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Victor Nikitushkin

Sports of the highest achievements: theory and methodology.

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**Nikitushkin V.G.**

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The manual is a systematic presentation of scientific, methodological and practical material on topical problems of sports training of qualified and highly qualified athletes, which is necessary for students of physical culture and pedagogical universities to master the professions of a coach-teacher in a sport. The manual is addressed to students, graduate students, coaches, teachers of physical education.

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**V.G. Nikitushkin, F.P.Suslov Sports of the highest achievements: theory and methodology**

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# Introduction

The modern system of training athletes has been formed as an educational and scientific discipline as a result of the long-term development of the theory and practice of sports. At the first stages of its development, the authors of the manuals paid the main attention to the system of sports training as a fundamental part of this scientific discipline. The complication of the system of training athletes, the use of a whole range of scientific disciplines for its substantiation: pedagogy, psychology, sociology, economics, biology, physiology, biochemistry, biomechanics, morphology, hygiene, sports medicine, mathematics and cybernetics - forced the authors to take a broader look at the problems of theory and sports methods and include seven sections in its composition: general characteristics of sports and sports training; trends and prospects for the development of sports in modern conditions; the system of sports competitions and competitive activity; sports training system; sports training system in extreme conditions; building the process of sports training and managing the system for improving the athlete.

The material presented is based on the achievements of the national school of sports, set forth in the works of famous theorists, practitioners and organizers of sports - N.G. Ozolin, A.D. Novikov, A.A. Ter-Ovanesyan, V.M.Dyachkov, V.M. N. Platonova, I. P. Ratova, N. I. Ponomareva, L. S. Khomenkov, S. M. Vaitsekhovsky, M. Ya. Nabatnikova, V. V. Kuznetsova, M. A. Godika, V. L Owl, VS Keller and others.

At the present stage of sports development, specialists are guided by the search for new ways to improve the effectiveness of sports training - S.V. Alekseev (2015), V. B. Issurin (2016), V. Ya. Ignatieva (2016), V. G. Pashintsev (2016) ), V. N. Platonov (2014, 2015), A. V. Pochinkin (2006), V. I. Stolyarov (2014), V. D. Fiskalov, V. P. Cherkashin (2016) and others.

The proposed study guide communicates not only established knowledge, but also materials reflecting certain contradictions in the knowledge accumulated by specialists oncepersonal scientific schools and directions. This information is also requiredyoung professionals entering the independent coaching path.

Modern sport has long gone beyond the boundaries of one or several countries, sports problems are closely intertwined with the social problems of the development of the whole society.This leaves an imprint on its development in all countries of the world; therefore, all participating athletes strive to successfully compete at major international competitions. In this regard, the theory and methodology of sports training have been rapidly developing in the world recently.

By order of the Government of the Russian Federation No. 1101-r dated August 7, 2009, the Strategy for the Development of Physical Culture and Sports in the Russian Federation for the period up to 2020 was approved, which reveals the main directions of state policy in the field of physical culture and sports, including increasing the competitiveness of Russian sports in the international sports arena.

The strategy formulates the main task of developmentsports of the highest achievements for the long term - entering the top three winners of the country's sports teams at the Olympics in the unofficial team event.

All of its attributes are included in the training system for elite athletes.from the means and methods of trainingloads to manage the athlete's improvement system.

In the training of highly qualified athletes, the main feature is the construction of the training process is the improvement of specific qualities through the concentration of training loads of a narrow orientation, and general physical training is used as an active rest and maintenance of motor skills. The most urgent is the use of more advanced forms of management of the training process by comparing the indicators of model characteristics of different sides of preparedness and competitive activity.

Another moment having essential in the control system is the choice of the most rational means and methods of training, which ensure both the achievement of model characteristics by athletes in terms of physical fitness and the planned sports results. The multivariance of methodological approaches and methods of increasing the level of special preparedness of athletes puts forward a whole complex of tasks related to finding the optimal options that best meet the goals and realistically available opportunities. Hence, the issues of planning and standardization of training loads, their effective structure, the ratio of various means of training and others are assigned one of the main places in the control system of athletes training.

To assess the effectiveness of the chosen focus the training process, one or another decision made during the training of an athlete, a system of complex control is used. Its task is to evaluate solutions after they have been implemented. Control involves setting certain standard indicators that must be achieved by athletes, comparing these indicators with what actually happened, taking appropriate corrective measures and organizing the implementation of the adjusted programs.

The management system largely defines and refines the very problem of athlete preparation.

The task of this textbook is to show the current state of the theoretical and methodological sections of sports training. At the same time, reflect new trends in modern science and methods of training highly qualified athletes.

# Chapter I. General characteristics of sport

## Basic concepts related to sports. Classification of sports

Sport in modern society reflects one of the forms culture, contributes to the maximum development and manifestation of the physical, mental and spiritual qualities of a person.

A characteristic feature of sport is competitive activity, without which sport cannot exist. It is carried out in competitions for a wide variety of purposes, organized on the basis of sequentially increasing rank with a focus on achieving the highest possible sporting result.

Based on the above, sports *in a narrow sense, it can be defined as a proper competitive activity, a specific form of which is the system of competitions, which has historically developed in the field of physical culture as a special area for identifying and unified comparison of human capabilities.*

However, sport cannot be reduced only to competitive activity; it also has a deeper meaning. This is due to the social essence and purpose of sports in our society.

In order to achieve high sports results, a fairly well-functioning system of training an athlete is needed, carried out in the field of diverse interpersonal contacts that develop between coaches, athletes, judges, organizers, spectators, etc. They are carried out at different levels, starting from the sports team and ending with competitions of various international levels.

Thus, sport in a broad sense is represented by the actual competitor *activity, special preparation for it, as well as specific relationships, norms and achievements in the field of this activity.*

Sports currently represents a diverse social phenomenon. As a product of social development, it constitutes an organic part of the culture of society, acquiring various features depending on specific social conditions.

All this allows us to say that sport is the most effective factor in physical education, preparing a person for labor and other necessary types of activity. Sport is an important means of ethical and aesthetic education, satisfying the spiritual needs of a person and society, strengthening and expanding international ties. The development of sports all over the world has led to the emergence and spread of many individual sports on all continents of the globe, of which there are now more than 200. Only in our country about 150 sports are cultivated, each of them is characterized by its own subject of competition, a special composition of actions, methods of conducting wrestling, its own competition rules.

The most common sports are included in the winter and summer Olympic Games.

However, the term "sport" itself and the related terms "sports discipline» and "type of competition program" need some clarification, since they are interpreted specialists in different ways.

Therefore, the basis for the terminology of these concepts should be taken from the wording of the Olympic Charter.

***Kind of sport -*** *historically formed in the course of its development, a specific type of competition activity, formed as an independent component of it.* May include one or more types of competitions (sports disciplines). For example, athletics, swimming, wrestling, football, speed skating, shooting and others.

***Sports discipline -*** *a constituent part of a sport, supervised by a single sports federation, which differs from the other constituent disciplines in the form or content of competitive activity.* For example, in athletics: running, walking, jumping, throwing; in wrestling: Greco-Roman and freestyle wrestling; skiing: racing, combined, ski jumping. Consists of the types of competitions (separate distances, separate weight categories).

***Competition type -****type of competitive activity within a particular sport, in which medals are played at separate distances, in yacht classes, weight*

*categories, etc.*

All sports that are currently widespread in the world can be divided according to the characteristics of the subject of competition and the nature of motor activity into six groups (according to Matveev L.P., 1977).

1. group - species sports, which are characterized by active physical activity of athletes with the utmost manifestation of physical and mental qualities. Sports achievements in these sports depend on the athlete's own motor capabilities. Most sports belong to this group.
2. group - sports, the operational basis of which is made up of actions to control special technical means of transportation (car, motorcycle, yacht, plane, etc.).

Sports result in these types is largely due to the ability to effectively manage technical means and the quality of its workmanship.

1. group - sports in which physical activity is strictly limited by means of hitting targets from special weapons (shooting, darts).
2. group - sports in which the results of the model-constructor are compared sportsman’s activity (aircraft model, car model, etc.).

5 group - sports, the main content of which is determined by competition the nature of the abstract-logical outplay of the opponent (chess, checkers, bridge, etc.).

Group 6 - all-around, composed from sports disciplines included in various groups of sports (orienteering, fox hunting, biathlon, sea all-around, service all-around, etc.).

In sports practice, there is another classification, mainly related to the first group of sports and based on the characteristics of the manifestation of physical and the technical ability of the athlete. It also consists of 6 groups.

1. High-speed power sports. These include jumping, throwing, weightlifting, ski jumping, sprint distances in running, swimming, skating and cycling, etc.
2. Cyclic sports requiring preferential prolongation of endurance, with a competitive exercise duration of more than 1.5 minutes (running, swimming, walking, rowing, skiing, skating, cycling, triathlon).
3. Complexly coordinated sports, in which complexity and beauty are assessed movements performed (sports, rhythmic gymnastics, diving, figure skating, acrobatics, equestrian sports, alpine skiing, etc.).
4. Sports games, both single and team.
5. Martial arts (boxing, all types of wrestling, fencing, kickboxing, martial arts state).
6. All-around - consisting of exercises belonging to different groups (athletic all-around, ski Nordic, modern pentathlon, etc.).

For the implementation of effective competitive activity and achievement socially significant, personal and team results, a well-functioning system of athlete training is required. In another way, it can be defined as the sum of subsystems reflecting the system of competitions, training and additional factors that increase and optimize the effectiveness of competitive and training activities.

The main form of training an athlete in this system is sports training, which is carried out in the form of compulsory training sessions under the guidance of a coach-teacher and additional, independent ones, conducted under his indirect control.

***Sports training -*** *it is a specialized pedagogical process based on a system of exercises and aimed at education and improvement, abilities that determine the readiness of an athlete to achieve the highest results tats.*

The most important component in the system athlete's training are competitions serving as the goal, means and method of training an athlete. It should be emphasized that competitions in the system of training highly qualified athletes (teams) also act as a means of effective economic provision of training.

A necessary component in the training system of an athlete is a system of selection and sports orientation. It aims at identifying gifted people and identifying first promising directions for achieving high results based on the study of the inclinations and abilities of athletes, their individual characteristics.

In addition to sports training and competitions, the athlete's training system includes factors that enhance, complement and optimize the effect training and competition.

***Athlete training system*** *is a collection of different knowledge, means, methods, organizational forms and conditions interacting with each other in practice on the basis of certain principles, rules and ensuring the best degree of the athlete's readiness for maximum achievements.*

Highest readiness to perform in competitions and the achievement of high sports results are possible under the condition of modern scientific and methodological support of the entire training system. Hence the concept of "School of Sports", which is understood as the system of training an athlete, formed on the basis of the latest scientific data and advanced sports practice.

In the practice of sports, the concepts of "sports activity" and

"Competitive activity". They are often used synonymously, but they contain the concept and semantic meaning of each of them differ significantly from each other.

*Sports activities* characteristic of sport as a multifaceted social phenomenon, since it affects various areas of human activity. Achieving the maximum result is impossible without involving a large number of people of various professions in the field of sports. Sociologists, doctors, teachers, physiologists, engineers, specialists from the administrative apparatus, the arts, logistics and many others ensure the functioning of sports in the country. Moreover, the activities of these people are determined by the social and economic conditions of society.

In this regard, sports activity is an orderly organization of activities to ensure maximum recovery and improvement of a person in the field of sports. Its basic principles and forms are determined by the social conditions of the functioning of sports in society.

***Competitive activity -*** *this is a specific motor activity of a person, carried out in the conditions of official competitions at the limit of mental and*

*physical forces of a person, the ultimate goal of which is to establish public knowledge tangible and personal results.*

The actual competitive activity of athletes is carried out in a competition. Competition is an important factor in the knowledge of human capabilities and the formation ethical relationships, as well as a form of communication between people or groups of people.

The end result of competitive activity is sporting achievement.nation, which is characterized by a quantitative or qualitative level of indicators in sports.

***Sporting achievement -****it is an indicator of sportsmanship and ability athlete, expressed in specific results.*

Sports and competitive activities, the organization and conduct of various different kind of competitions organically merge into the sports movement, since in all directions. They play an essential role in the latter's activities (mass, public sports and elite sports). Hence, the sports movement is a social movement, sports practice tick in the field of mass sports and sports of the highest achievements.

Along with the concept of "sport", the concept of "physical culture" or their combination - "physical culture and sport" is often used. Sport is an integral part, a major component of physical culture. A number of social functions of physical culture apply to sports. However, not all sports can be classified as components of physical culture. This is due to the fact that the term "physical culture" is understood as the organic part of the culture of society and the individual, the rational use of physical activity by a person as a factor in optimizing his condition and development, physical preparation for life practice.

Sports such as chess, checkers, bridge, modeling disciplines are not directly related to the use of physical exercises as the main means of preparing for sports achievements.

In this regard, although sport is one of the components of physical culture, it at the same time, it goes beyond its framework, gaining a certain independence.

The sports movement in our country and around the world, as a rule, covers the practice mass sports. A multimillion army of children, adolescents, boys, girls and adults people, doing sports, strengthen their health, get joy from communicating with people, improve in the chosen sports specialization, improve their physical skills range, general performance and achieve sports results in accordance with their capabilities.

## The essence and functions of sports. The main directions of sports movement in the modern world

Sport in the modern world, gaining more and more popularity, is becoming, alongside with science, technology, art, a full-fledged component of the social life of society. Vat the present time it is difficult to imagine our life without one or another manifestation of sports. Sport is often viewed as a kind of model of society, reflecting to a certain extent existing real connections, relationships and contradictions - competition and struggle, victories and defeat, rivalry and cooperation, striving for excellence, achieving the highest results in activities, meeting creative, prestigious and other interests, which, thanks to the emotional sphere in sports, are manifested most vividly in it, at the same time, however, sometimes acquiring hypertrophied forms.

Content sports, its types and disciplines, as well as forms of organization developed under the direct influence of changes in the field of production and science, ideology and politics, pedagogy and philosophy. At the same time, in the field of sports, play, work, cognition, and communication have always been presented in specifically concrete forms.

With the growing popularity of sports, sports achievements are getting more and more widespread public appraisal. In turn, the popularity of sport, due to its publicity and accessibility of the sports language, entertainment, awareness of the significance of achievements and aesthetics in a broad sense, is supported and often artificially inflated by various social groups that use sport to solve their specific tasks. The importance of sports achievements is also increasing due to the fact that their level is to a certain extent identified with the level of culture, the power of the state and its social system.

Athletes identify their goals with the tasks of the state, organizations, teams that they represent, they are aware of the responsibility for the results and consequences of personal success or failure, their social significance. On the other hand, sport, being a means of self-expression, also becomes a means of a relatively rapid increase in social status, a means of achieving material and moral encouragement in a sphere accessible to the younger generation.

The importance of sport for the comprehensive and harmonious development of the individual is also manifested in the fact that it is a vast area of ​​self-expression, manifestation and formation of certain abilities, talents, talent; on the other hand, it helps prepare people for life practice, that is, for various types of activities.

Sport has both indirect and direct impact on cultural and economic development society, state, people, the way of life of people. In addition, it is a "test bench" on which the qualities of a person are tested, approaches to the disclosure of abilities are experimented with. And in this sense, sport is unique, since no other human activity can give adequate results.

### Social functions of sports

The term "function" in the social sciences is associated with the concept of "function", act to act, to influence. From this point of view, it is necessary to talk about the impact of sports on a person in order to satisfy his physical and spiritual needs originating from his essence. But sport is not limited only to this, its functions are much broader. It influences human relations, develops certain needs of the individual and society. At the same time, the main thing is the all-round harmonious development of a person, which

due to the general purpose of education, which provides for the full preparation of people for labor and other necessary activities.

The functions of sport are understood as the objectively inherent properties of it to influence a person and human relations, to satisfy and develop certain needs. personality and society.

Sports theorists have identified a number of functions inherent in modern sports. So, LP Matveev (1991) names the following specific functions of sport - competitive-standard and heuristic-achievement and non-specific - versatile physical development, personality upbringing, preparation for life practice; sports and recreation (recreational); aesthetic; the function of socialization of the individual and social integration, economic, communicative.

NI Ponomarev (1987) identifies the basic functions of sport, which in turn generate a number of derivatives. He identified a number of the following basic functions: competitive (normative, entertainment, hedonistic); health-improving and recreational (health-improving, preparatory); informational and prognostic (informational, cognitive, educational, prognostic-heuristic, intellectualization function); humanistic (ideological, political, socializing, moral and educational, prestigious, internationally integrative).

A close examination of them shows that in some cases the authors repeat each other, calling the same function in different terms.

*Specific, competitive reference function.* The basis of the specificity of sport is the actual competitive activity, the essence of which is the maximum identification, unified comparison and objective assessment of certain human capabilities in the process of competitions, focused on winning or achieving a personal high sports result or place in the competition.

Records and achievements recorded in sports, performance of classification norms are gaining wide recognition and serve as a kind of indicator of individual and universal human capabilities. Unlike technical standards, a sports standard does not historically remain unchanged, but is progressing all the time, thereby stimulating the mobilization of an athlete's efforts for self-improvement. The reference function is most pronounced in the sport of the highest achievements, however, to one degree or another, it is characteristic of sports in general, including the mass publicly available through a system of specially organized competitions.

*Specific, heuristic-achievement function.* It consists in the fact that it represents a type of creative search activity, associated with a person's knowledge of his capabilities, along with finding effective ways to maximize their implementation and increase them (L.P. Matveev, 1991). This function is most fully expressed in elite sport, because on the way to them it is necessary to constantly improve the training system, look for new means, training methods, new samples of the most complex elements of technology and tactical decisions of wrestling.

It is necessary to improve the abilities to fully mobilize their capabilities in competitions and use them most effectively at different stages of many years of training in order to rise all the time to a new level of skill. Like a gigantic creative laboratory, sports are thus paving the way for the heights of human achievement. This can be confirmed by the words of the Nobel Prize laureate Archibald Hill that the greatest amount of concentrated physiological data is contained not in books on physiology, but in world sports records.

*Sports and recreational function (recreational).*It manifests itself in the positive influence of sports on the state and functional capabilities of the human body.

This is especially pronounced in children's and youth sports, where the beneficial effect of sports on the developing and forming organism is invaluable. It is at this age that the foundations of health are laid, the skills of systematic physical exercises are instilled, and the habits of personal and public hygiene are formed. Sport is at the same time a source of positive emotions, it levels the mental state of children, allows you to relieve mental fatigue, and allows you to know "muscle joy". Its role is also great in the elimination of the negative phenomena of hypodynamic in children.

Sports and work with the adult population play an important role. It is a means of health improvement, protection from the unfavorable consequences of scientific and technological progress with a characteristic sharp decrease in motor activity in labor activity and in everyday life. Sport is one of the most popular forms of organizing healthy leisure, recreation and entertainment. This is most noticeably manifested in mass sports, where the goal of achieving the highest sports results is not set.

*Educational function.* Sport presents great opportunities not only for physical and sports improvement, but also for moral, aesthetic, intellectual and labor education. The attractive power of sports, high requirements for the manifestation of physical and mental strengths provide ample opportunities for the purposeful education of the spiritual traits and qualities of a person. It is essential, however, that the final result in achieving educational goals depends not only and not so much on the sport itself, but on the social orientation of the entire educational system. Thus, the educational possibilities of sports are realized not by themselves, but thanks to the activities of educators.

Since sport is included in the conditional socio-pedagogical system, it is also an effective means of physical education, and thanks to practicing professionally applied sports, it becomes an essential component in labor and military activity.

*The economic function of sports.* Sport is of great economic importance, expressed in the fact that the funds invested in the development of sports are repaid a hundredfold, first of all in increasing the level of health of the population, its general working capacity, and prolonging human life. At the same time, the constituent functions, namely, increasing the role of sports science, improving the material and technical base, training personnel - all this contributes to the development of children's and youth sports, mass sports and sports of the highest achievements.

The financial resources obtained from sports shows and the operation of sports facilities are also of economic importance. However, this is a small fraction of what the state and public organizations are investing in the development of sports. The main value of our community state is health. And in this aspect, the role of sport is invaluable.

*Aesthetic (entertainment) function of sports.* It is revealed in the fact that sport (many of its types) carries aesthetic properties, manifested in the harmony of the physical and spiritual qualities of a person, borders on art. Especially in this regard, complex coordination sports are attractive, such as artistic and rhythmic gymnastics, figure skating, jumping into the water, etc. The beauty of the human body, technically challenging and perfected movement, festive mood - all this attracts true sports fans. The popularity of sport as a show is characterized by emotional clarity, the severity of the experiences it causes, affecting the personal and collective interests of many people, as well as the universality of the "language of sports", which is understandable to almost everyone.

For almost everyone, sports are interesting as an emotionally intense spectacle. Modern technical means of communication, especially television, have contributed to the fact that the audience of sports events has expanded like never before, and this has increased the influence of sports to the emotional world of humanity.

Without fans, sport would cease to be any generally significant social phenomenon. Empathizing with those who compete in the sports arena, fans of identifications they themselves with one of them, as if they themselves participate in sports battles, the struggle of characters, the resolution of sports conflicts on an emotional level, they find vivid examples to follow and reasons to assert themselves in their position in life.

*The function of personality socialization and social integration.* Sport is one of the most powerful factors in involving people in public life, familiarity with it and the formation of the experience of social relations in students. This is the basis of its important role in the process of socialization of the individual.

Specific sports relationships (interpersonal, intergroup, intercollecactive) are somehow included in the system of social relations that go beyond sports. The totality of these relations forms the basis of the influence of sport on a person, assimilation of his social experience both in the field of sports and on a wider scale.

The sports movement as a mass social movement has acquired considerable importance as one of the factors of social integration, that is, the rapprochement of people and unification them into groups, organizations, unions, clubs based on common interests and activities for their satisfaction. Popularity of sport, natural assessment of sporting success with prestige the interests of the people, nation, state make it a convenient channel for influencing mass consciousness. In the modern world, this channel used for commercial purposes as well.

*The communicative function of sports.* Humanization of society in the present period of the development of mankind makes sport a factor in the deployment of international relations, mutual understanding mania and cultural cooperation of peoples, consolidation of peace on earth.

Sport has long taken one of the leading places in international communication. Unsurprisingly, international sports ties have grown in our era to a global

ball sizes, and such forms of sports movement as "Sport for All" and the Olympic Movement have become the broadest international trends of our time. It should be noted that the International Olympic Committee currently unites over 200 National Olympic Committees.

### The main directions in the development of the sports movement

Sport in our country and around the world is developing in two main directions:

* + - 1. Massive public sports.
			2. High performance sport.

#### Massive public sports

Massive public sports include: school and student sports, professionally applied sports and recreational sports, conditioning sports and sports with a disability.

In many countries around the world, these varieties are included in the Sports for All movement, reaching millions of people involved.

Depending on the orientation of classes in mass public sports in the process of systematic classes, a number of tasks are solved: educational, upbringing, health-improving, professionally applied, recreational, improving personal physical condition (condition).

The basis of mass sports is school sports, focused on achieving basic physical fitness and optimizing general physical capacity (general education school, lyceums, colleges, vocational schools).

Thus, school and then student sports provide general physical preparation and achievement of sports results of a mass level. In mass sports movement also includes professionally applied sports - as a means of preparing for the determination divided profession (military and service all-around, fire-applied sports, various new types of wrestling and martial arts in the air force, airborne, internal warskakh and special-purpose units).

The mass sports movement also includes recreational sports - as a means of healthy recreation, recovery, recovery of the body and maintaining a certain level performance.

Conditioning sports serves as a means of maintaining the required level of performance.ability, increasing the physical fitness of people who take part in massive official competitions.

Disabled sport serves as a means their rehabilitation, increasing physical performance, emotional charging in the process of socially useful activities.

An intermediate position in the sports movement between mass (public) sports and sports of the highest achievements is occupied by athletes involved in the system of children sports schools, clubs, sections.

According to statistical data, in the Russian Federation, the number of people engaged in variousstructures of additional education is the following:

- CYSS - 60.6%;

* SDYUSSHOR - 24.4%;

- SHVSM - 1.8%;

* higher sportsmanship - 0.8%.

Thus, about 2% of athletes and workers are engaged in elite sports.about 3% of coaches are melting.

Of 3.5 million children and adolescents, boys and girls, only 68.5thousand become highly qualified athletes.

As a result, the modern system of sports schools and clubs works like a sport of higherachievements and mass public sports.

#### High performance sport

Elite sport is an activity aimed atsatisfaction of interest in a particular sport, to achieve high sports results that are recognized by society, to increase both their own prestige and the prestige of the team, and at the highest level - the prestige of the Motherland.

Achievements in "big" sports are possible only through constant training work with bigphysical and mental stress. Competition performance imposes a great responsibility on the athlete; the high "cost" of each mistake, each unsuccessful start becomes a factor that determines the stringent requirements for his psyche. This is the main specificity of elite sport.

At the same time, the sport of the highest achievements, as it were, grows out of mass public sports, is associated with a certain continuity in relation to the means and methods of training,stimulates the mass sports movement, creating benchmarks for achievement.

Modern elite sports are also heterogeneous. Currently in itthere are two directions:

1. The so-called amateur sports of the highest achievements.
2. Professional sports.

The main difference between professional sports and the so-called amateur spellIt is believed that it develops both according to the laws of business and according to the laws of sports, to the extent that they can be embodied in the training of professional athletes. The system of competitions of professional athletes is influenced by certain goals, consisting in successful performance in a long series of starts, following one after another, which is associated with material rewards for each start in accordance with the "value" of the athlete in the sports market. In this regard, some professionals do not set themselves the task of entering the state of the highest fitness of sports form only two or three times in a year's cycle. For a long period of time, they maintain a sufficiently high, but not maximum, level of preparedness.

Professional athletes can be divided into three groups.

*To the first group* should include athletes who strive to successfully perform asat the Olympic Games, World Championships, and in a series of cup and commercial starts.

*To the second -* athletes who have high results, but are not tuned in to victorious participation in major competitions. Their main task is to successfully perform in various cup, commercial competitions and starts by invitation.

*To the third group* should include veteran athletes, especially those specializing in sports games, martial arts, figure skating. These athletes, maintaining an average level of physical fitness and a very high technical level, accompanied by high artistry, demonstrate the highest sportsmanship for the sake of spectators and high earnings.

Representatives of "amateur" sports of the highest achievements, as a rule, are studentsdents, students or military personnel, which gives them the right to call themselves amateurs (although their earnings now often border on the earnings of professionals). Amateur athletes almost always build their training with an eye to the main competitions: the Olympic Games, World Championships, Europe, Russia.

Successful performance in these competitions allows them to raise their rating, and in the future, moving to "pure" professionals, to achieve higher fees.

In the XX century. the sports movement in the world has continuously expanded, despite the pessimismicalassessments of a number of sociologists and philosophers, who predicted a gradual decline of high-performance sports, in connection with certain negative trends accompanying its development.

If the structure of mass sports does not cause discussion among specialists, then the views on the structure of elite sports in literary sources differ significantly.Some authors divide it into Olympic and professional sports, others - into professional super-achievement and professional commercial, etc. In our opinion, modern elite sport is a mixed sport, the subjects of which are both amateur and professional athletes. In this regard, it is illogical to divide elite sports into “professional” and “Olympic”, since the majority of the Olympic Games are professionals.

Division of sports into professional super-achievement and professional commeasurement also does not correspond to the situation prevailing in real sports practicetike, since most professionals have very high athletic performance up toup to world records and compete at various levels.

