sports.

Special exercises with lenses and simpler exercises have been developed to enhance accommodation. For persons with myopia, a complex of general physical exercises that affect accommodation is proposed.

The main one is the method of training exercises for the ciliary muscle with the help of lenses, which has the following fundamental features:

- ✓ exercises reproduce the conditions of visual work at a close distance, since the main purpose of the accommodation apparatus is to ensure long-term work at a close distance;
- ✓ both minus and plus lenses are used for training, which makes it possible to implement the principle of physiological "massage" of muscles;
- ✓ apply a dosed effect on the accommodation apparatus that does not exceed the maximum loads.

Exercises with lenses are carried out as follows. Previously, when reading the text of any book, which is 33 cm from the patient's eyes, the positive and negative parts of the relative accommodation are determined according to the usual rules. 0.5-1.0 diopters are subtracted from the maximum positive and maximum negative lenses. The obtained values characterize the submaximal load for the ciliary muscle.

Methodology: the trainee in the prescribed distance glasses stands at the window at a distance of 30-35 cm from the window glass. A round mark 3-5 mm in diameter is attached to this glass at eye level. In the distance, on the line of sight passing through the mark, some object is outlined for fixation and then, one by one, they look at the mark on the glass, then at this object. Exercises are carried out 2 times a day for 15-20 days. In the first 2 days, the duration of the exercise session is 3 minutes, in the next 2 days - 5 minutes, on the remaining days - 7 minutes. Such exercises are repeated regularly at intervals of 10-15 days.

The method of training for myopia is determined by the tasks of exercise therapy:

- ✓ general strengthening of the body;
- ✓ activation of the functions of the respiratory and cardiovascular systems;
- ✓ strengthening the musculo-ligamentous apparatus;
- ✓ improving the blood supply to the tissues of the eye;
- ✓ strengthening the muscular system of the eye, especially the ciliary;
- ✓ muscles.
- ✓ Strengthening the sclera.

Reasonable attention is paid to general developmental, corrective, breathing exercises, as well as exercises to strengthen the muscles of the neck and back.

They are included in a set of exercises in order to improve the functional capabilities of the cardiovascular and respiratory systems, as well as to strengthen the muscular corset, muscles of the neck and back, weakened by an incorrect posture during visual work (head tilted sharply, stooped back). In the complex of therapeutic and preventive measures, a person's posture during work is of great importance. The position of the body is considered correct when the line of the center of gravity crosses the bench behind the hip joint, the head is slightly tilted forward, the eyes are at a distance of the length of the forearm and hand with outstretched fingers from the book lying on the table, the shoulder girdle remains horizontal, the body is moved away from the edge of the table by 3-5 cm.

Special exercises for myopia can be conditionally divided into several groups:

I. Exercises for the outer muscles of the eye:

- ✓ exercises for the rectus muscles of the eye;
- ✓ exercises for the rectus and oblique muscles of the eye/

II. Exercises for the internal (ciliary) muscle:

- ✓ at home;
- ✓ on an ergograph;
- ✓ with lenses.

These exercises are performed by moving the eyeball in all possible directions and by transferring the gaze from the near point of clear vision to the far one and vice versa.

III. Self-massage of the eyes.

Self-massage is performed by screwing up your eyes, blinking, as well as pressing with three fingers on the upper eyelid, without causing pain, with varying frequency and strength.

Self-massage of the eyeballs is carried out by lightly pressing with three fingers on the upper eyelid with the eyes closed with a frequency of 40 to 80 per minute, as well as closing the eyes with different strengths and blinking with different frequencies.

Self-massage is started from 10 seconds, then gradually brought to 1 minute.

Basic principles of eye relaxation suggest Margaret D. Corbet

The first law of sight is movement

When the eye moves, it sees. The sight of the eye that stares intently weakens. The author's goal is to break the habit of gazing through physical and mental movement of the gaze.

Before you try to normalize your vision, you need to perfectly master 4 exercises: solarization, palming, swinging and mental representation. Do them thoroughly 2-3 times a day for 1 week. Take off your glasses during all activities.

Solarization method

First step. Stand on the edge of thick shadow. Place one foot on a shady patch of ground and the other on a brightly lit area. Now close your eyes, and after taking a deep breath, begin to turn your head from side to side so that your closed eyes alternately pass through an unlit area and an area that is exposed to sunlight.

The head should be raised high enough so that the sun is right between the edges of the closed eyelids and the eyebrows. Repeat turns until closed eyes no longer flinch in the sun in pain.

Step two. Face the bright sunlight with your eyes closed. Now begin to freely, without tension, turn your head and body to the right, then to the left, lifting your heels off the ground for relief. Let the sun pass you by.

Step three. When the eyelids stop flinching and squinting from the sunlight and feel good under it during the turns, cover 1 eye with your palm so that not a single ray of light can penetrate it. Now begin to make turns, gliding with the gaze of your bare palm eyes on the ground at your feet. At the same time, he should blink continuously. Now, with your head and elbow raised, turn from side to side and blink quickly, looking directly at the sun.

Finally, do this exercise by bringing both eyes together and making turns, looking directly into the sun with closed eyes. This completes the work with the sun. You will feel that your eyes are literally dazzling from sunspots, dashes, etc., so step back into the shade and do palming 2 times longer than you did solarization.

Palming

Starting position: straighten the fingers of one hand and place your palm on your face. Place the little finger of your other hand across the base of the four open fingers of the first hand. The intersection of the bases of the little fingers forms a sort of bow of the glasses and should be located where the bow of the glasses is usually located on the bridge of the nose. In this case, the depressions of the palms are located exactly above the orbits of the eyes. Keep your eyes closed while palming. Eliminate tension in your fingers, relax your wrists, elbows. To do this, place them on your knees so that your neck is in one straight line with your spine. When palming, sunspots and dots will disappear. This exercise is necessary because it gives the eyes a rest.

Big turns

Stand facing the window of your room with your feet shoulder-width apart. Then, shifting your weight to your left leg, turn your head and shoulders toward the left wall. Ditto to the right. Do these movements in the rhythm of a slow waltz, lifting the heel off the floor during the turns. Make sure that your eyes do not close as you pass the windows, otherwise you will not be able to see them passing by you. Count the number of turns during the turns. To achieve the desired degree of relaxation, you need to make up to 60 turns. This exercise should be done 100 times every morning and evening before bed. This exercise develops the flexibility of the spine, normalizes the functions of the organs. But first of all, it promotes the excitation of a peculiar vibration (very small involuntary movements) of the eyes with a frequency of about 70 times / sec. These twists are a relaxation tool to release tension.

Finger turns

This exercise is the first step towards eliminating eye strain. Place your index finger in front of your nose. Turn your head gently from side to side, looking past your finger. It will seem to you that the finger is moving. A very quick sensation of movement can be achieved if you close your eyes and make turns so that the tip of your nose touches your finger each time you pass it 20-30 times.

Mental representation

The secret of any relaxation lies in the psyche: pleasant, joyful memories bring relaxation. For example, a musician may be pleasantly relieved by remembering a successful performance. You can perform any mechanical process, draw pictures - a square, a triangle, circles, with good music.

Gymnastics: stand up straight and smoothly move your eyes (look from the right shoulder to the left, "drawing" in this way a semicircle. Doctors using non-traditional oriental methods of treatment believe that the spine is a body channel, that many diseases begin with an incorrect position of the spinal column. Therefore, it is necessary make sure that your back is straight, your shoulders are straight, and your head is slightly upward. This is easy to do if you imagine that the ropes are tied to the crown and pulled up. This is the very natural position of the head and neck, beneficial to health.

Breathing exercises

1. I. p. - standing. Inhale in four counts, then exhale in four counts. Repeat 6-8 times. The same, but inhale and exhale in six counts.
2. Do the same exercise while walking. Four (six) steps - inhale, then four (six) - exhale.
3. The combination of slow running with deep breathing.

4. I. p. - standing, hands on the stomach. When inhaling, press on the anterior abdominal wall with your hands, slightly protrude the stomach, while exhaling, draw in the abdominal wall.
 5. I. p. - standing. Inhale and, without exhaling, push your stomach forward several times, and then draw in. Repeat 5 - 6 times.
 6. I. p. - standing. Raise your arms through the sides up - inhale, lower - exhale.
 7. I. p. - standing, hands on the back of the head. Taking a breath in four counts, take your elbows back, connect the shoulder blades, bend. When exhaling in four counts, the shoulder blades are forward.
 8. I. p. - standing. Raise your arms up, your leg back, inhale, etc. n. - exhale. The same with the other leg.
 9. I. p. - standing, hands behind the lock. Take your hands back, bend - inhale, and. p. - exhale. Repeat 8-10 times.
 10. I. p. - standing, hands up. Taking your hands back - inhale, returning to and. p. - exhale. Repeat 4-6 times.
- Inhale through the nose and exhale through the mouth.

ASTIGMATISM. TREATMENT

Astigmatism is a defect in the optics of the eye caused by the irregular shape of the cornea and / or lens. In all people, the shapes of the cornea and lens differ from the ideal body of rotation (that is, all people have astigmatism to one degree or another). In severe cases, stretching along one of the axes can be very strong, in addition, the cornea may have curvature defects caused by other reasons (injuries, infectious diseases, etc.).

With astigmatism, light rays are refracted with different strengths in different meridians, as a result of which the image is curved and indistinct in places. In severe cases, the distortion is so strong that it significantly reduces the quality of vision.

Astigmatism is easy to diagnose by looking at a sheet of paper with dark parallel lines with one eye - rotating such a sheet, the astigmatist will notice that the dark lines are blurred, then become clearer. Most people have congenital astigmatism up to 0.5 diopters, which does not cause discomfort.

This defect is compensated for by glasses with cylindrical lenses having different curvatures horizontally and vertically and by contact lenses (hard or soft toric), as well as by spectacle lenses with different optical power in different meridians.

INDICATIONS FOR USE OF EXERCISE IN MYOPIA

Exercise therapy is indicated for all persons with progressive myopia, acquired and uncomplicated by retinal detachment, of any degree.

Age is not a limiting factor, but exercise therapy is most effective in children. In myopic children who have at the same time various disorders of the musculoskeletal system (scoliosis, flat feet), the use of exercise therapy is mandatory. The earlier exercise therapy is prescribed for myopia and the lower the degree of myopia, the higher the effectiveness of the method.

With congenital myopia, the use of exercise therapy is ineffective.

The appointment of exercise therapy is contraindicated with the threat of retinal detachment.

BASIC CONTRAINDICATIONS FOR PURPOSING exercise therapy

1. Lack of contact with the patient due to his serious condition or mental disorders.
2. The acute period of the disease and its progressive course an increase in cardiovascular failure.
3. Sinus tachycardia (over 100 beats / min) and bradycardia (less than 50 beats / min).
4. Frequent attacks of paroxysmal or more than 1:10.
5. Negative dynamics of the ECG, indicating a deterioration in the coronary circulation.
6. Atrioventricular block II-III degree.
7. Hypertension (BP over 220/120 mm Hg) against the background of a satisfactory condition of the patient.
8. Hypotension (blood pressure less than 90/150 mm Hg).
9. Frequent hyper- or hypotonic crises, the threat of bleeding and thromboembolism.
10. The presence of anemia with a decrease in the number of erythrocytes to 2.5-3 million, an increase in ESR of more than 20-25 mm / h, pronounced leukocytosis.

The possibilities of exercise therapy in ophthalmology have not yet been fully disclosed. Of the multiple ocular pathologies, exercise therapy is currently used only for glaucoma and myopia.

For glaucoma, massage is more often used, physical exercises are carried out according to the same technique as for hypertension. Exercise therapy for myopathy has become more widespread. The high efficiency of this treatment method has been proven.

THEORETICAL MATERIAL:

1. Cook D. 100% vision without glasses and lenses in 7 minutes a day. - M.: Eskimo, 2006.
2. Corbet D. How to get good vision without glasses. - Publishing house: -Lan, 2004.
3. Sports medicine. Reference edition .-: Terra-Sport, 2003.
4. Methods for improving vision: how to get rid of glasses - Fedorov A.I.
5. Wikipedia-visual system.
6. Medical encyclopedia. Super-vision: The best recipes for traditional medicine from A to Z | Kozlova E.A., Kochneva S.A.

Topic 12. Acupressure massage

PURPOSE OF THE LESSON: training in acupressure technique.

A STUDENT SHOULD KNOW:

- the essence of acupressure;
- mechanical and physiological effects of acupressure on the human body;
- about changes in the body under the influence of acupressure;
- basic techniques of acupressure;
- basic and relative indications, contraindications for massage.

A STUDENT SHOULD BE ABLE TO: perform basic acupressure techniques.

TABLE OF CONTENTS:

1. Physiological effects of acupressure.
2. Technique for performing acupressure.
3. Basic techniques of acupressure.
4. Methods of acupressure.
5. Types of acupressure.
6. Point massage for some diseases.
7. Contraindications for acupressure.
8. Theoretical material.

