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Medical controls in sports (analysis and results)

Xujabekov Akhror Ubaydullayevich
Uzbek State University of Physical Culture and Sports

Annotation. The effectiveness of sports training would be the highest if you will be using physical exercises together with training procedures, to comply with hygienic conditions, the mode for proper nutrition.

Keywords. Self-control, medical control, educational control, subjective and objective indicators of self-control, functional state of the organism

Self-control is a system of self-protected state their health, potential and physical fitness. Self-control is an addition to medical control. Deciding to engage physical education, it is necessary to keep a diary of self-control, in which results of open and accessible methods of observation. objective (anthropometric measurements) and subjective (indicators such as sleep, appetite, self-sensitivity, pain sensations, working capacity, dysfunction, weight, pulse, results of unique functional tests, etc.). You should keep a diary regularly. This is a later reaction. attitude to physical education and sports, to dosing and analysis physical development and hardening procedures, compliance with the correct regimen. It is desirable to carry out self-observation at the same hours, and at the same method in pregnancy. The inadequacy of body functions can be determined by objective and tangible sensations, as a feeling of fatigue, irritability, unwillingness to complete a task, pain in the right hypochondrium, etc. But first of all it is necessary observe objective manifestations of fatigue. On the onset medium signs of body weight fatigue. When doing exercises, you need to monitor your breathing. Them coordination of beneficially assembled organs. Number of games and dosage should be gradual. Beneficial learning rate manifestations are muscle pain, but if it is severe, this is a sign that you too important. But first of all, before moving on to self-study, you must have understanding of the impact that physical application has on organ, what changes occur in it during prolonged muscle work, how to avoid overtraining, leading to indications not only physical but also mental performance. Changes in the conditions of resilience Any infection, especially strain infection sustainable changes in his human parameters. Yes, at long-term performance of complex muscle work, energy reserve entry into the blood impulses entering the cerebral cortex from a working skeletal muscles, leads to disruption of the processes of excitation and excitation braking. These changes are accompanied by unpleasant sensations. sensations that make it difficult to perform work, as a result of the body's performance decreases, fatigue sets in.

Medical control

Medical control is a system of medical research conducted jointly by a doctor and a coach (teacher) to determine the impact of training loads on the body of a student. The main form of medical control is medical examinations. Primary, repeated and additional examinations are carried out. Initial examinations are carried out before the start of regular training. Repeated (annual) allow you to get an idea of the correctness and effectiveness of the classes. Additional medical examinations are carried out before competitions, after illnesses and injuries, during systematic intensive training, etc.

After the end of the medical examination, a medical report is drawn up, which includes an assessment of the physical development, health status, functional state and preparedness of the examined; recommendations on the regimen and methods of training, indications and contraindications, therapeutic and prophylactic purposes.

External examination and anthropometry

The effectiveness of physical exercises, the physical development of those involved, during medical supervision, is determined using an external examination, anthropometry, etc.

External examination makes it possible to assess the shape of the chest, back, legs, abdomen, characterizing the overall physique of a person.

The shape of the chest can be cylindrical, which is most often observed in people who are systematically involved in physical education and conical or flattened in those who do not, leading a sedentary lifestyle.

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Flattening of the chest contributes to a decrease in the vital capacity of the lungs, a decrease in the respiratory function of the body.

The shape of the back can be normal, round, flat, round-concave, depending on the degree of severity of the natural curves of the spine.

The shape of the abdomen can be normal, pendulous and retracted, depending on the development of the muscles of the abdominal wall. Insufficient development gives a pendulous shape of the abdomen. From the degree of development of the abdominal muscles, normal or retracted forms of the abdomen are also distinguished.

The shape of the legs can be normal, X-shaped, O-shaped. If the heels, knees and inner thighs touch in the main stance, or there are small gaps between them, then this shape of the legs is considered normal. The absence of touch in the area of the knee joint is characteristic of the O-shaped legs. The divergence of the heels with closed knees gives an X-shape. The cause of O-shaped legs can be significant physical exertion, with poor muscle development, rickets suffered in childhood, etc.

Foot shape. The normal shape of the foot plays the role of a shock absorber, which is of great importance in protecting the internal organs of a person and his spinal cord and brain from excessive concussions when walking, running, jumping.

Flat feet are often accompanied by pain during long walking or sports exercises, in which a large load falls on the lower limbs. Foot pain may temporarily appear after training on hard ground due to overload of the muscles of the arch of the foot when running, jumping, weight training, etc. In these cases, it is recommended to reduce the load or complete rest for some time (until the pain disappears).

According to the external signs of physical development, one can determine the type of addition of a person, the proportions of parts of his body.