Thus, elite sport is a symbiosis that unites

"Amateur" and professional sports, the subjects of which are athletes,preserving, regardless of their social and legal status, loyalty to the ideals of the Olympic Charter. Yet the division of athletes creates certain difficulties for the national Olympic committees and national sports federations, since their interests

often disagree with the interests of managers and sponsors, on the one hand, athletes andnerves, on the other. Therefore, no ways have yet been found to consolidate all social groups - participants in elite sports, especially in preparation for the Olympic Games.

The successful functioning of elite sports is ensured by a highly organized training system, which includes three main subsystems: competition, training and factors,increasing the effectiveness of competitive and training activities. This system develops on the basis of the laws of both sports theory and systems theory, and the management of this system is based on the theory of management (management).

## Characteristics of the sports training system

##### The main components of the sports training system and the principles of its functioning

The main most important components of the system sports training are: competition system; training system; as well as a system of factors that increase the efficiency of their functioning, including: selection of athletes, personnel providing training, information, scientific, biomedical and material and technical support, financing; the management of sports and its effective organizational structures; and the use of environmental conditions. Each component of this system has its own functional purpose and at the same time is subject to the general laws of its structure, functioning and development.

The training process for a highly qualified athlete covers the period from 8 to 20

years.

Efficiencythe process of training an athlete is largely determined by the selection and

the placement of personnel, mainly athletes, coaches, scientists, doctors, superviselei, service personnel, their interest, talent and professional comperenniality.

Thus, the system of sports training is a multifactorial phenomenon, where the components, on the one hand, have their own specific functional purpose, on the other hand, they are subsystems, the whole set of efforts and actions of which is subordinated to the achievementultimate overall goals and results.

The most important component of sports training is the system of competitions.Sports competitions, being a specific form of activity in sports, determine the goals and orientation of training, and are also used as one of the most important means of specialized training that allows you to compare and improve the level of preparedness of those involved.

Taking into account sports and economic feasibility,conditions of conduct, traditions, specific features in each sport, systems of competitions are formed, which, as a rule, have continuity at the world, national, regional and local levels.

The functions of the system of sports competitions in modern sports are extremely broad and diverse. It is the most important universal mechanism for managing the improvement of the skill of athletes; largely determines the content, focus and structure of the training process; acts as a necessary control tool; has a significant impact on the development of the sport; allows you to quickly organize the interaction of the world and domestic systems of sports training; contributes to the development of publicity and popularity of sports; actively influences the formation of the motivational mechanism.

However, in certain cases, individual competitions go beyond the system underpreparation of athletes, since they are the result of this preparation in a multi-year or annual cycle. Such competitions most often include the Olympic Games, World and European Championships, and for less qualified athletes, the main target competitions are the championships of Russia, regions, etc.

The effectiveness of the functioning of the competition system, that is, the achievement of the plannedbathroom sports performance at certain starts and at the right time is provided by an effective training system.

The training process is the basis of sports training, determines the characterand the content of all motor activity, as well as financial, logistical, informational, scientific and medical support and rehabilitation measuresacceptance.

In the process of training activities, the athlete improves his physical,technical, tactical and mental readiness, and successful prerequisites forachieving their high level is the upbringing of a person and the level of his intellectabilities.

With the development of sports and the growth of sports achievements, the importance of factors that increase the effectiveness of the functioning of both the training system andcompetition system.

Considering the system of training athletes in all its diversity, it should be borne in mind that it was created by people and for people. Therefore, the most important goal of the system is the formation of the personality of an athlete with a high spiritual and moral potential, capableshow world-class sports results.

*Frames.* The progress of the national system of training athletes is always ensured by the level of professional qualifications of personnel, the presence of talented athletes andnerov, the scientific potential of specialists who are able to propose advanced steps in those areas that are most promising for the further growth of sportsresults.

In the context of increasing competition in sports, the deterioration of the environmental situation in the largest industrial regions, the most important factor in the success of trainingis the selection of promising athletes.

*Selection -* this is a complex of organizational and methodological measures pedagogical, biomedical, psychological and social nature, allowing to determine a high degree of predisposition (giftedness) of a child, adolescent, young man to a particular kind of sports activity (sports discipline). In modern sports, characterized by constantly increasing competition and continuous growth of results, it is especially important to identify athletes who have the necessary morphological and functional data and a synthesis of physical, mental and intellectual abilities that are at an exceptionally high level of development.

The main requirement for the selection system is that it should act as an organic component of the system of long-term training, since abilities can be revealed only in the process of training and education and are a consequence of a complex dialectical unity - innate and acquired, biological and social (V . N. Platonov, 2015).

*Scientific, biomedical and information support.*Timely implementationthe introduction into practice of the achievements of scientific and technological progress is one of the decisive factors in the effectiveness of training athletes. The system of scientific and methodological, medico-biological and information support includes a rather ramified network of specialized units in research institutes and academies of physical culture in our country; complex scientific groups (KNG), created under the combined teams of Russia, a number of republics and regions; medical and physical dispensaries, methodological offices at various sports organizations. This system should include specialized book publishers, newspapers, magazines, sports editions of television companies, Internet resources.

The system performs the following functions:

* identifies trends in the development of sports, carries out scientific foresight of ways to developtii of the main components of the training and forecasting system;
* develops theoretical, methodological and program-normative foundations of sports;
* improves organizational, managerial, economic and material and technicalnatural factors;
* develops medical and biological problems of sports, as well as realizesthe introduction of practical measures to preserve and restore the health of athletes, increasetheir performance;
* develops psychological problems of sports and ensures the implementation of practiceical measures for the mental support of sports training;
* conducts training and retraining of personnel;
* provides sports professionals with information.

It should be noted that the development of sports science, the introduction of the achievements of world scientific and technological progress into sports contributed to the involvement of specialists in various fields in the comprehensive scientific and information support of training athletes.

- teachers, doctors, biologists, physiologists, biomechanics, biochemists, sociologists, engineersmoat, mathematicians, etc. At present, the volume of information in the world is doubled in 20 months, powerful information centers are being created, equipped with computer technology.coy. In the training and competitive processes, diagnostic,measuring, computing, audio and video equipment, etc.

*Logistics support.*In recent years, cardiology has occurred in sports.changes associated with the improvement of the material and technical base, constructionthe establishment of sports facilities, training bases for sports, the creation of new modelsinventory, equipment, exercise equipment, sports shoes, clothing, etc.

Numerous specialized firms have sprung up in the world, between which there is fierce competition for priority in the development of the latest sports products. Progress in this most important area contributes to a change in technique, improvement of training methods, preservation of the health of athletes, and accelerates the growth of sports results.

In our country, at the present time, as the market economy develops, material conditions are created for playing sports of the highest achievements in sports schools, centers and clubs. Expansion of foreign economic activity made it possible to saturate the market with sportswear, footwear, exercise equipment, equipment and inventory.

*Financing.* At present, in Russia, sports are financed from various sources: the state budget, funds from charitable foundations,commercial organizations,sponsorship, as well as from local budgets. This allows creating conditions for free sports activities for the most gifted children, adolescents, disabled people and other categories of the population in sports schools, sports clubs and sections. In recent years, a number of sports organizations have been transitioning to self-financing and other non-traditional forms of management. The rights and opportunities of federations, DSOs, regional, departmental sports organizations, clubs, teams in matters of self-financing, including currency self-sufficiency, are expanding.

Due to the constant complication of technology and an increase in resource intensity, I notedthere is a tendency towards an increase in the cost of the process of training athletes, especially at the stage of highersportsmanship. Calculations show that the cost of training one athlete per year at the stage of superior mastery is 800-1000 times (and in some sports and more), more,than during the initial preparation phase.

*Environmental factors.*The functioning of the athletes' training system cannot beto build in isolation from social, economic, demographic conditions and natural environment. All these factors have a significant impact on the development of sports. For example, in the northern regions, preference should be given to winter sports, in the mountains - alpine skiing, etc. For example, in Yakutia, where a population of a certain morphotype prevails, it is advisable to develop all types of wrestling, weightlifting, and inappropriate - basketball, volleyball. At the same time, there is also an inverse relationship. The sports system as a whole or its regional subsystems actively influence the environment, especially the social one, which, to a certain extent, transforms it in accordance with the needs of society.

Environmental factors: altitude, temperature, ambient humidity, change in the time zone - also affect the effectiveness of training and competitive activity. On the one hand, they can contribute to an increase in sports performance, and on the other, they can significantly reduce it. It is especially important to consider factorsthe external environment in the process of preparing for the most important competitions.

*Management and organizational structure.* System management of an athlete's training improvement is a set of controlled and control subsystems, the action of which is aimed at the implementation of programs and the achievement of the assigned tasks. It is complex in nature and covers all levels - management of the direct training of athletes, local, regional, federal. At each level, specific tasks are solved, the subordination and coordination of which determines the systematic nature of management. Complexity is also manifested in the fact that the control system contains various components - biological, socio-economic, material and technical, informational, etc.

In the management system, an organizational structure and a mechanism are distinguished,the functioning of the system and the achievement of goals.

An organizational structure should be understood as a set of relationships and sopodthe ranks of various sports organizations,goals, tasks and functions of the system as a whole and its individual components, information flows between them.

The control mechanism is a complex of different methods, techniques, incentives thatare used by people in the management of the training of athletes.

The structure of the national system of training athletes has evolved historically, it includes many different organizations and is a state-publiccharacter. It should also be borne in mind that at present, within the framework of this structure, both mass physical culture and sports of the highest achievements are managed. In the conditions of an extremely complex structure of the organizational structure, various trends appear: on the one hand, integration, cooperation, coordination, on the other

- administrative and functional isolation, the formation of narrow departmental andnarrowly organizational goals.

## Sports achievements and tendencies of their development

*Sports achievement,* as a rule, expressed by a victory over an opponent, assessedin points, goals, points; demonstration of results expressed in terms of time, racesstanding, mass, accuracy of hitting the target, better performance of complex movementsspecific combinations with an assessment of their composition, etc.

Sport is unthinkable without striving for the highest (absolute) achievements, which are, as it were, standards for assessing the reserve capabilities of both an individual andsociety of people in general. However, the peculiarities of sports and its indicators in the form of sports achievementszhenie are that iftoday, absolute achievements are within the power of a narrow group of outstanding athletes, then in a few years they become the property of an increasingly wider mass of those involved.

What do sporting achievements depend on? What factors influence their dynamics in modern society?

### Factors Influencing the Dynamics of Sports Achievements in Sports

Athletic achievement is determined by many factors.

*Individual talent of an athlete.*

Modern science distinguishes between the inclinations, giftedness and abilities of a person. Engaging in any kind of sport requires a person to manifest certain abilities, which are expressed by individual personality traits, which are a condition for the successful performance of one or more types of activity. It should be noted that abilities are not limited to knowledge, skills and abilities, but "are found in the speed, depth and strength of mastering the methods and techniques of certain activities."

An innate component of ability is giftedness. It provides a person with the opportunity to successfully perform the corresponding activity. In relation to sports, we can talk about physical and mental qualities and personality traits that ensure the success of a certain competitive activitynosti. Giftedness is gradually becoming the main criterion in the transition of those involved in sports schools from one group to another, from onethe national team to another, higher rank.

The development of certain abilities for sports is based on certain inclinations, which are understood as innate anatomical, physiological and mental characteristics. However, the highest level of various human abilities is always the result of his development in the process of rationally structured activity, and in sports

- training systems. By themselves, the makings of a person can onlypromote the development of abilities. And this requires directed education, development and training. Thus, the inclinations of a person, combined with giftedness, with optimal pedagogical influence, and in some cases when using the experience accumulated by previous generations, make it possible to develop certain abilities.

When assessing athletic ability, the coach faceswith three key points

tami:

* the composition of the abilities for a particular sport;
* objective and earlier assessment of each person of these abilities in order to

predicting the features of the course of its further improvement;

- what ways to achieve the formation of these abilities, if they are not enough timeswhites, or how to compensate for them in case of their low level.

These and numerous other issues are resolved in the process of many years of selection in sports as a factor contributing to the achievement of high sports results.

*The degree of preparedness for sporting achievement.*

If the individual talent of an athlete is enougha conservative factor, since it is based on natural inclinations, the second factor is dynamic. Hence, purposeful training of an athlete is of decisive importance, determining the achievement of high results. By directly influencing the natural inclinations, the coach achieves the necessary development of the athlete's abilities, ensuring progress in a particular sport. In this case, the main condition is the athlete's great dedication, expressed in purposeful training and the achievement of the main and intermediate (stage) goals. One of the prerequisites for this is the significant expenditure of an athlete's efforts on self-improvement. None of the most gifted athletes can achieve great results without hard work.

In this regard, sports achievements are "an indicator of the size of the useful expenditures of an athlete's efforts on self-improvement, an indicator of his success on this path" (L.P. Matveev,1977).

At present, training loads and total time spent in the process of training athletes reach significant values. Suffice it to say that in various sports, the total amount of time allotted for training and competition ranges from 800 to 1500 hours per year. In some sports disciplines, three training sessions a day are practiced. All this makes high demands on the mental qualities and personality traits of the athlete. Only an athlete highly motivated for achievement can withstand such loads with high dedication and self-exactingness.

Thus, the degree of an athlete's readiness depends on his use of effective training and competitive systems, as well as on the awareness of the importance of social and personal sports activity and the motives that form the goal of this activity, which ensures the progress of sports achievements.

*The effectiveness of the athlete training system.*

The scientific and technological progress of modern society continuously affects the perfectthe development of the entire training system, provides for bringing it to a new high-qualitylevel. The first place in this group of factors influencing the level of sports achievements,occupy the scientific and methodological foundations of the system of sports training. Based only onmodern scientific data, processed into methodological developments and found their place in the structure of sports training, we can talk about the effectiveness of an athlete's training. An important point in the implementation of a modern system of sports training is the information support of all participants in this process: athletes, coaches, doctors, etc.

To a greater extent, the effectiveness of the athlete's training system depends onselection of high quality equipment, footwear, clothing, protective devices. The history of the development of sports shows that there is a constant search for new samples of sports equipment, its quality, operating conditions, high-quality and solid equipment is being created, various designs of simulators (mechanical, electromechanical, electronic), which help to solve both general and specific tasks in sports training ... A significant role in the training process is played by means and methods of restoring athletes

new after high training and competitive loads, as well as methods of increasinghis athletic performance.

An important role in improving the efficiency of the athletes' training system is assigned toproblems of improving tactical and technical training. In many sports, they are the dominant aspects of skill that determine the success of the entire system. The level of sports achievements ultimately depends on the timely development of new elements and combinations, tactical techniques.

*The scope of the sports movement and the provision of personnel.*

The effectiveness of the functioning of sports in any country depends on such a factor as the scope of the sports movement. Sociological and statistical analysis shows: the more people are involved in sports, the more athletes go to sports, this in turn increases the competitiveness among them and is reflected in sports results. At the beginning of the XX century. the outstanding French educator and humanist, founder of the modern Olympic movement Pierre de Coubertin wrote: “In order for a hundred people to go in for physical culture, 50 people need to go in for sports; in order for 50 people to go in for sports, 20 people need to specialize in a particular field of sports; and in order for 20 people to be engaged in a certain field of sports, it is necessary for 5 people to show amazing results. "

However, the increase in the mass of sports is associated with the social conditions of society and with the training of the necessary specialists: coaches, instructors, teachers, doctors, employees of sports facilities, etc. outstanding athletes.

##### Social conditions for the development of sportstraffic and its economic support

Sociological studies show that the level of sports achievements of that or another country largely depends on the conditions of the material life of society, which playthe leading role in determining the general life of a person. As showresearch by A.M. Maksimenko (2009), the aggregate level of achievements in many sports cultivated in different countries, correlates with indicators of the material well-being of the people, as well as with indicators of average life expectancy, total number and literacy of a person. At the same time, developing countries with low economic potential can successfully develop two or three sports that reflect the ethnic and geographical characteristics of the population and its traditions. An example of this is the runners of Ethiopia and Kenya, boxers from Latin America, football players from African countries, etc. However, the development of many popular and mass sports in the complex is beyond the power of these countries due to the economic conditions of society.

Thus, sports achievements are due to many factors, the most importantof which are the above. Overall, athletic performance reflects successa person in improving their abilities and are one of the indicators of developmentsports, physical culture and culture of society as a whole.

Sports performance as a quantitative characteristic also has an independent value for a person.

Of course, the achieved result is assessed by both the athlete and the society in relation to the scale and rank of the competition, the qualifications of the opponents, the conditions ofcompetition and, especially, in comparison with the record.

Sports results exceeding those previously achieved at official competitionsniyas of a certain rank are recorded as records.

Records are recorded in those sports in which athletic performance can be determined in units of weight, length, distance, height, number of hits, timehim, etc.

It should be noted that the level of records for men and women is slowly converging. Currently, record speeds in cyclic sports for women are 89 to 93% of men.

### Trends in the development of sports achievements

Modern sport is characterized by the constant growth of sporting achievements. Moreover, in each individual sport or individual discipline throughout historytheir development, there is an uneven dynamics of achievements. At some stages, she is connectedwith leaps in results, on others - with a temporary plateau, on the third - with a gradual and continuousrapid growth. This is due to a number of factors described in the previous section: the introduction of new training methods, the economic incentives of the competition system, the improvement of inventory, equipment, clothing, footwear, the use of new methods to increase the athlete's performance (psychological and physiological orientation).

However, in general terms, the dynamics of the growth of sports achievements in any sport can be described in the form of a logistic curve, first substantiated by the Polish scientists E. Skorowski and J. Brogli.

This curve consists of three phases, each with its own characteristics. To a certain extent, this curve reflects the history of the formation of the sport, as well as the individual growth of an athlete's skill. The duration of these phases in different sports disciplines is different.

*Phase one* This curve is associated with the origin of the sport, the development of rules and regulations for the conduct of competitions, a clear definition of the subject of rivalry between athletes or teams, the creation of a training methodology and exercise technique specific for this sport. In this phase, athletic performance tends to slightly increase.

In the individual development of an athlete, this phase is associated with the beginning of training.a new kind of sport, mastering the basics of technology, tactics, physical fitness.

*Second phase*logistic curve reflectscontinuous and rather rapid growth of sports achievements associated with an increase in the quantitative and qualitative parameters of training loads, improvement of the technical, tactical and mental readiness of athletes, the use of better quality inventory and equipment with fairly well-established rules and regulations of competitive activity.

In other words, the more athletes begin to work and the higher the quality of thisactivity, the stronger the growth of sports achievements is observed.

On an individual basis, the factor of biological age is added, long-termadaptation of the body, the acquisition of sports and life experience by a person.

*Third phase* the logistic curve is associated with a slowdown in the growth of achievements as a wholein a specific sports discipline and in an individualdevelopment. Although individual achievements of scientific and technological progress can cause a short-term "outbreak"

results. The same "outbreak" can be caused by the use of illegal drugs (doping).

The slow growth of sports achievements is observed against the background of significant efforts of both the athlete himself and all the participants who provide his training. Society represented byfederations, clubs, sponsors invest heavily in the training system,therefore, the growth of sports achievements is provided not only by a perfect and highly effective training system, but also by the reorientation of the competition system, which is acquiring more and more commercial foundations, as well as by a large proportion of all factors that increase the effectiveness of training and competitive activities (finance, organization and management, CME , MBO, MTO, etc.). In individual terms, the slowdown in the growth of sports results and their stabilization are also associated with the age of the athlete, his transfer to the group of veterans.

### Features of determining a sports result

Athletic performance is a quantitative measure of the outcome competitive activity of an athlete or team. According to the method of determining the competitive result, all sports can be combined into four groups.

*To the first group*it is possible to single out sports disciplines in which the results of changerye in metric values: time, distance, mass of projectiles, accuracy of the priestDenmark on target.

This group can be divided into two subgroups:

* sports disciplines with relatively constant external conditions competesports (athletics and weightlifting, swimming, cyclingtrack sports, shooting, etc.);
* sports disciplines associated with unstable external conditions of the competition, with the variability of the profile of the tracks and external weather conditions, the currents of water flows (skiing, skiing, sailing, speed skating, cycling on the highway,rowing, orienteering, triathlon, etc.).

*To the second group* you can include sports in which the sports result is determineddivided by judges subjectively in conventional unitsaccording to the external perception of the complexity and beauty of the performed combinations or individual exercises. This group can also be divided into two subgroups:

* sports in which one total conditional assessment in points is exhibited (artistic and rhythmic gymnastics, acrobatics, synchronized swimming, diving, etc.);
* sports where the final score is made up of two different indicators.For example, ski jumping (estimation of flight range and jump style); figure skating (assessment of the exercise in points and the amount of occupied places awarded by the judges according to the general impression).

*In the third group*three subgroups can be distinguished:

* sports in which the result is determined by the final effect (score) for a certain time limited by the regulations (football, hockey, handball, basketballand etc.);
* sports in which, despite the time limited by the rules of the duel, an accelerated achievement of victory is possible (wrestling, boxing, fencing, chess, etc.);
* sports in which victoryis determined by a limited final score, but the fight itself is not limited by the time of the event (tennis, table tennis, volleyball, towns, etc.).

*Fourth group*combines complex sports - all-around, in which the assessmentresults takes place according to the rules of the competition provided for the constituentsports disciplines.

##### Questions and tasks for self-examination

1. Give the basic concepts: kind of sport, sports discipline, type of competition.
2. Expand the classification of sports according to the characteristics of the subject of the competition.
3. Describe the social functions of sports.
4. What is the structure of mass public sports?
5. Describe the main areas of elite sports.
6. What is the fundamental difference between amateur and professional sports?
7. What groups of athletes are included in professional sports?
8. What are the factors that increase the efficiency of the friction systemcourses and competition systems.
9. What are the factors influencing the dynamics of sports achievements?

# Chapter II. Trends and prospects for the development of sports in modern conditions

## Game sports

By order of the Government of the Russian Federation No. 1101-r dated August 7, 2009, the Strategy for the Development of Physical Culture and Sports in the Russian Federation for the period up to 2020 was approved, which reveals the main directions of state policy in the field of physical culture and sports, including increasing the competitiveness of Russian sports in the international sports arena.

The actual problem is increased global competition in elite sports. Winning top sporting awards is one of the most desirable opportunities for a country to make itself known at the international level. In this regard, the Strategy formulates the main task of developing high-performance sports for a long-term period - entering the top three winners of the national sports teams of the country at the Olympics in the unofficial team event.

The solution to this problem is possible with the full support of the unified statepolitics in the field of elite sports, the introduction of modern forms and methods of olimtraining in the national teams of Russia by the all-Russian sportsfederations.

The program management principles fully justify themselves from the point of view of system planning and solving basic problems, since they ensure the rational distribution of the necessary efforts and resources in the main areas. As a result, economic and organizational efficiency increases, and the necessary control is provided. Social order as an economic and legal form of implementation of training programs for national teams of Russia, provided mainly at the expense of the federal budget, is the most effective form of development of Olympic training in sports. Modern sport in its development is based on the all-round improvement of performing skills, the highest level of athleticism, flexible, variable tactical

constructions.

Numerous games include “young” sports such as badminton, rugby, beach volleyball, mogul and a number of others, as well as “old” sports such as football, ice hockey andon the grass, water polo, basketball, volleyball, classic and table tennis, etc. In some sports, Russian teams perform quite successfully,in others it is weak and very weak.

For example, today Russian field hockey is in a stage of stagnation after a cutwhom the slowdown in development in the early 90s of the last century, caused by the incorrect adoption of a number ofpolitical decisions by the leadership of the federation. The decision to hold a qualifying tournament among the former republics of the USSR for the right to represent the country in the largest competitions set Russian hockey back several years ago. Consequently

- decline in the popularity of the Olympickind of sport. Only in the early 2000s there was a positive trend in the development of field hockey thanks to the Decree of the State Sports Committee of Russia No. 1 / 11a dated July 13, 1995 on the introduction of sports into state programs of physical education; Indoor hockey (indoor field hockey) is included in the list of sports recommended for development in Russia. Field hockey has become more accessible to children and young people; Indoor hockey, and then field hockey became active

deal with new regions. The lack of fields for field hockey (until 2001 there were only 2 fields), climatic conditions, the absence of a training system for coaches did not allow field hockey to develop in the right direction.

In team sports, there are various problems that need to be addressed.

The success of the teams' performance on the world and European arenas depends on this.

Speaking about the development trends of the modern game, one should immediately make a reservation that the developmentthis happens constantly and in almost all sections. Need to touch widea range of issues, one way or another, affecting the development of team sports. The most significant among them are the following:

1. The trend of evolution of the rules.
2. Growth data trends.
3. Age features of a modern sport.
4. Changesin technology.
5. Development of tactics.
6. Improving physical and functional fitness.
7. Improving psychological preparation.
8. Raising the level of the Russian domestic championship.
9. Scientific support.
10. The commercialization of the sport.

The main directions in the development of sports reflect the ongoing proevolution of sports.

The most significant of them are discussed below.

Changing the rules.

World and European federations are moving towards improving entertainmenta number of sports for the media, primarily for televisionfor spectators, and therefore change the rules of the competition. Using badminton as an example: reduceincreasing the number of lines, gaining points in each drawing, half-game breaks, reducing match time by increasing the speed of the game and decreasing the number of points. Speed-power qualities took the first place. The duration of the game has decreased by 20-30 minutes. The game became more athletic, speedy and psychologically intense. All of this leads to a change in the champion model.

International Federationvolleyball is also making changes to the rules of the game. The rules of the competition regarding the scoring in the set (up to 25) and the award of a point at the transition of the service have changed significantly, which determined a significant reduction in the duration of the game. Now even a game of five games lasts no more than one and a half to two hours. In general, the change in the rules of the game had an impact on the speed-strength training of athletes, technical and tactical improvement and psychological stability, since they require a lot of concentration of attention.

Given the trends in the development of the sport, at the upcoming Congress of the International Swimming Federation (FINA), decisions should be expected to change the rules forplaying water polo, namely, reducing the composition of field players to five, reducing the playing area (up to 25 m) and the size of the ball. All this will increase the effectiveness of the game by increasing the dynamics, increasing the speed and mobility of maneuvers, and increasing its combination component.

Age features of a modern game sport.

In connection with the change in the rules, the age range has expanded. At the highest sports level, both young and older players are currently performing. The trend towards rejuvenation of athletes, noted in sports, is characteristic of many team sports. However, this trend is typical primarily for individual sports. So, in ten-

nise individual athletes and female athletes of the main team, due to injuries that follow them throughout the season, significantly reduce the level of sports achievements; therefore reservethe composition of the Russian national team, consisting of young athletes, very often travelsfor training camps and competitions.

Sports games stand apart in this matter. Basketball, in any case, confirms the fact that more experienced teams that have passed 3-5 years of joint performances with young players achieve high results at the highest world and continental competitions, such as the Olympic Games, World Championships and Cups, the World League, and European Championships. at the highest level, tall, with good throwing performance.

***Changes in technology.***In the field of technology, changes are noticeable, associated primarilywith the acceleration of the implementation of techniques. High-speed technology is the main directionimprovement of technology. The second development trend in technology is its rationality.

Technique is changing in the direction of accelerating the game by increasing the speed and sharpness of the blow, improving the performance of a tennis player, volleyball player, badminton player. At the same time, there is a constant tendency to an increase in high-speed game actions with the priority of a quick breakthrough in basketball and an early attack in volleyball with a certain "simplification" of tactical game schemes and a decrease in the time of their implementation. The emphasis is on violent attack. This is obviously caused, on the one hand, by the selection of more powerful and taller attackers, and on the other, by a clear improvement in the defensive play. In addition to a forceful attack, the optimal use of deception is noticeable.