1. Introduction

Since ancient times, in the countries of the East, the finger massage method, *zhen*, has been used. The most ancient sources of literature indicate that acupressure already in the I-III centuries AD. e. became widespread in China, Korea and other countries as a method of traditional medicine, and since the VIII century it was officially recognized.

The method of acupressure (acupressure according to Zhu Lian, *finger zhen*), or pressing, is the effect on acupuncture points (TA) with a finger (s).

The ease of performing acupressure and its effectiveness contribute to the widespread use of this method.

The essence of acupressure is reduced to mechanical irritation of small areas (2–10 mm) of the skin surface, which are called biologically active points (BAP), since many nerve endings are located in them.

To date, scientists and specialists have described about 700 BAP, of which 140–150 are most often used.

To find BAP, you should use anatomical and topographic signs (tubercles, ligaments, muscles, bones, etc.)

However, these landmarks are clearly not enough to find some BAP. A kind of measure helps in finding them: individual *cun* — the distance between two folds that are formed when the second phalanx of the middle finger of the right hand is bent in women and the left — in men (see Fig. Individual *cun*).

Individual *cun*



It turned out that all parts of our body can be conditionally divided into a certain number of equal parts. Their border is called proportional *tsun*, which varies within 1-3 cm in depending on the physique of a person. Everyone can make a measuring tape for themselves with their own *tsuni*.

2. Physiological effects of acupressure

The physiological mechanism of finger effects - massage-pressure - is based on complex interdependent reflex, neurohumoral and neuroendocrine processes, regulated by the higher parts of the central nervous system. Direct irritation of skin receptors, including in the subcutaneous tissue, muscles, ligaments, causes a complex response from the body. It is a therapeutic system based on reflex and reflexogenic relationships formed in the process of phylo- and ontogenesis, implemented through the central nervous system. The result is a local, segmental and general integrative response.

The local reaction observed with finger acupressure, accompanied by a slight increase in the temperature of the skin of the massaged area, the appearance of severe hyperemia (redness) and even depression of soft tissues, the appearance of tissue hormones, contributes to the emergence of a nerve impulse, which is the initial link in the chain of neuro-reflex reactions of the mechanism of action of a point massage on the body. Nerve impulses are transmitted along afferent pathways centripetally to the spinal cord segments corresponding to the site of stimulation, causing a segmental reaction, and to the overlying parts of the central nervous system - projection zones, causing the development of a general integrative response. The integrative reaction is based on nervous reception with the subsequent development of neuro-reflex and neuroendocrine reactions. The pituitary gland, the adrenal cortex, the adrenaline system are the main implementers and generalizers of the nervous system for irritation of points and zones of the body.

In the mechanisms of action of acupressure, a special role is assigned to the autonomic nervous system, which has its centers in the brain and spinal cord, peripheral nodes or ganglia and a network of nerve fibers in organs and tissues. Its divisions - sympathetic and parasympathetic are involved in the regulation of body functions. The regulator of the autonomic nervous system is the diencephalic region, especially the hypothalamus, which are associated with the reticular formation, and the cerebral cortex exercises the highest control over all centers.

The main prerequisite for the effective conduct of finger pressure, massage (whatever type, system it may be) is, firstly, the correct choice of the place of application of mechanical irritations, and secondly, the definition of special techniques, as well as the strength and nature of the applied irritation, c- third, the compliance of the method of exposure to the initial state of the organism or organ. These conditions are consistent with the basic principle of reflex treatment

(reflexotherapy): the choice of the method of action, the method of action (dosage), the place of action (points, zones), adequate to the state of the patient or healthy at the time of the therapeutic or health-improving effect. Failure to comply with this principle can lead to a decrease in the therapeutic effect or a negative reaction of the body, an uncomfortable state.

3. Technique for performing acupressure

Before proceeding with acupressure, it is necessary to clearly study the location of BAPs and learn how to regulate the force of impact on them depending on the location - near bones, ligaments, blood vessels, nerves, etc. Weaker effects are exerted on the vessels and nerves.

The principle of BAP selection for exposure is determined primarily by the nature of the disease (injury) and its (its) main symptoms. However, in this case, the stage of the disease (acute or chronic), the severity of the development of the process, etc., are of great importance. So, for example, with severe general weakness, BAPs are primarily used, which have a tonic effect on the body as a whole. Then the number of points is gradually increased to treat individual symptoms of the disease.

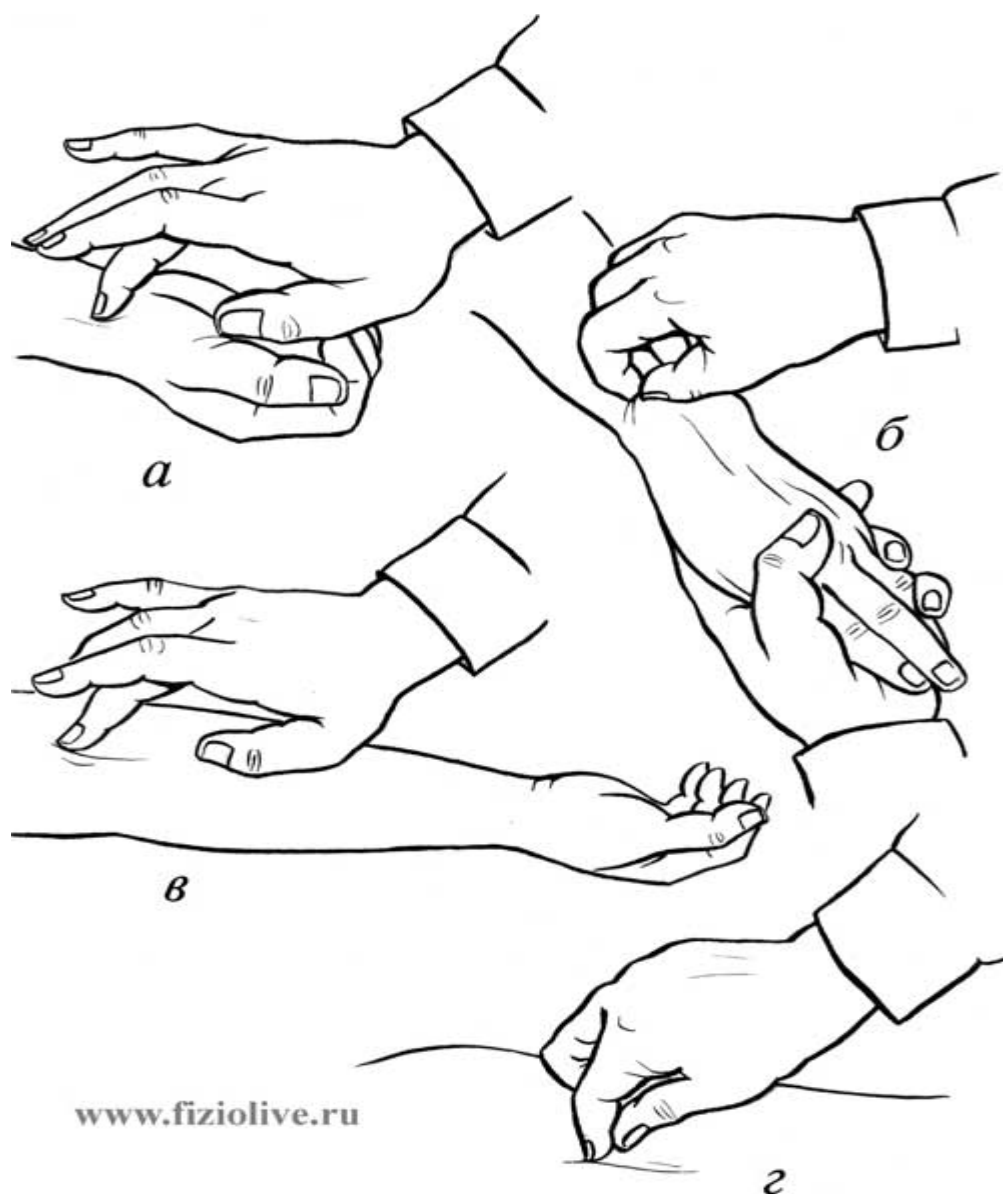
The very first treatments should be short to test the body's response to the acupressure. If any discomfort has arisen or after 3–5 procedures the healing effect has not come, there is no point in continuing the treatment.

The basis of acupressure is the mechanical effect of a finger (fingers) on biologically active points (BAP), which have a reflex connection (through the nervous system) with various internal organs and functional systems. The correctness of finding the point is evidenced by a feeling of aches, distention, numbness. Very often the point is painful. By the painfulness of any point (zone), one can sometimes assume a disease of one or another organ.

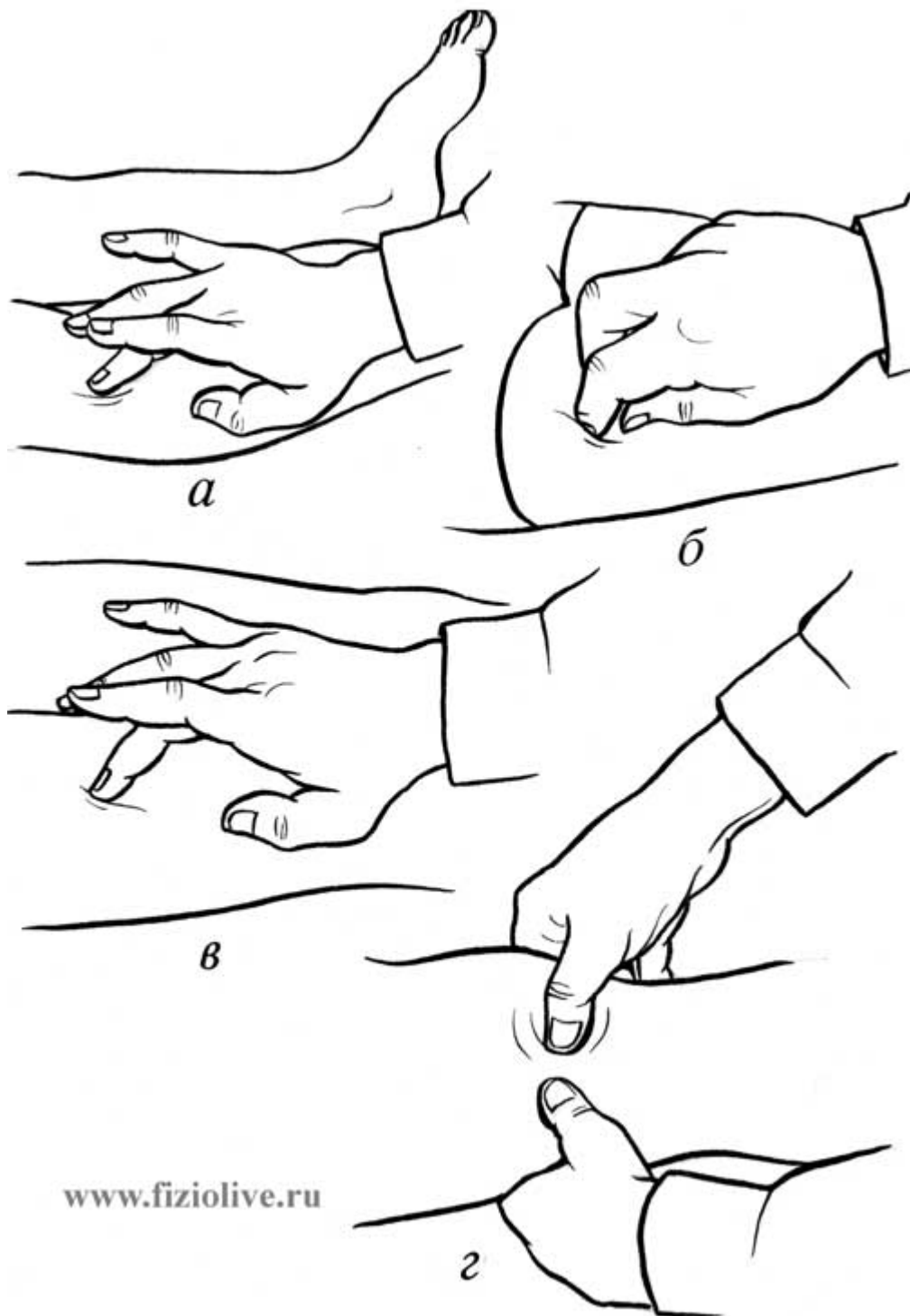
Naturally, this assumption should be checked with a doctor who will diagnose and prescribe, if necessary, appropriate treatment and give recommendations on massage.

The technique of acupressure includes various techniques: rubbing, stroking, pressure (pressure), vibration, grasping, etc. (see Fig. Technique for performing acupressure).

