ISSN NO: 2770-0003
Date of Publication: 15-11-2021

Sports Medicine and Therapeutic Physical Education

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Abstract. This article is about the current state of sports medicine and physical therapy. The article also mentions the formation of sports medicine in the historical context. You will find a detailed description of the practical application and action of sports medicine and physical therapy in this article.

Keywords: Sports, Medicine, Sports Medicine, Physical Therapy, Professional Sports, Prevention.

Sports medicine is a young and actively developing science that supports coaches and athletes during training. It differs from medicine as a whole in that sports physicians work with the human body, which is physically overloaded much more and, accordingly, there may be more potential injuries and complications.

For a long time, sports medicine in Russia did not meet the requirements of international standards. It was more like primitive controls and formal examinations of athletes. There were no clear recommendations for sports nutrition - there were simply no special supplements on sale, professional athletes got along with ordinary foods with a standard set of nutrients.

Therapeutic physical culture is an independent medical discipline that uses the means of physical culture to prevent exacerbations and treat many diseases and injuries, as well as restore working capacity. The specificity of medical physical culture is that, in comparison with other methods of treatment, it uses physical exercise as the main therapeutic agent, which is an essential stimulator of the vital functions of the human body.

In the middle of the 20th century, science stopped in its development, since officials were guided only by their own interests, not listening to the opinion of professionals, not allocating enough funds for high-quality diagnostics of the health of athletes, both amateur and professional. Despite this, the requirements for results became higher. This explains the increased incidence of injuries, which often deprived people of the ability to even simple movement. This was especially true of artistic gymnastics, figure skating, that is, sports related to acrobatics. It was simply impossible to survive in such a regime. Add to this the great psychological stress associated with increased responsibility.

The development of sports medicine began only in the 21st century.
Scientific research in the field of sports psychology, dietetics, pharmaceuticals has not been carried out either. All knowledge was accumulated by the coaches themselves and used in relation to athletes spontaneously, solely based on their own experience. It's good if this experience was. Unfortunately, in the history of the development of sports medicine, there are even cases when many former athletes took on the functions of doctors for the rehabilitation and recovery of athletes. Often there was not enough personal experience, and there was no professional knowledge. This ended with the departure of promising people from sports for health reasons. This situation had an extremely negative impact on the state of sports and the state of medicine.

It is believed that the tasks of sports medicine have not yet been determined, because it is confused with physical culture. But the loads of ordinary people to maintain the general tone and the load of professional athletes are completely different things.

Sports medicine is also often confused with exercise therapy. People engaged in physical culture have loads evenly distributed to all muscle groups, classes are dosed, there is no preparation for competitions, there is no responsibility for the result, therefore, there is no psychological load. Ordinary people do not adhere to a sports regimen, do not control their diet. And, most importantly, they themselves decide when to rest, leave and do other other leisure activities.

Professional sports are serious business. Training takes place, as a rule, twice a day. Half a day is devoted to working in the hall: in any weather, in any condition, in any mood. Therefore, in order to maintain such a schedule, control over training, nutrition, and muscle condition is necessary. Free time for athletes is very rare. Prevention of various diseases is necessary, especially during the competition period. Depending on the type of sport, the loads are always on the same muscles. The body, muscles, internal state gets used to a certain

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algorithm of actions, there is nothing new, everything is always expected.

For professional athletes, the body is a tool for improving the quality and standard of living. This tool should work well and a lot. The sport has become more complicated and younger. If in the middle of the 20th century they began to engage in rhythmic gymnastics at the age of 15-16, now they are looking for trainers in kindergartens. That is, children's sports medicine comes out on top, since at the age of 18 - 19 gymnasts already leave sports and begin coaching.

The peak of training falls on adolescence, when it is necessary to simultaneously think about the development of the body and about the results in sports. This complicates the task of sports medicine. Also, it should be noted that adolescence for athletes is difficult from the side of sports, because it is necessary to closely monitor the load, in order to avoid deterioration in physical condition and health in general. Otherwise, athletes can even overload their backs and "earn scoliosis", where the medical diagnosis will be the rejection of sports, and this is still at best. Unfortunately, here the coaches bear a huge responsibility not only for the present, but also for the future of athletes. And this is only one side of the coin. The adolescent period is also difficult psychologically. This is a period of crisis, it becomes easier to traumatize the psyche of a teenager than it might seem. Therefore, the importance of sports medicine and the work of coaches should not be underestimated.