Speaking about the trends in the development of technology in the future, it is most likely thattwo directions - rational and high-speed technology. At the same time, the teams are equipped with modern ball handling techniques, show high physical activity in the game without the ball, possess a variety of tactics and high operational thinking, have volitional activity and psychological stability. Especially noteworthy is the increased athleticism of the players and the universalization in the playing role.

Constant optimization of technology associated with the improvement of specialized equipment, which allows you to track the slightest changes in technicalindicators. Teams that have high-quality players in their ranks are equipped with modern technical means of control and analysis of the game. Whole brigades of assistants work for the head coach of the team. In the game without the ball, the teams use a variety of options for pressing, the tactics of which are associated with high operational thinking, volitional activity and psychological stability.

***Changes in tactics.***Increasing tactical readiness with non-standard variable tactical formations is associated with increased requirements for the venue of the competition, as well as the improvement of sports equipment. Game control andtactical non-standard and unexpected decisions of the coach during the game are the most important and underhour are crucial conditions for success.

In game sports such as table tennis, basketball, the main taskstactical training are:

* improvement of individual technical and tactical skills in extendedrange of game actions;
* increasing the variability of tactical actions in attack and counterattack with trainingvolume of enemy tactics.

In basketball, volleyball, water polo:

* increasing the variability of group and team tactical actions in defense andattack, taking into account the tactics of the enemy;
* the presence of new tactical combinations and homework;
* effective and efficient counterattacks;
* thinking ahead of the opponent in a positional attack;
* effective play of an “extra” player when sent off in the opposing team;
* successful defense in the minority;
* introduction to the tactical arsenal of teams of peculiar"Zest", that is, prepared in advance, unexpected for the opponent, changes in the tactical pattern of the game;
* operational management of the coach by the team's playing structure to change the tactical pattern of the game, based on the need to makecorrections in the composition of the team in connection with the game situation that has arisen and the expediency of implementing advancing tactical moves in relation to the opponent;
* the search for unconventional tactical solutions for managing the game by the coach is the highest professionalism in the stressful conditions of the outcome of important competitions.

Improving physical and functional fitness.

Continuous improvement of physical fitness and structure of the trainingprocess at all levels, primarily due to a clear individual planning of various stages and the ratio of fixed assets at these stages, has led athletes to improve it.

In recent years, this element of training has been given a great deal of attention by all national and club teams that set themselves hightasks. In addition to holding specialized training camps for physical training, there is a noticeable tendency towards independent individual work in this direction. Moreover, attention is paid to functional and speed-strength training, if not daily, then certainly weekly. The sportsmen are armed with new simulators, equipment for improving the ball flight speed, passing accuracy and other game elements. In team sports, individual teams began to conduct training camps on general physical training in mid-altitude conditions; in most leading teams, each microcycle has dedicated workouts or a separate time for this. There is a noticeable tendency to individualization of work on physical training, taking into account the playing role.

It is safe to say that further attention to this very important partthe training of athletes will not decrease. In our opinion, the role of selfworthwhile, individual work, i.e. professionalism will increaseand the universalism of athletes.

The increase in the calendar of competitions led to the intensification of the competitive activityness. The speed of the game increased, forcing the athletes to concentrateon the development of narrow-profile elements.

***Improving psychological preparation.*** In sports of the highest achievements timesthe technology of advancing development of the main factors of sports training has been worked out and is applied, where one of the main factors is psychological training. The implementation of the advanced development system is such a construction of the training system that allows you to achieve an advantage over the main rivals by a given period of time due to those elements of the system that are optimal for an established individual athlete in individual sports or the composition of a team as a whole.

It is very important to educate the "psychology of a winner". "Psychologywinner ”is to a very large extent based on the highest conscious training, household and game discipline, motivation of athletes, patriotism.

Improving the quality and efficiency of the game is almost impossible without the highestlevel of attitude and dedication. A mood for one hundred percent and even higher returns, both during a single game episode, from whistle to whistle, and for the entire game and, of course, for the entire tournament or season. Without this, it is impossible to achieve high results. If players can

allow yourself the slightest relaxation or distraction from the game, from the result - it will be impossible to achieve the result, somewhere these indulgences will manifest themselves, come out.

The presence of professional psychologists in teams is desirable, however, there are few of them, and it will be more expensive to invite a non-professional. As a rule, the head coaches are involved in the psychological preparation of the players in the teams. Psychological testing of the national team helps the coach to create a favorable "climate" in the team and promote the cohesion of the players; psychological testing is carried out in a number of club teams.

***Scientific support.*** It should be noted that without attention to this section of training athletes and high-class teams, it is impossible to achieve results. In combined teams, work should be carried out systematically on scientific, methodological and medical support for the training of athletes, and a program for monitoring functional readiness and a recovery system using modern means and methods should also be developed and used.

The purpose of scientific and methodological support for the training of national teams of the country isThe provision of the coaching staff with objective and reliable information on the degree of comprehensive preparedness of players and teams, the development of optimal management decisions and corrections in the process of preparation and participation of teams in the main and main competitions of each year of the Olympic cycle. It is carried out mainly by employees of complex scientific groups (AMG), specialists from medical and medical dispensaries, as well as other specialists involved in solving particular training problems.

Organizational monitoring of sports training will be implemented in traditionalforms of in-depth medical examination (UMO), stage complex control (IVF), current examination (TO) and examination of the competitive activity of sportsexchange of playing sports (OSD).

A milestone comprehensive survey aims to determine the level of various partiesfitness of athletes, including functional, taking into accountstate of health, technical, psychological on the basis of the use of special tests and in comparison with the performed loads and model characteristics, the issuance of recommendations for the correction of the training process and the level of their preparedness.

During the current examination, the means of pedagogical, medico-biologicaland psychological control over the process of urgent adaptation of athletes to trainingworkloads, as well as pedagogical observations and expertise.

The examination of competitive activity is carried out on the control and main competitions in order to determine the quantitative and qualitative indicators (individual and team) of competitive activity, study athletes of different roles and the team as a whole, harmonize the model and realized indicators of their preparedness and competitive activity.

On the basis of comprehensive examinations, AMG coaches and staff receive individual recommendations on the preparation of players, especially in such sections as physical, functional and technical preparation. This is possible only with a constant scientific analysis of the training and playing activities of the players. Developed and improvedmeans and methods of restorative measures, pharmaceutical correction and prevention.

Most national teams and club teams make extensive use of video recordings, both for analyzing their game, and for simulating the game against a future opponent on the set.

Information and analytical center in some sports allows you to keepclose control of the team and individual work of athletes-candidates for nationalnational teams in order to assess the effectiveness of their game actions.

***The commercialization of the sport.***In men's basketball and volleyball, it became noticeable.first of all, with the appearance in the calendar of competitions of the games of the World League, which in a greater

degrees are related to television and advertising. The emergence of these competitions in the internationalthe calendar, in addition to clearly visible pluses, brought a lot of minuses.

Plus, this is, first of all, high fees for players and a high rating of winners and prize-winners, both players and teams. Minus - the congestion of the international calendar with the emergence of World League competitions, especially in the Olympic year, CEV Cups, Challengesand etc.

Commercialization is noticeable both at the national team level and at the club level. Most of the teams have permanent sponsors and enter into very lucrative contracts for its advertising with firms that produce sportswear.

***Anti-doping assurance***sports national teams includes the main anti-doping activities: laboratory tests and laboratory researchtesting of biomaterials in order to identify the presence of prohibited substances and their metabolites, collecting biological material from athletes and delivering it to specializedlaboratory including planning, preparation for collection, collection,storage, transportation and delivery of biological material to a WADA accredited laboratory in accordance with the requirements of the WADA Code and the International Standard for Testing, as well as taking measures to prevent the use of doping.

By order of the Ministry of Sports of Russia, the All-Russian Anti-Doping Rules are approved annually. Rules are in line with the International Anti-Doping Conventionin sport adopted by the General Conference of UNESCO at the 33rd session in the city of Paris 19October 2005 and ratified by the Federal Law of December 27, 2006 No. 240-FZ "On Ratification of the International Convention against Doping in Sport" (hereinafter - the Convention), the World Anti-Doping Code adopted by the World Anti-Doping Agency, andWADA International Standards.

In chapter XV of the Rules defines the responsibility of athletes and personnel of national teams of Russia, all-Russian federations in sports.

Athletes are responsible for:

* knowledge of and adherence to all anti-doping principles and rules implemented in accordance withcompliance with the Code and the All-Russian Anti-Doping Rules;
* availability at any time and inany place for sampling;
* whatever they eat and use when preparing for and participating in sports anti-doping competitions;
* informing sports medicine professionals about their obligations not to use prohibited substances and / or prohibited methods.

Athletes are responsible for ensuring that any medical care they receive does not violate the All-Russian Anti-Doping Rules, as well as other internationalanti-doping rules.

Athlete Support Personnel are responsible for:

* knowledge of and compliance with these Rules and other international anti-doping lawspitchforks that apply to him and the athletes in whose training he participates;
* cooperation in testing athletes;
* using their influence on the athlete, his views and behavior in order to form intolerance to doping.

Sports federations are responsible for:

* timely and complete publication in all-Russian periodicalspublications and (or) posting on their official websites on the Internet of the All-Russian Anti-Doping Rules and Anti-Doping Rules approved by the International Federationin Russian;
* granting in accordance with the All-Russian Anti-Doping Rules, information required by RUSADA to form a registered testing pool;
* notification of athletes in accordance with the All-Russian Anti-Doping Rulesforks to include them in the registered testing pool;
* assistance in conducting testing in accordance with the procedure for dopingcontrol;
* application of a sanction based on and pursuant to a decisionthe relevant anti-doping organization on the violation of anti-doping rules by athletes, as well as coaches, other specialists in the field of physical culture and sports, in relation to athletes;
* informing about the sanctions applied by the Ministry of Sports of Russia, the executive authorities of the relevant constituent entities of the Russian Federation, RUSADA, international a sports federation in the relevant sport;
* obtaining written confirmation from athletes and other specialists in the fieldphysical culture and sports on familiarization with the anti-doping rules approved by the international federation, the all-Russian anti-doping rules, as well asCode and International Standards.

The internal regulations of the federation must provide for the obligationstrict acceptance of the conditions of the All-Russian Anti-Doping Rules by the responsible the face of the All-Russian Sports Federation.

Currently, the use of doping has become one of the most pressing problems in the national teams of Russia. Realizing the seriousness and scale of the danger posed by doping, the sports federations of Russia will contribute to the implementation of RUSADA's information and educational program on the prevention of the use of doping in sports. Programs are designed for athletes, sports doctors, coaches and athlete personnel. The main goal of the Programs is to prevent the use of doping in sports and to increase the level of competence of athletes, coaches and specialists of the Russian national team in the fight against doping and to prevent the use of doping in the youth environment.

## Athletics

##### Major global trends

The program of the Olympic Games in athletics consists of 47 types of competitions. In athletics, as in other sports, various changes are constantly taking place. In the last decade, there have been a number of significant changes in the organization and conduct of competitions. First of all, we are talking about competitions held by the European Athletic Association (EAA):

1. The European Cup has been abolished. Instead, the European Team Championship began to be held. The frequency of these competitions is annually (excluding the year of the Olympic Games). The number of participating countries in each League is 12. The standings are general, without division into men's and women's teams.
2. The frequency of the European Championship has been changed. This type of competitionwas carried out 1 time in 4 years, now -1 time in 2 years.

EAA continues to work to find means of increasing the entertainment of athleticscompeting and maintaining the status of European athletics. This results not only inthe emergence of new forms of competition, but also in changes in their regulations and program.

Such innovations forced, and in the next Olympic cycle they will force,to look for compromise solutions and approaches (including with regard to the selection and formation of national teams), especially in the year of the Olympic Games, the summer season of which now accounts for 2 major official international competitions - the European Championship and the main start of the sports four-year period.

Due to the fact that the national athletics team did not participate in the 2016 Olympic Games, as an example, we can cite the holding of the 2012 European Championship a month before the start of the athletics program of the XXX Olympiad, which left its imprint on both the composition of the teams - participants and the final results. Many countries gave the European Championship a secondary role and considered it either as a control, starting start for the main (Olympic) squad, or as a review of the nearest reserve.

In addition, due to the small (only monthly) time interval between two starts, the program of the European Championship was reduced by 5 disciplines: 20 km race walking (men, women), 50 km race walking (men), marathon running (men, women), which also influenced the overall team results.

Along with the continental championships, the world championships were also marked by somechanges.

The practice of interrupting competitions in technical disciplines during the final races and award ceremonies was taken into account and is currently taken into account by athletes and coaches in preparation (primarily psychological and tactical) for official international competitions.

Major competitionsof recent years have confirmed the main processes that, to one degree or another, have an impact on the development of world athletics as a whole. These processes include the following:

* Ongoing IAAF Work to Develop Athletics in Laggard Athletestic countries;
* attracting foreignspecialists, mainly in technical disciplines, for the preparation of athletes in lagging countries;
* active work of WADA, implementation of blood passports of athletes, development ofand collection of material for steroid and gene passport;
* the continuing practice of moving athletes from countries with a high level of internal competition in certain disciplines to other countries (economically more developed).

The influence of the listed processes to one degree or another manifested itself in the following years.in the following:

1. There has been a sharp increase in the number of countries participating in the Olympic Games and world championships (both winter and summer) and countries whose athletes took places in the final protocols.from 1 to 8 (for example, at the 2012 Games, this figure increased to 70 (compared to 62 in 2008).
2. Medals of the Olympic Games and World Championships receivedcountries whose athletes in the history of their participation in these competitions either never climbed the podium at all, or had significantly weaker achievements, moreover, 8–20 years ago.

The increase in the number of teams participating in world championships and the Olympic Games and the appearance in the team classification among the medalists and finalists of countries whose athletes have never performed at a high level before, speaks of the systematic work of the IAAF aimed at promoting athletics in the world. However, there is a certain bias in this process. It seems that in order to increase competition and entertainment at official international competitions, outsider countries, which in the near past did not come to the attention of the IAAF regulatory bodies, began to be provided with certain privileges relative to countries whose athletes have always been among the world leaders (for example, the withdrawal from some athletes of doping suspicions, admission to competitions of athletes of undetermined gender, massive failure of a number of countries, etc. recorded facts).

1. The results of the World Championships in 2010 and 2012 confirmed the earlier assumption that world leaders (both individual athletes and national teams as a whole) began to view the official winter competitions not as an independent start, but as a means and / or a stage of preparation for the main (summer) competitions of the year.
2. Improved overall performance in virtually all athleticsdisciplines OI, World Cup and European Championship does not allow even recognized world leaders to predict a successful performance and guaranteed to count on the highest step of the podium. As practice has shown, the slightest weakening by an athlete of his positions can entail not only the loss of a gold medal, but also the opportunity to remain generally beyond the prize-winners, and even the finalists of the competition.
3. The trend of naturalization of black athletes by economically developed countriesus continues its development and results in the fact that in running disciplines, be it a sprint,running on medium or long distances, there is a "squeezing" of European athletesnoah race. As a result, a kind of specialization begins to be seen - "black" speed-power types and running at medium and long distances and "white" technical disciplines and race walking.
4. The geography of the winners, medalists and finalists of the Olympic Games and the World Championships in a number of technical events was replenished with representatives of African, Asian and South American countries that did not previously have high-level athletes.

We are talking, in particular, about the javelin throw, where the winner of the 2012 Games was the 19-year-old representative of Trinidad and Tobago (Keshorn Walcott), and among those who passed the qualifying stage was an athlete from Kenya (Julius Yego, 12th place).

Indium competed in the discus throw for men and women in the final stage of the competitionathletes (Vikas Gowda, 8th place and Krishna Poonia, 7th place).

Colombia climbed to the second step of the podium in the women's triple jumpsky sportswoman. Prior to this success, the Colombian team had only Olympic bronzein the 400 m race (women) in 1992

21-year-old high jumper Mutaz Essa Barshim from Qatar brought his country the second bronze medal in the history of the country's participation in the Olympic Games. Prior to that, third place in the Olympic Gameswas in Qatar in 1992 in the 1500 m race (men).

It is worth noting the silver medal of the 18-year-old world champion among juniors in 2012.from Botswana, Nijel Amos in the 800 m race. This is the first Olympic award in the history of the country, and it is marked by a world junior record.

1. In previously lagging athletics countries, promising youngathletes who are ready to intervene in the near future in the distribution of medals at international competitions of the highest rank. The names of some of the athletes are listed in the previous paragraph.
2. In some countries that previously extended their interests to only a limited number of priority disciplines (depending on the degree of development of certain types or the presence of clear world leaders in them), a tendency has emerged to expand the number of specialsocialization of their athletes.

It is highly likely that the trends listed above have recently begun to influence the overall team results of major international competitions.However, in the next two to three years, the final distribution of teams will bedepend on the results of the performances of the leading athletics countries - the higher the percentage of implementation of the readiness of the athletes of the leading teams, the less opportunities there will be to get into the medal or points classification in other countries.

***Russian tendencies.*** Russian athletes began performing at the international arena with a separate team since 1993

Today, therefore, the Russian national athletics team is prowent 5 Olympic training cycles and performed in 5 Olympic Games.

The 2012 Olympic Games have confirmed that the Russian national athletics team takes a solid second position in the world (the only exception was the 2000 Games in Sydney). In London, Russian athletes were able to win a record number in their history.

number of Olympic gold medals - 8, while coming close to the main rivalNick and the irreplaceable world leader of the last 20 years - the US team (9 gold).

Throughout the history of the performances of the Russian national team as a separate team Olympicycle 2009–2012 became the most successful.

At the 2011 World Cup, 9 gold medals were won(absolutely the best indicator), and at the 2012 Olympic Games - 8 (a record number of Olympic gold medals).

Preparations for the 2012 Olympic Games, in addition to solving specific tasks for each year of the Olympic cycle, consisted in the search and testing of new organizational approaches that take into account the trends in modern world athletics.

Successful performance of the Russian national athletics team at the ChampionThe 2011 World Cup and 2012 Olympic Games were driven by the following factors:

1. The optimal combination of centralized training with an individual approach. According to the Unified Schedule of Interregional and All-Russian Sports and Physical Culture Events (UCP), during each year of the Olympic cycle (except for the period of the main competitions), up to 5-6 centralized training events were organized.events at Russian and foreign sports bases, with an average duration18-21 days.

All main candidates for the national team, taking into account the approved individualplans, were trained at one of the centralized training events.

1. A flexible approach to the formation of national teams to participate in the official betweennational competitions. Formation of the national teamit is carried out according to the "2 + 1" principle: 2 athletes in each individual type of the competition program are included in the team based on the results of the main qualifying start (corresponding to the Czech Republic); 1 athlete is determined by the proposal of the Head Coaching Council.

Depending on the importance of the upcoming competition and on the tasks facing the collectionNoahteam, the Head Coaching Council proposes for approval to the ARAF Presidium as third participants in each individual form of athletes from among: the winners of the previous World Cup or Olympic Games; world season leaders; indisputable Russian leaders; young promising athletes who have become winners of international competitions in the current competitive season.

This approach allows, firstly, to remove excessive psychothe logical load of participation in the selection and gives them the opportunity to conduct targeted preparation for the main international start; secondly, it allows young promising athletes to join the main team of the national team and learn from the experience of the leadingathletes; thirdly, to build more accurate forecasts of the performance of the national team.

1. The core of the national team for the London Olympics was formedfrom already experienced athletes. As shown by the analysis, more than a third of them participated in the 2008 Olympic Games, more than 40% of the team - in the 2009 World Championships and 2011 World Championships. About 15% of the participants in the 2012 Games in the completed Olympic cycle 2009–2012. became winners of the World Cup. At the same time, four out of eight winners of the London Olympic Games hold the 2011 World Championship title.

This fact allows us to talk about the correct line of strategic and organizational measures, as well as about the objectivity of the selection criteria, which made it possible to form the most competitive team with a high percentage of potential opportunities realization.

1. Application of more stringent selection criteria and conditions for the formation of the national team. This practice made it possible not to include in the national team athletes who, in terms of their results, did not have the opportunity to reach the final part of the relevant international competitions. For example, the composition of the Russian national team for participation in the 2011 World Cup was reduced, in comparison with the 2008 Olympic Games and the 2009 World Cup, by more than 20 people. However, this fact did not have a negative impact on the results of the performance of the Russian team. On the contrary, the percentage of sales of the national team in the last several world championships turned out to be the highest - 62% of Russians took places from 1 to 8, and places from 1 to 3–40%. At the same time, 30 people, or about 38% of the national team, were among the athletes who were in the final protocols below the 8th place.

In addition, the minimum number of failures and against this background a large percentage of successfulperformances had a positive effect on the psychological climate of the entire team, thereby increasing the athletes' sense of self-confidence and involvement in overall success, which in turn was reflected in the final results of the performance of the entire team.

1. Qualifying start - the main championship of Russia for4 weeks prior to the relevant international competition. Before the 2011 World Cup (Korea), due to the need to undergo temporary adaptation, the selection time for the national team was increased to 4 weeks. This fact did not have a negative impact on the preservation of athletes' sports form, as well as on the overall performance of the team. This practice was repeated in 2012 when the national team was formed to participate in the Olympic Games in London.
2. Selection of the most optimal dates for the arrival of athletes in the Olympic Village.
3. Improving the material and technical support of the training process; osnscheduling of the main training bases with the necessary equipment and inventory.
4. Significant improvement in medical support and biomedical, inincluding pharmacological, ensuring the training of athletes.
5. Close cooperation of senior coaches of the national team with leading sportsby us and their personal trainers throughout the preparation for the Olympic Games.
6. Systematic work on anti-doping assurance throughoutstages of preparation, including in the pre-departure period.
7. High motivation of the leaders of the national team to win.
8. The most effective organizational chart the structure of the national team, formed with close cooperation of the ARAF and the Federal State Budgetary Institution "Center for Sports Training of Russian National Teams", which ensured the most optimal combination of administrative and coaching personnel units.

In addition to the positive aspects, the results of the Olympic cycle 2009–2012. allowedidentify the weakest points in ensuring the preparation of the national team, as well as bareproblems, the solution of which was of paramount importance in preparation for the 2016 Olympic Games.

1. Continuation of the outflow of leading athletes from areas that are weak from the point of view of providing training to regions interested in the development of athletics and providing comprehensive support for high-performance sports.

Most of the athletes of the main composition of the national team continue to concentrateto be located in Moscow, Moscowregions, Mordovia, Krasnodar Territory, Volgograd and a number of other regions - that is, in the constituent entities of the Russian Federation, in which the best conditions for the training and support of athletes are created today.

This fact causes concern, since the preparation of the reserve of the national team is directly related to the development of athletics in the regions. Working on a solution to this problemwill allow to remove the currently existing imbalance and division of the subjects of the Russian Federation for the goodreceived and dysfunctional.

1. Loss of experience accumulated in the Soviet past in many areas of sportsscience and practice.
2. Short bench in a number of disciplines.
3. One of the weakest points in the organizational measures to ensure the preparation of the national team is the unsatisfactory scientific and methodological support of the training and competitive processes. This issue requires a fundamentally newapproach and early program changessurveys and the very principles of AMG work, among which the main ones should be consistency, continuity and flexibility.

## Combat sports

***Freestyle wrestling.*** Recently, competition in international competitions of the highest level has been intensifying due to the countries of the Near Abroad. The level of training of competing countries is increasing due to the work of our specialists in them. Due to the subjectivity of refereeing (introduction of a new competition system, assessment of visible activity with technical points and warnings), the probability of victory of a less prepared wrestler against a stronger opponent increases.

The high level of material and technicalniche provision, training of national teams: availability of specialized sports bases, provision of sports equipment and equipment used for training camps. Specialized nutrition, individual pharmacological and biomedical support, modern restorative means and drugs, individualized training methodology - all these aspects form the basis of the high level of motivation of our competitors. It is also necessary to note the strengthening of the leadership of qualified coaches of the national teams of the rival countries at the expense of high-class specialists from Russia and the former USSR.

Since its inception, women's wrestling has been actively developing in countries withditionally strong school of women's judo (Japan, France, Holland, Norway) and in countries with strong schools of freestyle wrestling (Russia, USA, Germany and CIS countries). Recently, the geography of the countries participating in the medal distribution has expanded. In Beijing and London, Olympic medals were won by athletes from 11 countries (in Athens, medalsreceived by athletes from 7 countries).

Materials of statistical analysis of the state of the femalefreestyle wrestling in the regions and sports and human resources indicates that the process of development of women's freestyle wrestling in Russia has stabilized, we continue to have a sufficiently strong coaching and scientific potential, which, with appropriate funding, is capable of improving the quality of the educational and training process, improving the competition system , selection criteria, etc. to preserve and strengthen the leading position of Russia in the international sports arena.

According to statistics, more than 135 thousand people are engaged in freestyle wrestling in SDYUSSHOR, CYSS, UOR and SHVSM in the country, including 71 thousand women.More than 4 thousand coaches work in freestyle wrestling in the country (including 3313 full-time) , 2322 of them with higher education.

The geography of women's freestyle wrestling in Russia is constantly expanding. Fight for medalsthe Russian championships were led by representatives of 14 regions. In the final table among the winnerschampionship appeared representatives of Chuvashia, Buryatia, the Republic of Sakha (Yakutia), Krasnoyarsk, Kemerovo, Moscow, St. Petersburg, Bryansk, Moscow region, Stavropol Territory and Irkutsk region.

It is also a gratifying fact that competition is intensifying and the geography of the participants in the Russian championships among juniors and cadets is expanding. So, at the Russian championship among girlsin Cheboksary, medals were won by representatives of 20 constituent entities of the Russian Federation, and at the Russian championshipamong juniors, representatives of 15 constituent entities of the Russian Federation became prize-winners.

Preparations for the Olympic Games in Rio de Janeiro revealed a number of problems, without the solution of which it is difficult to expect a significant improvement in the skills of athletes. To these problemsmoms should be attributed:

* lack of strong sparring partners at training camps and even more soin places;
* high injury rate of athletes who come to the national team from the cadet and junior teams (low level of physicalpreparedness, untreated injuries, large and unjustified weight loss);
* insufficient number of starts at important international competitions;
* increased competition fromathletes from the countries of the former USSR, as well as from Africa, India and South America;
* the absence of a federal center for training in women's freestyle wrestling;
* weak work of AMG, due to the lack of specialized laboratories andcenters capable of providing real and timely assistance to the coaching council of the national team in assessing the state of athletes and correcting training loads.

Development trends***Greco-Roman wrestling***in Russia:

* a slight increase in the number of people engaged in Greco-Roman wrestling in the centralregions of Russia, and the mass character is provided by the Southern regions;
* there is no inflow of coaching staff of all skill levels due to low wages;
* there is no material and moral interest of the coaches working with the reserve;
* lack of sufficient funding for the calendar of mass sports eventstiy (All-Russian and international competitions, training camps);
* living conditions, nutrition for athletes and coaches at the sports bases whereTCB must comply with the change in pricing policy;
* there are practically no modern devices, software, informationtechnical and technical means, research stands for the assessment of the competitive actwrestlers' ability to be specialists of a complex scientific group.
* no financial support for travel expenses,related to the work of Russian representatives in European governing bodies.

The dynamic development of fencing in the world is characterized by:

* an increase in the number of people involved in and participating in the largest internationalnative competitions of athletes and teams of foreign countries;
* an increase in the number of competing teams in the fight for prizes at championshipsthe world and, especially, in the qualifying and main Olympic tournaments;
* blurring the lines between the clear leaders of world fencing and their closest competitors;
* an increasing number of competing teams in youthand junior age;
* significant migration of qualified coaching staff;
* the increase in the number of people involved in fencing;
* a decrease in the age of starting fencing;
* more detailed age gradation of those involved, participatingin competitions;
* an increase in the number of private fencing clubs;
* better competitive training;
* high material and technical support of the training and competitiveactivity.