Technique for performing acupressure



- 1: a - stroking with the middle finger in the area of the wrist joint;
b - "pinch" in the forearm;
c - vibration with the middle finger on the hand;
d - "pinch" on the back



- 2: a - vibration with the middle finger on the lower leg;
 б - "pinch" on the thigh;
 в - rubbing with the middle finger on the thigh;
 2 - pressure with the thumbs on symmetrical points



- 3: a - rubbing with the middle finger on the chest;
 b - stroking with the middle finger on the stomach;
 c - pressure and vibration with the thumb on the lower back;
 d - pressure with the middle finger on the back

4. The basic techniques of acupressure

The basic techniques of acupressure include rotation, vibration, pressure, pricking, stretching, separation and joining.

1) The reception of rotation is performed mainly with the palmar surface of the terminal phalanx of II, III or I fingers of the hand (fingertips), less often with the back of the middle phalanges, the terminal phalanx of the first finger, the base of the palm and the fist. Rotation takes a large place in almost any type of massage, and symmetrical points are processed simultaneously with two hands. Therefore, in order to correctly do the rotation with two hands, it is necessary to master this technique separately with the right and left hand.

The reception of rotation can be conditionally divided into three phases:

“Screwing in” is the application of a finger pad or other massaging area of the hand to the acupuncture point and then penetration through smooth, slow rotational movements into body tissues (skin, subcutaneous tissue, muscles) to different depths depending on the location of the point. Slow circular movements are performed without sliding on the skin, but always with an increase in pressure.

In the literature there is information that the shift in the potassium-calcium balance occurring in the tissues affects the neuro-reflex mechanism (V. Natsuk, V. S. Goidenko). If you massage, that is, perform circular movements in a converging spiral, potassium ions will begin to collect from the surrounding tissues towards the center, which will give an exciting effect. When performing circular motions along an unfolding spiral, the same ions, as more mobile ones, will scatter, leaving in the TA low-mobile calcium ions, which will give an inhibitory effect. This opinion is difficult to argue scientifically, but practice confirms it.

Cessation of rotational movements and holding the finger at depth with pressure.

"Unscrewing" - the return of the finger to its original position. In the third phase, slow circular movements are also performed without sliding on the skin, but with a decrease in pressure. At the end of the phase, the finger does not detach from the massaged area, and the first phase of a new cycle of reception begins immediately, and so on. The frequency of rotational movements is on average one per second. At a depth of pressure, the so-called foreseen sensations in the form of distention, numbness and soreness should occur. The number of rotations, the degree of pressure, the delay time of the finger at a depth with pressure depends on the goals of the massage. The direction of rotational movements can be different, although in the works of Japanese authors it is indicated that clockwise rotation of the massaging finger has a tonic effect, while counterclockwise - sedatively.

When performing the technique of rotation, errors are encountered: rough, painful rotations with a tense hand, causing discomfort and pain; movements on the skin, and not with the skin, which reduces the effect of the technique; trauma to the skin with a nail; uneven pace of rotational movements; constant (small or large) force of pressure on the tissues in the first and third phases of admission, which is unpleasant for the person being massaged and quickly tires the masseur.

2) Reception of vibration consists in the application of vibrational-tremulous movements to a point or painful areas of the body, produced by the pads of one or more fingers, the palm, the elevation of the first finger or all fingers clenched into a fist. The fingers are usually placed perpendicular or at an acute angle to the acupuncture points. On painful areas of the body, vibration is performed with the palm, fist, or elevation of the 1st Finger. In all cases, the massaging surface should adhere tightly to the massaged place, and the vibrational-trembling movements are directed into the depths of the tissues.

The force of pressure on the tissue can be constant or variable, then increase, then decrease. Therefore, the foreseen sensations can be different - from the feelings of bloating to painful ones with irradiation.

The vibration is produced stably, that is, in one place, or labile - along the meridian or the entire painful area of the body, the vibration can be intermittent. In this case, the masseur's hand, in contact with the massaged surface of the body, each time breaks away from it, as a result of which the technique takes on the character of separate vibrational-trembling jerks following each other.

The vibration amplitude should be minimal, and the frequency - maximal, on average 160-200 vibrations per minute.

Vibration reception can be combined with rotational movements, mainly in the phase of delay at depth with pressure.

Vibration is a tedious technique for manual execution, and therefore special devices can be used to transmit vibration to the massaged area with different frequencies.

The most common mistakes when performing vibration reception: large amplitude and non-maximum rate of oscillatory movements; trauma to the skin with a nail.

3) Reception of pressure is mainly carried out with the help of the 1st finger, and you need to press on the point with the second phalanx from the shoulder, bending the finger, with the arm straightened. If you need to press on the point with more force, you need to put your fingers crosswise so that the force of both fingers passes along one line, but the lower toe would be more rounded. In addition to pressing with the 1st finger, the following varieties are used in acupressure: the

second phalanges of the II-IV fingers, the elevation of the 1st finger, the edge or base of the palm, with the burden of the 1st finger with the ulnar edge of the hand.

The pressure on the tissue can be constant or variable, then increase, then decrease. The force of pressure is different - from weak to strong, therefore the foreseen sensations are also different - from the appearance of a feeling of warmth and the appearance of redness to numbness.

The reception is laborious for a masseur, and in this regard, in acupressure, spherical tips with a diameter of 1 to 20 mm, made of plexiglass, hard wood (oak, boxwood), duralumin, ebonite, fluoroplastic, can be used.

The main mistakes when performing a pressure reception: pressing the first phalanx of the finger, which can lead to injury.

4) Pricking is a technique of acupressure. When pricking, the corresponding point is excited by rhythmic tapping or striking movements with the tip of the index or middle finger.

5) Stretching - acupressure technique. in the area of some special points and areas, the technique of stretching the skin turns out to be very effective and effective. In this case, with the thumb or forefinger (or both at once), rubbing or stretching movements are performed along an imaginary line in the selected area. The stretching movement follows the patterns of Chinese massage.

Stretching towards the midline of the body produces a strengthening and strengthening effect. A stretching movement directed from the midline of the body, or towards the fingers or big toe, has a weakening and abduction effect.

6) Separation and connection - acupressure technique. A method of separating or combining energy around points. Both thumbs simultaneously move in opposite directions from the center of the point (separation) or, on the contrary, make movements from both sides towards the center of the point (connection).

7) Stroking is performed with the pad of the thumb (or middle) finger with rotational movements. It is used mainly in the area of the head, face, neck, arms and, in addition, at the end of the entire procedure.

It should be noted that the described massage techniques are very arbitrary. It is difficult, for example, to say what the effect will be - inhibitory or stimulating, if you apply the technique of "injection" or pressure, since the force, the depth of the impact is different for each masseur. The location of the finger, the direction of pressure on the point, the skin-fat layer, etc. matter. This is all the more important during self-massage. The reaction to the impact in different people is also not the same, it depends on the nature of the pain, the stage of the disease, the individual

characteristics of the person. It is necessary to influence the points more strongly in men than in women. For people with low fatness, weakened, with an easily excitable nervous system, irritations are applied quickly and superficially.

Do not apply massage techniques in the axillary and groin areas, on the mammary glands, at the sites of large vessels, lymph nodes.

With a massage on the abdomen, pressure is applied during exhalation. To massage the points on the back, you need to bend over or lie down with a pillow under your stomach.

Before starting the massage, you need to wash your hands, rub them to warm your palms and increase blood circulation. The person being massaged should empty the bladder and intestines, take a comfortable sitting or lying position to relax the muscles.

Observations show that with insomnia, lumbosacral radiculitis, massage is best done in the evening. With bronchial asthma, in the morning, with migraine, a few days before menstruation. Acute illnesses should be treated daily, and chronic illnesses after a day or two.

Treatment should be a course of 10-15 sessions, with breaks between courses for 1-2 months. For repeated courses, 5-10 procedures are enough. The course must be carried out completely, even if the unpleasant symptoms have already been removed.

In the first days, 3-5 points are selected for exposure, no more. Each subsequent time, their combination is changed so that there is no addiction.

5. Methods of acupressure

Three methods of acupressure are applied: strong, medium and weak.

Strong - inhibitory, providing analgesic and relaxing (decrease in muscle tone) effect. Pressure is allowed with a force necessary to penetrate all tissues to the bone system and reaching the intensity of the pain threshold and irradiation. Rotational movements, vibration and pressure are performed periodically, that is, 20-30 s with increasing effort and 5-10 s and with decreasing pressure on the point. The total exposure time for each point is 5 minutes or more. As guidelines for dosage, you can use the appearance of a vasomotor reaction in the form of the disappearance of the pale spot after the cessation of pressure or the onset of muscle relaxation, clearly felt by the massaging finger.

In sports practice, a strong, inhibitory version of acupressure is mainly used for myogelosis, distinct muscle hypertonicity.

The middle way is a braking option that has a relaxing effect. The pressure is applied with a force that penetrates the muscles until the intended sensations are obtained in the form of bursting, numbness and aches. The frequency of movements is small, 10-12 s with increasing efforts and 3-5 s with decreasing pressure on the point. The total exposure time is 2–3 minutes per point. The dosage criterion can be a vasomotor reaction in the form of a noticeable reddening of the skin at the sites of massage.

It is widely used for all conditions and diseases associated with increased muscle tone.

Weak - an exciting option that has a stimulating effect in the hypotonic state of the muscles. To achieve the stimulating effect, the finger, rotating, vibrating or pressing, deepens into the skin and subcutaneous tissue for 4-5 s, after which it is torn off the skin for 1-2 s. The duration of exposure at each point is 1 min on average. It is used mainly in medical practice in combination with physiotherapy complexes.

Its calming or stimulating effect depends on the nature of the irritation. It is believed that a sharp, strong and prolonged pressure has a calming effect, and a weak, sharp and short irritation has an exciting effect.

6. Types of acupressure

Soothing massage. This version of acupressure is carried out with continuous, slow, deep pressure. Rotational movements are done evenly, without shifting the skin. Fingertip vibration is performed with a gradually increasing force on the point, followed by a short pause without lifting the finger from the skin and vibration again. The brake version of acupressure is used for various contractures, pains, some circulatory disorders, for muscle relaxation, when massaging children. The duration of exposure to one point is 1.5 minutes.

Toning massage. This version of acupressure is characterized by a stronger and shorter-term effect on each point, combined with deep rubbing and quick withdrawal of the finger after each use. It is carried out for 20-30 seconds 3-4 times. Intermittent vibration can be enabled.

I must say that the described options are very conditional, since each massage therapist has different strength and depth of impact. Therefore, it is difficult to predict whether this or that technique will produce an inhibitory or tonic effect. The movements are usually adjusted during the massage in accordance with the elicited reaction. The impact on the points in men is stronger than in women.

It is forbidden to carry out massage techniques in the axillary and groin areas, on the mammary glands, as well as at the sites of large blood vessels and lymph nodes. Acupressure massage on the abdomen is performed during exhalation.

Before starting the massage, you should wash (disinfect) your hands, rub them to warm your palms, increase blood circulation and sensitivity of your fingers. In order for the acupressure to be effective, the skin must first be cleansed. This can be done with a cotton swab dipped in a solution of alcohol (1 tablespoon of alcohol to 4 tablespoons of cold water) or in vodka (1: 2). Dry skin is cleaned with a gauze cloth dipped in clean water. It is also necessary to empty the bladder and intestines in advance, before the massage, take a comfortable position so that the muscles relax and do not strain.

In the bath, acupressure is used to relieve fatigue, swelling of the legs, relieve pain in the lower back, joints, relieve headaches, and treat colds.

The brake version of acupressure is used for various contractures, pains, some circulatory disorders, for muscle relaxation, when massaging children, etc. The duration of exposure to one point is up to 1.5 minutes.

