

Physiological Basics of Forming Movement Skills and Teaching Sports Techniques

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Abstract: In this article, a complex process is carried out in the Jude during the formation and control of movements, in the human central nervous system and nervous system. This is the case when, in sports, several muscles in my organizim and cases associated with nerve ischemia are reflected in the control of dynamic movements and keeping certain states of the torso in balance.

Keywords: movement, nervous system, exercise, physiological basis, movement skills, dynamic stereotype, bioelectric activity.

Introduction

The composition of the muscles that perform during the training process and the number of contractile units of movement in them can, at the same time, continuously change not during the transition from one phase of the act of movement to another, but within its own framework of that phase. In addition, both the composition of the muscles involved in these movements and the number of units of movement involved in the work, the movement alternates places during changes in speed, the degree of tension, exhaustion and a number of other factors. The foundation of various movement skills in the body, on the one hand, is made up of Innate actions, on the other — acts of action that arise as a result of special training during individual life. In response to the action activity of human complexity (sucking, swallowing, eye twitching, pain and other influences, bending and adjusting the arms and legs, etc. k.) ready looks are born with a foundation. Along with these, in the genealogical way, a very important feature passes — the plasticity of the nervous system.

Exercise - specially selected actions to increase the level of physical development of a person. Regular and consistent exercise forms the basis of physical education. Physical exercises composed in the practice of physical education (based on the actions and actions taken from a person's labor, marriage, military activity — running, jumping, ironing, rock climbing, swimming in water, etc.) are used in gymnastics, athletics, weightlifting, action and sports games, sports tourism and h.k.ni caused. Exercise, selected on a scientific basis, improves the functioning of all organs of movement, increases the ability to work. the types of exercise require correct and accurate classification.

Then the desired effect can be achieved from them. Exercise is the main tool of physical education, which has historically been grouped in the style of gymnastics, games, sports and tourism, using it as a means of the educational process. Physical exercise is understood as a variety of voluntary action activities that meet the requirements of the laws of physical education, which are carried out consciously.

Provides a high level of exercise, that is, the ability to acquire new forms of action acts, which are adequate to the changed conditions of life activity, through training (L. A. Orbely). This provides only great opportunities for perfecting the technique of sports movements. The ability to practice inbreeding varies from person to person. In addition to him, he strongly changes in one person himself, even in relation to different manifestations of activity. Therefore, when choosing in sports, along with the state of morphological characteristics and vegetative functions, it is also necessary to take into account the specific levels of exercise in relation to certain coordination of movements, which are characteristic of this particular exercise.

At different periods of life, exercise is expressed differently. There are such Age periods in which exercise, especially high and learning, including action acts, occurs very successfully. These periods are typical for different types of mental and muscle activity. For example, the movement coordinates associated with the correct pronunciation of foreign words are light and rapid acquisition during childhood. If middle-aged people with a slight decrease in exercise, compared to Coordination of speech muscle activity, begin to master a new language, then many of them, however, face great difficulties. New ones of complex sports movements are also mastered in certain periods of a person's life. Therefore, in order to effectively teach the technique of movements, it is necessary to determine such Age periods in which, let the exercise in this type of exercise be very complete. From sports practice, it is known that training in complex movement acts in Figure Skating, water jumping and some other types of physical exercise is especially effective in childhood.

Conditional reflector mechanisms-the physiological basis for the formation of Motion skills sensory and executive (operant) components of Motion Skills. The physiological mechanism of exercise is the temporary connections that occur through a conditional reflector, and thanks to them, new, individually mastered types of movement activity are formed, including sports techniques. Reflective nature of voluntary movements I. M. Revealed by Sechenov. Later I. P. Pavlov, with a large number of readers and followers, had identified the Basic Laws of the formation of new forms of action acts, according to the mechanism of conditional reflector communications. Classical conditional reactions in experiments with salivary separation are characterized by the occurrence of a temporal association between an indifferent signal and an unconditioned reflex (First Order conditional reflexes) that powers that signal, or a previously generated robust conditional reflector reaction (much higher order conditional reflexes). These are sensory conditioned reflexes in which the response reaction to the afferent signal (e.g., salivation, pulling the arm when the pain effect is given) is either an unconditioned reflector or a previously acquired conditioned reaction. It follows that the body uses a response in the form of a pre-existing reaction, and only the signal, i.e. the sensory part, gains new (conditional reflector) properties.