Modern trends in the development of female andmale weightlifting is determined by the following basic facts:

* through the efforts of the IOC, IWF, WADA is improving out-of-competition and competitive doping control. For all countries, this increases the importance of the scientific and methodological aspects of the training process;
* at the 2012 Olympic Games among women in 6 weight categories out of 7 (except for the weight category 69 kg), gold medals were won by athletes who at least 1 time became

champions at the previous 3 world championships. Men have a similartrend;

* dominant positionin the world, China continues to occupy men and women. This is especially true for light weight categories. In men, athletes from Iran traditionally have strong positions (especially in heavy weight categories). Weightlifters from Kazakhstan and North Korea are making significant progress;
* over the past 4 years, Kazakhstan has become one of the leaders in world women's weightlifting. This was done by attracting foreign athletes. (All 3 gold medals at the 2012 Olympic weightlifting competition for Kazakhstan were won by naturalized athletes: two from China and one from Russia).

## Cyclickinds of sports

Physical culture development strategyand sports in the Russian Federation for the period until 2020, adopted in 2009, among the main reasons for the insufficient performance of the Russian national teams in the international arena, the following should be highlighted:

* low efficiency of work of most sports schools and colleges of the Olympicreserve of municipal and federal subordination;
* Olympic schools chartersreserve require serious adjustments. The tasks of training athletes who are able to compete in the international arena have practically been replaced by the training of middle-level athletes, who bring credit to the region at the All-Russian competitions. In many sports schools, the content of the primary training groups prevails over the sports improvement groups;
* insufficient, and sometimes franklypoor basic training of athletes. As a rule, this is a consequence of the imperfection of the existing standards for the training of athletes and the management structure in sports schools of all levels, from CYSS to UOR.

***Swimming.*** In a number of regions, there is a steady practice of creating integrated sports schools that combine different sports. In addition to the positive aspects of such a union, there is also a negative practice. The liquidation of swimming schools or the abolition of their independence leads to the fact that funds allocated for swimming are eroded and, as a rule, redistributed in favor of the development of more successful sports united in this sports school and, often, not in favor of swimming.

Lack of real competition among athletes who are able to compete successfullyand compete internationally arena. To be a competitive athlete, one must have sufficient training conditions, practically adequate to the conditions that their competitors have. Taking into account the actual financing of sports swimming in the constituent entities of the Russian Federation, an athlete can receive decent training conditions mainly through centralized training conducted by the Federal State Budgetary Institution CSP, and, with rare exceptions, locally. There is a need to revise the normative documents of the Ministry of Sports, expanding the possibility of attracting promising young athletes to centralized training conducted by the FSBI CSP.

Improving the performance of the Russian national team in the international arena to a decisive extent depends on the level and efficiency of work with the reserve. Onlywell-thought-out system of work with long-range and short-range reservesis able to prepare ambitious competitors for the current leaders of the domestic swimming, which will inevitably lead to "pushing" both herself and them to achieve better results.

The system of work with the reserve must necessarily provide for the continuity of breeding work and special training already at an early stage of selection from the age of 11-12. With this approach, when athletes of all age groups participate in the training, it is possible to prepare in advance a reserve for international competitions of different age groups (European Olympic Festival, European and World Championships, Youth Olympic Games, Olympic Games 2020 and subsequent).

In this regard, the main task is set - this is a significant increase in performance.performances of Russian athletes in the main competitions of the year.

The All-Russian Swimming Federation conducts purposeful work on the preparation of the sports reserve, the beginning of which was laidin the Olympic cycle 2008-2012, and was continued in the cycle 2012-2016, which led to the successful performance of the youth

teams at the European Championship. The main task of preparing the reserveis the replenishment of the main composition of the Russian national swimming team with capable, gifted athletes.

In order to effectively solve this problem, the program "I will become a champion" was organized and financed from the WFTU funds. This program, in addition to solving its main task - the qualitative selection of the most talented athletes, solves the problem of improving the qualifications of coaches. Age of program participants: girls 11–12 years old, boys 13–14 years old. In the selection process, a complex of various indicators is used: biological age, anthropometric data, the level of development of physical qualities, the level of technical readiness and sports results.

All trainers (participants in this program) undergo compulsory training in speciala new professional development program developed by the WFTU. This program includes the study of modernapproaches to training young swimmers at lectures conducted by leading experts. In practical classes, coaches draw up a multi-year and annual individual training plan for their students, and also directly participate in training sessions under the guidance of experienced mentors. The main trends in the development of open water swimming as a sport are

There are two components: an increase in the average speed of passing a distance by athletes and adaptation to external aggressive factors (wave, wind, precipitation, water temperature,high solar activity, high air temperature). Both directions of development are extremely important and necessary for achieving high results in open water swimming.

***Rowing.*** World records continue to be updated every year, in this regard, the question arises of limiting potential increases in speed with one dominant physical quality: speed in sprint, endurance in long-distance running,strength in weightlifting, coordination in gymnastics. However, rowing requires all of the above qualities, plus crew coordination and the use of sophisticated equipment. Thus, the room for improvement in rowing is much wider.

The main factors behind the growth of achievements are the intensitycompetition, effective methods of identifying talents in the early stages of preparation,effective talent recruitment and training methods, the use of sports science, optimal management and funding.

The growth of results is caused by the constantly improving conditions for the training of athletes, sports equipment, the use of the most effective methodologies, high technologies of building the training process and, as a result, an increase in the level of professionalism of elite sports.

In the UK, Australia, Germany and other countries, a year-roundpreparation of national teams using the middle mountains, scientific recovery systemathletes after heavy training loads. Indoor pools with controlled water flow were built in Canada, Great Britain, and a mobile reducer was equipped.centers, etc.

***Rowing and canoeing.*** Athletes under 23 years of age show high results at the world championships, therefore this age group is the reserve of the main team and deserves close attention.

In rowing sports, in recent years, there has been a gradual increase in sports performance.zheniy; seven world records, six Olympic records were set.

The main factors that make boats "go" faster are efficientmethods of training athletes, the level of their physical fitness, scientific and methodologicaltechnical support (CMO), optimal management and financing.

The main disadvantages of training athletes of the Russian national team, in their opinioncoaches to the main international starts:

* low level of general physical fitness of athletes,involved in centralized training;
* low level of strategic and tactical planning and management of the training process of athletes at different stages of training, poor performance controltasks for the athlete from the side of the coaching council;
* low level of methodological preparedness of trainers;
* lack of common understanding of rowing technique, lack of regular biomechanicalcontrol and correction of technology.

In this regard, the Russian national rowing team was unable to fulfill the plan to win Olympic medals at the 2012 Olympic Games in London.

Preparations for the 2016 Olympic Games excluded limiting factors andShaft negative experience of past years. This was an improvement in the organization systemtraining of athletes of the national team of the Russian Federation.

It should be noted the high level of physical qualities and functional development of the best athletes in the world, manifested in increased working capacity. Without this, it is almost impossible to achieve success at the Olympic Games.

Based on the foregoing, the coaching council determined the basic principles for optimizing the training of athletes of the Russian national rowing team to achieveimplementation of the assigned tasks, namely:

* optimization of the management of the national team through the creation of a system of functional and job responsibilities of the management staff of the national team coaches usingthe rotation of personnel, if necessary;
* regular correction of individual training plans for athletes;
* centralized training of the combined team in 2014–2016. in places that meet the requirements for the training of athletes, with full provision of material and technical means of training;
* introduction of a transparent system for the selection of athletes to the national team to participate inpreparation for the main starts;
* systematic increase in the level of methodological preparedness of the coaching composition by conducting scientific and methodological seminars with the invitation of foreign and domestic specialists;
* formation of a rational model of rowing technique and a scale for its assessment;
* comprehensive, systematic scientific and methodological, biomedical support andinformation support;
* preparation of the team in the autumn-winter-spring period on warm water (Italy, Portugal), conducting high-altitude training in the winter at the bases of Tsaghkadzor (Armenia)and Belmiken (Bulgaria).

The trends in the development of rowing slalom in the world are as follows:

* diversification of the activities of the world's leading athletes in Olympic programs towards universality and participation of athletes in competitions of various levels and typesprograms. Canoes and solo kayakers moved into twos and formed strong crews that competed at the highest level from the very beginning of the 2009 Olympic cycle;
* growth of the class of female solo canoe. Introduction of this class into the Championship programpeace and desire for internationalFederation of ICF to enter the OI program in the future. The participation of a large number of female kayak leaders in this class and the beginning of a serious attitude towards the development of this class of boats on the part of the world's leading countries;
* expansion of the geography of special facilities for rowing slalom;
* using one's national resource and limiting the capabilities of rivals;
* rotation of high-quality HSR specialists between teams in Europe, Asia, Africa, America and Australia.

In connection with the growing popularity of mountain biking in the world, the firms - manufacturers of sports equipment are constantly updating and improving the technology of making bicycles and equipment. When preparing the tracks for cross-country races, the organizers began to include many artificial and natural technically challenging sections that require athletes not only to have elementary courage, but also to have impeccable bike handling. With the reduction in race time (rules of the international federation UCI 01/01/2011), there has been a tendency for a significant increase in the average speed of passing the distance. Thanks to new progressive rules and constant development to improve the bicycle, the element of randomness in cross-country racing has been significantly reduced, which increases the entertainment of the competition and the level of competitive activity.

The main proposals for the development of BMX cycling in Russia:

* support and assistance in the construction of new routes;
* construction of starting slides and reconstruction of tracks that meet internationalstandards (there are no tracks in Russia to prepare for the World Cup and the World Championship);
* construction of four indoor velodromes (Omsk, Krasnodar, Moscow, Bryansk) (due to the climatic characteristics of the regions of Russia, there is no year-round training in training over specialization);
* creationa bicycle base and a cycling center in the south of Russia (Krasnodar Territory) will provide an opportunity for year-round training of athletes and an increase in the number of all-Russian competitions from February to December. In the center, create modern conditions for the preparation of Russian national teams;
* development of a system for organizing and holding the calendar of all-Russian competitions (organizing committee, refereeing, advertising; inclusion in the calendar of the winter championship and the firststate of Russia);
* licensing of tracks to get the opportunity to host international competitionsinnovations. Inclusion of Russian competitions in the UCI calendar;
* development of a cycling program-BMX for work in sports schools and clubs;
* to improve the qualifications of trainers once or twice a year to organize seminars and master classes, the possibility of training trainers in international centers.

***Cycling Highway.***By analyzing the results of the Olympic Games and World Championships, you canto conclude that most often the success was achieved by the racers preparing for the competitionas part of professional teams.

Professional sports are the latest methodological developments, medical and biological support (including regular examination and testing according to modern methodskam), pharmacological support, material and technical support.

All novelties in technology, medicine, methodology, etc. are used primarily in professional sports.

With the creation of Russian professional teams "Katyusha", "Itera-Katyusha",

"RusVelo", whose main task is to prepare and successfully perform at the main starts of the four-year period, it became possible to plan the preparation of each candidatedate in the starting line-up of the team for the World Championships and the Olympic Games individually.

The presence of elite teams in Russia has become a powerful incentive for young athletes and Russian coaches working with reserves, and has stopped the outflow of our best athletes.to foreign clubs.

The following trends are characteristic of modern highway cycling:

* further growth in popularityand an increase in the interest of spectators and the media in cycling-highway in the world, as well as the development of cycling in breadth, which is reflected in an increase in the number of countries participating in the world championships, Europe, Asia, America;
* widespread introduction of modern methods and technologies for training riders of the highestqualifications in many countries;
* biological, pharmacological, informational, material and technical support, further commercialization of the sport, attraction of significant financial resources from various sources (government support, sponsorship funds).

## Difficult coordinationkinds of sports

Rhythmic gymnastics is characterized by the following development trends:

* increasing difficulty of competitive programs;
* increasing the volume of training work;
* near-limit realization of the individual capabilities of gymnasts;
* optimal balance of motor actions;
* an increase in the volume of auxiliary and especially special training in totaleme of training work (TFP, STP, etc.);
* increase in the number of competition days and the duration of the competition period;
* professional development of trainers;
* professional development of judges;
* one of the progressive factors in the development of rhythmic gymnastics is the improvement of competition rules;
* an increase in new sports departments of rhythmic gymnastics in the CYSS;
* the opening of training centers in various cities of Russia and the CIS;
* implementation of research and development in various aspects of traininghighly qualified athletes;
* constant improvement of equipment.

In our opinion, these trendsare sustainable and have a long-term perspective.

***Diving.***The main direction in training the strongest athletes in the world is mastering jumps of maximum difficulty. In all jumping disciplines, both for men and women, athletes from China, Mexico, USA, Russia, Great Britain, Canada, Germany, Cuba, Malaysia approached the maximum possible level of difficulty.

At the FINA Congress, which took place within the framework of the 2009 World Cup, it was adoptedsolution:

* from January 2010, to enter into the CAT table of jumps, jumps of maximum difficulty, asfrom the springboard and from the tower;
* change the rules for holding competitions in synchronized jumping from a springboard and a platform, all five classes must be involved in the programs: 2 rounds of jumps with the prescribed difficulty coefficient of 2.0 and 3 rounds of jumps from subsequent classes for women, and for men in the 6th round the class can be repeated.

The ability to perform jumps of maximum difficulty is ensured by highlevel of jumping ability, which allows you to increase the height of the trajectory and the duration of the athlete's stayexchange in flight.

Therefore, in order to perform jumps of maximum difficulty, it is necessary to focus the attention of coaches and athletes on a high level of acrobatic, trampoline, as well as high rates of speed-strength training.

Particular attention is paid to basic training on the water, which includes all the main components of a jump (repulsion, rotation, opening, head entry into the water without splashing).

The main trends in the development of synchronized swimming:

* further increase in the complexity and originality of compositions with the inclusion of riskyacrobatic elements;
* the main emphasis of arbitrary compositions is on the speed of movement in bassseinu and performing a large number of technical elements in the program;
* the inclusion of men in official competitions;
* interest in the combined program and in the use of various premeta that increase the entertainment of the compositions.

The main global trends in the development of bullet and trap shooting can be considered:

* an increase in the number of countries developing clay pigeon shooting (Qatar, Kuwait, India,Egypt, etc.), as a result of which the number of countries conqueringmedals at the European, World and Olympic Championships (Olympic Games 2008–10 countries, Olympic Games 2012–12 countries);
* an increase in the number of starts in which competing athletes take part in the flowthe year; competitive load volumeabout 50% higher in comparison with Russian athletes (foreign - 30–35 competitions per year, Russian - about 20);
* increasing the volume of training shooting load (the number of shots per hour,in training, on a training day);
* an individual training program for most of the leading athletes;
* equal access for most countries developing bullet and clay pigeon shooting, to high-quality weapons, cartridges, target equipment, etc., which excludes the possibility of the advantage of any one country in terms of technical equipment;
* cardinal changes in the rules of the competition increase the psychological stress on the athletes, lead to an increase in the significance of the final series.

*The main trends in the development of bullet and trap shooting in Russia can be consideredthief:*

* an increase in the number of visits to centralized training eventsand international competitions for both the main team and the youth;
* in the off-season period, up to 60 days, shooting training increased in favorableclimatic zones abroad;
* positive dynamics of financing needs for special equipmenthighly qualified athletes and material and technical support for bulletshooting;
* lack of internal competition among athletes - formed a rather small group of leaders in all exercises. As a result, the gap with the rest of the athletes is sufficient to win Russian championships and cups, but the level of psychological and emotional stress is insignificant;
* insufficient competitive practice with an increased number of centralized training events (which is unusual for all our competitors), against the background of significantly increased competition at the international level;
* lack of competition among the coaching staff. Most trainers workwith national teams for two or even three Olympic cycles, but during this time practically not a single new coach appeared, and those working for a long time did not raise their professional level; lack of knowledge of foreign languages.

##### Questions and tasks for self-examination

1. Describe the trends in the development of sports.
2. Why are there rule changes in some game sports?
3. How global trends in the development of athletics influenced the performances of Russiasportsmen?
4. Due to what factors there was an increase in the competition of our rivals in the disputetive martial arts?
5. Why competition among sports has decreased in some cyclic sportsof men who are capable of successfully performing in the international arena?
6. Why is there an increase in the difficulty of competitiveprograms in summer complex coordination sports?
7. What is the spectacle of synchronized swimming?
8. Why is there an increase in the volume of training shooting load in the pool?howling and clay pigeon shooting?

# Chapter III. The system of sports competitions and competitive activity

## Competitions- the basis for the existence of sports

*General Provisions.*The system of sports competitions is the main systema determining and integrating factor that most significantly affects all other elements of sport. In the founding writings of leading theorists of sports, competition tractThey are used as a goal, means, method and model of training, as a powerful lever for controlling a sport.

Specially organized sports competitions are aimed at maximum the realization of the spiritual and physical capabilities of a person, a group of people, a team, demonstration and comparison of the level of preparedness, achievement of the highest results or victory in competitions regulated by special rules in conditions of non-antagonistic rivalry specific to the sport (L.P. Matveev, 1977).

Sports competitions, being the essence of sports,determine the goals and direction of the development and education of the athlete for effective activity.

Sports competitions are a kind of model of human relations, really existing in society: struggle, victory, defeat, mutual assistance, directeda desire for continuous improvement and achievement of the highest result in activities,satisfaction of creative and prestigious goals, etc. Competitions in sports are based on the moral rules of society, therefore, the social environment, social structure often have a decisive influence on the nature of competitive orientations and attitudes of athletes (V.S. Keller, 1995).

The entire system of sports as a social and pedagogical phenomenon is implemented under the signcompetitiveness. This is manifested in the rivalry of the strongest sports countries in the world, I leadsports organizations for the priority in the effectiveness of means and methods of training an athlete, material and technical support, organization and management, selection for sports, training of trainers, scientific, methodological and medical support.

Competitionsin modern sports are not only a way to identify a winner, but also the most important means of training an athlete, improving sportsmanship, monitoring the level of fitness, etc. functional capabilities of the organism "(LP Matveev, 1991).

The system of competitions in its development is associated with the continuous commercialization of sports, which led to a significant expansion of the general (official) calendar of international competitions. This trend is most clearly manifested in the holding of serial competitions in World Cups, Grand Prix and commercial starts in various sports. In this regard, a certain contradiction arose, since the achievement of the highest results in the main competitions is associated with a certain, most rational for the individual, the total number of starts and their number with the maximum mobilization of the body's capabilities and the corresponding connection to the main ones.

The number of competitions in an individual calendar largely depends on the particularsports, qualifications,age, sports experience and personal characteristics

athlete. However, endlessan increase in the number of competitions is still inappropriate. Therefore, the problem arises of determining the optimal competition density, which is characterized by the size of the intervals between individual starts filled with training.

From year to year, the physicaland the mental tension of the individual calendar. This is due both to the increase in competition in winning prizes in competitions and obtaining a high rating, which affects the athlete's further material rewards, and to the payment of sums of money directly for participation and success in a particular start. The study of quantitative indicators of the competitive practice of the world's strongest athletes showed sufficient variability of the individual competition system, and quantitative and qualitative differences in different sports are associated with bio-mechanical, physiological, sports-medical, psychological reasons that determine and limit the quantitative parameters of the individual calendar.

In many sports, groups of athletes have formed who are trying to solvein parallel, there are two main tasks of successful performance: at the Olympics and championshipsworld, as well as commercial starts, starts of World Cups, Grand Prix. For some outstanding athletes who have a great advantage over their rivals, the solution of these two problems is quite within their power. However, in most individual sports, for many of the world's leading athletes (especially in the Olympic years), this turns out to be unattainable. Successful performance at the Olympics and World Championships is incompatible with an excessive number of competitions and uncontrolled participation of athletes in various commercial starts. Therefore, a reasonable combination of a series of starts with periods of intense training is necessary, during which the athletes must reach the state of the highest readiness in the required time frame.

Many studies have shown that in almost all cases, the loads during the competition exceed the similar loads performed in training and even in conditions simulating the competition. As an example, in table. 1 shows the data of V.S.Keller (1995) on the value of the load of highly qualified football players in training, model and competitive conditions.

Contributing to the development of physical fitness, improvement of mental and motor functions, the growth of sportsmanship, moral education of sportsexchange, competitions contribute to the comprehensive and harmonious education of the athlete's personality. By stimulating the activity of going in for sports, focusing on the highest achievements, competitions are a way of society's influence on the formation of a person.

###### *Table 1.*Heart rate (per 10 s) in highly qualified football players during training and competition



Sports practice unites a number of types of sports competitions, which are subdivided according to various criteria, and above all tension and importance in the system of annual training. There are preparatory, control, lead-in, qualifying and main competitions.

There are also competitions of the "offset" type; by the type of championship drawing; according to the hierarchy of sportsmanship (major league, first, second, etc.). There are also other classification criteria and ways of conducting competitions.

The choice of this or that way of holding competitions depends on the kind of sport and the traditions that have developed in it; goals of the competition; number of participants and venue; the possibilities of the panel of judges and the time allocated for the competition; traditions of the venue of the competition, etc. - and is determined by the Regulations on the competitions, in accordance with the rules of refereeing this sport.

The most common ways of conducting competitions in the overwhelming majority of sports are: round-robin, qualifying round-robin, mixed and directmy dropout.

Sports competitions can be personal, team and personal-team.In individual competitions, the places of all participating athletes, winners and prize-winners are determined. In personal-team, in addition to the personal places of the participants, the places of the participating teams are also determined according to the places they occupy. A characteristic feature of personal-team competitions is that all participants, including athletes of the same team, compete with each other.

In team competitions, members of one team compete only with sportsthe names of other teams, only the places occupied by the teams are determined.

In most sports games (football, basketball, volleyball, etc.), as well as in rowing (except for single boats), only team competitions are practically played.

Sports competitions can be held as match meetings between two or more teams of sports clubs, cities, departments, regions, republics, countries, etc. In match meetings, in addition to the team championship, the personal places of the participants can also be determined, and the individual championship can be played.

A characteristic feature of modern sports is the holding of complex competitions, the program of which includes several types of sports. The most large-scale complex competitions are the Olympic Games, Spartakiads and Regional Games. A significant number of sports are included in the program of these competitions.

The continuous expansion of the Olympic Games program has forced the IOC to develop restrictive criteria for the inclusion of new species. The IOC special commission on the Olympics program limited them to 300 types of competitions (in 2008 - 302). Cyclic sports (35.2%) are the most represented in the program of the Games of the Olympics, martial arts are in second place (20.2%), followed by difficult coordination types (10.6%), speed-strength types (10.3 %), sports games (9.6%), shooting sports (7.0%), sailing (3.7%), equestrian sports (2%) and all-around (1.3%).

Athletics, which includes 47 types of the Olympic program, is the most capaciousits appearance (15.6%). However, these numbers have changed throughout the history of the modern Olympics; they will change in the future in accordance with the interests of young people, the popularity of sports and the interests of television, since at present it provides great means for the existence and activities of the IOC and IFs. This is confirmed by the sale of rights to broadcast the Games of the Olympics and a significant rise in their cost: from 0.66 million US dollars in 1960 to 1.181 billion dollars in 2012.

Over 120 years of the development of the program of the modern Games of the Olympics, the number of sports has increased4 times (from 9 to 37), types of competitions - 7 times (from 43 to 301), participating countries - 14times (from 14 to 202); number of participants - 45 times (from 245 to 11099 people), including women

- from 0 to 4069 people The number of countries that won gold medals at the Olympics for thisthe period increased almost 6 times (from 10 to 57); countries that won medals of various denominations - 8 times (from 10 to 80). At the same time, the competition in the fight for medals became so high that the winning team in the unofficial team competition (NKZ) significantly reduced its indicators in the number of gold medals - as a percentage of the total number of medals played: from 78.6% (1904) to 11 , 6% (2004).

The national teams of Russia, which participated as a separate team at the Games 1996, 2000, 2004, 2008 and 2012, won gold medals 26, 32, 27, 23, 24, respectively; silver

- 21, 28, 27, 21, 36; bronze - 16, 28, 38, 29, 32; and in total - 63, 88, 92, 73, 82, taking second place in NKZ after the United States (1996, 2000, 2004), third place after China and the United States (2008), third place in the amount of medals after the United States , China (2012).

According to the IOC classification - the number of sports is 28. International sports federations combine sports, rhythmic gymnastics and trampoline jumping into one sport; Greco-Roman and freestyle wrestling; bullet, trap and bow shooting; rowing

kayaking and canoeing and rowing slalom; swimming, diving, water polo; volleyball and beach volleyball.

The analysis shows that the development tendencies of the highest sports mastermedal-intensive sports are similar to the tendencies in the development of the Games of the Olympics, during which the competition in the fight for medals of all merits, as well as for the championship in the unofficial team event, has significantly increased. Even the largest and most developed countries of the world manage to win medals in only half of the types of the Olympic program.

These data also determine the strategy of preparing the leading countries for the Olympic Games. In regional games and sports days, national, applied

new kinds of sports,sports typical for a given region or group of people (army, disabled people, etc.), mass sports performances and competitions (races, swims, etc.).

Currently, the Paralympic Games for the Disabled and other complex competitions are regularly held, including non-Olympic sports in their program.

Requirements for the entertainment of sports, sports lotteries and sweepstakes, television, using sports programs for commercial, advertising purposes, lead to the creation of a play-off system - a multi-stage system of competitions, identifying a winner in sports games.

Sports competitions are governed by special rules specific to each sport and sports discipline. The rules of the competition, being the legislative basis for the activities of all persons, one way or another included in the scope of their organization andholding, to one degree or another taking part in them (not only athletes, butand judges, organizers, coaches, doctors, spectators, etc.), determine: a set of organizational measures for the preparation of competitions in this sport, types of competitionsand methods of their implementation, the contingent of athletes and the natureconfrontations, features of the competition venues, equipment, the composition of the panel of judges and its duties, the rules of judging, the rules of conduct and actions of participants and much more.

The fulfillment by athletes and judges of the competition rules is of great educational value, since the rules determine the norms of behavior for athletes in sports.zanii contain a list of prohibited actions. Competition rules affectimpact on the development of the technique and tactics of this kind of sport, and hence on the improvement of the methods of training athletes. Any change in the rules will inevitably affect the nature of the competition as a whole and the composition of competitive activity, and, ultimately, the content of the training of athletes and its organization. In a number of sports, the rules of the competition have repeatedly changed for various reasons, such as: improving sports equipment; clarification of certain ambiguously understood sections of the rules; the need to reduce the time of competitions and increase their entertainment, etc. For example, in wrestling from 1980 to 1992, three radical changes in the rules were carried out, including the time structure of the fight changed from 9 minutes with two breaks

* to 6 minutes with one break, and then up to 5 minutes without a break. However, it should be remembered that too frequent changes in certain points of the rules can, to a certain extent, slow down the development of this sport.

The general requirements for the rules of the competition are: completeness of content, their unambiguity and clarity, the presence of special instructions for various contingents of participants, compliance with the humanistic principles of sports. In recent years, the need to increase the spectacularity of the sport, associated with the constant commercialization of sports, has become increasingly important. This trend causes a reduction in the time of competitions taking into account the time of television broadcasting, a change in the shape of sports facilities in order to attract and create more convenience for the audience, the introduction of special pauses during the competition to include advertisements in the reports, etc.

Pre-drafted regulations about it are important for the smooth running of the competition. By varying the content of the regulations on competitions within a given sport, it is possible to significantly influence the development of the sport as a whole, as well as the organization and content of the training of athletes.