7. Point massage for some diseases and syndromes

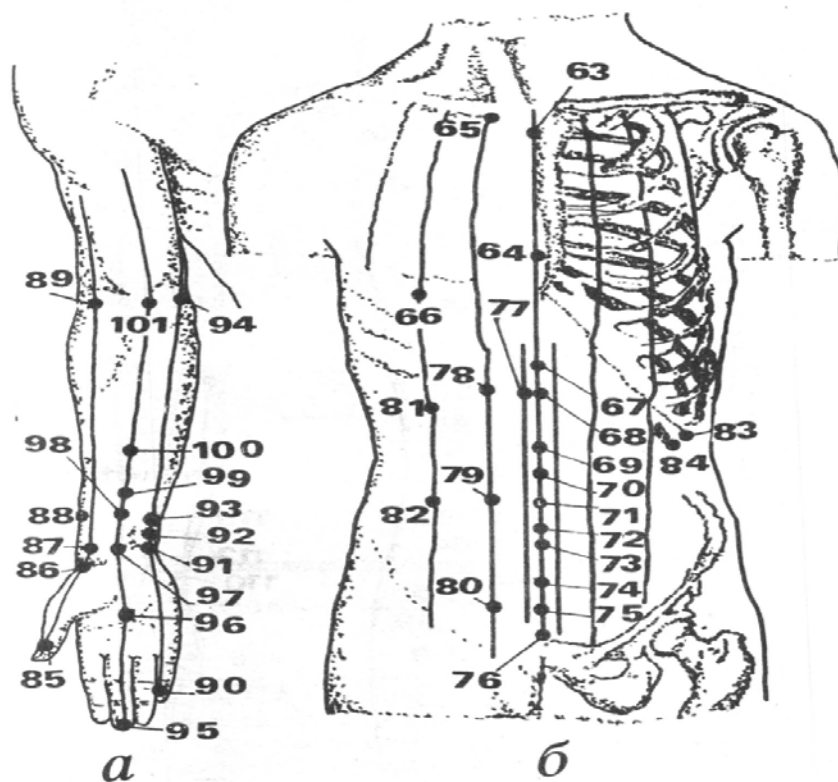
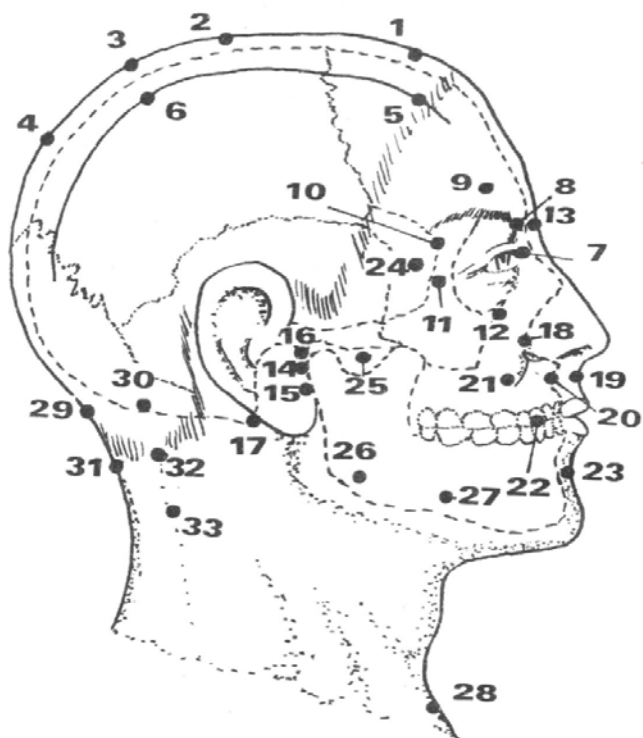
Headache, insomnia, depressed mood ... these symptoms are familiar to one degree or another to every adult. An acupressure often helps to improve health, relieve acute pain, and provide first aid. Of course, it is also useful as an additional remedy for most chronic diseases, when a person himself can take measures to prevent an attack, the development of inflammation, etc.

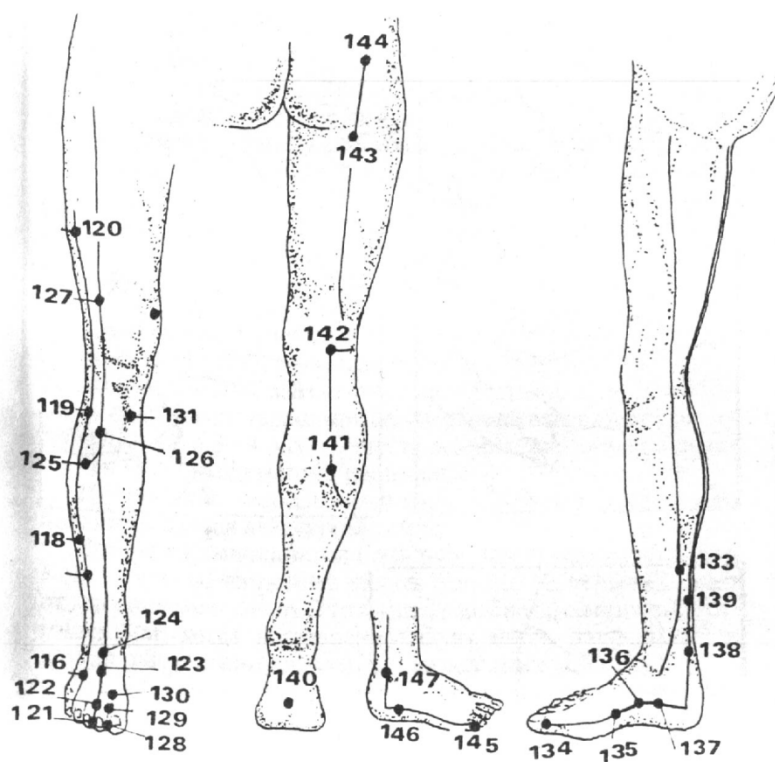
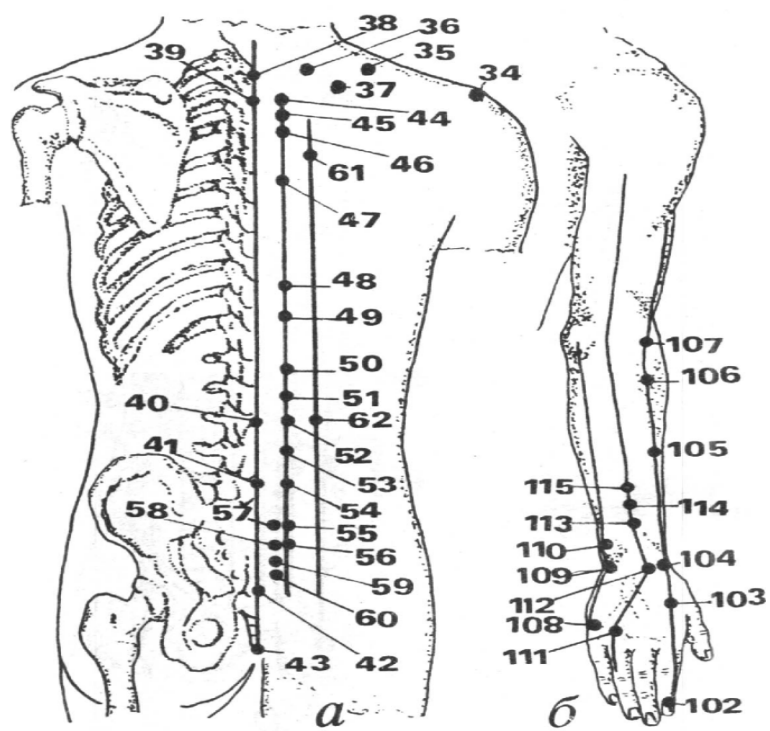
Before starting to use the method of acupressure, it is necessary to clearly study the location of the BAP and learn how to regulate the force of impact on the points depending on their location: near bones, ligaments, blood vessels, nerves, etc.

The principle of choosing points for exposure is primarily determined by the nature of the disease and the main symptoms, however, the stage of the disease (acute, chronic), the severity of the development of the process and the state of the person are of great importance. So, for example, in case of severe general weakness, BAPs are first of all used, which have a tonic effect on the body as a whole. Only then gradually increase the number of points for the treatment of individual symptoms.

The very first treatments should be short to test the body's response to the acupressure. If any discomfort has arisen or after 3-5 procedures there is no effect, there is no point in continuing the treatment.

The main BAPs for influencing them with acupressure techniques for the most common diseases and syndromes.





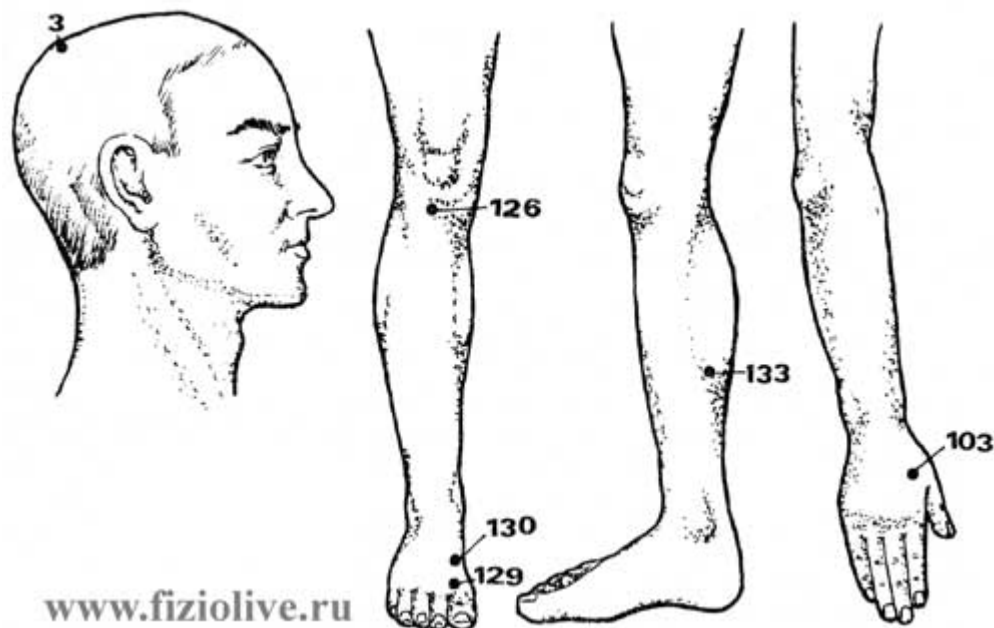
The location of the main BAP.

Hypertonic disease

The disease is based on the narrowing of functional arterioles. High blood pressure causes headaches (often in the back of the head), tinnitus, palpitations, sleep disturbances, decreased performance, etc.

In addition to the treatment prescribed by the doctor, you can influence the points: 3, 103, 126, 129, 130, 133 (see Fig. Points for action with high blood pressure). The massage is carried out daily, the effect on the points is weak.

Points for action with high blood pressure

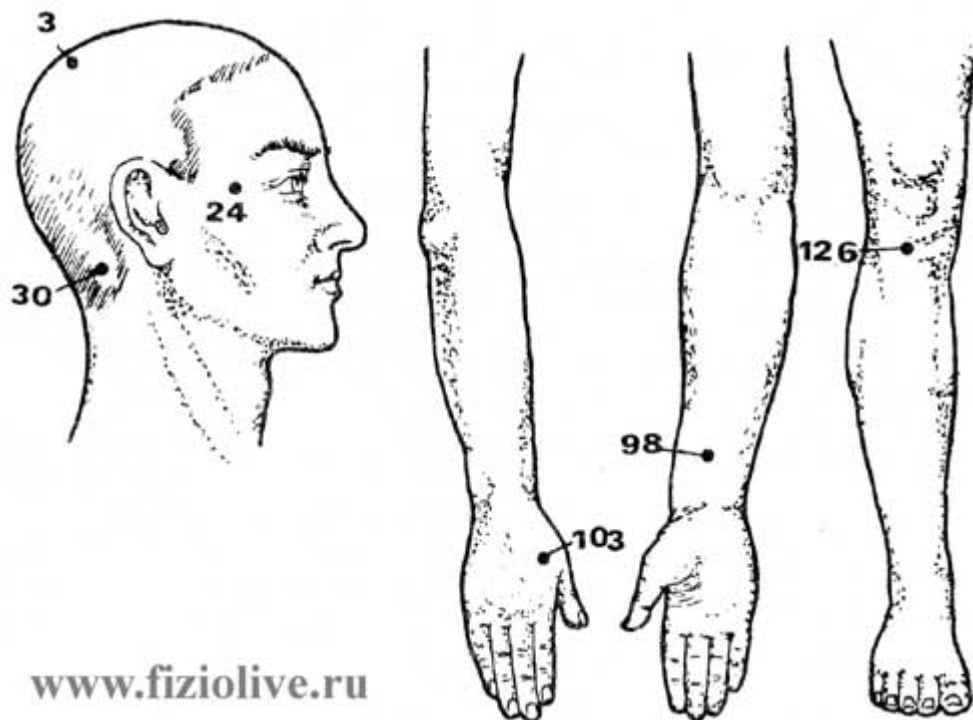


Arterial hypotension

Drop in systolic (lower) pressure below 100 mm Hg. Art. due to dysfunction of the neuro-humoral apparatus regulating vascular tone. A person feels weakness, drowsiness, dizziness, headache worries, there is a reaction to a change in body position (flies in the eyes). In case of hypotension, it is imperative to consult a doctor. Acupressure massage can often be helpful.

Make an impact on points: 3, 24, 30, 98, 103, 126 (see. Fig. Points for exposure at low blood pressure). Influence by the braking method.