But, when it comes to movement skills, it is always implied that operant temporal connections occur, rather than simply reversing the previous existing reaction on the conditional signal. Operant temporal communications are also known as instrumental or manual temporal communications. It is characterized by the formation of connections, new forms of actions or a combination from familiar elements of a new, complex act of action that does not exist in this organism, until then. It follows that the temporal connections in this case are not only afferent

(sensory, sensory) but also efferent (effector), i.e. belonging to the executive branches of action reactions. The movement skills of a person are characterized by the fact that in them, at the same time, both types of temporary communication coexist. On the one hand, through the first and second alarm systems, a connection is established between the triggers and subsequent activity, which were previously indifferent for the athlete (sensory components of a temporary connection), on the other — new action response reactions are developed (operant components of a temporary connection). In a person, during the formation of sports and other movement skills, high-order temporary connections, which are formed not only through the first, but also through the second signal system, are of great importance (training in various skills, always, is carried out not only by show, but also by verbal explanation). The formation of movement skills is accompanied by the formation of temporary connections that help to provide movements, especially those of a cyclical nature that are performed in the long term, much more efficiently with the functions of the vegetative organs. It is important that the motor and vegetative components of the movement skill do not form at the same time. In relatively simple movement skills (for example, when running, skiing), movement components are first formed, and in complex movement skills (for example, in gymnastics, wrestling, sports games) — vegetative components are formed. Once the skill is formed, vegetative components can become much more inert than motion components.

For example, changing the form of activity that has become a habit

— during the transition from continuous execution to work of variable intensity
— movement functions change rapidly, in some cases suddenly, while vegetative members, in accordance with the previously formed character of the movement, still function for a long time. The importance of previously developed coordinates for the formation of complex movements. When teaching the technique of sports movements, the formation of movement skills always takes place in the base of the coordinates that the Horde - nizm developed earlier. For example, the child's standing skills are formed at the base of his sitting skills, since the ability to keep his head and body in a vertical position during sitting is formed; The Walking skill is formed at the base of the Standing skills. During the formation of various sports movements, for example, in gymnastics, figure skating, most components of physical exercise are not considered new to completeness, they will be in the form of elements of previously developed skills. When it is necessary to master a complex movement technique, in which most of the components are new, preparatory exercises and training on its elements are usually used, in which the technique of performing the movement is gradually complicated in the base of temporary contacts formed during much simpler coordination. In some cases, the presence of strongly strengthened skills not only contributes to the formation of a new act of action on its character, but also provides resistance. This is especially observed when the structure of the new movement is associated with the re-transformation of the old skill. For example, when training in Figure Skating, which is strengthened by teaching the skill of turning only on one side, it makes it difficult to develop the skill of performing the same rotation on the other side. Therefore, during the training of sports exercises, it is important to form the right movements at once, since if non-full-fledged acts of movement are strongly strengthened, then changing them again can take a very long time and a lot of Labor. Dynamic stereotype and extrapolation in sports movement skills. The action skill is manifested as a complex act of action, composed of several elements (phases), United into one whole act of action, rather than elemental. In acyclic exercises, individual phases alternate, in a specific order. In cyclic exercises, too, there is a multiple reversible legal connection of the action phases in each cycle. In the process of motion skill formation, individual action phases in the form of different components of an action Act that occur are attached to a specific chain of reactions that take place in the form of a given dynamic

stereotype. It should be said that the dynamic stereotype in physical exercises belongs only to the successive phases of action. For example, when running, walking, swimming, only the lethality of these phases remains the same, while the temporal relationship between them, determined by the length and frequency of the step, is constantly changing. And the internal structure of the movement, that is, the composition of the muscles involved in the act of movement and the number of contracting units of movement in these muscles, can change continuously. This is also characteristic of the duration of latent periods, the sequence of their inclusion in the activity of individual muscles, the duration of the impulse period in them, the average and maximum magnitudes of the amplitude of biopotentials, etc. This case, explained as follows, is that during the presence in the body of a large amount of executive equipment (hundreds of muscles in each of them and hundreds and even thousands of units of movement), the MAT is able to achieve the same external effect at the expense of a large number of variations of the delicate internal structure of the movement.

Dynamic stereotype, only such skills are characteristic of the sequence of phases of the external structure, in which this sequence can pass by a certain standard (cyclic exercises). But, there are other skills in which, due to the frequent changes in states, it is necessary to react with a new movement each time (acyclic exercises). To this type of skills, in singles (boxing, javelin, wrestling) and sports games (football, hockey, basketball, etc.) skills include. In them, a dynamic stereotype in the form of a stable whole system of changes in the phases of movement, as a rule, is not formed; stability, not the manifestation of complex combinations of movements, but individual structural elements (for example, shooting a penalty ball in basketball) it belongs to a certain extent. The movement activity of a person is characterized by great variativeness. Most of the new structure motor acts are made possible by extrapolation due to the high plasticity of the MAT. It provides the opportunity to move skills and perform new actions "from place to place". Extrapolation is the ability to adequately solve the central nervous system, based on acquired experience, the tasks of the newly emerging movement. The increase in the reserve of acquired actions helps to greatly increase the chances of finding the right solution, close to the action tasks that a person has previously solved, without special training of new action tasks. The forms of extrapolation are diverse. They are connected by various aspects of the activity of the movement, including the correct assessment of the situation that has occurred and programming the character and form of actions that are carried out with the determination of the tactics of the movement. Extrapolation is common when performing acts that are not only completely new, but also have become a habit.