Of particular importance is the regulation on competitions when holding large teams.complex competitions, since it provides for the composition and functions of the main panel of judges, the jury of appeal, competition regulations for varioussports, the technology for identifying the general team championship, the venue and sequence of competitions in different sports, the rules for accrediting journalists and much more.

Preparation for such competitions as the Olympic Games, Spartakiad of peoples and, in particular, the drafting of a clear regulation on the competition begins several years (3–6) before their start.

In sports competitions, in addition to athletes, equal participants arealso judges. Not only the result of the competition depends on their qualifications, objectivity,but also the prospects for the development of sports. This or that interpretation by the judge of the rules of the competition affectson the focus of technical and tactical training of athletes.

The referee must have a high and adequate level of perception of information about the fight, quick reaction, the necessary volume, distribution, switching of attention, special physical fitness and other qualities.

Based on sports standards, the referee must have a fundamental knowledge of the rules of the competition; have sufficient experience in conducting an appropriate level of competition; to study the features of the competitive activity of athletes - participants in the upcoming fightskov; have mental resistance to confounding factors of both fans and competitors and their coaches; skillfully lead (especially in team sports and martial arts) a duel, without interfering with athletes fully showing their level of preparedness and their individual characteristics, and suppressing unsportsmanlike behavior. The judge, of course, must be absolutely impartial and objective, an example of the observance of the moral and ethical norms of sport.

Errors in the judges can manifestboth as a result of insufficient qualifications and as a result of insufficient physical fitness.

## Content and featurescompetitive activity

Competitive activity provides for the demonstration and assessment of opportunitiesathletes in various sports in accordance with their inherent rules, the content of motor actions, methods of competitive wrestling and assessment of results.

Clear and complete knowledge of the content and results of the competitionactivities in each individual sport are necessary primarily for:

* + defining an overall training strategy;
	+ choice of means, training methods, parameters of training loads, useout-of-training factors;
	+ objectification of sports results in a specific competition - opportunitiesquickly and accurately identify the reasons for success or failure;
	+ making timely adjustments to training plans;
	+ increasing the effectiveness of tactical training, in particular, the choice of the tactical variant of performance in a specific competition, adequate to the goal of the performance and the possibilitynoses of prospective rivals;
	+ modeling in training the conditions of real competition. Competitive activity has a great impact on the athlete's body.

This is connected with its extreme motor modes (maximum speed of movements and actions; manifestation of maximum strength, endurance; coordination complexity of actions with elements of risk, etc.) and with neuro-emotional stress, stressful influences caused by the social status of competitions, their prestige, etc. ...

Therefore, in recent years, the study of the patterns of competitive activitymuch more attention began to be paid.

The competitive activity of an athlete has a phase character.

The first phase - pre-start - consists of psychological adjustment and pre-competitionwarm-up, which often differs significantly from the training one.

The second phase - the competition itself - includes the constructed model of technical and tactical actions, the very process of sports rivalry and the correction of individual elements of competitive activity in the process of competition.

Third phase - aftereffect- includes the phase of near recovery (final physical activity of low intensity, often called "hitch"), analysis of the competition and long-range recovery with a possible entry into the phase of supercompensation (a state higher than before the start).

An athlete in the process of competitive activity must have a specific system of goals, resources for their implementation, information for making a decision.

In competitions, an athlete has to deal with a large amount of information of a technical-tactical, psychological and other nature. This informationmust relate to the tasks facing the athletes in each combat situation and in the competition as a whole. To solve a specific problem, useful information about the situation has been correlated with the tactical plan developed by the athlete in the training process and competitive experience. Active selection and processing of the necessary information is one of the important tasks of the tactics of competitive activity.

An athlete in a competition makes a decision based on reflection - an analysis of his own mental and physical state in order to choose the intended response of the opponent (or partner). Having reconnoiteredfeatures of the opponent's actions, the athlete, on the basis of his idea of ​​his intended reactions, makes his own

plan. At the same time, in all his tactical reasoning, the athlete reproduces the reasoning of the opponent (teammate) (V.S.Keller, 1986). The activity of an athlete in a duel is determined by his representation, mental reproduction of modeling the main provisions of the alleged behavior of the opponent and his own. In sports games and single combats, modeling of competitive activity in specific competitions and starts is of decisive importance.

The ability to think and analyze in sports games is due to the fact that a player, unlike athletes of other specializations, must recreate in his mind not only the tactical plan of his actions, but also adequately reflect the actions of his teammates, i.e., represent their capabilities : state of preparedness, individual characteristics, technical skill and tactical thinking.

In sports where there is no direct contact between athletesin the course of the competition and the sequence of the start, the decision making is determined by the sequence of performance of athletes in the competition before and after the main competitors. So, for example, the application of the initial weight in weightlifting and the height in athletics jumps is determined by the athlete, based on the specified condition, as well as the inclusion in the combination of the most difficult elements in gymnastics and diving, figure skating.

Decision-making in the course of competitive activity in sports characteristicthe simultaneous beginning, perhaps directly in the process of fighting rivals. With the simultaneous start of teammates, mutual assistance and group variants of competitive wrestling are possible (middle and long-distance track and field races, roadracing in cycling, etc.).

The effectiveness of competitive activity on condition of good preparednessthe athlete's performance depends on the reliability of perception and the speed of information processing, the nature of its reflection, the time of elaboration and expediency of the decision, the timeliness of its implementation, due to purposeful specialized actions.

The system of movements and actions of an athlete in the process of competitive activity, aimed at achieving a sports result, is interpreted as a techniquekind of sport. Depending on the characteristics of a sports discipline, technique as a system of movements can be aimed at: achieving the maximum metrically measured result (athletics, swimming, barbell, etc.); achievement of a certain form and structure of movement, the criteria of which are the complexity and aesthetics of actions (gymnastics, figure skating, diving, synchronized swimming, etc.); achieving the final effect - to score a goal, throw a ball, a puck, strike, strike, etc. (martial arts and games). Purposeful ways of using techniques in competitive activity for solving competitive problems, taking into account the rules of competition, positive and negative characteristics of readiness, as well as environmental conditions are called

sports tactics.

Each sport leaves a certain imprint on the tactics of conducting a competition.wrestling, therefore, the interpretation and definition of this concept in various sportsmay differ to some extent from each other. So, for example, in gameIn sports, tactics are defined as the organization of individual and collective actions of players aimed at achieving victory over the enemy.

The whole point of tacticsconsists in using the techniques of competitive activity in such a way that they would allow the athlete to realize his capabilities (physical, technical, mental) with the greatest efficiency and to overcome the opponent's resistance with the least cost. Sports tactics should be based on the compliance of the tactical plan and behavior of the athlete during the competition with the level of development of his physical and mental qualities, technical readiness and theoretical knowledge.

In addition to the choice of methods, techniques and actions, it includes a rational distribution of forces in the process of performing competitive exercises; application of techniquespsychological impact on the enemy and masking intentions.

Tactics can relate to competitive, starting (fight, duel, scrum, start, etc.) and situational goals. A feature of tactics is its individual, group or team nature, determined by the type of sport, sports discipline, and especiallythe competition.

Different variants of tactics of competitive activity can be solved with differentcomposition of participants:

* + individual athletes in individual sports with their own individualsdual tasks and not related to other team members (martial arts, cyclic types, complex coordination and speed-power disciplines). Such tactics are individual;
	+ a group of athletes who have common tasks and perform the same functions and work in the course of competitive activity (group exercises in artisticgymnastics, synchronized swimming, rowing in crews, relay race, teamrace in cycling). This tactic belongs to the group;
	+ a team of athletes who have common tasks, but perform different functions in competitive activity (game) - goalkeeper, line of defense, middle line and attack.This tactic belongs to the team.

Depending on the specifics of the sport, the qualifications of the athlete, the situation, there wasin competitions, we can distinguish: algorithmic, probabilistic and heuristic nature of tactics.

*Algorithmic tactics*provides for the implementation of actions in a strictly planned sequence according to a previously drawn up plan. This is typicalfor sports with minimal variability of tactical decisions (throwing, weightlifting, rowing, speed skating, etc.).

*Probabilistic tactics* competitive wrestling presupposes "deliberate impromptu" actions in which only a certain beginning is planned; optionscontinuation of actions depends on the specific reactions of the enemy and partners, the situation in the competition.

*Heuristic tactics*is based on the impromptu response of athletes depending onfrom the situation created during the competitive fight.

The success of competitive activity is associated with many factors, including the level of preparedness of partners and rivals and their morphometric data. VIn a number of sports, especially in sports games, boxing at a professional level, there is even a specially organized reconnaissance, consisting in regular observation and video recording of the performances of prospective opponents, assessing their level of preparedness and developing recommendations for building tactics of competitive activity. The height-weight data of the opponents in combination with the technique of exercises fulfillment are of great importance in the development of a model of future competitive activity. All of this has a particularly striking effect on the course of a duel in martial arts and sports games. For example, in boxing

* left-sided or right-sided stance, arm length, height; in handball and basketball - nalitaller players, etc.

## Modeling competitive activity

Models of competitive activity serve to form the goal of the training process, since in sports training they reflect not just a high sports result, but a complex of interrelated factors characterizing the state of an athlete at the momentachieving this result.

Each athlete or team before the start of the competition of almost any rankdraws up a fight plan or model, which reflects the features of the upcoming competition; technique and tactics of competitive activity, its psychologicalfeatures based on information about one's own level of preparedness, one's own operational state, preparedness and features of the opponent's competitive activity, environmental conditions and other factors.

The content of models of competitive activity in different groups of sports is characterized by certain features. Let us dwell on the most general characteristics of this activity in groups of related sports.

Cyclic sports associated with preferentiala manifestation of endurance.

Competitive activity in cyclic sports is significantly influencedenvironmental conditions, the shape of the sports facilities and a number of other factors that vary from competition to competition. To the general laws of sopinnovative activities in various cyclic sports include the ability to assess the effectiveness of overcoming the distance directly during the competition using indicators of the speed of overcoming individual segments of the distance, the pace (frequency) of movements in these segments and the length ("step" - in swimming; cross-country, skiing, speed skating

"Steps"; "Postings" in rowing; "Styling" - in cycling). These data are the basis of the construction.neniya model characteristics.

By the nature of overcoming the distance in accordance with the rules of the competition cycleThere are many different kinds of sports. In the most general form, these differences are determined by:

* + relatively uniform passage of the distance;
	+ variable mode of passing the distance (with intermediate finishes, accelerationrhenium);
	+ variable nature of the track;
	+ execution of other structurally motor actions (for example, overcoming barriers in running, turns in swimming);
	+ pronounced start and finish.

In many cyclic sports, the largest competitions are held in conditions of intense tactical struggle with rather sharp drops in speed. This applies primarily to those disciplines where athletes start in a common group, for example, in middle and long distance running. In these cases, the speed at the finish line often exceeds the speed at the start section.

In cases where athletes start alone or in pairs (as in speed skatingsports), significantly smaller fluctuations in speed are observed, and its value in manyIn these cases, it gradually decreases from start to finish.

In the skiIn sports, the profile of the track has a very significant effect on the dynamics of the speed of movement. But even in this form, the dynamics of the speed of passing competitive distances among athletes showing higher results is characterized by a greater uniformity of overcoming the same sections and a slight decrease in the average distance speed on subsequent laps, especially at a distance of 50 km.

Relatively even the distance is covered by highly qualified swimmers. A characteristic feature of the structure of competitive activity in swimming is the presence of turns; thus, sports performance is determined not only by the distance speed, but also by the efficiency of the start and the turns. In a number of cyclic sports, relatively long-term, starting acceleration plays an important role. In these cases, it is possible to speak about uniform overcoming of the distance only from the moment of completion of this acceleration. According to many experts, the starting acceleration is justified by the possibility of using an anaerobic-alactic energy source in the first 5–10 s of activity. The moment of transition to economical overcoming a distance with a relatively even distribution of forces depends on the reserves in the body of creatine phosphate.

In general, you can present the optimal model of competitive activityusing rowing as an example:

* + powerful starting acceleration;
	+ economical passage of the main part of the distance;
	+ maximum possible acceleration at the finish line.

Cyclic sprint sports.

Let's distinguish two subgroups:

* + "Short" sprint (sprint running for 100, 200 m; hurdles running for 100, 110 m; swimming for 50 m; sprint race and git for 200 m in a cycle track;
	+ "Long" sprint (running 400 m and 400 m hurdles, swimming 100 m, as well as 500 and 1000 m speed skating).

An important characteristic of the competitive activity of sprinters isabsolute speed, and it can be reached up to 60 m.

According to some reports, the latent period of a motor reaction in a sprint can reachdistance of 0.09 s, however, according to E.S. sprinter for their implementation, the following.

After the shot: the latent period of the motor reaction -0.14 s, separationhands from the surface of the track - 0.01 s, separation from the block behind the standing leg - 0.10 s, separation from the block in front of the standing leg - 0.13 s, total - 0.38 s.

In general, the “sprint in place” lasts approximately 0.3 seconds and is about 3% of the total result of a 100m sprint.

Here you can present the optimal model of a special physical preparedsti (Table 2).

###### *Table 2.* Model characteristics of the winner and prize-winners of the World Championships and the Olympic Games (sprint and hurdle group) Men





10 m;

In swimming, the characteristics of a sprinter's competitive activity include:

* time to overcome the starting segment - the first 10 m of the distance and the finishing segment
* time to overcome the turn section - 15 m (7.5 m before each turn and 7.5 m

after him);

* + the time to overcome the “clean” swimming area - the distance minus the start and turn segments;
	+ "clean" swimming speed;
	+ pace of movements (numbercycles in 1 min);
	+ "Step" (progress of the swimmer in one cycle).

At the same time, achieving a specific result even with the same swimmer can providebaked in various quantitativethe ratios of these characteristics (Table 3).

###### *Table 3.*Variants of swimmers' competitive activity (freestyle, master of sports)

Table 4 shows the model characteristics of the competitive activity of the elitesswimmers (women) at the Olympic distances.

###### *Table 4*... Model characteristics of the competitive activity of the elitesswimmers (women) at Olympic distances

***Speed-strength sports***(athletics jumping, throwing, heavy liftingtick, kettlebell lifting, ski jumping, etc.).

In these sports and sports disciplines, all the most important characteristics associated with speed and efforts in individual phases of movement, duration

these phases, the level of development of speed-strength qualities and the implementation of these qualities on the modelny, competitive speeds. Indicators of the rhythm of movements are required.

For the manifestation of a high level of speed-power readiness in competitive activity, kinematic characteristics are important (articular angles, their dynamics in underpreparation and finishing phases of movement, angles of departure and take-off, angles of applicationefforts to the projectile, etc.).

For rate most of the listed characteristics require special equipment.

As an example, we will give the model characteristics of the high jumpers - men.highly qualified (Table 5).

###### *Table 5.* Characteristics of the competitive activity of high jumpers of the highest qualification (n = 38)

***In weightlifting*** when developing model characteristics of a competitive actionThe age, height and weight of the athletes must be taken into account. In the future, according to these data, it is possible to determine the prospects of an athlete's performances in a certain weight category. For this, height and weight indicators are compared with the norms developed by specialists for weightlifters of various qualifications, performing in different weight categories.

An important criterion for assessing competitiveactivity in weightlifting (as in other speed-strength sports) is the reliability of performance, which is defined as the percentage of successful implementation of approaches to the barbell. The implementation of two approaches in each movement can be considered as positive, and as ideal - all six approaches in two movements. The declared weight and the success of the first approach are of particular importance.

When planning sports results, the proportionality of development is taken into accountspeed-power (snatch) and power (jerk) qualities of an athlete. For this, a percentage is used.results in the clean and jerk. For the strongest athletes, it slightly exceeds 80%.

Separate parameters of the model of competitive activity are: time, speedthe growth and acceleration of the lifting of the bar in individual phases of movement, the distance of movement of the bar in these phases, the height of the stick out and its displacement relative to the initial position at the start, etc.

Difficult coordination sports.

This group of sports should include disciplines related to the assessment of the beauty of movements, artistry of athletes (artistic and rhythmic gymnastics, figure skating, diving, synchronized swimming).

The generalized model characteristics of competitive activity in this group of sports include: the number of elements of the highest complexity; the number of supercomplex elements; jump difficulty coefficient; average score in major competitionsniyah (in points).

At the same time, it is necessary to focus on the best achievements of the strongest athletes.the world. Table 6 shows data on the number and complexity of highly qualified elementstrained gymnasts.

###### *Table 6.* The number of elements in difficulty groups for women in the finals at the 1988 Olympic Games

*Note:* The numerator shows the average results, the denominator shows the resultsOlympic champions E. Shushunova and D. Silivash.

Currently, in rhythmic gymnastics, the trend continues to increase the difficulty of programs, the saturation of compositions with complex and original elements against the background of a higher technical performing skill and improvement of harmonii and aesthetics of movements, which is reflected in the improvement of the overall composition of the competitioncreative combinations, increasing the artistry in their performance.

Currently, the frequency of using elements in an arbitrary program

"C" (super difficult) and "D" (high difficulty) for women on three shells reached "3", ie.up to 6 elements in total.

However, in modern conditions, assessments of only these characteristics in conditions of competitive activity become insufficient. Each element of increased complexitycan and should be assessed as a separate motor act with the help of appropriate measuring equipment. In this case, the experience of assessing the competitiveactivities in other sports. Table 7 shows the model characteristics of the competitionactivity in rhythmic gymnastics.

###### *Table 7.* The number of elements in difficulty groups for women in the finals at the 1988 Olympic Games

Shooting sports.

The issues of developing model characteristics of competitive activity in various shooting disciplines in the special literature are not fully covered. In these sports, the timing of the shot must be recorded during the competition.and the distribution of firing efficiency over series.

In connection with the changes in the rules of shooting competitions in recent years, it is necessary to take into account the nature of competitive activity both in qualifications and in the final series, where the results are calculated taking into account tenths of a point (Table 8).

###### *Table 8.*Model characteristics of competitive activity of highly qualified athletes in bullet shooting (exercise MP-6)



Martial arts.

In the most general form, the model characteristics of competitive activity in combat sports should reflect: the effectiveness of technical and tactical actions; activity; variety (Tables 9, 10).

###### *Table 9.* Model characteristics of the competitive activity of highly qualified athletes in freestyle wrestling in the Olympic cycle 2013–2016

Thus, the successful implementation of the technical and tactical elements of a competitive fight, taking into account the time intervals of attacking actions and their number, reflects the fundamentalsnye criteria of competitive activity, presented in table. ten.

*Table 10.***The main criteria for competitive activity**

As a result of many years of research, the following generalized displays have been developed.bodies to assess these parameters.

The effectiveness of an athlete is assessed by the coefficient of reliability of the attacking actionscondions:



*where TTD -* technical and tactical actions, TTDots - assessed by the judges; in the numerator - the sum of all evaluated technical and tactical actions, and in the denominator - the sum of all actions (evaluated and unvalued).

Coefficient of reliability of protective actions (Кнз):



The activity of technical and tactical actions is assessed:

* + the number of different evaluated moves; often - an indicator of density, i.e. ifthe number of evaluated (or all attacking) actions per unit of time;
	+ interval of evaluated attacks is the reciprocal of the density,that is, the time spent on average for one attacking action;
	+ distribution of attackers, won and lost actions by periods, rounds, minutes of the battle; often used as a proxy for tactical prowessor psychological readiness for a fight.

Diversity reflects the number of techniques used (or its relation to the total number of techniques classified in the sport, which is interesting when comparingvarious types of martial arts).

However, it should be noted that the specificity of combat sports- groups of contact sports, where one has to face active resistance of an often unknown opponent, - does not provide grounds for strict planning of competitive activity.

Researchers in this area have accumulated extensive material indicating the possibility of distinguishing several types of martial arts (groups, styles, manners) in each type of martial arts.individual competitive activity, quite simply identifiable and,certainly requiring a choice of different sports training strategies. This is especially true for such types of martial arts as boxing and fencing, where differences in the styles of activity are manifested to a greater extent, while experts express an opinion about some leveling of styles of fighting in wrestling in recent years due to changes in the rules of the competition, and it is quite possible clearly group the best wrestlers in the world according to the manner of fighting (Table 11).

###### *Table 11.* Grouping of the strongest domestic and foreign wrestlers of the Greco-Roman style according to the manner of fighting

***Sport games***are subdivided into team - football, ice hockey and ball, field hockey, volleyball, basketball, rugby, handball and individual - tennis, table tennis and badminton. In team sports, excluding volleyball, the fighting time is limited and the result at the end of the match can be equal.

For a more detailed division of sports games, other criteria are used.

One of the characteristic features of most team types of sports games is the presence of a role, which leads to the need for three types of assessments of competitive activity - team as a whole, group by role and individual - for individual players. What are the main components of competitive activity in sports games,

what can be directly assessed during the competition? In the very first approximation, this is

- operations (techniques, leading elements of technical and tactical skill) and actions (tactschemes, combinations) of individual players and the team as a whole.

The analysis of the competitive activity of qualified football players showsthat the main means of conducting team play are still short and medium passes in various directions, interception of the ball, its dribbling and tackling from the opponent,as well as passing the ball on the move, which together account for 73% of all actions in a match.

The most commonly used TTD is the pass, which is 43.1% of all team actions. Very rarely used in the game of passing the ball with his head (1.6%) and shots on goal (2.2%). It is characteristic that most often the players use the simplest in coordination and well-mastered techniques. The exception is

only tackles of the ball from the opponent (10.3% of the TTD), during which the players make a large number of mistakes (60.1% of the rejects).

Analysis of the data shows that the total quantitative indicators of the performance of techniques among the teams - prize-winners of the World Championship and Russia did not have reliable timeslich, while the percentage of technical defects in our players was significantly higher.

The most commonly used method of identifying indicators of a competitive figurenosti (techniques, technical and tactical actions) - measuring the frequency of their use. So,highly qualified volleyball players perform mainly 15 types of technicaltechniques, of which the most common: reception from below (22% of all cases), overhead transfer of the ball (19%), direct attacking blow (12.6%), blocking group (11.8%), serving

"Planning" (up to 10%), while other techniques are used quite rarely (Yu. D. Zheleznyak).

For all the techniques used in the game, efficiency coefficients are calculated(or marriage), proceeding from the number of technical and tactical actions, the activity of individualathletes, groups or teams as a whole.

At the heart of the assessment of the tactical actions of the team, the most important condition is a strict definition of the spatio-temporal factors of the game that correspond to the rules of competition.innovations and the modern level of sports. These primarily include: the time and number of game situations in team tactical actions, the spatial structure of the game (the frequency and sequence of using the zones of the playing field, the site in various kinds of game actions).

Let's give the model characteristics of the competitive activity of basketball players of the highest qualification - members of the national team (Tables 12, 13). Achievement of these characteristics, according to experts, makes it highly probable to win the largest international competitions.

The model of highly qualified athletes consists of two interconnected parts - a team model and individual models of basketball players of different playing roles: defenders (height - 188-199 cm, weight - 88-95 kg - male; height - 174-184 cm, weight - 70-82 kg - women), strikers (height - 200–206 cm, weight - 95–98 kg - men; height - 185–194 cm, weight - 82–88 kg - women) and center (height - 210–220 cm, weight - 115-120 kg - male; height -185-194 cm, weight

- 82–88 kg - women).

Table 12 presents model indicators of competitive activity with highco-qualified basketball players in the main competitions of the Olympic cycle - Thanpionate of the world and the Olympic Games.

###### *Table 12.*The model characteristics of competitive activity are highlyco-qualified basketball players



Table 13 presents the individual model indicators of the competitive activities of highly qualified basketball players.

###### *Table 13.* Individual model characteristics of the competitive activities of highly qualified basketball players

All-around.

All-round sports are distinguished by a very wide range of requirements,presented to athletes. These requirements can in no way be reduced to the sum of the requirements for the individual disciplines constituting the all-around. The growth of achievements in modern sports inevitably leads to a situation where it is impossible to win in the all-around due to a clear advantage in certain disciplines. Apparently, the same tendency persists with an increase in sportsmanship of athletes - the higher the qualification, the less variability in the results of athletes of the same qualification group in the all-around events.

The main characteristic feature of competitive activity in all-around is, thus, the distribution of sports results in certain types of all-around (table. 14).

However, among less qualified athletes, depending on the individual characteristics of the adaptation of the body of athletes to certain types of all-around, usually several groups of athletes can be distinguished. For example, for the modern pentathlon four groups of pentathletes are distinguished, which differ in the following characteristic features: "coordination" - high results in fencing, shooting and horse riding; "Cyclic with a predominant manifestation of endurance" - high results in swimming and running;

"Mixed" - a large number of points scored in swimmingor running and in types related to 1 group (fencing, horseback riding or shooting); "Smooth" - high results in all forms.

###### *Table 14.*Model characteristics of the "winner-medalist" of the championshipsWorld and Olympic Games (group of athletics all-around)

The most widespread nature of the distribution of the forces of highly qualified athletes was investigated in all-around track and field athletics. Experts have analyzed the results of the competitive activity of the strongest foreign and domestic all-rounder athletes and developed the optimal ranges of sports results in individual disciplines.plinas necessary to achieve a world-class result (Table 14).

## Sports competition system

The system of sports competitions (calendar) is an ordering inplanning, organizing and conducting competitions, based on certain principles and patterns, in order to stimulate the development of sports and is built taking into account the interests of athletes and spectators. The competition system has a hierarchical structure, based onbathroom on the submission of the lower floors (mass starts)upper (main starts).

Sports competitions in world sports represent a mobile dynamic system. In most sports, there is currently a significant expansion of the general calendar of sports events, both internationally,and at the national level. This led in some sports to an increase in the number of individual starts in the annual cycle, participation in competitions for 8-10 months, the emergence of several competitive periods (stages), etc.

Highly qualified athletes have significantly changed the structure of their competitivetraining starts, the number of performances in competitions with greater mental tension (international, all-Russian) has increased and the share of starts with low responsibility has significantly decreased (in cities, regions, republics, DSO and departments).

In certain sports (cycling, playing), the number of oldtov (games) and the number of days occupied by the competition. In other sports, despite the expansion of the calendar, the number of competitions and starts and the days they occupied in the individual training of athletes remained practically unchanged (athletics, rowing, gymnastics, boxing, wrestling, weightlifting, etc.).

The main trend in the training of athletes highly qualified - the intensification of the entire system can be most effectively solved only through the optimization of competitive practice and an individual start calendar. Already in the early 1950s, the concept of "competitive training" was introduced in a number of sports, and the competition itself began to be viewed, on the one hand, as a goal, and on the other, as a means of training. It has been proven that participation in competitions is also a serious test of all aspects of the fitness of athletes, since many qualities and functional capabilities of a person are manifested in them. At the same time, the competitions themselves also serve as a means of their formation. Training and competitive loads, different in strength and specificity of the impact on the athlete's body, within a long period of time are quite specific.

noisy consistency and logical continuity.

The first - training - provide a deep functional restructuring of the body. The second - competitive - contribute to the intense manifestation of all physiologicalgic processes, increasing their level.

In this regard, in the system of sports training, a fairly wide place was taken by the competitive method, the essence of which is the use of a series of starts from smallshimtime (2-5 days), instead of intensive specialized training in order to develop the level of preparedness. Gradually, in the process of many years of training from a beginner to an international master of sports, competitions began to occupy an increasingly significant place, since, due to their psycho-physical impact on an athlete, they became an effective factor that gives an effect when ordinary training has already ceased to be effective.

It was found that the higher the sports results of qualified athletes, the more difficult it isthe expansion and implementation of the reserve capacities of the body in the process of training is carried out, and, consequently, the growth of sports performance. Shifts,

occurring in the athlete's body during the competition, as a rule, turn out to be moresignificant.