Points for action with low blood pressure



Acute bronchitis

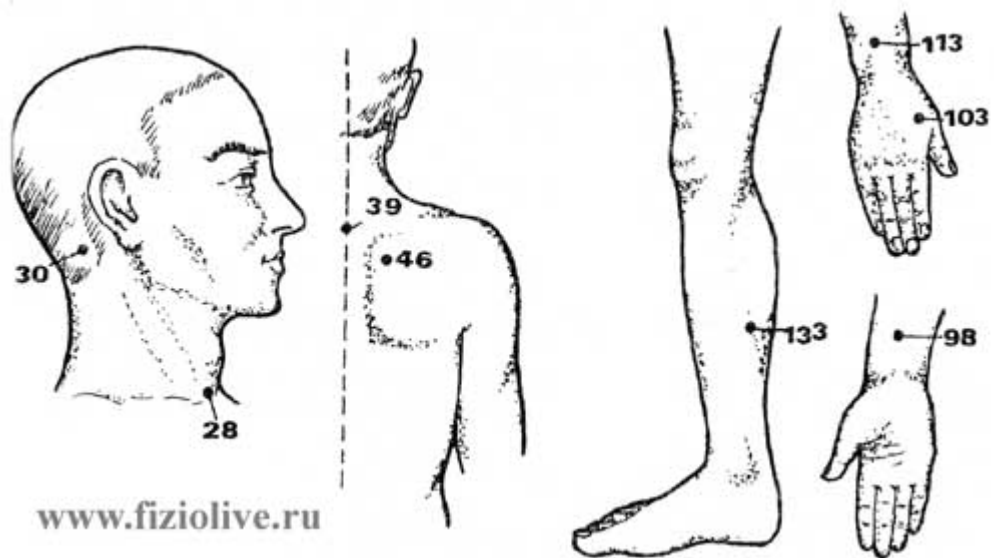
Acute inflammation of the tracheobronchial tree is caused by viruses. A predisposing factor is hypothermia, smoking, persistent foci of infection in the nasopharynx, impaired nasal breathing, etc. A person feels tickling, rawness behind the breastbone, sore throat, often runny nose, pharyngitis, etc.

Along with medicines, acupressure is useful. Impact on common points: 46, 98, 103, 113. (see fig. Points for action in bronchitis)

Additional points are selected in accordance with the course of the disease. So, in case of bronchitis, accompanied by fever, cough, headaches, massage points 30, 39, 98. In case of irritation of the windpipe, points 28, 133.

Acupressure massage is performed daily.

Points for action in bronchitis



Chronical bronchitis

Chronic bronchitis is characterized by cough in the morning with discharge of mucous sputum. The cough appears day and night, exacerbations of the disease are frequent in cold, damp weather.

Points for action: 28, 32, 36, 46, 68, 73, 87, 89, 125, 126.

The massage is carried out on no more than 3-5 points at the same time, their combination changes daily. The course is 3-10 days, then the effect of exposure decreases.

Acupressure massage must be combined with the use of medicines. In addition, warm compresses with various ointments should be done at night (efkamon, gold star, tiger ointment, finalgon, etc.).

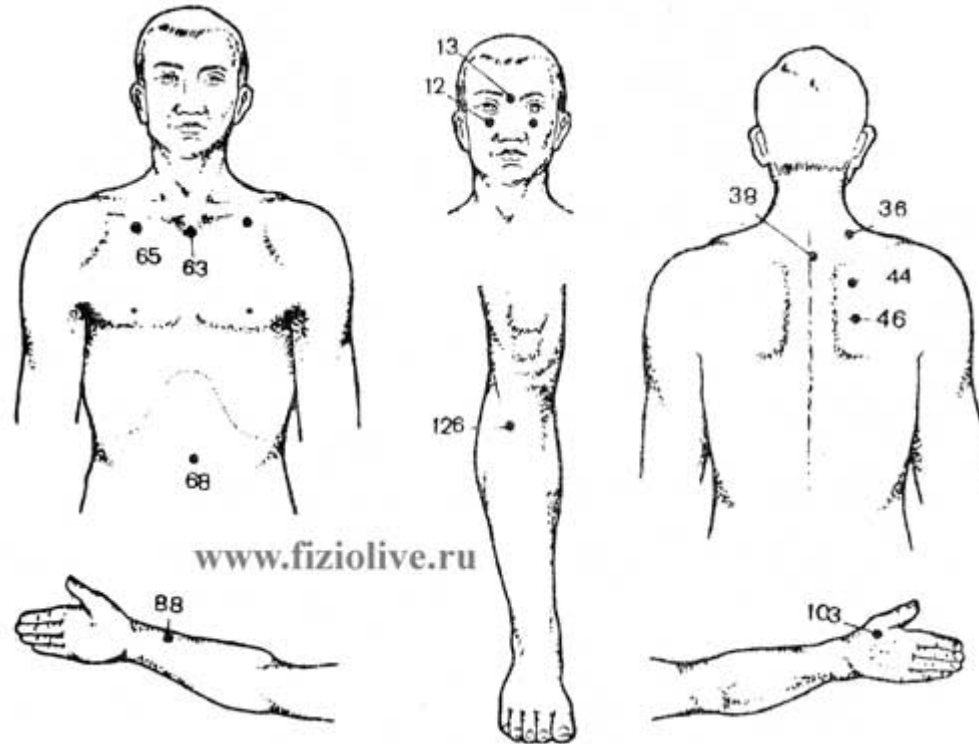
Bronchial asthma

Bronchial asthma is an allergic disease, the main manifestation is an attack of suffocation caused by impaired bronchial patency.

The disease often begins with a paroxysmal cough, accompanied by shortness of breath with the discharge of a meager amount of vitreous sputum. The course of the disease is cyclical: the exacerbation phase is usually replaced by remission.

Acupressure massage is performed during remission. Affect the following points: 12, 13, 88, 103, 65, 63, 68, 36, 38, 44, 46, 126. (see Fig. Points for action in bronchial asthma).

Points for action in bronchial asthma



The massage is performed daily for several days.

Simultaneously with the acupressure, a warm wrapping (compresses) of the chest is shown.

Runny nose

Runny nose (acute rhinitis) - inflammation of the nasal mucosa can be an independent disease or a symptom of acute infectious diseases (flu, acute respiratory infections, etc.). Characterized by slight malaise, sneezing, lacrimation, copious liquid nasal discharge.

The affection points are 1, 18, 30, 38, 103, 107, 113. Additional points: 12, 11.

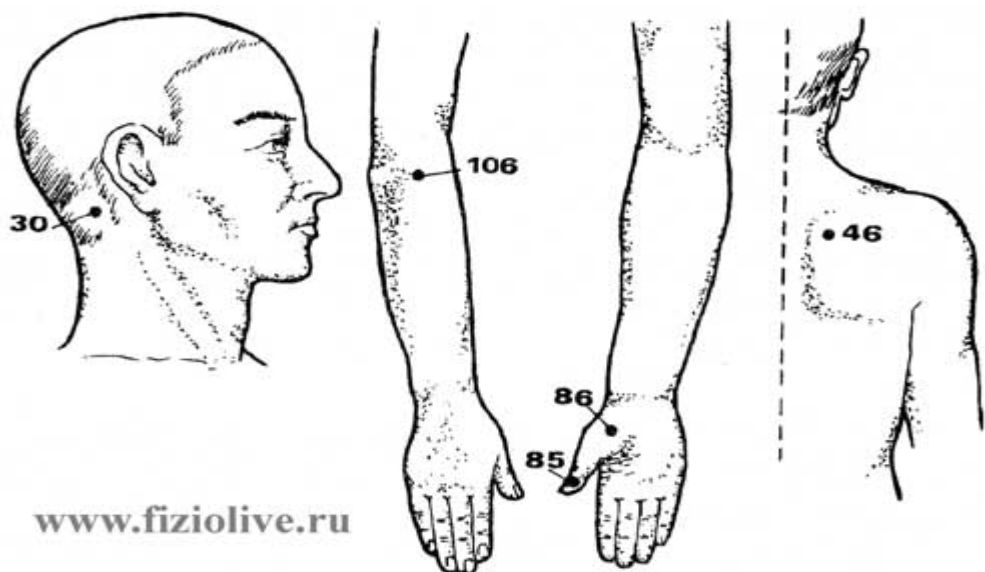
Massage begins with exposure to common points, moving on to points in the face and combining them with segmental ones.

Angina

Angina (acute tonsillitis) is an infectious disease with a primary lesion of the tonsils. The person is feeling unwell, pains when swallowing, the temperature rises. Often complaints of headache, periodic chills.

First, they influence the main points: 30, 86, and then on additional ones: 46, 85, 106 (see Fig. Points for action with angina).

Points for action with angina



Laryngitis

Laryngitis - inflammation of the laryngeal mucosa usually proceeds as one of the manifestations of acute catarrh of the upper respiratory tract, influenza, etc. Its development is facilitated by general or local hypothermia, smoking, inhalation of dusty air, etc. Under unfavorable conditions, the disease can turn into chronic ...

In acute laryngitis, the impact is carried out on the following points: 18, 28, 19, 30, 35, 88, 99, 103.

No more than 3-4 points are used in one procedure.

With chronic laryngitis, you can additionally massage points 29, 30, 38, 39, 89, 102.

Nose bleed

Bleeding from the nose occurs when it is injured, acute infectious diseases, arterial hypertension, etc. Apply the inhibitory method of acupressure.

Massage points: 1, 18, 30, 32, 35, 36, 38, 74, 107, 103, 106, 142 and pressure in the center of the tip of the nose. Brake action method.

Toothache

The main point of action for toothache is 116. Massage of points is also performed: 103, 104, 108, 122, 138. Points in the head and neck area are also affected: 15, 16, 20, 23, 25, 26, 29.

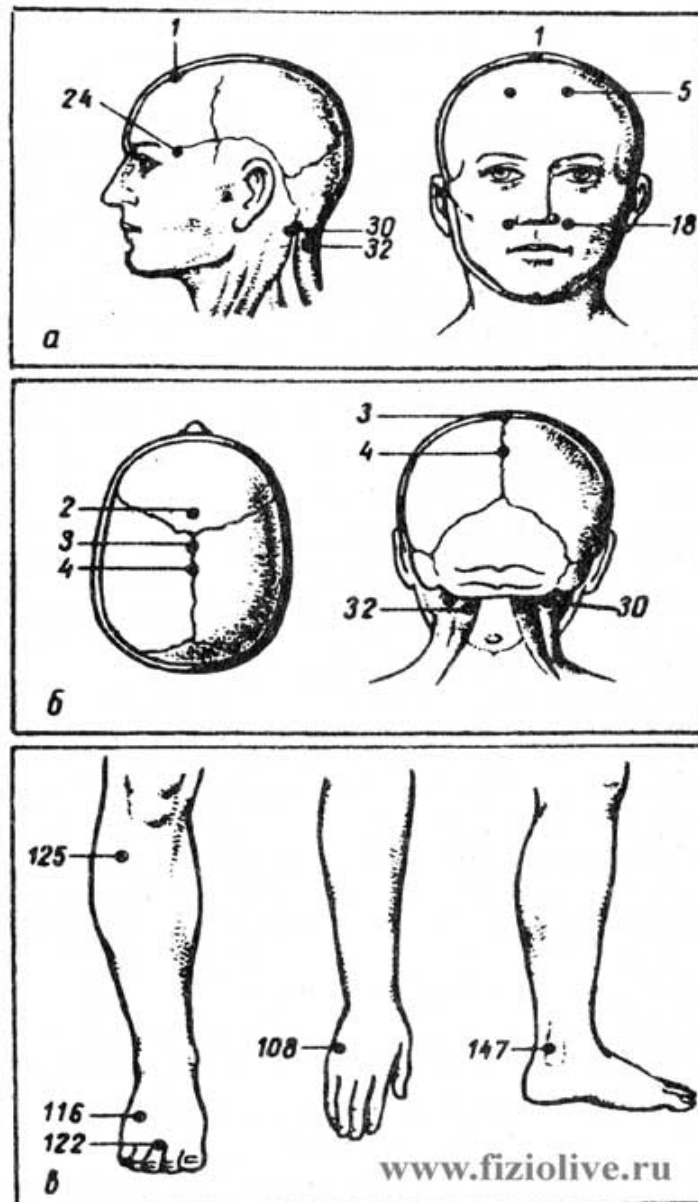
Headache

The vast majority of headaches are caused by arterial spasms. Often they occur with eye diseases, sinusitis, cervical osteochondrosis, etc.

To relieve headaches, points are used depending on the localization of pain (see Fig. Points for action in case of headache):

- for pain in the frontal region: 1, 24, 122, 125;
- for pain in the parietal region: 1, 3, 5, 108;
- for pain in the temporal region: 5, 24, 116;
- for pain in the occipital region: 4, 30, 32, 147.