When performing actions, acts of action, in which there are much more variations of an external character, extrapolation becomes even more significant. For example, a player can get up from a different starting position, with different parts of his right or left leg, hitting the ball with different forces. This is solved by extrapolation, after teaching a relatively limited number of methods of different types of action tones. During the occupation of acts of action, a person's ability to extrapolate is determined by genealogical information only to a lesser extent. Therefore, it is necessary to take into account extrapolation during the selection of a complex of preparatory exercises. This complex should include exercises that can have a positive effect on mastering the basic exercise. If, several auxiliary exercises give the same effect on extrapolation mechanisms, then, their number can be reduced. During the selection of preparatory exercises, the use of vegetative functions that ensure the activity of movement (blood circulation, breathing, etc.k.) it is necessary to take into account both the effect that affects the development by the mechanism of extrapolation and always. Stages (phases) of formation of movement skills. The formation of an

action skill consists of several stages. In the first stage, an irradiation of nerve processes is observed, with the generalization of the response reaction and the attraction of excess muscles to work. At this stage, the Union of individual private actions into one whole act begins. In the second stage, there is a concentration of nerve processes, an improvement in coordination, the elimination of excess muscle tension and a much greater perfection of the appearance of the stereotype of movements. At the third stage, the skill stabilizes, and the coordination and automation of movements becomes more perfect.

In a number of cases, it is also possible to eliminate some of the stages. This depends on most factors on the degree of complexity and strength of muscle work; with the initial position of the movement apparatus; the qualification of the athlete. As already said, new complex movements are formed against the background of constantly existing coordinates. Thanks to this, training (for example, to gymnastic exercises), in New participants, in moderately qualified athletes and in Masters of sports, goes completely differently. For example, in highly qualified athletes, training in exercises can take place without the first and even the second stage, due to the skills acquired before and the ability to extrapolate. The strength of the skill and the duration of its maintenance. Movement skills, like other manifestations of temporal communication, are not sufficiently stable at the onset of formation, and later become much more robust. In doing so, the simpler they are in terms of their structure, the more robust they will be. Skills with complex coordination relationships tend to be robust at a much lower level. As a result, even a highly qualified athlete will find it difficult to show his high performance during the return of complex movements. If, however, any factor associated with the quality of the exercise is not full, the result will decrease. Factors that reduce the strength of the skill — deterioration of the general condition of the nervous system (for example, during exhaustion), the development of hypoxia, insufficient adaptation during much larger changes in the time zone, lack of self-confidence in front of a strong opponent, etc. The type of nervous system is important. After the cessation of systematic training, the skill begins to disappear. But this is manifested differently for its different components. Much more complex movement components can deteriorate even after a break of several days. They become more passive, during much longer-term (weeks, months) breaks. For high results, exercise should be done systematically, without long-term breaks. Uncomplicated components of the skill can be performed for months, stored for years and decades. For example, a person who has learned to swim, skate, or ride a bike will maintain simple manifestations of these skills even after a very big break. The vegetative components of the skills associated with the control of blood circulation, breathing and other functions are somewhat different from those of the action components. During the short-term replacement of one type of activity, the second type, vegetative components are rebuilt more slowly than the action components. The vegetative components of the skill can completely fade during long-term breaks, in contrast to the action components. Description of muscle activity during the formation of movement skills. The specificity of muscle activity at the moment of formation of a movement skill can be observed according to the data of the electromyogram at the moment of registering several muscle biopotentials at the same time. As already said, in the initial periods of the formation of sports skills, biopotentials are listed not only in the muscles necessary to carry out this act of movement, but also in a number of "excess" muscles. This is due to the phenomenon of irradiation in the nerve centers. Depending on the strengthening of the skill, the limitation of irradiation occurs, while when it is fully formed, it is observed in unusual situations, for example, under the influence of strong alien triggers, during exhaustion.

Electromyogram of muscle-antagonists:

shoulder triceps (1) and biceps (2) muscle,
A-in the untrained,
B-coaches (R. S. Person).

As a result of skill perfection, in cyclic movements, the duration of the period of muscle activity changes. In the initial periods of skill formation, the electrical activity of the muscles in a suitable rave is observed not only during the active phases of movement, but also at intervals between them. Later, electromyographic jumps become shorter. In the process of skill formation, changes occur in the interaction between muscle-antagonists. At the beginning of the study, their simultaneous bioelectric activity can be observed, during relatively slow movements, a reciprocity occurs between them, and bioelectric activity begins to occur in turn. But even in the formed skill, reciprocity may not be fully manifested, it is observed only in a decrease in antagonist activity at the time of agonist contraction. In this case, the faster the rate of movement, the more bioelectric activity of the agonist coincides with the simultaneous activity of the antagonist. In a number of cases, the concurrent activity of musculoskeletal antagonists manifests as a distinct form of coordination observed during the high perfection of this movement skill. In particular, this is present during sluggish movements that require smooth movement of the body joints, for example, when the shooters press the trigger of the rifle. Bioelectric activity in different people is different. This is explained by the fact that one movement itself can be performed in a slightly different harmony of the activity of the muscles performing the work. It follows that athletes with the same qualifications can also have significant level differences in the appearance of bioelectric activity, in addition to generality.

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