### The structure of the general and individual competition system

The atmosphere of the competition creates a special physiological and emotional background that enhances the effect of physical exercises and contributes to the highest manifestation of the body's functional capabilities due to reserves that are not revealed in training.classes.

Therefore, competition is considered one of the most important forms of training an athlete. At the same time, during the competition, technical and tactical skills and abilities are improved, experience in wrestling is accumulated.

Thus, both the general and the individual system of sports competitions act as a factor in the management of the training process, with the help of which it is possible to regulate the acquisition of a sports form in accordance with the timing of important starts.The training of highly qualified athletes requires a specific individual competition system, which includes a set of competitions at various levels,

aimed at bringing the athlete to the main starts of the season and four years.

Experts distinguish four levels of competition:

1. *Preparatory or training competitions,* whose main purpose isadaptation of athletes to the conditions of competitive wrestling, working out rationaltechnical and tactical scheme of competitive activity, the acquisition of competitiveexperience, increasing the level of preparedness. One of the varieties of preparatory competitions are leading starts, the tasks of which include bringing the athlete to the main starts of the season and monitoring the progress of pre-competition training.
2. *Control competitions,* in which the capabilities of the athlete are checked, the level of his preparedness, the effectiveness of the past stage of training are revealed. Based on their results, a program for the subsequent training of athletes is developed. ControlThese functions can be performed both by official competitions of the calendar, and specially organized ones.
3. *Qualifying competitions,* according to the results of which the teams are formed and selectedparticipants in individual types of the program for the main competitions for whichThere is a certain category of athletes.
4. *Main or main competition,* the purpose of participation in which is to achieve victory orthe conquest of the highest possible places. Athletes and teamsfocus on achieving maximum results, full mobilization of their functionality. Such competitions should not be more than 3-4 per year, and the interval between them is less than one month. They crown individual macrocycles or the entire process of many years of preparation as a whole. In this regard, rational competitive practice should lead the athlete or team to the decisive culminating competition of the year, which becomes the focal point of the entire system.

System content competition varies significantly depending on the stage of long-term preparation. So, at the initial stages, only preparatory and control competitions are planned for young athletes. There is practically no special preparation for the competition. Their main goal is to control the effectiveness of the past training stage, gain competitive experience, increase the emotional saturation of the training process. As the athlete's qualifications grow, at the stages of in-depth specialization and higher sporting achievements, the number of competitions is

melts, qualifying and main competitions are introduced into competitive practice, ifthe number and role of which are significantly increasing.

At the same time, in the four-year cycle, the quantitative and qualitative indicators of indiThe individual competition systems can vary considerably. This is due to the definedstrategic tasks, especially among athletes preparing for their second or third Olympics, planning separate annual cycles with a reduced level of stress, as well as with the tactics of bringing an athlete or team to the main competitions of the four-year period in a state of highest readiness. In certain sports, such tactical tasks in the last macrocycle are solved both by reducing and, conversely, increasing the total number of starts before the start of the main competition of the year.

Currently, in most sports, competitions are held for 7-10 months, regardless of the number of completed macrocycles and competition periods. Even in seasonal sports, roller ski races are held - for skiers, biathletes, nordic athletes; on skating rinks and tracks with artificial ice - for skaters, bobsledders, sledges. Separate competitions in order to control and increase the emotionality of the classes are also held during the preparatory period.

In the individual structure of competitive starts, three forms: permanent, local and mixed, associated with the specifics of various typessports.

*Permanent structure* characterized by a long competitive period, onduring which individual starts (games) are held with practically no intermediate stages (mesocycles) aimed at increasingperformance of athletes. This form of an individual calendar is typical for sports with a large number of starts (more than 60 per year): football, hockey, tennis, field hockey, cycling, etc., where the competitive load is characterized by significant changes in intensity, which is reflected in the heart rate, which varies in during the competition from 100 to 200 beats / min. Typically, each week will include 1 to 3 competition days.

*Local structure* organizing individual the calendar is characterized by participation in a small number of competitions (from 5 to 10), the interval between which is approximately 20 days or more, and the starts themselves are concentrated for 1–7 days. The system of competitions in boxing, all types of wrestling, gymnastics, weightlifting, equestrian sports, figure skating, marathon, race walking, etc. has such a structure. Competitive activity in these disciplines is highly intense. Athletes have a significant number of microtraumas.

*Mixed structure* the individual calendar is characterized by the alternation of individual serial starts for 2-5 weeks, with intermediate mesocycles aimed at preparing for major competitions, as well as single competitions concentrated over one to several days. This form is used to build competitive practice in sports with an average number of competitions per year (11-30): athletics, swimming, skiing, speed skating, rowing, etc.

In sports games - basketball, volleyball, handball, etc. - this structure has its own specifics. During the series (tournaments), starts take place both daily and with an interval of one day, and between separate rounds with several games there is a long mesocycle of training.

In cyclic sports, the most optimal interval is 3-4 days with a series of 5-6 starts in the first half of the competition period. At the same time, the weekly interval, in comparison with shorter and longer ones, turns out to be less effective, since it is not possible to organize the work of a developing orientation (N.N. Ozolin, V.K.Kalinin, 1977).

Usually, a series of starts ends with qualifying competitions, and in some cases, several starts of the series are qualifying. In many sports, the series is usually held in the first half of the competition period or after the main start of the season. In the preparatory period, short serial starts with control are often usedorientation, and in the competitive period - leading starts, providingbringing the athlete to the main climax of the season. In recent years, elite sports haveNewly, these functions are performed by commercial starts, stages of world cups and "Grand Prix".

Thus, the competition period can have a simple and complex structure.In the first case, it is built from homogeneous structural units - competitive stages (mesocycles). In the second, it consists of two (sometimes more) actual competitive stages, separated by a special "intermediate" stage. The decisive role in choosing a particular structure is played by the duration of the competition period. At the intermediate stage, the dynamics of the loads of the special preparatory stage is most often reproduced in an abbreviated form on the basis of predominantly special preparatory exercises (L.P. Matveev, 1977).

The need for intermediate mesocycles in the competition system is explained by the followingfor the following reasons:

* in competitive mesocycles, despite their inherent load intensitysok, it is not possible to constantly create sufficiently powerful growth factors in the general trainedsti;
* increased intensity of physical and mental stress in competitive mesocycles creates with a sufficiently large number of startsdanger of overvoltage.

At the same time, training loads in intermediate mesocycles can have both developing and restorative orientation.

In conditions of a long competitive period (over 3 months), it is advisableconcentration of competitions in series for two or threespecial stages. This frees up time for in-depth training work in between series and thus ensures the highest results at the main competitions of the season.

At the same time, when planning the quantitycompetitions and starts in each specific case, you need a strict individual approach. Competition overload can explain the fact that, showing high results in minor competitions, some athletes perform unsuccessfully in responsible ones.

"Overdose" of the competition leads to chronic fatigue of the athlete (especiallybeno young), primarily of his nervous system and mental sphere. Therefore, the rationalization of the individual system of competitions is one of the most essential reserves for further improving sportsmanship.

Experts came to the conclusion that, determining the number of competitions in each typesports in relation to long-term average statistical indicators, it is necessary to take into account the individual peculiarity of the athlete, first of all, his ability to quickly recover after the starts, which, in turn, is associated with the level of the athlete's preparedness and the type of his higher nervous activity. With insufficient technical readiness, a long recovery period, the competition should be less, with excellent technical readiness, rapid recovery - more.

At the same time, the practice of training highly qualified athletes and sports reserves in certain sports has developed certain quantitative indicators of the individual competition system, which ensures an increase in the level of fitness and achievement of sports results. At the same time, there are certain indicators of the number

starts, games, fights, fights necessary to achieve an optimal state of preparationlaziness on the eve of the main competition.

Table 15 provides indicativeannual parameters of the number of starts, games, fights, series, attempts and competition days among elite athletes in Olympic sports.

Factual materials indicate that the number of competitions (starts) in Olympic sports ranges from 7 (42 approaches) in weightlifting to 35 (190 starts) in cycling (track sprint). While the strongest boxers spend 15–20 fights a year, the similar figures in fencing are 20–30 times higher: 18–24 tournaments, 400–480 fights. In modern pentathlon, where fencing goes up to one thrust, the athlete spends 800 fights during the year. There are also fundamental differences in the number of days of competition: weightlifting - 7; handball, water polo - up to 100; cycling - up to 140 days.

###### *Table 15.*Indicators of competitive practice in the annual cycle at highco-qualified athletes



The share of the volume of the competitive load as a percentage of the total volume of work in different sports also significantly differs. Thus, in wrestling, the total time spent on competitive bouts is about 3%; the volume of competitive kilometers in rowing and running is 1–2%, and in cycling - 30–40% or more. All these differences depend on a number of factors: the number of completed macrocycles in a calendar year, the duration of recovery after the start, the established standards of competitive and training loads in different sports related to the load on the musculoskeletal system, energy supply systems and hormonal systems. So, for example, two cyclical disciplines (teams

road cycling and marathon running) have an equal duration of competitive activity - about 2 hours. A cyclist starts a year 100-120 times, a marathoner - 1012 times, including in the marathon - only 2-4 times.

Why is their individual competition system so different?

*Biomechanical aspect.* From a biomechanical point of view, a cyclist in the process of work has a support on 5 points, a runner - on 1. The load on the foot of the first is 40 kg, in the second

- 200 kg (verticalcomponent).

*Physiological aspect.*Along the waydistance, a cyclist loses about 3 kg, a marathon runner - about 5 kg, rectal temperature, respectively - 39.8 ° and 42.1 °. Starting at any distance, the marathon runner runs them with a heart rate of 165-180 bpm. At the same time, in multi-day races, which by the nature of competitive activity differ significantly from the team race, the cyclist's heart rate varies from 100 to 190 beats / min. At the same time, the cyclist is in the peleton for most of the distance, and his heart rate is maintained at 120–140 beats / min. But it is in multi-day races that a huge competitive mileage is gained.

The competitive practice of young athletes hassignificant differences from adults

lykh.

Competitions significantly increase the emotional side of the preparation process and in

at the same time, they make high demands on the body of a young athlete. In this regard, the total number of competitions among young athletes of different age categories is insignificant.It differs significantly from the number of competitions among highly qualified athletes.

However, the content of the competition itself has certain differences. They are less tense, they should have fewer starts, fights, games, attempts, series. A number of competitions, especially in younger age groups, are held according to the all-around program, including types reflecting the level of general, special physical and technical readiness. Young athletes must compete in other sports.

* + 1. Features of the individual competition system in connection with the professionalsport

In the last decade, in the development of "amateur" sports of the highest achievements,a continuous striving for professionalization is given.This is primarily expressed in a significant expansion of the calendar of international competitions, which is rightly raised to the rank of one of the trends in the development of modern sports. This trend is most clearly manifested in the holding of competitions for World Cups in various sports, "Grand Prix" and international commercial starts.

A feature of these competitions is their serial performance for 5-6 months in a one-year macrocycle. In general, the competitions are held depending on the sports for 7-10 months.

The question arises: how is the trend of expanding the general calendar of competitions reflected?at the level of sports achievements?

The system of competitions of professional athletes is influenced by certainspecific targets, consisting in successful performance in a long series of starts, which is associated with material rewards for each start. For a long period, they maintain a sufficiently high, but not the maximum level of preparedness,allowing them to perform according to their personal rating.

At the same time, the system of competitions among amateur athletes was decisivelythe impact of preparation for the Olympic Games, World Championships, European Championships and other regional games. In this regard, the main goal of the amateurs was a successful performance in these competitions, which, as a rule, took place in different years. This is a

fans of such a construction of the preparation process, which provided them with a way outinto the state of the highest readiness - "sports form", exactly on the dates of the main competitionny of the season and no more than one to three times a year.

Such management of sports form is always associated with a certain, most rationaltotal for the individual, the total number of starts,starts with the maximum mobilization of the body's capabilities and the corresponding connection to the main ones, providing for the inclusion of intermediate mesocycles in the competitive period with a limited number of starts.

Therefore, despite the significant the expansion in recent years of international and national calendars, in most sports there was no significant increase in the number of individual starts among the leading athletes of our country and the world. Exceptions to this rule are cycling and certain sports games.

However, in recent years, the internal structure of the individual has changed significantly.new competition system, its mental tension increased.

There was a sharp increase in the number of starts at the international level and a decrease in the number of starts within the country, especially at the level of clubs, cities, regions, sports organizations.

Thus, despite the further expansion of the general calendar, an increase in the number of prestigious and commercial competitions, the individual number of starts for the world's leading athletes preparing for the Olympic Games and World Championships remains approximately at the same level with the natural fluctuations of this indicator associated with the individual characteristics of athletes and national calendar traditions.

At the same time, in many sports, a group of athletes formed who triedtackle two main tasks in parallel: successful performance at the Olympic Gamesand world championships and successful performance in commercial starts and starts of the World Cups and "Grand Prix". Selected outstanding athletes who have a great advantage overtheir rivals, as well as in sports where competition between countries and athletes is low (for example, skiing and speed skating), the solution of these two tasks is quite achievable.

However, in a number of other sports (athletics, biathlon, etc.), decide in parallelmore than half of the leading athletes, especially in the Olympic years, are not capable of these two tasks.

Solving two of the most difficult tasks of itstraining, professional athletes and the strongest "amateurs" should always take into account the factor of a decrease in the level of preparedness due to frequent starts. What makes them include separate training mesocycles in the competition period, especially on the eve of the most important starts.

At the same time, in the course of various commercial starts and stages of World Cups, leading athletes have to solve such problems that athletes of lower qualifications solve in training (lead-in) and relaxed competitions.

From this we can conclude that the so-called "amateur" and "professionalon-line sports are continuously converging according to individual characteristics, however, until they are completely merged and identified, they are still veryfar (and may not happen at all), especially in connection with the goals and the choice of a limited number of parameters of individual specific competitive activity for athletes preparing for the Olympic Games and World Championships. Numerous materials show that it is impossible to be in a state of sports form for a long time. This state should be systematically renewed and developed according to its own specific laws (A.P. Bondarchuk, 1989, 2007; L.P. Matveev, 1991).

That's whytoday we can confidently say that successful performance at major competitions is incompatible with the uncontrolled use of commercial starts and their excessive number.

Winning medals in the Olympic Games and World Championships now requires a sensible combination of a series of starts with periods of intense training, during which athletes must reach the state of highest alertness at the right time.

This is especially true for young athletes, only recently transferred from the junior group to the main national teams.

Summarizing the above factual material, it is possible to determine the requirementsto the system of sports competitions (calendar).

The system of sports competitions should:

* obey the most important strategic task of all training - to ensure the achievementgetting in shape for the main start (s) of the year;
* take into account patterns and the peculiarities of the formation of sportsmanship in a particular sport, contributing to the growth of the results of athletes; be in an organic relationship with the dynamics of training loads; correspond to the tasks of training athletes at a particular stage;
* provide the required number of competitions in four-year and one-year cycles,simulating the conditions and regulations for the main starts;
* provide for highly qualified athletes the necessary set of nationalnational and international competitions (games, starts, attempts, fights) as in their number,and by rank;
* create equal conditions and opportunities for all athletes when selecting for national teamscommands;
* to provide a certain stability in the four-year and one-year cycles in order to increase the reliability of the management of the entire system of the athlete's (team's) improvement.The calendar of competitions should be subordinate to the interests of the development of sports, which is ensured by the continuity of international, republican, regional competitions from top to bottom and feedback; its compliance with the organizational structure of the sport;

observance of the principle of age continuity and taking into account the specifics of sports.

##### Questions and tasks for self-examination

1. Draw up a regulation on complex competitions.
2. Give an example of sports tactics in team sports.
3. What does the model of competitive activity in cyclic sports consist of?
4. List the main components of the competitive activity model in the gameout sports.
5. List the main criteria of the model of competitive activity in single combatproperties.
6. What components are included in the model of individual and group competitiveactivities in difficult coordination sports?
7. List the competition levels in preparation for the main starts of the season.
8. Describe three forms of competition: permanent, local and mixed.

# Chapter IV. Sports training system

The purpose of sports training is to prepare for sports competitions, aimed at achieving the highest possible level of readiness for a given athlete, due to the specifics of competitive activity and guaranteeing achievementthe implementation of the planned sports results.

Sports training includes in one way or anotherall main sections or relatively independent aspects: sports and technical, physical, tactical and mental training. Such a structure streamlines the idea of ​​the components of sportsmanship, allows, to a certain extent, to systematize the means and methods of their improvement, the system of control and management of the process of sports improvement. At the same time, in training and especially in competitive activity, none of these sides is manifested in isolation. They are combined into a complex complex aimed at achieving the highest sports performance. The degree of inclusion of various elements in such a complex, their interconnection and interaction occur according to the laws of formation of the necessary functional systems (P.K.Anokhin, 1975; V.D.Fiskalov, V.P. Cherkashin, 2016).

It should be borne in mind that each of the partiesreadiness depends on the degree of perfection of its other sides, is determined by them and, in turn, determines their level. For example, an athlete's technical improvement depends on the level of development of various motor qualities - strength, speed, flexibility, coordination abilities. The level of manifestation of motor qualities, for example, endurance, is closely related to the efficiency of technique, the level of mental resistance to overcoming fatigue, the ability to implement a rational tactical scheme of competitive wrestling in difficult conditions. On the other hand, tactical readiness is associated not only with the athlete's ability to perceive and promptly process information, the ability to draw up a rational tactical plan and find effective ways to solve motor problems, depending on the current situation,

The highest degree of an athlete's readiness is characterized by his ability to simultaneously implement various aspects of readiness in competitive activity

- sports-technical, physical, tactical, mental and is called sports***form.***

The fact is that each side of an athlete's preparedness in a certainthe least is a consequence of the use of narrowly targeted methods and means. This leads to the fact that individual qualities and abilities, manifested in local exercises, often cannot fully manifest themselves in competitive exercises. Therefore, one of the important problems of sports training is the optimal combination of analytical and synthesizing approaches in the training process. The first of them presupposes purposeful work on the improvement of individual qualities or sides of readiness, and the second - ensuring the coherence of complex manifestations of all sides of readiness in competitive activity.

Due to this, a part of the training process, in which the synthesis of various qualities and abilities is carried out into a single whole, taking into account the specifics of the competitive exerciseneniya is an integral part of sports training.

Thus, in the process of sports training, the following main tasks are solved:

* mastering the technique and tactics of the chosen sports discipline;
* improvement of motor qualities and an increase in the capabilities of the functional systems of the body, ensuring the successful fulfillment of a competitive exerciseniya and achievement of planned results;
* education of the necessary moral and volitional qualities;
* ensuring the required level of special mental readiness;
* the acquisition of theoretical knowledge and practical experience necessary for successtraining and competitive activity.

However, the effective implementation of all these tasks is possible against the background of the athlete's education andhis intellectual level as a prerequisite for the improvement and manifestation in competitive activity of all sides of the athlete's readiness.

All these tasks in the most complex form determine the main directions of sports training. Some authors call these tasks of sports training inte*granular training.*

## Sports training tools

The main specific means of sports training in sports, characterwho are subject to active physical activity, are physical exercise. The composition of these exercises, to one degree or another, is specialized in relation to the peculiarities of the sports discipline, chosen as the subject of sports improvement.

Sports training tools can be divided into three groups of exercises:selected competitive, special preparatory, general preparatory.

*Selected Competition Exercises -* these are integral motor actions (eithera set of motor actions), which are a means of wrestling and are performed, if possible, in accordance with the rules of competitions in the chosen sport.

A number of competitive exercises are relatively narrowly focused and actions limited by the motor composition. These are cyclical disciplines (easytic running; walking; ski, cyclingrace; ice skating; swimming; rowing, etc.); acyclic (weightlifting, shooting, martial arts, etc.) and mixed exercises (athletics jumping, throwing, etc.). By the nature of the impact on the basic physical qualities, these exercises can be subdivided into speed-strength and those requiring the predominant manifestation of endurance, as well as complex ones - affecting a wide range of physical abilities, which include sports games and combat sports (wrestling, boxing, fencing). In these types of competitive exercises, the complex manifestation of the main physical qualities occurs in conditions of constant and sudden change in the situation and forms of movements.

Competitive exercises such as slalom and downhill skiing have a similar character, however, they are less diverse in composition and there is no direct moment.my interaction between the competitors.

There are also complexes of relatively independent competitive exercises.nenii representing special sports - biathlon and all-around. They can includeboth competitively homogeneous exercises (speed skating), and completely differentrelatives (modern pentathlon, athletics all-around, ski nordic, etc.). Vat the same time, there is a large group of competitive multi-track exercises with a constantly changing content (gymnastics, figure skating, divingand etc.).

Along with the above complexes of competitive exercises in the processsports training, their training forms are also used, which, according to individual features of the execution mode, may differ from the actual competitive ones, since they are aimed at solving training problems and can be more heavier or lighter forms of these exercises.

The proportion of selected competitive exercises in most sports forexcluding sportsgames are small, because they make very high demands on the athlete's body.

*Special preparatory exercises* include elements of competitive eventseffects, their connections and variations, as well as movements and actions that are substantially similar to them in the form or nature of the manifested abilities.

Simulation exercises are also part of the special preparatory exercises. These exercisesare selected in such a way that the actions of the athlete as closely as possible correspond in terms of the coordination structure to the nature of the performance, and especially

on kinematics, selected sports discipline. So, among the specially preparedrunner's exercises include, for example, running along segments of a selected distance; among gymnasts, the performance of elements and ligaments of competitive combinations plays a similar role; for gamers - game actions and combinations (this may include the execution of individual strikes, elements of game combinations, etc.). Another example is the exercisesapproximating the form of competitive action (exercises on rollerskiing for skiers, trampoline exercises for divers and gymnasts, performing various blows with a "mallet" with all kinds of special devices for tennis players, etc.). In certain cases, special preparatory exercises include exercises from related, related sports, aimed at improving the specific qualities necessary in the discipline of specialization and manifested in the corresponding modes of work.

Exercise only if it is legitimate to consider it as specially preparatory, if it has something in common with the selected competitive exercise, either in the form of performance, or in its content, that is, the functioning of the main energy systems, the work of the muscular apparatus, etc.

The composition of special preparatory exercises is decisively determined, aftertherefore, the specifics of the chosen sports discipline, and therefore the range of such exercisesniy is always comparatively limited.

On the other hand, the special preparatory exercises are not identical.new competitiveexercise (otherwise there would be no point in using them). They are designed and selected in such a way as to provide a more targeted and differentiated impact on the improvement of physical abilities and the formation of the skills required by the athlete. This is explained by the fact that often the repeated performance of competitive exercises from the chosen kind of sport does not allow to improve the strength, speed, endurance, mobility in the joints to the necessary extent, as this can be achieved with the help of special exercises. The reason for this, first of all, is that very often the number of repetitions of competitive exercises in a holistic form cannot be made large enough, mainly due to high nervous and physical stress, which is especially important to take into account in individual sports.

The complexity of the special preparatory exercises can be different. The simpler they are in coordination, the number of elements, the more local their impact can be. For example, elementary special preparatory exercises can develop joint mobility, speed of movement, accuracy, speed of motor reaction, jumping ability, and manyother qualities. A large role can be played by relatively elementary special preparatory exercises for the development of a separate muscle group in relation to the peculiarities of the chosen kind of sport.

Depending on the primary focus, special preparatoryExercises are subdivided into leading, promoting the development of the form, technique of movements, and developing, aimed at fostering physical qualities (strength, speed, endurance, etc.). This division is, of course, conditional, since the form and content of motor actions are often closely interrelated.

Quite often in sports practice, special preparatory exercises,aimed mainly at improving physical qualities, to a certain extent, are associated with the improvement of sports equipment and its elements. Such an integrated approach is called the conjugate method of performing special preparatory exercises (V.M.Dyachkov), however, if the exercise is intended mainly for technical improvement (leading exercises), then the athlete's attention should be directed to training.

Among the many special preparatory exercises, the coach must be able not to only to select them for solving a specific task, but also to create new ones from parts, elements, bundles of movements. These should be exercises similar in coordination, effort, character, amplitude and other features to the competitive exercise. However, all training means should be selected taking into account the individual characteristics of the trainees. Some of them should further improve the athlete's strengths (for example, a player has a certain strong "signature" blow - such special preparatory exercises are selected that make this blow even more effective). Other means should tighten up individual lagging technical skills, skills or physical qualities.

*General preparatory exercises* (GTC) are primarily meansgeneral training of the athlete. As such, a wide variety of exercises can be used - both approximate in the characteristics of their impact to special preparatory ones, and significantly different from them (including oppositely directed ones). The range of these means is theoretically limitless. In practice, it is limited by time, place of study and other circumstances.

The importance of general preparatory exercises in many sports, especially in ththe level of growth of young athletes is often underestimated. Individual specialists at allstages of long-term training dramatically increase the volume of special physicaland reduce the amount of general physical fitness, which leads to the forced training of young athletes.

The effect of general preparatory exercise on improving performance ismedium, especially since in many sports it is often very difficult to identify the differences between special preparatory and general preparatory exercises. Obviously, more specialized means (competitive and special preparatory exercises) have a more direct impact on improving results. On the other hand, it can be argued that an insufficient increase in results, or even a cessation of their growth at the stage of higher achievements, as well as an increased traumatism of an athlete, are due to an insufficient volume of general preparatory exercises in training and, especially, at its early stages.

When choosing general preparatory exercises, the following requirements are usually observed: the general physical fitness of an athlete should include, at the early stages of the sports path, means that allow effectively solving the problems of a comprehensive physical exercise.vitality, and at the stages of in-depth specialization and sports improvement to be the foundation for improving competitive skills and physical abilities that determine sports results:

* when educating nonspecific, i.e. general endurance - long running is moderatenoisy intensity, cross-country skiing, swimming;
* when educating self-powerabilities - exercises with a barbell, borrowed from weightlifting, as well as exercises of auxiliary sports gymnastics with various kinds of weights and resistance;
* when training speed of movements and motor reaction - sprint exercisesniya, training varieties of sports games and outdoor games;
* when fostering coordination abilities - elements of artistic gymnastics,acrobatics, games with high requirements for coordination of movements.

However, the trainer should always remember that GPA should at the same time express the peculiarities of sports specialization. Between different physical exercises, both positive and negative interactions are possible due to the law.

dimensions of positive and negative "transfer" of various physical qualities andmotor skills.

For this reason alone, the means of general physical training cannot be the same for different sports disciplines. Along with some similarity, the composition of thesemeans in each case should have its own specifics. This also applies to their selection, and the place they occupy in the structure of the training process.

The inclusion of general preparatory exercises in the training process is usuallycontributes to its overall effectiveness. Thus, mastering and improving various motor skills improves coordination abilities. Thanks to this, the athlete can quickly master complex forms of sports technology and achieve a higher degree of perfection. This also becomes possible due to the "transfer" of elements of previously acquired skills to new movements. Versatile sports and technical training is especially important in those sports that make complex demands on the coordination of movements (gymnastics, diving, skydiving, alpine skiing, games, etc.).

Children and adolescentsthe body is in constant development. Its osteo-ligamentous apparatus is relatively fragile and vulnerable to extremely unilateral loads. Young athletes who perform large volumes of specialized loads are more susceptible to injury than those exercising with sufficient amounts of general training equipment.

The ability to endure high loads and activate recovery processes depends on the efficiency of the cardiovascularsystems. In many sports, the means used are not effective enough for the necessary adaptation of this system (artistic gymnastics, wrestling, boxing, weightlifting, tennis, etc.). In this regard, to develop endurance in the training program in these sports, it is necessary to include general preparatory cyclic exercises and sports games.