Points of interest for headaches



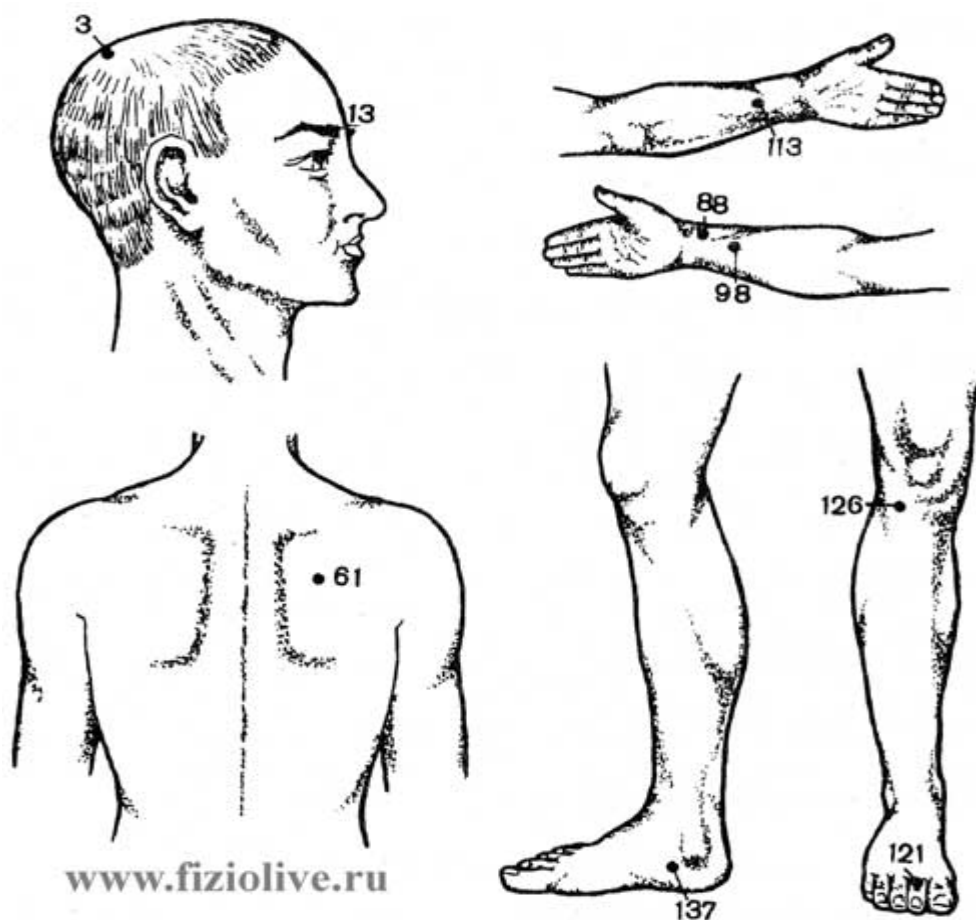
The strength of the effect of medium intensity, daily or every other day. Initially, you can conduct sessions several times a day until the pain disappears.

For a final cure, it is necessary to find out from the doctor the cause of the underlying disease and treat it.

Sleep disorder

Insomnia, difficulty falling asleep, restless sleep, nightmares can be caused by external and internal stimuli (loud noise, itching, flatulence, etc.). When these factors are eliminated, sleep is quickly restored. But sleep disorder can be one of the manifestations of neurotic reactions, various diseases. With prolonged and persistent insomnia, it is necessary first of all to treat the underlying disease, use herbal medicines (tinctures, decoctions, etc.) and perform acupressure, acting on the following points: 13, 3, 88, 98, 113, 126, 137, 121, 61 (see Fig. Points for action in sleep disorders).

Points of interest for sleep disorders



Occipital neuralgia

The cause of neuralgia of the occipital nerve can be trauma to the occipital region, osteochondrosis of the cervical spine, hypothermia, influenza, acute respiratory infections, etc. Pain appears in the innervation of the occipital nerve and spreads to the neck and parietal bone. On palpation, pain points are determined in the region of the mastoid process and the upper cervical vertebra.

The affection points are 17, 29, 30, 32, 106, 4, 3, 6.

Sciatica (sciatic nerve neuralgia)

Sciatica develops after trauma, cooling, inflammatory processes in the soft tissues surrounding the nerve; the most characteristic symptom is pain in the back and leg along the sciatic nerve, limitation of dorsal extension of the foot, and movement of the fingers. It becomes difficult to walk, it is difficult to rise on tiptoes and squat, sensitivity on the back of the thigh, lower leg, dorsum of the foot and toes is disturbed.

The affection points are 51, 53, 54, 55, 119, 126, 142, 144, 147.

Acupressure massage is carried out daily or every other day, the effect of medium intensity.

Gout

At the heart of the disease is a violation of protein metabolism, which leads to an increase in the content of uric acid in the blood and the deposition of uric acid salts in the joints. Acupressure massage is used to regulate impaired metabolism, relieve inflammation in the joints. To do this, they act on common points, spinal and segmental.

Points used: 52, 54, 56, 68, 74, 107, 133, 123, 126, which are combined with points around the sore spot. If, for example, the metatarsophalangeal joint of the big toe hurts, then use the points: 122, 129, 135, 138.

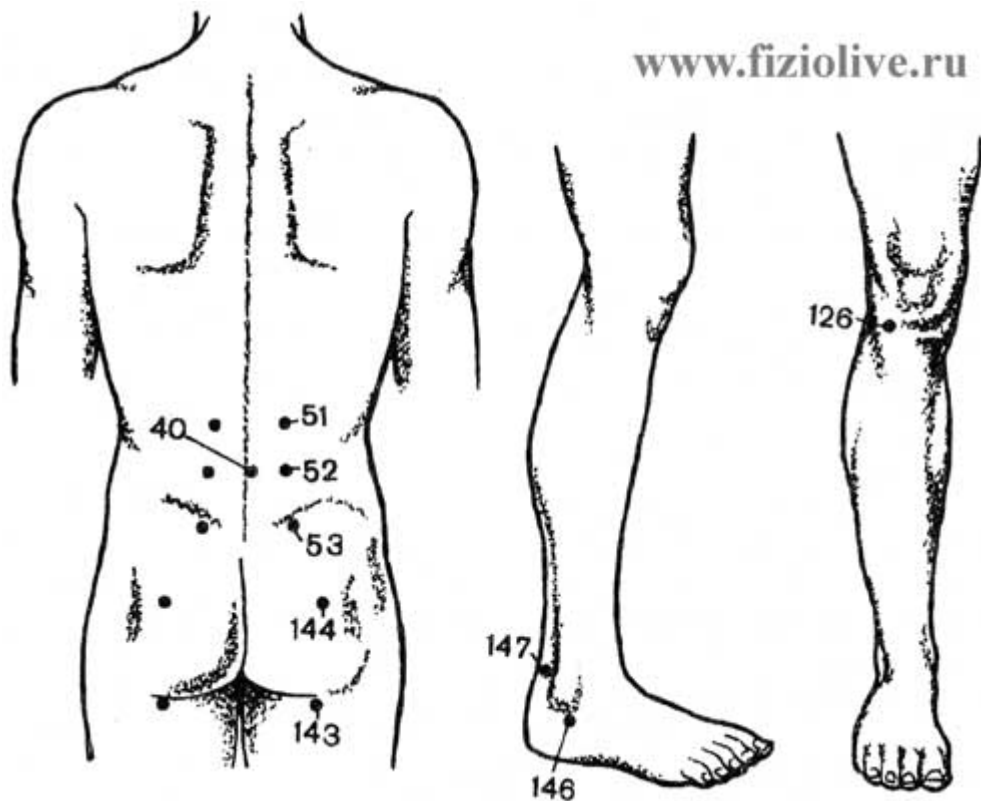
At the same time, in local points, acupressure is used with an exciting method, in distant points, an inhibitory version of acupressure is used. When acting on the points of the back and abdomen, a braking method is used.

Lumbosacral sciatica

The disease is mainly caused by congenital or acquired changes in the spinal column and its ligamentous apparatus. The pain, which periodically intensifies with exacerbation of the disease, is localized in the lumbosacral region, usually on one side, radiating to the buttock, the back of the thigh, the outer shin surface. Sometimes there is numbness and impaired skin sensitivity.

The impact is carried out on the points of the lower back, sacrum, and if pain radiates to the lower limb, then on them: 40, 41, 42, 43, 52, 54, 55, 57, 58, 59, 60, 62, 141, 142, 143 , 144, 147 (see Fig. Points for action with lumbosacral radiculitis).

Points for action in lumbosacral radiculitis



Myositis

Myositis is an inflammation of muscle tissue. On palpation, the muscles are painful, seals in the form of nodules or strands appear in them. Movement is limited due to pain and decreased muscle elasticity.

Common points for exposure: 30, 32, 33, 35.

For pain in the lumbar region and sacrum, points are used on both sides: 40, 41, 42, 51, 53, 54, 55, 56, 57, 58, 59, 60, 62.

For pain in the shoulder: 34, 35, 36, 37, 61, 111, 112, 113, 115, 148, as well as painful points in the area of the shoulders and shoulder blades.

For back pain points are used: 29, 35, 37, 38, 39, 46, 47.

For pain in the hands, use the points: 107, 108, 110, 113, 114, 115.

For pain in the legs, use the points: 118, 119, 120, 126, 127.

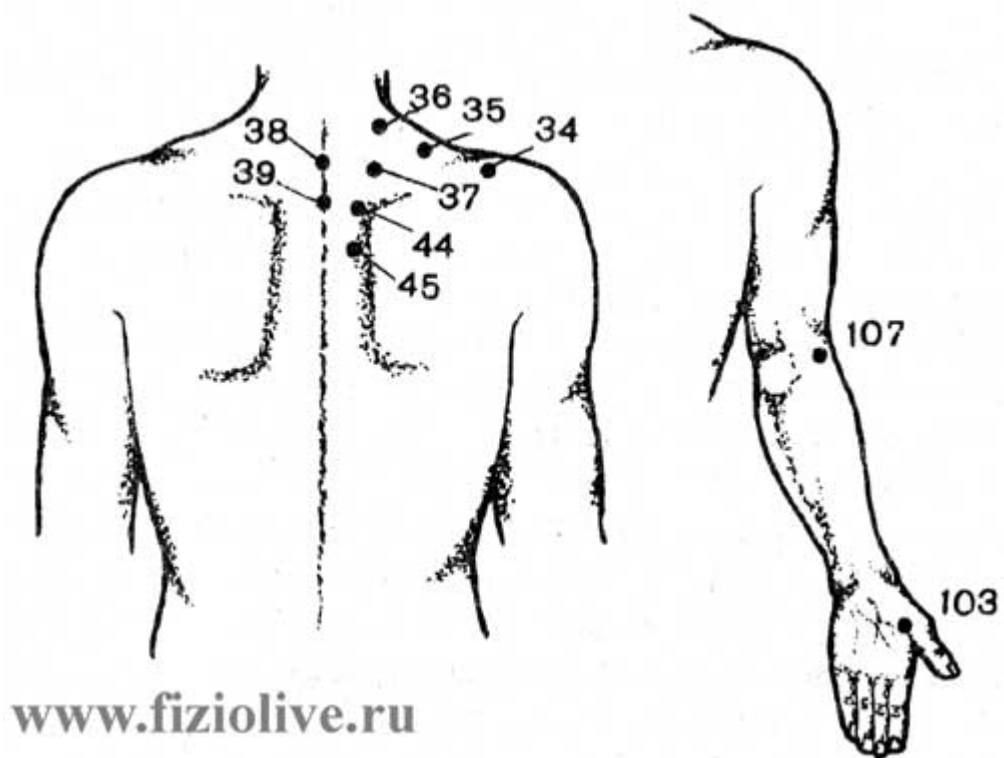
Massage should begin with painful areas and near them, then distant points. The method of action is tonic, and in case of muscle atrophy, an exciting method is used.

Shoulder-scapular periarthrititis

The disease is associated with trauma or disease of the spine (osteochondrosis). On palpation, painful points on the shoulder are determined.

The impact is carried out on the following points: 34, 35, 36, 37, 38, 39, 44, 45, as well as on painful points located on the anterior surface of the shoulder joint (see Fig. Points for impact in case of periarthrititis of the shoulder scapula).

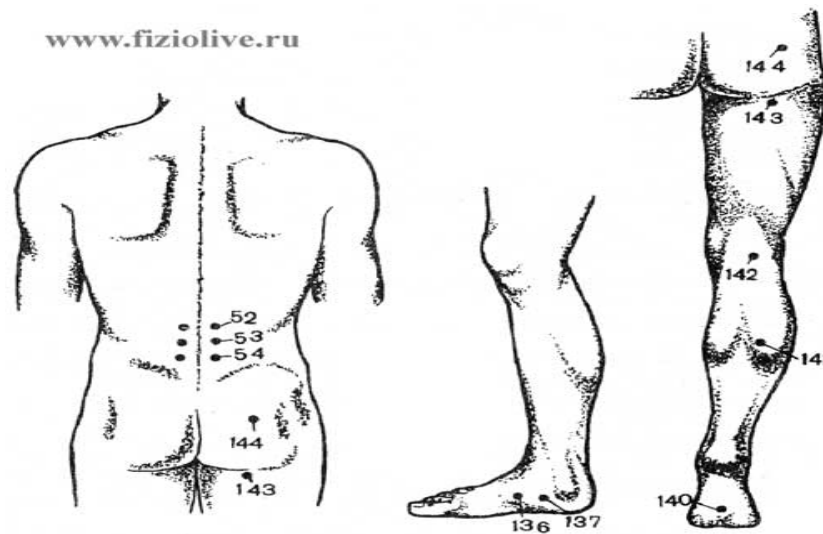
Points for action in case of periarthrititis of the shoulder scapula



Calf muscle cramps

If a person has cramps in the calf muscles, they affect the following points (on the spasmodic side): 144, 143, 140, 136, 137 (see fig.)