Sports medicine has a number of tasks:

1) Assistance to the coach in the selection of candidates for professional sports;
2) Leading the younger generation through sports loads for many years;
3) Determination of the optimal mode of work and rest individually for each athlete;
4) Recommendations for the type of food in different periods of activity;
5) Prevention of injuries due to increased physical activity;
6) Control over the intake of pharmaceuticals;
7) Development of a set of measures to improve performance and improve results;
8) Correct treatment and rehabilitation after sports injuries; control over hygiene and general diseases;
9) Doping system in sports.

Sports medicine also studies the pathological processes that take place in high-level athletes. As a result of an unprofessional approach on the part of medical personnel who have no idea about physical activity, there have been many such pathologies in the history of Russian sports, including spontaneous deaths during training. The modern situation, of course, has changed, but similar cases still occur [Matveev LP, 1991].

In order for a sports doctor to apply all his knowledge and experience, he must have the authority to remove a person from competition or training if it threatens injury or disability. A compromise can only be full-fledged financial support for athletes, in which there is an opportunity to recover faster, or to undergo a course of treatment abroad.

Many health care professionals have fought to enforce the rules in training and nutritional regimen, as well as to distribute the load. But their proposals were ignored. The sports system is interested in results more than in the health of those who bring those results. This negatively affects athletes, or rather, their health. For coaches, the doctor is often not the first authority.

There is knowledge that this doctor needs:

1) Theories and methods, as well as sports hygiene;
2) Sports morphology;
3) Pharmacology;
4) Physiology and biochemistry of sports;
5) Psychology;
6) Sports rehabilitation;
7) Physiotherapy;
8) Traumatology.

This is not counting the usual disciplines that are required for all doctors. Even rehabilitation after sports injuries has different goals, a different methodology than that of ordinary people.

A sports doctor is, first of all, a specialist in the field of high loads, who must know how the body behaves in extreme conditions. With hard physical training, the human body loses its immunity, minerals in large quantities. Body systems that are genetically weak can fail at the wrong time and interfere with

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participation in competitions:

1) Cardiovascular system;
2) Digestive tract;
3) Kidneys.

The medical personnel of the national teams must be aware of the health condition of each participant. The approach is carried out individually, taking into account the characteristics and degree of the athlete's training.

It is possible that the unforeseen may happen during the trip, and some of the participants in the competition will get sick. Taking care of the state of health before the competition rests entirely with the sports doctor. Therefore, he must have knowledge of pharmaceutical preparations that are approved by the doping committee and do not contain prohibited substances, even if they were used for their intended purpose.

Preventive vaccinations are of great importance. In hot countries, where local insects carry infections to which Russian athletes have no immunity, there is a risk of getting sick and getting to the hospital even before the competition. You need to know what diseases people from other regions of the world are most susceptible to. Vaccinations are made in advance to protect competitors from infectious diseases.

For example, in India there are many malaria mosquitoes, hepatitis, fevers, dirty water. Dysentery, typhoid fever, and cholera are common in eastern countries. You should also be careful at competitions in Mexico, Brazil. The local climate is favorable for the reproduction of parasites in the water. Symptoms can include poisoning, digestive upset, and an athlete's failure.

It is necessary to diagnose the health status of athletes. For professional monitoring of the health of athletes, specialized medical equipment is used:

- X-ray apparatus;
- MRI;
-CT scan;
- ECG.

Preventive examinations are carried out regularly - once a month in preparation for the competition.

Diagnostics of the athlete's body in sports medicine. In professional athletes, doctors often diagnose an increase in the number of coronary vessels. It is a kind of defense mechanism to provide oxygen to the heart muscle and growing tissues of the body. With a lack of nutrients - a building material for tissues - the body does not have time to build new blood vessels. As a result, the heart does not receive enough oxygen and tissues die off. This process takes place against the background of intensive training. A striking example is the bodybuilder actor Vladimir Turchinsky. In pursuit of muscle mass and sports achievements, I did not take into account the physiological characteristics of my body, became carried away by loads, neglected the regimen and good nutrition. With constant filming and stress, the body could not stand it, and the actor died of a heart attack.