Pedagogical control

Pedagogical control is the process of obtaining information about the impact of physical exercises and sports on the body of those involved in order to increase the effectiveness of the educational and training process.

The practical implementation of pedagogical control is carried out in the system of specially implemented checks included in the content of physical education classes. Such checks allow keeping systematic records in two most important areas:

– the degree of mastering the technique of motor actions; - the level of development of physical qualities.

Training sessions:

- compulsory classes (practical, theoretical, consultations), which are provided for in the curricula for all specialties in the amount of four hours a week and are included in the curriculum during the entire period of study in excess of the established pedagogical volume of the teaching load;
- consultative and methodological classes aimed at creating methodological and practical assistance for students in organizing and conducting independent physical education classes;
- individual classes for students with poor physical training or lagging behind in mastering educational material, which are organized according to a special schedule of the department during the academic year, vacations, during the period of industrial practice

Extracurricular activities:

- physical exercises in the mode of the school day (small forms of self-study in the form of “minute of cheerfulness” complexes and the like);
- classes in sections, informal groups and clubs on physical interests;
- mass recreational, physical culture and sports events.

The integrated use of all forms of physical education should ensure the inclusion of physical education in the lifestyle of students, the achievement of an optimal level of physical activity.

To assess the physical condition of the human body and its physical fitness, anthropometric indices, exercise tests, etc. are used.

Self-control consists of simple public observation methods and consists of taking into account subjective indicators (well-being, sleep, appetite, desire to exercise, exercise tolerance, etc.) and objective indicators (weight, pulse, spirometry, respiratory rate, blood pressure, dynamometry). Self-control must be carried out during all periods of training and even during rest. Self-control has not only an educational value, but also teaches a more conscious attitude to classes, to observe the rules of personal and public hygiene, the regime

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of study, nutrition, life and rest. The results of self-control should be regularly recorded in a special self-control diary.

Subjective indicators of self-control

Mood. A very significant indicator that reflects the mental state of those involved. Exercise should always be fun. The mood can be considered good when a person is self-confident, calm, cheerful; satisfactory - with an unstable emotional state and unsatisfactory, when a person is upset, confused, depressed.

Well-being. It is one of the important indicators for assessing the physical condition, the effect of physical exercises on the body. Those involved in poor health, as a rule, happen when they have diseases or when the functional capabilities of the body do not correspond to the level of physical activity performed. The state of health can be good (feeling of strength and vivacity, desire to exercise), satisfactory (lethargy, loss of strength), unsatisfactory (noticeable weakness, fatigue, headaches, increased heart rate and blood pressure at rest).

Fatigue. Fatigue is a physiological state of the body, manifested in a decrease in performance as a result of the work done.

It is a means of training and improving performance. Normally, fatigue should pass within 2-3 hours after class. If it lasts longer, this indicates the inadequacy of the selected physical activity. Fatigue should be dealt with when it begins to turn into overwork, when fatigue does not disappear the next morning after training. An approximate scheme of external signs of fatigue is shown in Table

Dream. The most effective means of restoring the health of the body after exercise is sleep. Sleep is critical to the recovery of the nervous system. Sleep is deep, strong, coming immediately - causes a feeling of cheerfulness, a surge of strength. When characterizing sleep, the duration and depth of sleep, its disturbances (difficulty falling asleep, restless sleep, insomnia, lack of sleep, etc.) are noted.

Appetite. The more a person moves, does physical exercises, the better he should eat, as the body's need for energy substances increases. Appetite, as you know, is unstable, it is easily disturbed in case of ailments and illnesses, with overwork. With a large intense load, appetite can drop sharply. Therefore, on the basis of appetite, the student can judge the correspondence of physical activity to the individual capabilities of the organism. Appetite can be rated as good, fair, reduced or poor.

Working capacity. Rated as high, normal and low. With the correct organization of the training process in dynamics, the working capacity should increase.

Objective indicators of self-control

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 pulse rate of a healthy untrained person at rest usually ranges from 75-80 beats / min for 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, for 10, 15 or 30 seconds, after which the obtained values are recalculated per minute. Heart rate measurement is carried out immediately in the first 10 seconds. after work. For control, it is important how the pulse reacts to the load and whether it decreases quickly after the load. It is for this indicator that the student should follow, comparing the heart rate at rest and after exercise. At low and medium loads, the restoration of heart rate after 10-15 minutes is considered normal.

If the heart rate at rest in the morning or before each lesson is constant for a student, 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.

A significant increase or slowdown in the pulse against the background of a deterioration in well-being is one of the symptoms of fatigue, overwork or a health disorder.