Points to target for cramps in the calf muscles



With convulsions of the calf muscles, the points of the spasmodic muscles are massaged: 141, 142, as well as the segmental points of the lumbar region 52, 53, 54.

Ankle sprain

Massage the following points: 117, 124, 138, 147.

Damage to the ligamentous apparatus of the joints

Pain and swelling are characteristic of damage to the ligamentous apparatus of the joints. In complex treatment, acupressure is also used. Massage points below and above the site of injury, as well as segmental points of the spine.

In case of elbow joint injury, the effect is exerted on the points: 89, 94, 101, 106, 107, as well as on the points of the cervicothoracic spine: 36, 44, 45, 61.

In case of injuries of the knee joint, the points are affected: 119, 125, 126, 131.

Muscle bruises

The impact is exerted on the points above and below the injury, as well as on the symmetrical points of a healthy limb.

Diseases of the stomach

For diseases of the stomach, the main points of influence are used: 98, 122, 126, 135. Auxiliary points: 50, 68.

In addition, massage is performed in accordance with the manifestations of a specific dysfunction of the gastrointestinal tract.

Acute gastritis

The disease occurs due to errors in nutrition, infection, the action of certain drugs, etc., causing inflammation of the gastric mucosa. Characterized by a feeling of heaviness and fullness in the epigastric region, nausea, vomiting, diarrhea, weakness, dizziness. Points for action: 28, 44, 50, 68, 106, 126, 135.

The course of treatment is 10-15 days. The impact on the points located on the limbs should be intense, and at point 68 weak. Last but not least, affect the points of the abdomen.

Chronic gastritis

The following points are affected: 48, 49, 50, 51, 67, 68, 98, 107, 126, 135. Massage is carried out daily or every other day, the force of impact on the point of medium intensity.

In the treatment of gastritis, spicy foods should be excluded from the diet, the diet prescribed by the doctor should be followed, pharmacological medications should be used, giving preference to herbal ones.

Pneumonia

Pneumonia is an acute or chronic inflammation of the lungs, accompanied by the appearance of a cough, fever, and other symptoms.

After the acupressure, it is also necessary to perform a warming massage (rubbing and kneading the muscles of the back and chest with warming ointments; in children - heated olive or sunflower oil). Then the patient's chest should be wrapped in a terry towel (with a pre-heated iron).

Massage points: 103, 88, 45, 98, 113, 126, 5, 61, 46, 69, 64, 66 (points on the back are massaged on both sides). In adults, a braking method is used, in children, a tonic one. Acupressure massage in the first 3-5 days is carried out several times a day. If there is an increase in temperature, then more points are massaged: 129, 5, 61 (on both sides). When coughing and phlegm, they have an effect (the patient can do it himself) on points: 103, 88. Acupressure massage is performed in combination with drug therapy prescribed by the attending physician.

Arthrosis

Arthrosis is a chronic joint disease that causes degenerative changes in the articular cartilage. In the initial phase of the development of the disease, quickly onset fatigue in the joint, dull or aching pains are characteristic. They are apparently caused by reflex changes in the muscles, impaired blood circulation, etc. The cause of arthrosis is microtrauma, systematic exposure to overload, hypoxia, violation of the innervation of the joint tissues, damage to cartilage, etc.

In arthrosis of the knee joint, massage points: 119, 125, 126, 120, 143, 131. In arthrosis of the ankle joint, the points are affected: 117, 124, 138, 120, 119, 126, as well as on the points of the lumbosacral spine: 52, 52, 53, 54, 55, 56, 59 (both sides).

With arthrosis of the elbow joint, massage points: 89, 93, 94, 101, 106, 107, 113, as well as points of the cervicothoracic spine: 35, 44, 45, 61.

For arthrosis, a tonic method of exposure is used, and in the area of the joint itself, a brake one.

Osteochondrosis of the spinal column

Osteochondrosis of the spinal column is a degenerative process in the intervertebral disc that occurs both as a result of the physiological neuro-endocrine aging process and as a result of wear and tear under the influence of single injuries or repeated microtraumas. A characteristic symptom is pain, it is dull, aching in nature, sometimes subsides, and then reappears, usually aggravates in the morning, when getting out of bed, after morning exercises it weakens or disappears. The pain increases with forced physical exertion, hypothermia, infectious diseases (acute respiratory infections, flu, etc.). On palpation of the back muscles (especially the muscles of the shoulder girdle, the area of the shoulder blades, the exit of the occipital nerves, etc.), painful points are noted.

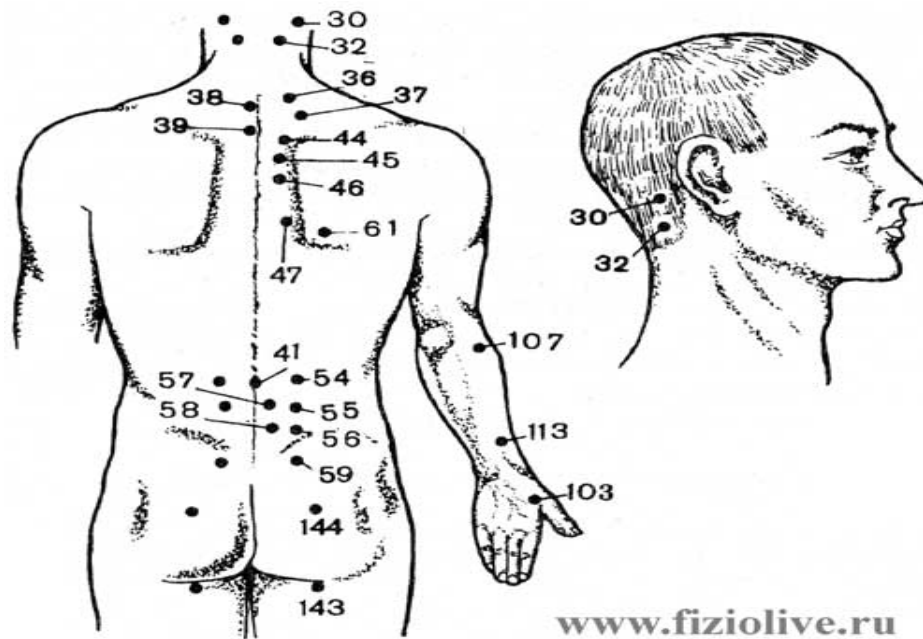
The purpose of acupressure is to relax muscle contractures, improve trophism (nutrition) of the intervertebral discs, reduce pain, etc. The choice of BAP should correspond to the localization of the lesion (roots, plexuses, nerve trunks or their combinations), the level of the lesion (cervical, thoracic, lumbosacral) and the stage of the disease (acute or chronic).

Massage points located along the middle, first and second lateral lines of the back (at the level of the cervical, thoracic and lumbosacral spine), in the shoulder girdle and points on the upper (if the cervicothoracic region is affected) and lower (with lumbosacral radiculitis) limbs.

With osteochondrosis of the cervicothoracic spine, the effect is exerted on the points: 32, 30, 44, 38, 37, 36, 107, 106, 113, 103 (press symmetrically), 39, 45, 46, 47, 61.

In case of osteochondrosis of the lumbar spine, the following points are massaged: 50, 51, 40, 52, 62, 53, 41, 54, 57, 58, 55, 56, 59, 60, 42. In case of pain in the lower limb, the points are also affected : 144, 143, 142, 141, 145, 146, 147. Use the inhibitory method of action (see Fig. Points for action in osteochondrosis of the spine).

Points for action in osteochondrosis of the spine



Periostitis.

Periostitis is an inflammation of the periosteum with partial involvement of the bone in the process of attachment to it of muscles, tendons and ligaments. The braking method of influencing BAP is used: 117, 61, 70.

Asthenic syndrome

This condition is characterized by increased fatigue, weakening and even loss of the ability to great physical or mental stress. The syndrome can be constitutionally conditioned, but it can develop with insufficient nutrition, "vitamin hunger", excessive physical and mental stress, during the period of recovery from illness, injury, etc.

Massage points: 103, 3, 24, 30, 98, 126, and for general strengthening –50, 51, 54, 61, 107, 113, 117, 126. The tonic method is used.

Neurocirculatory dystonia (vegetative-vascular dystonia)

Vegetative-vascular dystonia is the result of a violation of the innervation of the blood vessels. Distinguish between systemic and regional vegetative-vascular dystonia. Systemic, or neurocircular, dystonia occurs in a hyper- and hypotensive type.

The hypertensive type of dystonia is characterized by small and transient rises in blood pressure in the blood within the range of 140 / 90-160 / 94 mm Hg. Art. and a variety of neuro-vegetative symptoms (emotional instability, restless sleep, fatigue, increased heart rate, sweating, etc.). In such cases, the points are massaged: 3, 103, 126, 129, 130, 88, 133. Apply a brake (soothing) option.

Hypotensive neurocirculatory dystonia (neurocirculatory astonia) is characterized by a systological pressure below 100 mm Hg. Art., and diastological - below 60 mm Hg. Art., weakness, dizziness, headache, increased fatigue, drowsiness, lethargy, fainting, increased heat and pressure sensitivity. In this condition, you should act on the points: 3, 24, 30, 98, 103, 126, 47, 133, 99, 95, 90, 61. Use the tonic version.

Hyperhidrosis

To reduce the sweating of the palms, use the following points: 68, 92, 98, 112, 114, 103, 111.

For sweating feet, use the points: 69, 116, 124, 129, 130, 131, 136, 140.

When sweating in the armpit, massage points: 35, 94. When sweating in the perineum, points are irritated: 131, 40, 76, 42, 46. The points are influenced by a tonic method.

For sweating of the arms and legs, the named points on the limbs should be combined.

8. Contraindications to the use of acupressure

The main contraindications for acupressure are: pregnancy, appendicitis, myocardial infarction, heart defects, kidney disease (glomerulonephritis, pyelonephritis, etc.), severe atherosclerosis of the cerebral vessels, hypertension II and III degree, thrombophlebitis, osteomyelitis, bleeding (gastric, etc.), oncological diseases, etc.

In the modern world, a person is almost constantly in a state of stress, many diseases are directly or indirectly associated with disorders of the nervous system. To relieve the general tension of the body means to get rid of one of the causes of the disease - this is within the power of acupressure.

Acupressure massage of certain points has an indirect effect on the skin, muscles, nerves, blood vessels. Massage enhances their functional activity and improves the efficiency of the whole organism, increases the protective properties of the skin, its respiratory functions, improves its nutrition and cleansing.

Thanks to the massage, muscle tension is relieved, blood circulation is restored. Such phenomena as pain, swelling, etc. disappear. Massage also improves blood circulation, increases the elasticity of blood vessels, normalizes blood pressure and facilitates the work of the heart.

Massaging the points that are responsible for the digestive process, as a rule, helps relieve pain symptoms and improve the functioning of the gastrointestinal tract.

Massage has a beneficial effect on the functioning of the respiratory system. With its help, you can remove the swelling of the lungs and bronchi, alleviate or completely eliminate attacks of bronchial asthma.

Many diseases of the genitourinary system can be cured with acupressure. It is also successfully used to treat prostatitis.

Acupressure massage is one of the most effective means to influence the nervous system, especially its vegetative part.

With the help of massage, the activity of the excretory functions of the body improves, the metabolism is normalized.

9. Theoretical material

1. Acupressure massage. Tutorial. Authors: Popova N.M., Kharlamov E.V. Publisher: Grif UMO for medical education. 2009.
2. Point massage. Author: Luvsan J. Publisher: Citadel. 2006 year.
3. Point massage. Author: Ustimenova S.V. Ed .: Ripol classic. 2004.

Topic 13. Fasting technique according to G. Shelton.

PURPOSE OF THE LESSON: teaching students fasting techniques according to G. Shelton.

A STUDENT SHOULD KNOW:

- basics of fasting;
- basic principles of the methodology;
- basic principles of proper nutrition;
- fasting in acute forms and chronic diseases.

A STUDENT SHOULD BE ABLE TO: apply the fasting technique.

TABLE OF CONTENTS:

1. Causes of starvation.
2. The nine main steps of fasting.
3. Basic principles of the methodology.
4. The basic principles of proper nutrition.
5. Fasting for chronic diseases.
6. Theoretical material.

Herbert Shelton is one of the worlds renowned advocates of nutrition and fasting benefits. The basic principles of Shelton fasting are very similar to the rules of the classic "water" fast. But at the same time, a peculiarity of his approach is a very peculiar "preparation" for a hunger strike - not a special diet, but a simple accumulation of determination for such a step.

Fasting reasons

There are many different reasons for fasting, Shelton identifies four of them:

The first is weight loss.

The second is what he calls physiological compensation, in which nature's delicate automatic balance begins to work. If you need to digest food, then a lot of blood must flow to the digestive organs, and we become lethargic, we feel sleepy. And if we force ourselves to do some more hard work, then the digestion process practically stops. Energy saved in one area can be used in another.