In the process of sports training, it should be borne in mind that the boundaries between presentedgroups of training means are to some extent conditional.There are always exercises that occupy, as it were, an intermediate position, combining the characteristics of all three groups.

An example of this is the swim stroke dynamogram,where the differences are clearly traced between the direction of the efforts of the stroke in the water, on the simulator and when stretching the rubber shock absorber.

For the practical work of the trainer, the following scheme can be proposed, which allowsto systematize all means of sports training (Table 16).

## Sports training methods

In sports training, the term "method" should be understood as a method of using the main training means and a settechniques and rules for the activities of an athlete and a coach.

###### *Table 16.*Systematization of training means (physical exercise)

In the process of sports training, two large groups of methods are used:*general pedagogical,*including verbal and visual methods, and practical, including methods of strictly regulated exercise, play and competitive (Table 17).

All these methods are used in various combinations. Each method is not used byfree, but constantly adapt to specific requirements due to the peculiarities of sports practice. When choosing methods, it is necessary to ensure that they strictly correspond to the tasks set, general didactic principles, as well as special principles of sports training, age and gender characteristics of athletes, their qualifications and readiness.

##### General pedagogical methods

Verbal methods used in sports training include storytelling, volumeclarification, conversation, analysis and discussion, etc. These forms are most often used in a concise form, especially when training qualified athletes, which is facilitated by special terminology, a combination of verbal methods with visual ones. The effectiveness of the training process largely depends on the skillful use of instructions and commands, remarks, verbal assessments and explanations.

The visual methods used in sports practice are diverse and significantlydegree determine the effectiveness of the training process. First of all, these should include the methodically correct demonstration of individual exercises and their elements,which is usually conducted by a coach or qualified athlete.

*Table 17.***Methods used in sports training**



In recent years, demonstration aids have been widely used - educational films, video tape recordings, models of playgrounds and fields for demonstrating tactical schemes, electronic games. Orientation methods are also used. Here it should be distinguished as the simplest landmarks that limit the direction of movement,distance covered, etc., as well as more difficult- light, sound and mechanical leading devices, including those with programmed control and feedback. These devices allow an athlete to receive information about tempo-rhythmic, spatial and dynamic characteristics of movements, and sometimes provide not only information about movements and their results, but also forced correction.

##### Practical exercise methods

The main ones belonging to this group are the methods of strictly regulatedexercises, as well as play and competitive. Methods of strictly regulated exercise are very diverse and are used practically in solving almost all problems arising in the process of sports training.

In sports practice, a number of varieties of methods are distinguished.bath exercise. These include, first of all, two main groups: methods, mainly aimed at mastering sports technique, and methods, mainly aimedfostering motor qualities.

The selection of these groups is due to the fact that in various sports, especially in complexno coordination, martial arts and games, technical training is difficultand a constant process of either mastering new elements, ligaments, techniques (figure skating, jumping into water, acrobatics, artistic and rhythmic gymnastics, martial arts, games), or improving technique with a relatively stable structure of movements (cyclic and speed-strength sports).

Among the methods aimed mainly at mastering sports equipment, the followingblowing to highlight the methods of learning exercises as a whole (holistic-constructive) and in parts (dismembered-constructive). Learning the movement as a whole is carried out while mastering relatively simple exercises, as well as complex movements, the division of which into parts is impossible. However, when mastering a holistic movement, the attention of the trainees is consistently focused on the rational fulfillment of individual elements of a holistic motor act.

When learning more or less complex movements, which can be divided into relativeare relatively independent parts, the development of sports equipment is carried out in parts. In the future, the holistic performance of motor actions will lead to integration into a singlea whole set of previously mastered components of a complex exercise.

When using these two methods of mastering movements, a large role is given to the basegiving and imitation exercises.

In imitation exercises, the general structure of the main exercises is preserved, however, when they are fulfilled, conditions are provided that facilitate the development of motor actions. As imitation exercises, pedaling on a bicycle ergometer can be used - for cyclists; imitation of swimming movements - for swimmers; work on a rowing machine - for rowers, etc. Simulation exercises are very widely used to improve the technical skills of both beginners and athletes of various qualifications.

Methods aimed primarily at improving motor qualities.The structure of practical training methods is determined bywhether the exercise in the course of a single use of this method is continuous or is given at intervals for rest, it is performed in a uniform (standard) or variable (varying) mode.

In the process of sports training, exercises are used in the framework of two maingroups of methods - continuous and interval. Continuous methods are characterized by onemultiple continuous execution of training work. Interval methods involve performing exercises both with regulated pauses and arbitrarilypauses of rest.

When using both methodsexercises can be performed both in a uniform (standard) and variable (variable) mode. Depending on the selection of exercises and the peculiarities of their application, training can be complex (integral) and selective (predominant). With a complex impact, a parallel improvement of various qualities is carried out, which determine the level of an athlete's preparedness, and with a selective one, the predominant development of individual qualities is carried out. With a uniform mode of using any of the methods, the intensity of work is constant, with a variable mode, it is variable. The intensity of work from exercise to exercise can increase (progressive version) or change repeatedly (variable version).

Continuous training methods applied under uniform and variable conditionswork, mainly used to increase aerobic capacity,education of special endurance to work of medium and long duration. As an example, we can cite rowing at distances of 5000 and 10,000 m with constant and variable speed, running at distances of 10,000 and 20,000 m with both uniform and variable intensity. These exercises will, as a rule, contribute to an increase in the aerobic performance of athletes, the development of their endurance for long-term work, and an increase in its efficiency.

The possibilities of continuous training methods in conditions of variable work are much more diverse. Depending on the duration of the parts of the exercises performed with more or less intensity, featurestheir combination, the intensity of work when performing individual parts, it is possible to achieve a predominant effect on the athlete's body in the direction of increasing speed capabilities, developing various components of endurance, improving private abilities that determine the level of sports achievements in various sports.

In case of application of the varying variant, parts of the exercise performed with different intensities or with different intensities and varying durations may alternate. For example, when skating a distance of 8000 m (20 laps of 400 m), one lap is completed with a result of 45 s, the next is free, at an arbitrary speed. Such work will contribute to the education of special endurance, the formation of competitive technique. The progressive variant of the load is associated with an increase in the intensity of work as the exercise progresses, and the descending one - with its decrease. So, swimming a distance of 500 m (the first one-hundred-meter segment swims in 64 s, and each subsequent one - 2 s faster, that is, in 62, 60, 58 and 56 s) is an example of the use of a progressive option; cross-country skiing 20 km (4 laps of 5 km) with results, respectively 20,

**Interval methods** trainings (including repeated and combined) are widely used in the practice of sports training. Performing a series of exercises of the same and different duration with constant and variable intensity and strictly regulated random pauses is typical for these methods. Examples are typical series aimed at improving special endurance: 10 × 400 m; 10 × 1000 m - in running and skating, rowing, etc. An example of a varying variant can be series for improving sprint qualities in running: 3 × 60 m with maximum speed, rest - 3-5 min, 30 m s running at maximum speed, slow running - 200 m.

An example of a progressive option are complexes that involve sequential passage of segments of increasing length (running a series of 400 m + 800 m + 1200 m

+2000 m), or standard length at increasing speed (sixfoldswimming a distance of 200 m with the results of 2 min 14 s; 2.12; 2.10; 2.08; 2.06; 2.04).

The top-down option suggests the opposite combination: sequential execution exercises of decreasing length or performing exercises of the same continuewith a sequential decrease in their intensity.

In one complex, progressive and descending options can also be combined. Exercises using interval methods can be performed in one (for example

measures, 10 × 800 m - in running, 6 × 5 km in skiing, etc.) or several series 6 × (4 × 50 m) in swimming, 4 × (4 × 300-400 m) - in cycling sports (track), etc.

In the modes of continuous and interval work in sports training, the game method is also used, aimed at selective or complex improvement of physicalical qualities.

**Game method**most often it is embodied in the form of generally accepted outdoor and sports games, but it cannot be carried out with any particular game. In principle, it can be used on the material of a wide variety of motor actions, provided that they lend themselves to organization in accordance with the requirements of the game method.

The game method is characterized, first of all, by a "plot" organization:the activity of the players is organized on the basis of a figurative or conditional "plot" (intention, game plan), which outlines a general line of behavior, but does not strictly predetermine specific actions and ways to achieve a game goal (win). Within the "plot" and the rules of the game

various paths and goals are allowed, and the choice of a specific path and the implementation of the gameideas occur in the conditions of a gradual, more often accidental, change in the situation. Hence, it is clear that the play method makes it possible to program the actions of those involved only with a greater degree of probability. At the same time, it provides the broadest opportunities for creativesolving motor problems and in a real measure contributes to the manifestation of independentlysti, initiative, resourcefulness.

One of the essential features of the game method is that it simulates active interpersonal and intergroup relationships, which are built both by the type of cooperation (between players of the same team) and by the type of rivalry (between opponents in pair and team games), when opposing interests collide, game conflicts arise and are resolved. This creates an emotional intensity and contributes to a vivid identification of the moral qualities of a person.

However, the dosage accuracy in the play method is always significantly less than in the methodsstrictly regulated exercise.

The game method, due to all its inherent features, is used in the process of sportsNoah training is not so much for basic training of movements or selective exposureimpact on individual abilities, how much for the complex improvement of the motoractivities in difficult conditions. To the greatest extent, it allows you to improvesuch qualities and abilities as dexterity, resourcefulness, quick orientation, independence, initiative. In the hands of a skilled teacher, it also serves as a very effective method of educating collectivism, camaraderie, conscious discipline and other moralpersonality traits.

Its role is no less important as a means of active recreation, switchingthose engaged in a different kind of motor activity in order to accelerate and increase the effectiveness of adaptation and recovery processes, to maintain the previously achieved level of preparedness.

**Competitive method** suggests specifically organized competitive activity, which in this case acts as an optimal way to increase the effectiveness of the training process. The use of this method is associated with high requirements for the technical-tactical, physical and mental capabilities of an athlete, causes profound changes in the activity of the most important systems of the body and thereby stimulates adaptation processes, provides integral improvement of various aspects of the athlete's readiness.

When using the competitive method, the conditions forconducting competitions in order to maximizethem to those requirements that are most conducive to solving the assigned tasks.

Competitions can be held in difficult or easier conditions compared towith the official.

Examples of the complication of competition conditions include the following:

* competitions in mid-altitude conditions, in hot climates, in bad weather conditions (strong headwind - in cycling, "heavy" ski track - in skisnumber, etc.);
* competitions in sports games on fields and smaller grounds, with painthe number of players in the opposing team;
* conducting a series of fights (in wrestling) or fights (in boxing) with relatively short pauses against several opponents;
* competitions in games and single combats with "inconvenient" opponents using unusual technical and tactical schemes of wrestling.

Facilitation of competition conditions can be provided by: planning competitions at shorter distancesin cyclic forms; a decrease in the duration of fights, fights - in single combats; simplification of the competitive program - in complex coordination forms; the use of lightweight shells - in throwing; decrease in the height of the net - in volleyball; ball masses - in water polo and football; application

"Handicap", in which a weaker participant is given a certain advantage - he starts a little earlier (in cyclic forms), gets an advantage in castingwashers or balls (in sports games), etc.

By the peculiarities of load regulation and other regulatory aspects, the competitive method occupies, as it were, an intermediate position between the playing method and the methods of a strictly regulated exercise. The competition is rather strictly regulated by certain rules (official and unofficial), but this regulation affects only some aspects and conditions of the competition (subject of the competition, order of performance, equipment conditions, etc.). The same applies to the specific nature of the activity and is determined to a decisive extent by the logic of the competitive struggle.

## Training and competition loads

The problem of loads in the system of sports training for both young and highly qualifiedfit athletes occupies one of the central places, since it is the loads that link into a single whole the means and methods of training used by the athlete, with those reactionstions of the body that they cause.

Training and competitive load is usually understood as an additional functional activity of the body relative to the level of rest or other initial state, introduced by the exercise (LP Matveev, 1977–1991).

There is another definition of this term. Exercise is the impact of physicalexercises on the athlete's body, causing an active reaction of his functional systems (V.N. Platonov, 1987, 2014).

In sports, the volume of training load is understood as the amount of work done per session or any training cycle. Physical activity is determined by the dosage of exercises or training tasks, their frequency, duration, and conditions.yami fulfillment.

Physical activity in training is regulated by: a) changes in exercises and training tasks; b) the number of repetitions; c) reducing the time to complete the task; d) an increase or decrease in the pace of execution and the range of motion; e) complicationor simplification of exercise; f) the use of simulators and trainingdevices.

Regulate the loadin a training session - this means ensuring its optimal volume and intensity. The rational provision of the general density of the training lesson is of great importance in the process of training. The general density of a lesson is the ratio of the time used pedagogically justifiably to its entire duration. The following expenditures of time are considered justified: demonstration, instructions from the coach, physical exercises and the necessary rest, rebuilding, installation of equipment, etc. for lack of equipment, violation of discipline, etc.) Striving for the optimal density of classes, it is necessary to minimize downtime in various ways: a) reduction of breaks between exercises; b) the use of in-line execution of the exercise; d) advance preparation of places of employment and equipment; e) the inclusion of additional exercises.

Ways to increase volume and intensity: 1) increaseexecution speed; 2) increasing the distance; 3) an increase in the weight of the shells; 4) an increase in the duration of exercises or training tasks; 5) replacing light exercises with more complex ones; 6) increasing the number of repetitions.

Each lesson has its own measure of maximum permissible loads, but any load must be determined and depends on the age, gender, level of preparedness of the trainees.

The size of the trainingloads are ranked in cyclic sports in accordance with the zones of intensity into aerobic, mixed (aerobic-anaerobic) and anaerobic. In other sports, loads are divided into four groups: 1) large; 2) significant; 3) medium; 4) small.

*Heavy loads*accompanied by significant functional shifts in the organnism of an athlete, a decrease in performance. External criteria for heavy loadis the inability to continue performing the proposed work.

*Significant load*characterized by a large total volume of work performed under steady state conditions, and is not accompanied by a decrease in the workablesti. Its volume is 70% of the volume of work performed before the onset of fatigue.

*Average load* corresponds to the beginning of the second phase stable performance, accompanied by stability of movements. The amount of work usually ranges from 40-50% of the work performed before the onset of obvious fatigue.

*Light load* significantly intensifiesthe activity of various functional systems is accompanied by the stabilization of movements. The number of exercises in a lesson is usually 20–25% of the amount of work performed before fatigue.

All these data are relevant to the training process for athletes of highqualifications.

The training load does not exist on its own. It is a function of muscle work inherent in training and competitive activities. It is muscular work that contains the training potential, which causes the corresponding functional restructuring on the part of the body. Currently, there are a number of classifications of training loads, the authors of which proceed from the motor specificity of sports, energy and power of muscular work, pedagogical tasks solved in the training process, the influence on recovery processes and the effect of subsequent work, the interaction of work of various predominant orientation and other criteria. ...

However, by their nature, the loads used in sports canbe subdivided into training and competitive, specific and non-specific; the largest

- for small, medium, significant (near-limit) and large (extreme); in orientation - to those contributing to the improvement of individual motor qualities (speed,strength, coordination, endurance, flexibility) or their components (for example, alaktat or lactate anaerobic capabilities, aerobic capabilities), improving the coordination structure of movements, components of mental readiness ortactical skill, etc .; by coordination complexity - on performedin stereotypical conditions that do not require significant mobilization of coordination abilities, and associated with the implementation of movements of high coordination complexity; by mental tension - to more intense and less intense, depending on the requirements for the mental capabilities of athletes.

In sports practice, there are "external" and "internal" indicators of trainingand competitive loads. "External" load indicators in the most general form canbe represented by indicators of the total volume of work and its intensity. The total amount of work is usually expressed in hours; the volume of cyclic work (running, swimming, rowing, etc.) - in kilometers, the number of training sessions, competitive starts, games, fights, combinations, elements, jumps, shots, etc. Disclose these general “external” load indicators it is possible, highlighting its particular characteristics. For this purpose, for example, the shares of a particular specific load in its total volume are determined, the ratio of work aimed at educating individual qualities and abilities, the ratio of the means of general and special physical and technical training, etc.

Another important external indicator of the load is the parameters of its intensity. These indicators include: the pace of movements, the speed or power of their implementation, the time to overcome training segments and distances, the density of exercises per unit of time, the amount of weights overcome in the process of developing strength qualities.etc.

The loads are most fully characterized by "internal" indicators, that is, the reactionpits of the body for the work performed. Here, along with indicators that carry information

on the short-range effect of the load, manifested in a change in statefunctional systems immediately during work and immediately after its completion, data on the nature and duration of the recovery period can be used.

"External" and "internal" load indicators are closely interrelated: an increase in the volume and intensity of training work leads to an increase in shifts in functionalthe normal state of various systems and organs, to the development and deepening of the processes of fatigue.However, this relationship is manifested only within certain limits. For example, with the same total volume of work, with the same intensity, the effect of the load on the athlete's body can be fundamentally different. With the same external characteristics, internal load indicators can change under the influence of a variety of reasons. Thus, the performance of the same work in different functional states leads to different reactions on the part of individual systems of the body. As an example, we can cite the research results obtained when modeling the conditions of orienteering competitions: performing work on the treadmill, approximately the same in speed and duration, under conditions of fatigue leads to a sharp increase in shifts in the activity of functional systems (Table 18).

###### *Table 18.* The reaction of the functional systems of the body of six orienteering athletes at the beginning (1) and at the end (2) of modeling a competitive distance on a treadmill

The ratio of external and internal parameters of the load varies depending on the level of qualification, fitness and functional state of the athlete, his indivisual features, the nature of the interaction of motor and autonomic functions.For example, work of the same volume and intensity causes different reactions among athletes of different qualifications.

Moreover, the ultimate (large) load, which naturally assumes different volumes and intensity of work, but leading to the refusal to perform it, causes them to have different internal reactions. This is manifested, as a rule, in the fact that in high-class athletes with a more pronounced reaction to the extreme load, the recovery processes proceed more intensively.

With the improvement of the qualifications of athletes, there is a decrease in energy consumption when performing a standard load, with a simultaneous increase in them under heavy loads with poppythe maximum mobilization of forces.

For large (limiting)loads in a trained person, the IPC can exceed 6 l / min, while in an untrained person it does not exceed 3 l / min; cardiac output can reach 44–47 l / min, systolic volume - 200–220 ml, while in untrained people - the maximum value does not exceed 20 l / min and 140–145 ml. The trained as compared to the untrained have a significantly more pronounced reaction of the sympathoadrenal system. All this provides a person adapted to physical activity with greater efficiency, which is manifested in an increase in the duration and intensity of work.

Standard (moderate) and ultimate loads cause unequaland the nature of the reaction at various stages of the training macrocycle, as well as if they are planned with a non-restored level of the body's functional capabilities after previous loads. So, at the beginning of the preparatory period, the response of the athlete's body to moderate specific loads is more pronounced in comparison with the indicators recorded at the end of the preparatory and in the competitive period.

Thus, an increase in special fitness leads to a significant economization of the function when performing standard work. Large loads, on the other hand, are linkedwith more pronouncedreactions as athletes grow in fitness. For example, a highly qualified swimmer, when passing a competitive distance (100 m, freestyle) with a maximum speed in the preparatory period, shows a less pronounced reaction compared to the indicators registered in the competitive period.

At the same time, swimming 100-meter distances with a standard result, as training increases, causes a less pronounced reaction.

The loads characteristic of modern sports lead to long-term adaptationorganism. Unfortunately, long-term use of large loads is often the reason for the suppression of adaptive capabilities, the cessation of the growth of results, the reduction in the duration of the athlete's performance at the level of highest achievements, the appearance of pre-pathological and pathological changes in the body.

All loadsaccording to the magnitude of the impact on the athlete's body, they can be divided into developing, supporting (stabilizing) and restorative. However, there are no clear boundaries between these indicators, since the direction of the impact of the load on the body largely depends on the level of preparedness and the condition of the athlete.

So, in a state of low training load of a certainvalues ​​can be developing, in a state of average fitness the same loads - only supporting, and in a state of sports form - restorative or supporting.

As a rule, developmental loads should include large and significant loads, which are characterized by high effects on the main functional systems of the body and cause a significant level of fatigue. Such loads in terms of the integral effect on the body can be expressed through 100% and 80%. After such loads, a recovery period is required for the most involved functional systems, respectively, 48–96 hours and 24–48 hours.

Supporting (stabilizing) loads include medium loads,affecting the athlete's body at the level of 50-60% in relation to large and trerecovery of the most tired systems in the period from 12 to 24 hours.

Recreational loads include small loads on the athlete's body.at the level of 25-30% in relation to largeand requiring no more than 6 hours for recovery.

In sports practice, loads are used: 1) aimed at the predominantthe formation of individual sides of readiness or components of sportsmanship; 2)

aimed at combining into a single whole diverse local abilities, whichrye in a complex provide a high level of integral qualities.

However, most loads,used in training, has a complex, conjugate effect (V.M.Dyachkov, 1967). Therefore, the choice of a particular load must be justified primarily from the standpoint of efficiency. The most significant signs of the effectiveness of training loads include (M.A.Godik, 1980):

1. Specialization, that is, a measure of similarity to a competitive exercise.
2. Tension, which manifests itself in a predominant effect on a particular motor quality, when certain mechanisms of energy supply are activated.
3. The value as a quantitative measure of the impact of the exercise on the athlete's body.The specialization of the load presupposes their distribution into groups depending on the degree of their similarity with the competitive ones. On this basis, all training loads are divided into specific and non-specific. The specific loads are those that are significantly similar to the competitive ones in terms of the nature of the displayed abilities.

and reactions of functional systems.

### Training classificationsand competitive loads

In domestic and world literature, there are a number of different classifications of load

zok.

Some of them are based on taking into account only individual indicators, most often internal

them (heart rate, energy consumption, energy supply, consumption oxygen, blood lactate concentration, pulmonary ventilation, etc.). Other classifications, especially sports practitioners, are based on taking into account only "external" indicators (cyclic, acyclic, strictly dosed and variable, in relation to the speed or power of the exercises performed, etc.).

At the same time, in a number of studies of teachers, physiologists and biochemists (N.I. Volkov, 1969; V.L. Karpman, 1969, 1974; V.D. Chepik, 1969; Ya.M. Kots, 1985, etc. ) it was found that a number of internal and external indicators of training loads have a linear relationship with each other at a certain power of muscular activity, a range of speeds. For example, in the heart rate intervals of 120-170 bpm, there is a linear relationship between heart rate, oxygen consumption, pulmonary ventilation, cardiac output, oxygen demand, work power or movement speed.

The moment of nonlinear change in the relationship between the accumulation of lactate, pulmonary ventilation, heart rate and other functional indicators, on the one hand, and the power of work or movement speed, on the other, is commonly called the “anaerobic threshold” (AN).

The indicator of the speed of movement, power of work and oxygen consumption at the level of ANP in recent years has become considered one of the most important characteristics of the loads and performance of athletes.

The level of anaerobic threshold is directly determined by the concentration of lactate inblood. Wide usereceived the ANP index equal to 4 mmol / l (fixed threshold) (A. Mader, 1982). However, each athlete has his own individual anaerobic threshold, the values ​​of which can vary in terms of lactate values ​​up to 6.0 mmol / l.

With the help of a fixed and individual anaerobic threshold, you can more accurately control the development of working capacity and select the required intensity and continuework efficiency. In practice, indirect methods for determining anae are widely used.robust threshold:

* the ventilation anaerobic threshold is determined on the graph(pulmonary ventilation - work power) at the inflection point of the straight line of the respiratory minute volume indicators with an increase in the speed or power of the work performed;
* pulse anaerobic threshold is also determined on the graph by the inflection point of the straight linelines of heart rate indicators with an increase in the speed or power of the work performed.

The intensity of work at the ANP level helps to establish a balance between the assetthe presence of glycolytic and oxidative enzymes in the muscle and allows maintaining a higher concentration of ATP and CrF in cells by increasing the oxidative capacity of mitochondria, which helps to choose the optimal modes of operation. All this indicates that the power (speed) of the ANP is a reliable indicator of the adaptation of the oxygen-transport and muscular systems to specific work and can be used as a boundary when developing the classification of loads.

However, in the process of testing athletes in order to determine the anaerobic thresholdit should be borne in mind that it is a specific indicator and should be measured only using competitive exercises. Thus, the level of ANP among qualified rowers, measured while working on a rowing ergometer, corresponds to a power in the range of 2200-2400 kgm / min, and in the process of a bicycle ergometric test or running on a treadmill - only 1300-1500 kgm / min (N.N. Ozolin , 1986; V.E. Borilkevich, 1987).

In order to build a sportstraining, it is necessary to systematize all the loads encountered in the preparation of athletes on the basis of a single principle that would combine, on the one hand, the form and direction of the exercises (pedagogical external indicators), on the other hand, would link them with the integral response of the main autonomic systems of the body (biological internal indicators ).

Specialists most often divided training loads into three or four power zones according to the energy principle: aerobic, mixed - aerobic-anaerobic and anaerobic, including exercises of glycolytic and alactate orientation.

In the process of development of sports physiology, the most common classification in the 50s-80s of the last century was based on the analysis of the record curve (V.S. Farfel, 1949), dividing all loads into four power zones (moderate, large, submaximinimum and maximum).

However, in sports practice, this classification gave way to another, usedin Russia, Germany, Italy, Bulgaria and other countries. It is based on the sign of the use as the boundaries of the corresponding load zones at the level of world records, and the corresponding speeds or powers recorded with increasing load and having certain biological criteria: maximum speed, VO2 max, ANP speed, aerobic threshold speed (blood lactate 2 mmol / l). In this modern classification of loads, five zones are distinguished, which have certain physiological boundaries and pedagogical criteria that are widespread in training practice. In addition, in some cases, the third zone is divided into two more subzones, and the fourth - into three in accordance with the duration of competitive activity and the power of work. For qualified athletes, these areas have the following characteristics.

Zone I - aerobic recovery. The short-term training effect of loads in this zone is associated with an increase in heart rate up to 140-145 beats / min. Lactate in the blood is at rest and does not exceed 2 mmol / l. Oxygen consumption reaches 40–70% of the VO2 max. Energy supply occurs due to the oxidation of fats (50% or more), muscle glycogen and blood glucose. The work is provided by completely slow muscle units (MMU), which have the properties of complete utilization of lactate and therefore it does not accumulate in the muscles and blood. The upper limit of this zone is the rate (power) of the aerobic threshold (lactate 2 mmol / l). Work in this area can take from several minutes to several hours.

It stimulates recovery processes, fat metabolism in the body and improvesaerobic capacity (general endurance).

Loads aimed at developing flexibility and coordination of movements are performed inthis zone. Exercise methods are not regulated.

The volume of work during a macrocycle in this zone in different sports ranges from 20 to 30%.

Zone 2 - aerobic developmental. The short-term training effect of loads in this zone is associated with an increase in heart rate up to 160-175 beats / min. Blood lactate - up to 4 mmol / l, O2 consumption

-60–90% of the IPC. Energy is provided by the oxidation of carbohydrates (muscle glycogen and glucose) and, to a lesser extent, fat. Work is provided by slow muscle units and fast muscle units of the "a" type, which are switched on when loads are performed at the upper boundary of the zone - the speed (power) of the anaerobic threshold. The muscle fibers of the BMVa type that enter into work are capable of a lesser degree of oxidation.

lactate, and it graduallyincreases from 2 to 4 mmol / l.