Diagnostics on the equipment is very helpful when the athletes themselves describe their feelings and well-being. But often people in pursuit of results hide their condition from doctors and, possibly, from themselves. In this mode, injuries most often occur, after which a long period of treatment and rehabilitation begins.

The longest process is rehabilitation. During this period, heavy loads are contraindicated, because the muscles and tendons are weaned from regular loads and there is a risk of re-injury.

During this period, it is shown:

- lymphatic massage;
- physiotherapy procedures;
- moderate loads;
- enhanced nutrition;
- drinking enough water;
- vitamins and mineral complexes.

Rehabilitation of professional athletes after injuries. You should not rush to switch to normal loads. The musculoskeletal system is very vulnerable after injury. Experienced trainers in such cases control the loads and keep them at an average level. A sports doctor, based on the results of an MRI, an X-ray, monitors the condition of the tissues - how much they have recovered and are ready for stress.

It is important that the athlete understands that there is no need to rush at the stage of restoration of the

ISSN NO: 2770-0003
Date of Publication: 15-11-2021

body's functional capabilities. As they say - time heals, but you need to wait for it. The help of a psychologist or the same sports doctor who can convince a person to wait is of great importance. For his own good.

Restorative medicine is a system of scientific knowledge, one might say

- a new word in the rehabilitation of patients. In sports, this means getting back in shape and continuing to train. The recovery of athletes requires special funding, as it implies the costs of:

- masseurs and reflexologists;
- Spa treatment;
- purchase of special clothing to support organs or joints;
- special meals.

Sports medicine is directly related to physical therapy, that is, an independent medical discipline that uses the means of physical culture for the prevention of exacerbations and treatment of many diseases and injuries, as well as restoration of working capacity. The specificity of medical physical culture in comparison with other methods of treatment is that it uses physical exercise as the main therapeutic agent, which is an essential stimulator of the vital functions of the human body.

Therapeutic physical culture should be considered as one of the elements of modern complex treatment. Comprehensive treatment refers to individually selected therapeutic methods and means that ensure a positive change in the reactivity of the body, improvement and restoration of the functions of an organ or system affected by the disease. Complex treatment affects not only pathologically altered tissues, organs or organ systems, but also the entire body as a whole. The proportion of various elements of complex treatment depends on the period and clinical course of the disease. In the process of clinical recovery and the need to restore the working capacity of a person who has undergone this or that disease or injury, a significant role in complex treatment belongs to physical therapy, as a method of functional therapy. Physical exercises, regardless of the place of their application, affect the reactivity of the whole organism and involve the mechanisms that were involved in the pathological process in the general reaction. In this regard, therapeutic physical culture can be called a method of pathogenetic therapy.

Therapeutic physical culture provides for the conscious and active implementation of appropriate physical exercises by patients. In the process of practicing them, the patient acquires the skill of using natural factors of nature for the purpose of hardening, learns to observe the regime of movements, to use physical exercises for therapeutic and prophylactic purposes. This allows us to consider the use of physical exercises for therapeutic purposes as a therapeutic and pedagogical process.

Therapeutic physical culture uses the same means and principles of application as physical education for a healthy person. It is based on the principles of the Soviet system of physical education, namely, the principles of comprehensive impact, application and health-improving orientation. Thus, according to its content, remedial physical culture is an integral part of the Soviet system of physical education.

The outstanding Tajik scientist Abu-Ali Ibn-Sina (Avicenna) played an important role in the further development of medical physical culture. He theoretically substantiated the use of physical exercises for therapeutic and prophylactic purposes, the use of sun and air baths, and described in detail a number of gymnastic and applied exercises. During the Renaissance, a number of prominent scientists (A. Comenius and I. Mercurialis) in their works promoted the importance of physical education. In the XVIII century. and especially in the 19th century. there were works on the therapeutic value of physical exercise. The Swedish system of physical education Linga had a great influence on the development of medical gymnastics in Europe.