The weight. To determine the normal weight, various weight and height indices are used. In practice, the Broca index is widely used. Normal body weight for people with a height of 155 to 165 cm = body length - 100

165-175cm=body length-105

175 cm and above = body length -110

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More accurate information about the ratio of physical weight and body constitution is given by a method that, in addition to height, also takes into account chest circumference height (cm) x chest volume (cm). Weight in kg.

Breathing should be rhythmic and deep. Normally, the respiratory rate in an adult is 14-18 times per minute. When loaded, it increases by 2-2.5 times. An important indicator of respiratory function is the vital capacity of the lungs (V1: L) - the volume of air received during the maximum exhalation made after the maximum inhalation. Normal in women is 2.5-4 liters, in men it is 3.5-5 liters.

lood pressure (BP). Systolic pressure (max) is the pressure during systole (contraction) of the heart, when it reaches its highest value during the cardiac cycle. Diastolic pressure (min) - is determined by the end of diastole (relaxation) of the heart, when it reaches a minimum value throughout the cardiac cycle.

Ideal pressure formula for each age:

– max. BP = 102+ (0.6 x number of years)

– min. BP = 63+ (0.5 x number of years)

The World Health Organization suggests that blood pressure for systolic (max.) - 100 -140 mm Hg be considered normal figures; for diastolic 80-90 mmHg

The respiratory rate depends on age, health, level of fitness, and the amount of physical activity. The number of breaths in an adult is most often 18-20 per minute. When doing physical culture and sports, the respiratory rate at rest decreases. So, for athletes, it usually ranges from 10-16 per minute. During exercise, the respiratory rate increases the more, the higher its power and can reach 60 or more per minute. To count the respiratory rate, you need to place your palm so that it captures the lower chest and upper abdomen. When counting, breathe evenly.

Vital capacity (VC) reflects the functionality of the respiratory system. In healthy untrained young men, VC is usually in the range of 3500-4200 cm3, in women 2500-3000 cm3. With age, VC decreases. The value of this indicator also depends on height, weight, state of health, duration of physical exercises and the direction of these activities. Runners, swimmers, rowers, skiers usually have rather high VC values - 5 liters. and more in men and about 4 liters. - among women.

After an intense tiring load, VC can decrease by an average of 200-300 ml, and recover by evening. If the VC indicator does not recover to the initial level the next day after class, this indicates an excessive load.

The functional state of the body and its assessment

HR (heart rate). An important and simple indicator that provides information about the activity of the cardiovascular system is the pulse. Normally, in an untrained adult, the heart rate ranges from 60-80 beats / min. When determining the value of the pulse, it should be remembered that the cardiovascular system is very sensitive to various influences (emotions, physical activity). That is why the rarest pulse is recorded in the morning.

In addition to the heart rate, one more characteristic of the pulse can be determined - its rhythm or arrhythmia. Arrhythmia can be of a respiratory nature - on inspiration, the pulse quickens, and on exhalation, it slows down. Such an arrhythmia is not a deviation from the norm. Among different types of arrhythmias, extrasystolic arrhythmia is the most common. Rare, single extrasystoles are quite common, and they are relatively harmless. Frequent dropouts of a pulse beat have an adverse effect on the function of blood circulation (the systolic volume of blood decreases sharply). The most common cause of extrasystolic arrhythmia in athletes and athletes is physical overstrain and overtraining.

The compliance of the applied load should be judged by the restoration of the pulse after exercise or a dosed test.

Assessment of the state of the cardiovascular system

Test with 20 squats in 30 seconds. After squatting for 3 minutes while sitting, the pulse is counted in 10 second intervals. In trained people, the increase in heart rate can increase from 8-10 beats / min. (at rest) up to 13-15 beats / min. After work, recovery, as a rule, occurs by the end of the 1st minute. Or at the beginning of the 2nd. If the pulse returns to normal by the end of the 1st minute, this is excellent, if the 2nd is good, if the 3rd is satisfactory. If recovery did not occur within 3 minutes, this indicates a decrease in the functional state of the cardiovascular system.

If, after a long period of physical exercise (56 months), the recovery time of the pulse after physical activity is reduced, this is one of the indicators of improving the body's adaptability to them.

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In addition, there are many different tests to determine the fitness of the heart. They differ in the magnitude of the load, its duration, so it is difficult to compare. In the practice of medical control, the Ryuffier index, the PWC test and the Harvard step test are often used.

The Ruffier Index is a test in which men do 30 sit-ups and women do 24 in 30 seconds. The index is calculated by the formula (P1 + P2 + P3-200) / 10 (pulse is calculated in 30 seconds), where P1 is the heart rate at rest; P2 - immediately after the load; P3 - one minute after the load. A score less than 0 indicates excellent functioning of the circulatory apparatus; from 0 to 5 - good; from 6-10 - satisfactory; 11-15 - weak; more than 15 - unsatisfactory.