The third reason is to provide physiological rest for the digestive, nervous and other systems. If the amount of food consumed sharply decreases, these organs rest more. It is easy to understand that in the absence of nutrition, the entire digestive system, liver and pancreas rest. The heart and arteries also feel less stress and work easier. The glands of the body, other than secreting digestive juices, can also reduce their secretory activity. Breathing slows down and the load on the nervous system decreases. And all this means rest.

The fourth reason is the most important, the cleansing of the body. From the moment of refusal from food, a little time passes, and as the excretory organs increase their activity, real physiological cleansing comes into force. As fasting is carried out, the associated or, more precisely, deposited toxins are removed, and all human systems are cleansed.

The nine essential steps of fasting

There are conditions under which fasting is not only undesirable, but even contraindicated. In a state of severe exhaustion, with advanced heart disease, tuberculosis, cancer and diabetes. Fasting should be especially avoided for liver and pancreatic cancer. If the fear of fasting is very great, then it should not be undertaken either. You should resort to fasting during pregnancy only if absolutely necessary. Be under the supervision of someone experienced in fasting. At the beginning of fasting, certain physiological phenomena almost always occur, which should not cause alarm. The main ones they have: strongly sweeps the tongue in the mouth, an unpleasant taste arises and during breathing there is an unpleasant odor from the mouth. These phenomena can cause some trouble, but they go through a cleansing process. No matter how light the urine is at the beginning of

the fast, it becomes very dark and dirty in the first hours of the initial fast. After a week or two, depending on the state of the starving person, the urine becomes lighter and its smell weakens, and by the time the appetite returns, the color and smell return to normal. Weight loss resulting from fasting is a consequence of using the body's reserves to nourish vital tissues and throw away toxic accumulations. The feeling of weakness, experienced sometimes during fasting, appears as a result of a general decrease in functional activity.

A skin rash rarely develops during fasting, but if it does, it indicates clearing. Probably the most unpleasant experience during fasting is nausea and vomiting. If vomiting continues for several days, then water is not retained in the body, inevitable dehydration occurs. This is serious. Interruption of fasting should be considered promptly.

Basic principles of the method

1. The categorical refusal to use enemas and laxatives is one of the basic principles of the method of G. Shelton

He pays special attention to the danger of excessive fluid intake, although in general the author does not put restrictions on the amount of fluid you drink. The main thing, according to Shelton: "If there is no desire, you do not need to drink water." Shelton argues that water for a "water" hunger strike should not have a bad taste or be mineral. Clean, uncontaminated water is much better suited: filtered or distilled, rain or melted.

2. The next principle of fasting according to Shelton is as follows: during fasting, physical activity should be significantly limited, since during fasting the body produces little energy, and any additional loads only exhaust it, which negatively affects the general condition of a person.

3. For the same reason, the author recommends limiting the number and duration of water procedures.

4. The essence of the next principle of fasting according to Shelton's method is solar procedures. Shelton claims that a person during fasting, just like a plant that feeds mainly on solar energy, must replenish the body's energy reserves through sunlight. Shelton emphasizes that sunlight during fasting does not act as a medicine, but as a necessary basis for the proper functioning of the body. After all, everyone knows that sunlight performs many vital functions of the body. For example, it is necessary for proper calcium metabolism, and is also an important factor in the absorption of phosphorus by the body and helps to build muscle

strength. If it is reasonable to take sun baths, then they do not require much energy, but on the contrary, they help to cheer up. Most often, severe fatigue after sunbathing is associated with excessive intensity of sun rays, excessive sunbathing time, etc. If sunbathing is taken in special solariums outside the home, then additional energy is also spent on getting to them.

Shelton also advises the following:

- ✓ sunbathing should be taken only when the temperature is not too high (in summer it is better to do it either in the early morning or in the evening);
- ✓ it is not worth taking long sunbathing on the very first day: it is better to start with five-minute sunbathing for the back and for the front half of the body, and then, increasing the duration of the baths by 1 minute every day, it is worth reaching 30 minutes and stop there;
- ✓ if fasting is long-term (20 days or more), then the time for sunbathing should be limited to 8 minutes for each side for the entire duration of the fast.

In addition, you should pay attention to the individual reaction of the starving person to sunbathing: if after taking them there is a strong weakness, then the time should be reduced. In no case should you abuse sun exposure.

Each person can choose for himself how many days he will starve. It depends both on the body of the person himself and on the characteristics of his place of residence. However, G. Shelton expresses the opinion that physiologically complete starvation is the most useful for the body. How does this manifest itself in practice? Simple: plaque on the tongue and unpleasant odor disappear, the nasty taste in the mouth disappears in the morning. All of these signs clearly show that the body has cleared itself and is ready to start feeding again.

“Fresh juices are the best food to eat if you've just stopped fasting,” Shelton says. In order not to harm the body, you need to get out of fasting at least half of the time when you were fasting. Particular attention should be paid to your diet.

The most reasonable options:

- ✓ a vegetarian diet;
- ✓ separate food.

The basic principles of proper nutrition can be summarized as follows:

- 1) Simultaneous reception is prohibited (in one dish):
 - sour foods and starch;
 - proteins and starch;
 - proteins and fats;

- sugar and proteins;
 - sugar and starch;
 - fruits are sour and sweet;
 - sugar and sour fruits;
 - melon and any other food (including fruits);
 - milk and any other food (after sour fruits, you can only after 30 minutes).
- 2) Any acidic foods should be eaten 15-30 minutes before meals.
 - 3) Do not eat more than 1 concentrated protein at one meal.
 - 4) Greens can be eaten either with sweet fruits, or with cottage cheese and sour fruits (instead of cottage cheese, you can eat nuts).
 - 5) You cannot eat more than 2 foods rich in starch and sugar at one meal.
 - 6) It is advisable to drink the liquid before meals (10-15 minutes).
 - 7) Eating desserts is undesirable, but if you really need to, it is better with an abundant amount of greens.
 - 8) Any chilled desserts (especially ice cream) should be excluded from the diet altogether.
 - 9) To make it easier for the body to digest food, it is better to have breakfast with fruits with sour cream, cream, etc., to dine on dishes rich in starch, and to dine on protein foods.
 - 10) Shelton also highlights several body-friendly food combinations. For example, starch and fat, starch and non-starchy greens. Especially useful, in his opinion, is the combination of sour cream, nuts or cheese with raw cabbage.

Fasting for chronic diseases

The most important feature of fasting in chronic diseases is the remarkable acceleration of waste elimination at this moment, the rapid release of the body from the accumulated toxins. Abstaining from food gives the body the freedom to act to heal, which is usually impossible in conditions of overeating. Overeating makes it impossible to cleanse body fluids and tissues during physiological cleansing of the body. Properly conducted fasting helps a patient with chronic diseases get rid of toxins - the causes of illness, and a proper lifestyle helps to restore energy and health in the future. It is a mistake to assume that one fast, even a long one, can completely cleanse the body of all accumulated debris; toxins accumulated over many years cannot be removed immediately in a few days or weeks. For diseases such as Parkinson's disease, arthritis, severe inflammation and tumors, three or more courses of fasting are required to achieve optimal

improvement, and in each case individually. Inflammation of the ear, conjunctiva, gastritis, colic, volvulus - all for a course of long fasting.

Fasting and asthma. The duration of fasting, which gives an asthmatic person the opportunity to breathe easily and freely, depends on the depth of the disease. Patients usually need to stay in bed for 24 to 36 hours. Fasting should be carried out until all symptoms and abnormal sounds in the lungs are completely cleared and disappear. This is not always recommended for very thin and weak patients. In such cases, fasting of a safe duration should be changed by a period of light feeding, and then another course of fasting is recommended. In advanced cases, complete recovery may require several short fasts, followed by periods of carefully thought out nutrition. The return of symptoms shortly after starting a meal means that fasting has not yet reached the level necessary for the body to restore full order.

Arthritis. Rheumatoid arthritis is one of the most serious and terrible diseases, as it makes a person disabled or semi-disabled, makes him suffer from pain. The main and primary cause of arthritis is toxemia - the sum of a number of abuse in eating habits, drinking alcoholic beverages, too intense emotional life. Overeating since childhood lays the foundation for toxemia. Rheumatoid arthritis is a combination of poor diet and general toxemia. To completely get rid of rheumatism - lumbago in radiculitis, gout, arthritis, the patient must give up all his habits that weaken the body. The duration of fasting for arthritis depends on individual circumstances, it should be carried out under the supervision of a person who is familiar with the technique of its implementation. Exercise is undesirable. Recovery from chronic arthritis is a slow evolution from a state of ill health to a state of biochemical consistency and reliability.

Peptic ulcer disease. With ulcers, there is a preliminary long and persistent inflammation with hardening and subsequent tissue disruption. The history of gastric ulcer and duodenal ulcer reveals that the patient previously suffered from irritations and gastrointestinal inflammation, such as gastritis and colitis. The increasing hardening impedes arterial circulation, oxygen and tissue supply, they begin to die off, and open wounds or ulcers form on them. The final development of this process can be cancer. An ulcer, like cancer, is the end of a series of symptoms that begin long before the ulcer develops. The main links in the chain of pathological evolution are as follows: weakening, intoxication, irritation, inflammation, hardening. The nutrition of the ulcer patient is a difficult problem. Firstly, his digestive organs are not able to process any food, and secondly, the ulcerated surface is endlessly irritated by a variety of foods. There are many different diets and different ulcer treatment programs. These diets help reduce

ulcer irritation, but they are not good for the cause. Medicines serve the same purpose - to relieve symptoms. Surgical treatment of ulcers leads to the same reasons. Nothing provides peace of mind to ulcers than fasting. Fasting quickly eliminates 3 sources of local irritation at once: mechanical, caused by food particles in contact with the surface; mechanical, caused by compression and contraction of the walls of the stomach, which processes food; and chemical, caused by acidic gastric juice. When these three sources of irritation are removed, the healing process is quite fast. Fasting should continue until all reactions indicate that the systematic renewal is complete.

High blood pressure. High blood pressure is believed to be a direct result of arterial sclerosis and the cause of heart disease. It is important to recognize the fact that high blood pressure is the final link in the chain of causes and previous diseases in a person's life over a long period of time: various types of physical overstrain and overload of the nervous system. Treatment should be sought not in a temporary artificial decrease in pressure, but in the thorough elimination of the causes of the disease.

It is necessary to treat the abnormal state of the body as a whole if we want to achieve a stable decrease in blood pressure. Treating the symptom will only provide temporary relief of the symptom, but will not cure the disease. The speed with which fasting has a marked effect on reduction and arousal. The drop in blood pressure can be very noticeable in just a few days of fasting. As the toxic load in the body decreases, the nervous system becomes less irritable, the function of the adrenal, thyroid and pituitary glands is restored to normal, so that the blood pressure drops to normal and remains so after the resumption of nutrition. This level of pressure persists as long as the patient leads a lifestyle that does not create a toxic state for him again.

Fasting and heart. Fasting is the most effective means of strengthening weak hearts, and the only rational physiological remedy.

By starvation, excess weight is removed from the heart, thereby restoring the organ to its normal state, this happens in the fastest way. The rest provided to the heart by fasting is responsible for two factors:

- ✓ significantly reduces the number of heart pulsations;
- ✓ another sedative factor is the lowering of blood pressure.

Weakened pulsation, combined with a lower heart rate, provides rest for a tired weakened organ. Under such conditions, the heart recovers and strengthens, and in most cases, when the heart was considered incurable, it was completely cured. The first step in removing the accumulated water and salt in the body is their involvement in the circulation. Fasting promotes the extraction of fluid from

tissues and its subsequent excretion from the body. With the onset of fasting, the intake of salt into the body stops, and this gives it the opportunity to quickly extract water and salt from the edematous tissues. But no person suffering from cardiovascular disease, even in the early stages of heart disease, should try to starve at their own risk.

Nephritis. Fasting should be prolonged. Two days, two weeks, sometimes three weeks is usually enough. Kidney health will quickly improve when fasting begins. The protein and blood disappear from the urine. The symptoms of urinary poisoning - headaches, dizziness, frequent and profuse urination, sweating - quickly disappear already in the first night, difficult and scanty urination, too, soon disappears. The urine becomes normal in color and odor, and all indications of the return of normal pressure. Kidney recovery that occurs after the end of fasting will be more reliable, complete and quicker if the diet used is moderate and consists of fresh fruits and leafy vegetables, with very limited amounts of heavier foods. Onions and all their types, garlic, sauces, mustard, radish and other foods containing mustard oil that irritate the kidneys should be excluded from the diet. Cereals, it is also better not to eat, about meat, meat products, alcoholic beverages, refreshing drinks, tea, cocoa, coffee, chocolate, one should not even think of a person with kidney problems. Drinking too much water is also not helpful.

Theoretical material:

1. Classics of natural healing. Complete encyclopedia. - Publ.: Krylov, 2008.
2. Bach B. The best health improvement systems.- AST Stalker, 2007.
3. Mironov A.A. Healthy food according to P. Bregg, Montignac, Nishi, Shelton. - Vector, 2005.
4. Mironov A.A. Herbert Shelton. Separate food. - Vector, 2007.