The therapeutic effect of physical exercises for diseases and injuries of the spinal cord is manifested in their general tonic effect. Under the influence of muscular activity, the conduction of impulses along the motor and sensory nerves and the blood supply to the affected areas are improved, weakened muscles are strengthened and the contracted ones are stretched. Exercise prevents the development of contractures and helps restore impaired coordination of movements. An early start to physical therapy helps prevent complications associated with prolonged lying (pneumonia, constipation, etc.), and the formation of compensatory motor skills.

The value of the general strengthening effect of physical exercises in diseases and injuries of the spinal cord increases many times compared to diseases and injuries of the peripheral nervous system because those suffering from disease or injured spinal cord are physically helpless and mentally depressed. Conscious, active

ISSN NO: 2770-0003
Date of Publication: 15-11-2021

participation of the patient in treatment is very important.

If a spinal cord rupture occurs during injury, it is almost impossible to restore movement. In this case, exercises are used to strengthen those muscle groups in which innervation is preserved. The patient is taught the elements of self-care, the use of a wheelchair or orthopedic devices. More often, trauma or tumor does not result in a complete rupture of the spinal cord. In these cases, in order to achieve the effect, the instructor and the patient need to work for a long time (up to a year or more) on the restoration of movements. Even in the late period - after 2 years or more - after an illness or injury, systematic physical therapy exercises in combination with physiotherapy and occupational therapy give positive results.

When conducting medical gymnastics classes, the above principles are observed. For the purpose of a general strengthening effect, muscle groups are exercised that are not involved in the painful process or are less affected. Any exercise always begins with the work of healthy limbs. The restoration of movements should be stimulated by sending impulses, passive movements, a combination of both with active movements. If there is muscle hypertonicity, then relaxation exercises are included in the classes. As a rule, the first signs of movement are found in physical therapy classes. The patient's attention should be focused on this.

Until active movements appear, preventing contractures and deformities, it is necessary to apply passive movements and posture treatment.

Sometimes movement is restored, but the musculoskeletal feeling is not (with a deep lesion of the posterior columns), and the patient does not "feel
land ". Then it is recommended to train in walking under the control of vision (on the floorboard, pattern, footprints).

In case of damage associated with a tumor, therapeutic exercises begin before the operation - in order to establish contact with the patient, identify his motor abilities and familiarize him with the exercises that will have to be performed after the operation. Due to the fact that during an operation to remove a tumor, the arches of the vertebra are always bite off, 10-12 days after it, classes are carried out in the position of the patient on his side.

Physiotherapy is also indicated for brain injuries. In case of damage (trauma, tumor or impaired cerebral circulation: hemorrhage, thrombosis, embolism) of the motor pyramidal tract, central, or spastic, paralysis or paresis develops.

Despite the fact that dead nerve cells do not regenerate, exercise helps to remove inhibition from depressed areas around dead cells and create new functional centers.

The methodology of physical therapy exercises provides a tonic effect, restoration of innervation and the formation of compensations (the last two tasks are difficult to separate). The principles and techniques are basically the same as for the previously described diseases, but the approach must be very careful, given the fact that the patients here are very difficult. The technique of therapeutic gymnastics for vascular diseases of the brain is as follows: 2-3 days after the patient comes out of a serious condition (consciousness returns, breathing is normalized, etc.), position treatment, light superficial massage and soft passive movements are used in conditions of strict bed rest. (slowly, smoothly, gradually increasing the amplitude).

By the end of the month, the patient is transferred to lightweight bed rest. In addition to what was performed in the previous mode, active movements with healthy limbs, the sending of impulses to movement by paretic limbs (calmly, without tension), active movements of the affected limbs with outside help and relaxation exercises are added.

With the transition to a ward mode (after 1.5-2 months), some of the exercises are performed in sitting and standing positions, exercises are included to strengthen the muscles of the legs and develop correct posture, to improve gait.

When the patient is transferred to a free regime, work continues on improving the coordination of movements. Classes are held in the office of physical therapy. They always begin in the initial lying position to give the patient a rest after moving into the office from the ward.