Assessment of the respiratory system

Breath holding test. The functional state of the respiratory organs and the cardiovascular system can also be determined using a test with holding the breath during inhalation (Stange's test) and exhalation (Genchi's test). The methodology for their implementation is as follows:

Stange's test (holding the breath on inspiration). After 5 minutes of sitting rest, take 2-3 deep breaths and exhale, and then, having taken a full breath, hold your breath, the time is noted from the moment of holding the breath until it stops.

The average indicator is the ability to hold your breath while inhaling for untrained people for 40-55 seconds, for trained people - for 60-90 seconds or more. With an increase in training, the breath holding time increases; in case of illness or overwork, this time decreases to 30-35 seconds.

This test characterizes the resistance of the body to a lack of oxygen.

Genchi test (breath holding on exhalation). It is performed in the same way as the Stange test, only the breath is held after a full exhalation. Here, the average indicator is the ability to hold your breath on exhalation for untrained people for 25-30 seconds, for trained people for 40-60 seconds. and more.

Assessment of vestibular stability

Romberg test. It is possible to determine the state of the nervous system and in particular the state of the vestibular apparatus using the Romberg test.

When performing the Romberg test, it is simple, you need to stand with your feet together, hands with slightly spread fingers, stretch forward, close your eyes. The time of stability in this position is determined. If equilibrium is lost, the test is stopped and the time of its execution is recorded. In a complicated version, the legs are on the same line, while the heel in front touches the toe of the other leg, otherwise the position is the same as in a simple test. The stability time in healthy untrained people is usually more than 30 seconds, while there is no tremor (tremor) of the hands and eyelids. The stability time for trained and athletes, especially for gymnasts, figure skaters, divers, swimmers, can be 100-120 seconds. and more. Swaying, and even more rapid loss of balance, indicate a lack of coordination. Trembling of the fingers and eyelids also indicates this, although to a much lesser extent.

The Romberg coordination test is used before and after classes. A decrease in the test execution time can be observed with fatigue, overstrain, overtraining, during the period of illness, as well as with long breaks in physical education.

Yarotsky's test. In addition to the Romberg test, Yarotsky's test is recommended to study the state of the vestibular analyzer. It is simple and accessible and consists in performing circular turns of the head in one direction (to the right or to the left) at a rate of 2 turns per second, the balance time is fixed. For non-athletes, it averages 25 seconds. For trained and athletes, the time to maintain balance can increase up to 40-80 seconds. and more.

orthostatic test. An orthostatic test is used to determine the degree of dysregulation of the circulatory apparatus (fatigue, overtraining, overstrain). To this end, in the morning, without getting out of bed, you need to calculate the heart rate in one minute. Then calmly get up, wait a minute and count the pulse again. An increase in heart rate by 6-12 beats indicates a good reaction of the heart to the load. An increase in heart rate by 13-18 beats is satisfactory, and more than 20 beats is an unfavorable reaction.

An orthostatic test is also recommended before and after exercise. If the test indicators on the next day after class come to the initial values, then the load was acceptable and the body's working capacity is restored. If, within 2-3 days, the pulse does not return to normal compared to the first orthostatic test, you should consult a doctor.

Rules for conducting independent physical exercises Rules for conducting independent physical exercises:

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1. Before starting independent physical exercises, find out the state of your health, physical development and determine the level of physical fitness.
2. Be sure to start your workout with a warm-up, and at the end, use restorative procedures (massage, warm shower, bath, sauna).
3. Remember that the effectiveness of training will be the highest if you use physical exercises in conjunction with hardening procedures, observe hygienic conditions, and maintain a proper diet.
4. Try to follow the physiological principles of training: a gradual increase in the difficulty of exercises, the volume and intensity of physical activity, the correct alternation of loads and rest between exercises, taking into account your fitness and load tolerance.
5. Remember that the results of training depend on their regularity, since long breaks (4-5 days or more) between sessions reduce the effect of previous sessions.
6. Do not strive to achieve high results in the shortest possible time. Hurry can lead to overload of the body and overwork.
7. Physical activity should correspond to your capabilities, so increase their complexity gradually, controlling the body's reaction to them.
8. When making a training plan, include exercises for the development of all motor qualities (speed, strength, flexibility, endurance, speed-strength and coordination qualities). This allows you to achieve success in your chosen sport.
9. If you feel tired, then in the next workouts, the load should be reduced.
10. If you feel unwell or have any deviations in the state of health, overwork, stop training, consult with a physical education teacher or doctor.
11. Try to train outdoors, involve your comrades, family members, relatives, brothers and sisters in training.

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