In case of brain injuries, the same training methodology is used as in vascular diseases of the brain. The expansion of the motor regime is carried out depending on the age and state of health. So, if a young man received an injury (wound) and his condition allows, then the transfer to the ward mode is carried out faster.

With brain tumors, therapeutic exercises begin to be engaged only after the operation, and the technique depends on the nature of the disorders associated with the localization of the tumor. An approximate set of

ISSN NO: 2770-0003
Date of Publication: 15-11-2021

exercises for a patient who does not have active movements, increased muscle tone in the paralyzed limbs (the hemorrhage is 3 weeks old), the following (all of them are carried out in the initial supine position):
1. Calm breathing (2-3 times). The exhalation is somewhat longer than the inhalation. The patient's attention is fixed on the feeling of relaxation of the muscles of the paretic limbs.
2. Alternate flexion and extension of the forearm: passive for the paretic hand, active for the healthy one (4-6 times). Preliminarily, a massage of the flexors and extensors of the forearm and hand of the paretic hand is carried out, followed by its supination. When performing the exercise, the forearm and the hand of the paretic hand are held by the methodologist in the supination position.
3. Passive flexion and extension of the fingers of the paretic hand (7-8 times). The hand and forearm of this hand are massaged beforehand. During the exercise, she is in the supination position.
4. Alternate flexion and extension of the legs in the hip and knee joints - active with a healthy leg, passive with paretic (5-6 times).
5. Active flexion and extension of the healthy arm in the shoulder joint (2-3 times).
6. Passive extension of the legs, bent at the knee and hip joints, to the sides (5-6 times). A preliminary massage of the adductor muscles of the paretic leg is performed.
1. Passive flexion of the paretic arm in the shoulder joint (4-5 times). A preliminary massage of the shoulder joint area is carried out. When performing the exercise, make sure that the shoulder bag does not stretch. With one hand, the methodologist fixes the clavicle and the head of the shoulder, as well as the scapula.
2. Alternate abduction of the legs to the sides - passive patient, active healthy (4-6 times). A preliminary massage of the adductor muscles of the paretic leg is performed.
3. Abduction of hands to the sides - passive paretic, active (without tension) healthy (6-7 times). Movements begin with a small amplitude. After performing the exercise, the paretic arm is placed in the supination and maximum abduction position in the shoulder joint.
Alternating flexion and extension of the feet - passive paretic, active healthy (4-6 times). The methodologist pre-bends the paretic leg in the hip and knee joints, supporting the lower thigh with one hand, and the other foot.

Closed brain injuries (concussions, bruises) cause loss of consciousness of varying duration. Then the patient is, as it were, in a state of stunning, numbness for some time. For several days, he is worried about headache, aggravated by sudden movements, dizziness, noise and ringing in the ears, nausea.

After a bruise (contusion), paralysis and paresis, impaired sensitivity, speech disorders, etc., that is, focal phenomena, the nature of which depends on the localization of the lesion, can be observed. If there are no focal lesions, then 1-2 weeks after the injury, the patient is prescribed restorative exercises (hygienic and therapeutic gymnastics) with little physical activity and gradual training of the vestibular apparatus (exercises in balance, head and torso movements in a small amplitude). When the patient performs exercises in balance (especially with closed eyes) or movements that enhance vestibular reactions, insurance is required [Popov SN, 2003].

As the residual effects after trauma disappear, the expansion of motor activity is carried out strictly observing didactic principles in teaching.

Thus, you and I can see what an important role sports medicine plays. And also, its importance for the development of the country in a sports direction, without numerous injuries, as it was before.

It is also important that athletes understand that their health does not depend only on doctors. It is important to monitor your own health, stress, pace, rhythm. During the recovery period, learn to endure and wait, and not turn a blind eye to your problems and put your health at risk again.

At the same time, in these cases and in preventive situations, it is necessary to pay attention to physiotherapy exercises, which are often not taken seriously by athletes. It also helps during the recovery period.

The most important thing is to monitor your health and not neglect prevention, diagnosis, treatment and recovery. Health must be protected regardless of the physical fitness of a person.

ISSN NO: 2770-0003
Date of Publication: 15-11-2021

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