Competitive and training activities in this area can also take several hours and are associated with marathon distances, sports games. It stimulates the education of special endurance, which requires high aerobic abilities, strength endurance, and also provides work for educated coordination and flexibility. The main methods are continuous exercise and interval extensive exercise.

The volume of work in this zone in the macrocycle in different sports ranges from 40 to 80. Zone 3 - mixed aerobic-anaerobic. The near training effect of loads in

this zone is associated with an increase in heart rate up to 180-185 beats / min, lactate in the blood - up to 8-10 mmol / l, oxygen consumption - 80-100% of the BMD. The provision of energy occurs mainly due to the oxidation of carbohydrates (glycogen and glucose). Work is provided by slow and fast muscle units. At the upper border of the zone - the critical speed (power) corresponding to the VO2 max, fast muscle units of type “b” are connected, which are not able to oxidize lactate accumulating as a result of work, which leads to its rapid increase in muscles and blood (up to 8-10 mmol / l), which reflexively also causes a significant increase in pulmonary ventilation and the formation of oxygen debt.

Competitive and training activities in a continuous mode in this zone can last up to 1.5-2 hours. Such work stimulates the education of special endurance, provided by both aerobic and anaerobic-glycolytic abilities, strength endurance. The main methods are continuous and interval extensive exercise. The volume of work in the macrocycle in this area in different sports ranges from 5 to 35%.

1. zone - anaerobic-glycolytic. The closest training effect of loads in this zone is associated with an increase in blood lactate from 10 to 20 mmol / L. Heart rate becomes less informativematitive and is at the level of 180-200 beats / min. Oxygen consumption gradually decreases from 100 to 80% of the VO2 max. The provision of energy occurs due to carbohydrates (both with the participation of oxygen and anaerobic). The work is performed by all three types of muscle units, which leads to significant increases in lactate concentration, pulmonary ventilation and oxygen debt. The total training activity in this zone does not exceed 10-15 minutes. It stimulates the education of special endurance and, especially, anaerobic glycolytic capacity.

Competitive activity in this zone lasts from 20 seconds to 6-10 minutes. Basicmethod - interval intensive exercise.The volume of work in this zone in the macrocycle in different sports ranges from 2 to 7%.

1. zone - anaerobic alactate. The short-term training effect is not related to the heart rate and lactate indices, since the work is short-term and does not exceed 15–20 s in one repetition.

rhenium. Therefore, blood lactate, heart rate and pulmonary ventilation do not have time to reach high levels. Oxygen consumption drops significantly. The upper limit of the zone is the maximum speed (power) of the exercise. The supply of energy occurs anaerobically due to the use of ATP and KrF, after 10 s, glycolysis begins to connect to the energy supply and lactate accumulates in the muscles. Work is provided by all types of muscle units. The total training activity in this zone does not exceed 120–150 s for 1 training session. It stimulates the education of high-speed, speed-strength, maximum-strength abilities. The volume of work in the macrocycle in different sports is from 1 to 5%.

The classification of training loads gives an idea of ​​the modes of work in which the various exercises should be performed used in training directedon the education of various motor abilities (Table 19). At the same time, it should be noted that young athletes from 9 to 17 years old have separate biological indicators, for exampleHeart rate, in different zones, may be higher, and lactate values ​​may be lower. The younger the athlete, the more these indicators diverge from those described above and given in Table 19.

As mentioned above, in cyclic sports associated with the predominant manifestation of endurance, for more accurate dosing of loads, the third zone in individualcases are divided into two subzones: "a" and "b". To the first ("a")include competitive exercises lasting from 30 minutes to 2 hours, and to the second ("b") - from 10 to 30 minutes. The fourth zone is also divided into three subzones: "a", "b" and "c". In subzone "a" competitive activity lasts approximately 5 to 10 minutes; in subzone "b" - from 2 to 5 minutes; in subzone "c" - from 0.5 to 2 minutes.

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### Training Load Components

Training loads are determined by the following indicators:a) the nature of the exercises;

b) the intensity of work during their implementation;c) volume (duration) of work;

d) the duration and nature of the rest intervals between individual exercises

The ratios of these components in training loads determine the value and

the direction of their impact on the athlete's body.

*Table 19.*Classification of loads and characteristics of individual intensity zones



\* In one repetition

*The nature of the exercise.* By the nature of the impact, all exercises can be subdivided into three main groups: global, regional and local impact. To exerciseglobal impactinclude those in the performance of which 2/3 of the total muscle volume is involved in the work, regional - from 1/3 to 2/3, local - up to 1/3 of all muscles (V.M. Zatsiorsky, 1970).

With the help of exercises of global impact, most of the tasks of sports are solvedtraining, ranging from increasing the functionality of individual systems andending with the achievement of optimal coordination of motor and autonomic functions in conditionsviyah of competitive activity.

The range of use of exercises of regional and local impact is significantreally already. However, using these exercises, in some cases it is possible to achieve shifts in the functional state of the body, which cannot be achieved with the help of exercises of global influence.

*The intensity of the load.*She is largelymeasure determines the magnitude and direction of the impact of training exercises on the athlete's body. By changing the intensity of work, one can promote the preferential mobilization of certain energy suppliers, intensify the activity of functional systems to varying degrees, and actively influence the formation of the main parameters of sports equipment.

The intensity of work is closely interrelated with the developed power during exercise, with the speed of movement in cyclic sports, densitycarrying out tactical and technical actionsin sports games, duels and fights in single combats.

In different sports, the following dependence is manifested up to 1/3 of all muscles (V.M. Zatsiorsky, 1970).

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The intensity of work is closely interrelated with the developed power during exercise, with the speed of movement in cyclic sports, densitycarrying out tactical and technical actionsin sports games, duels and fights in single combats.

In different formssports, the following dependence is manifested - an increase in the volume of actions per unit of time, or the speed of movement, as a rule, is associated with a disproportionate increase in the requirements for energy systems, which bear the predominant load when performing these actions.

Data on the real intensity of work during the performance of various exercises should be constantly in the field of vision of the trainer and the athlete, since even a seemingly insignificant decrease in the speed of movement or a decrease in the number of motor actions per unit of time (decrease in the density of classes) can result in a sharp decrease in the load.

*Workload.*In the process of sports training, various exercises are used.duration - from a few seconds to 2–3 or more hours. This is determined in each specific case by the specifics of the sport, the tasks that are solved by a particular exercise.nenia or their complex.

To increase alactate anaerobic capacity, the most acceptable areshort-term loads(5–10 s) of extreme intensity. Long pauses (up to 2–5 minutes) allow recovery. Work of maximum intensity for 60–90 s leads to complete depletion of alactate anaerobic sources during exercise, and, consequently, to an increase in their reserve, that is, work that is highly effective for improving the glycolysis process.

Given that the maximum formation of lactic acid in muscles is usually notedafter 40-50 s, and work mainly due to glycolysis usually lasts for 60-90 s, it is the loads of this duration that are used to increase glycolytic capabilities. Rest pauses should not be long, so that the lactate value does not significantly decrease.

This will help to improve the power of the glycolytic process andincreasing its capacity.

Prolonged aerobic exercise leads to intense engagementfats in metabolic processes, and they become the main source of energy.

Comprehensive improvement of various components of aerobic performance can be achieved only with fairly long-term single loads orwith a large number of short-term exercises.

It should be borne in mind that as you perform long-term work of varying intensitynot so much quantitative as qualitative changes in activity occurvarious organs and systems of the body.

*Duration and nature of rest intervals.*The duration of the rest intervals is the factor that, along with the intensity of work, determines its preproperty orientation. Rest periods should be carefully planned.taking into account the recovery period after the applied exercises and individual training sessions. It is known to flowuneven: at first, the recovery processes are very intensive, then, as the athlete's functional state approaches

to work, slow down. Repetition of exercises in the first third of the recovery periodode creates for the athlete's body completelydifferent conditions than in the second or third.

The duration of the rest intervals should be planned depending on the tasks and the training method used. For example, in interval training aimed at primarily increasing the level of aerobic performance, you should focus on the rest intervals at which the heart rate decreases to 120-130 bpm. 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 athlete, his readiness to effectively perform the next exercise, forms the basis of a variant of the interval method, called the repetitive one.

When planning the length of rest between repetitions of an exercise or differentexercises within the framework of one lesson should distinguish between 3 types of intervals:

* + - 1. *Full*(ordinary) - guaranteeing by the time of the next repetition of practicallyski such restoration of working capacity, which was before its previous execution,which makes it possible to repeat the work without additional stress of functions.
			2. *Tense* (incomplete), in which the next the load falls on a state of more or less significant underrecovery, which, however, will not necessarily be expressed for a certain time without a significant change in external quantitative indicators, but with an increasing mobilization of physical and psychological reserves.
			3. *Minimax interval.*This is the smallest rest interval between exercises, afterwhich there is an increased efficiency (supercompensation), which occurs whencertain conditions due to the laws of recovery processes.

When developing strength, speed and dexterity, repeated loadsusually combined with full and "minimax" intervals. All types of rest intervals are used in endurance training.

By the nature of the athlete's behavior rest between individual exercises can be active or passive. With passive rest, the athlete does not perform any work, with active rest, he fills in the pauses with additional activity. The effect of active rest depends primarily on the nature of fatigue: it is not detected with light previous work and gradually increases with an increase in its intensity. Low-intensity work in pauses has the greater positive effect, the higher the intensity of the previous exercises was.

Compared with intervals of rest between exercises, intervals of rest between classes more significantly affect the processes of recovery, long-term adaptation of the body to training loads.

Based on the features of the phases of trace processes, on which the effects of regular activities are layered, three types of rest intervals are also distinguished: ordinary (full), hard(incomplete) and supercompensatory (L.P. Matveev, 1991).

With an ordinary interval between classes, the level of performance of athletesby the beginning of the next lesson, he manages to return to the level that was at the beginning of the previous one.

The hard interval is shorter than the regular one. With it, a more significant summation of the effects of the previous and next occupation is observed, due to which there is a more complete mobilization of the reserve capabilities of the body, and therefore twoYak effect: stimulationto the deployment of supercompensatory processes or a decrease in working capacity for the next lesson, which will then require certain recovery measures in the form of unloading exercises or special procedures.

The supercompensation interval is commensurate in time sufficient for the onset of the supercompensation phase, which makes it possible to perform a more significant load in the next lesson than in the previous one. However, such intervals are quite long and frequent.their use can lead to a decrease in the number of lessons in a microcycle.

## Principles (patterns) of sports training

In the theory and methodology of sports, as in any scientific and practical discipline dealing with the problems of education and upbringing, paramount importance is attached to the definitionthe most important theoretical and methodological provisions - principles that reflect the main patterns in this area of ​​practice and, therefore, serve as a guide to action. The basic pedagogical principles apply to sports training, since they concentrate the most general starting points that are valid for any educational and educational activity: consciousness and activity, visibility, accessibility and individualization, systematicity, as well as other principles expressing the specifics of physical education.

General pedagogical principles, however, do not specify the specifics of sports training. Therefore, they do not exhaust the entire system of principles, which the leadership followsto engage in training activities.

Among the principles that are also of fundamental importance in the system of physical education, in general, general social principles should also be taken into account, such as all-round assistance to the comprehensive harmonious development of the individual; preparation for labor andronny activity, health-improving orientation of physical education.

In the field of sports, not only general, but also their own specific laws are objectively operating. They represent the intrinsically necessary essential relationships in sportstraining, determining the dynamics of loads and the resulting effect, the order of building various training cycles.

Thus, the principles of sports training ultimately concretize objective laws.

##### Focusfor maximum possible achievements, in-depth specialization and individualization

If, when using physical exercises without sports goals, only a certain, not the maximum possible degree of achievements is realized, then sports activity is characterized by an orientation towards the maximum. And although this maximum is individually different, it is natural that everyone strives to follow the path of sports improvement as far as possible.

Sports achievements are important, of course, not in themselves, but as specific indicators.development of abilities and skills.In this regard, the attitude towards higher sports results has significant social and pedagogical significance, since it means striving for the highest boundaries of human perfection. Such an aspiration is stimulated by the entire organization and conditions of sports activity, especially by the system of sports competitions and progressive rewards (from the assignment of the initial sports category to the gold medal of the champion).

The setting for the highest indicators is realized by the corresponding construction of sportstraining, using the most effective means and methods, in-depth specialby civilization in the selected formsports. The orientation to the maximum determines in one way or another all the distinctive features of sports training - an increased level of loads, a special system of alternating loads and rest, a pronounced cyclicality, etc.

This pattern of sports training manifests itself in different ways depending onfrom the stages of many years of sports improvement. At the first stages, when sports activities are carried out mainly by the type of general training, the training process does not have

of pronounced features of sports specialization - the attitude towards higher achievements has the character of a long-term perspective. As you ageorganism and an increase in the level of fitness, this setting is fully realized until the limiting age and other factors begin to act. Thus, the general principle of progression acquires special content in the field of sports training. It should be understood as a requirement to ensure the highest possible degree of improvement in a particular sport. And this means the need for in-depth specialization.

Sports specialization is characterized by such a distribution of time and effort inthe process of sports activity, which is most favorable for improvement inthe chosen sport, but not so for other sports. In this regard, when building a sports training, it is extremely important to take into account individual characteristics. Narrow specialization, carried out in accordance with the individual inclinations of an adult athlete, makes it possible to most fully reveal his talent in the field of sports and satisfy sports interests. On the contrary, the erroneous choice of specialization, which does not correspond to the individual qualities of an athlete, and in some sports - and a certain role in the team, largely negates the efforts of the athlete and the coach. The principle of individualization requires the construction and conduct of training of athletes, taking into account their age characteristics, abilities, level of preparedness. Exercise complexes, their structure, the nature of the performance should be chosen in accordance with the age, gender, and the degree of preparedness of the trainees. Training material should be positioned so that athletes, especially young athletes, move from one available task to another. The individualization of training is largely carried out by planning it, taking into account the capabilities of each practitioner.

##### Unity of general and special training

Sports specialization does not exclude the all-round development of the athlete. Against,the most significant progress in the chosen sport is possible only on the basis of the versatile development of physical and spiritual abilities, a general rise in the functional capabilities of the body. This is convinced by the entire experience of sports practice, as well as numerous data from theoretical and experimental research.

Dependence of sports achievements on versatile development, including intellectual, is due to two main reasons. First, the unity of the organism -the organic relationship of its organs, systems and functions in the process of activity and development. Secondly, by the interactions of various motor skills and abilities. The wider the range of motor skills and abilities mastered by an athlete, the more favorable are the prerequisites for the formation of new forms of motor activity and improvement of those mastered earlier.

The objective laws of sports improvement require that sportsNaya training, being a deeply specialized process, would at the same time lead to all-round development. In accordance with this, general and special training are inextricably combined in sports training. It is extremely important that the organic combination of general and special training meets not only the laws of sports improvement, but also the general laws of the national education system, where the all-round development of an athlete is one of the prerequisites for his physical improvement. A number of patterns of progression in sports require that training,

the maximum degree of perfection of an athlete in the chosen specialization,

would simultaneously contribute to his all-round physical development and general "enginenomu "education.

Practically embodying the principle of the unity of general and special training, it is necessarykeep in mindthe following provisions emphasizing the nature of the relationship between these parties in sports training:

* inseparability of general and special training as equally necessary sidessports training;
* interdependence of the content of general and special training;
* irreducibility of general and special training and the need to comply with certaina certain measure of their ratio in the process of many years of sports training.

The unity of the general and special training of an athlete means that none of these sides can be excluded from training without prejudice to the growth of athletic achievements and ultimatethe goals of using sports as a means of education. The unity of general and special training also lies in the interdependence of their content: contentgeneral physical training is determined taking into account the peculiarities of the chosen kind of sport, and the content of special training depends on those preconditions that are created by general training. Different periods of long-term and year-round training are characterized by uneven

the total share of general and special training.

In practice, there is both an excessive narrowing of general training, and an excessive increase in its specific weight at certain stages of the training process.

The optimal ratio of general and special training does not remain constant, butchanges naturally at various stages of sports development.

##### Continuity of the training process

This feature of the training process in sports is characterized by three main provisions:

1. sports training is built as a year-round and long-term process that guarantees the greatest cumulative effect in the direction of sports specialization;
2. the impact of each subsequent training session as if "layered"on the "traces" of the previous one, fixing and deepening them;
3. the interval of rest between sessions is maintained within the limits that guarantee the general trend of recovery and increase in working capacity, and within the framework of trainingmeso and microcycles, under certain conditions, it is allowed to conduct classes against the background of partial underrecovery, due to which a compacted regime of loads and rest is created. It is necessary to strive to build the training process in such a way that, to the greatest extent possible,

penalties to ensure the continuity of the positive effect of training sessions, possible in the given specific conditions, to exclude unjustified breaks between them and to minimize the regression of training. This is the main essence of the principle of the continuity of sports training. The fundamental methodological meaning of this provision is concludedis included in the requirement to avoid unnecessarilylong intervals between training sessions, to ensure continuity between them and thereby create conditions for progressive achievements.

Heterochronism (non-simultaneity) of restoration of various functional capabilities of the body after training loads and heterochronism of adaptation processes.cessov allows, in principle, to train daily and more than once a day without any phenomena of overwork and overtraining. The continuity of the training process is associated with the degree and duration of the impact of individual exercises, individual training sessions or competitions, as well as individual training cycles on the athlete's working capacity.

The effect of these influences is variable and depends on the duration of the load and its direction, as well as the magnitude.

In this regard, a distinction is made between the short-range training effect (BTE), track trainingny effect (STE) and cumulative training effect (KTE).

BTE is characterized by the processes occurring in the body directly during the exercise, and those changes in the functional state that occur at the end of the exercise or lesson. STE is a consequence of performing an exercise, on the one hand, and the response of body systems to a given exercise or lesson, on the other.

At the end of the exercise or lesson in the period of subsequent rest, a trace process begins, which is a phase of relative normalization of the functionalthe state of the body and its performance. Depending on the beginning of the repeated load, the body may be in a state of underrecovery, returning to its original workcapacity or into a state of supercompensation, i.e., higher efficiency thanoriginal.

With regular training, the trace effects of each training session or competition, constantly overlapping each other, are summed up, as a result of which a cumulative training effect arises, which is not reduced to the effects of individual exercises or sessions, but is a derivative of a combination of various trace effects and leads to significant adaptive (adaptive) changes in the state of the athlete's body, an increase in his functional capabilities and sports performance. However, such positive changes in the state of readiness are possible with the correct structure of sports training and after a fairly long time. Thus, the interactions of BTE, STE and KTE provide the continuity of the sports training process.

##### Unity of gradualness and limitation in increasing training loads

Increasethe functional capabilities of the organism naturally depends on the value of the training and competitive loads presented. In the process of playing sports, this dependence is used to the fullest extent, since sports are directly aimed at the maximum possible achievements. Each new step on the way to sports achievements means a new level of training loads. Both physical activity and the requirements for the technical, tactical and mental readiness of an athlete are gradually and steadily increasing, which is expressed in the consistent performance of such tasks by him that mobilize him to master more and more complex and perfect skills, abilities, to increasingly higher manifestations of physical and spiritual forces. For the dynamics of loads during training, it is characteristic that that they increase gradually and at the same time with a tendency towards the maximum possible. It would be wrong to always equate the concept of "maximum load" with the concept of "load to failure", to the point of complete fatigue. It would be correct to say that this is a load that is on the border of the available functional abilities of the organism, but in no case goes beyond the limits of its adaptive capabilities. In the dynamics of training loads, two seemingly incompatible features are organically combined - gradualness and "breaks of gradualness", that is, a kind of "jumps" in the load when it periodically increases to maximum values. Gradual and which is on the border of the available functional abilities of the organism, but in no case goes beyond the limits of its adaptive capabilities. In the dynamics of training loads, two seemingly incompatible features are organically combined - gradualness and "breaks of gradualness", that is, a kind of "jumps" in the load when it periodically increases to maximum values. Gradual and which is on the border of the available functional abilities of the organism, but in no case goes beyond the limits of its adaptive capabilities. In the dynamics of training loads, two seemingly incompatible features are organically combined - gradualness and "breaks of gradualness", that is, a kind of "jumps" in the load when it periodically increases to maximum values. Gradual and

"Spasmodic" are interdependent in the training process. Maximum load is normalis always set according to the available capabilities of the body at this stageits development. As the functional and adaptive capabilities of the body expand

As a result of training, the "maximum" load will gradually increase.The practice of modern sports has fundamentally changed the recent understanding of the available values ​​of training loads. Due to extremely high requirementsto the functional capabilities of the body in the process of sports training, it is necessary to especially carefully observe the principles of accessibility, individualization and systematicity.

A gradual and maximum increase in training and competitive loads determines the progress of sports achievements. This is ensured by a steady increase in the volume and intensity of training loads, a gradual increase in the complexity of the requirements.requirements for the training of an athlete. All this is expressed in a consistent implementationthe athlete has such tasks thatallow him to master increasingly complex and sophisticated skills and motor skills. Gradual training should correspond to the capabilities and level of preparedness, especially of a young athlete, ensuring a steady progressive growth of his athletic achievements.

Of particular importance is the principle of unity and gradualness and the tendency towards "extreme" loads. With regard to the training of young athletes, this necessitates full correspondence of the volume and intensity of training and competitive loads to the functional capabilities of the growing organism of children, adolescents, boys and girls. Sports training of this contingent of athletes can be carried out rationally only if it causes positive anatomophysiological changes in the body, has a health-improving effect, promotes all-round physical development and provides an increase in results in the chosen sport. A gradual increase in training and competitive loads with their episodic increase to the maximum contributes to a more effective increase in the fitness of young athletes. A steady increase in loads, a gradual complication of the requirements for the training of a young athlete, is expressed in the consistent performance of such tasks by him that allow him to master more and more complex and perfect skills and abilities. Gradual training should correspond to the capabilities and level of preparedness of a young athlete, to ensure a steady progressive growth of his sports achievements.

##### Undulationload dynamics

Progressive increase in training loads at certain stages of thefalls in contradiction with the course of adaptive changes in the athlete's body. This makes it necessary, along with rest, to temporarily reduce the load, which provides the necessary biological changes in the athlete's body. Therefore, the dynamics of training loads cannot have the form of a straight line - it acquires a wavy character. Wavelike changes in the load are characteristic both for relatively small segments of the educational and training process, and for the stages and periods of the annual training cycle.

The tendency of a gradual and at the same time rather rapid increase in frictionstraightening loads are most naturally embodiedin their wave-like dynamics, although other forms of load dynamics are possible in sports training (straight-ascending, step-jump, etc.).

Wavelike fluctuations are characteristic of both volume dynamics and intensity dynamics.loads, and the maximum values ​​of those and other parameters in most casesteas do not match. At the present time, it is possible to provide an indicative scheme of general tenload denominationsin different phases, stages and periods of the training process. According to this scheme, "waves" of the following scales are distinguished:

* small, characterizing the dynamics loads in microcycles that span several days;
* average, expressing the general tendency of the loads of several small "waves" beforelakh mesocycles (medium cycles) training;
* large, characterizing the general trend of medium "waves" in the period of large cyclesfishing training.

The art of building a sports training to a large extent consists precisely in how to correctly measure all these "waves" with each other, that is, to ensure the necessary correspondence between the dynamics of loads in microcycles and more general tendencies of the training process characteristic of certain of its stages and periods.

The inevitability of undulating load fluctuations is explained by a complex of interconnectiongiven reasons. The most significant of them are as follows:

* phasicity and heterochronism of recovery and adaptation processes during training;
* periodic fluctuations in the body's capacity due to its naturalnew biorhythms and general environmental factors;
* the interaction of the volume and intensity of the load, due to which these aspects of it changerun in certain phases of the training process as multidirectional,and unidirectionally.

Waveform is not the only possible form of dynamicstraining loads. So, for example, in microcycles of training, not only wave-like, but also other variants of the dynamics of individual load parameters (straight-line ascending, stepped, etc.) are often observed.

The duration and degree of change of individual load parameters in differentthe phases of its undulating oscillations depends on: the absolute value of the loads; on the level and pace of development of the athlete's fitness; on the characteristics of the sport; from stages and periods of training.

At the stages immediately preceding the main competition, the wavelike change in loads is primarily due to the patterns of "lagging transformation" of the cumulative effect of training. Externally, the phenomenon of delayed transformThis is manifested in the fact that the peaks of sports results seem to lag behind the peaks of the volume of training loads in time: the acceleration of the growth of the result is observed not at the moment when the volume of loads reaches especially significant values, but after it has stabilized or decreased. Hence, in the process of preparing for the competition, the problem of regulating the dynamics of loads is brought to the fore in such a way that their overall effect is transformed into sports results in the planned time frame.

From the logic of parameter relationshipsvolume and intensity of loads, you can derive the following rules regarding their dynamics in training:

* the less the frequency and intensity of training sessions,the longer the phase (stage) of a steady increase in loads can be, but the degree of their increase each time is insignificant;
* the denser the mode of loads and rest in training and the higher the total intensity of the loads, the shorter the periods of wave-like fluctuations in their dynamics, the more often they appearthere are “waves” in it;
* at the stages of a particularly significant increase in the total volume of loads (which is sometimes necessary to ensure long-term adaptations of a morpho-functional nature)the share of high-intensity loads and the degree of its increase are limited the more, the more the total volume of loads increases and vice versa;
* at the stages of a particularly significant increase in the total intensity of the loads (whichis necessary to accelerate the pace of development of special training) their generalthe volume is limited, the larger the increase in the relative and absolute intensity

Although these rules are not always taken into account explicitly, in fact, soor otherwise they are guided when constructing training in appropriate conditions.

##### Cyclicitytraining process

The main regularities of the sports training process also include a clearly expressed cyclicality, that is, a relatively complete cycle of its stages with partial repetition of individual exercises, classes, stages and whole periods in frameskah certain cycles. Training cycles are the most common forms of its structural organization.nization.

Each successive cycle is a partial repetition of the previous one and at the same time expresses the development tendencies of the training process, that is, it differs from the previous one in updated content, a partial change in the composition of means and methods, an increase in training loads, etc. dynamic features, its effectiveness depends decisively.

The entire training process is built in the form of cycles - from its elementary links to the stages of long-term training.

Depending on the time scale within which the training program is builtcess, are distinguished: microcycles, mesocycles,macrocycles. All of them are integral links of the rational construction of the training process.

Training cycles are the most common forms of its structural organization. Understanding the basics of their structure means understanding the general procedure for building a workout. This is what the principle of the cyclic training process aims at.

Being guided by this principle means:

1. building a training, proceed from the need for systematic repetition of the main elements of its content and at the same time consistently change training tasks, inin accordance with the logic of the alternation of phases, stages and periods of the training process;
2. solving the problems of the expedient use of the means and methods of training, to find an appropriate place for them in the structure of training cycles (because any training exercises, means and methods, no matter how good they are in themselves, lose the effectvigor, if they are applied at the wrong time, out of place, without taking into account the peculiarities of the phases, stages and periods of training);
3. normalize and regulate training loads in relation to the regularities of changing phases, stages and periods of training (it has already been shown that wave-like changeschanges in the dynamics of training loads are in a certainin accordance with training cycles of various duration - micro-, meso- and macrocycles;
4. consider anya fragment of the training process in its relationship with larger and smaller forms of the cyclic structure of training, given that the structure of microcycles, for example, is largely determined by their place in the structure of middle cycles, and the structure of middle cycles is due, on the one hand, to the characteristics of their constituent microcycles, and, on the other hand, a place in the structure of a macrocycle, etc .;
5. when building different training cycles, you shouldtake into account both the natural biological rhythms of the body and the perennial ones associated with natural phenomena,

annual, lunar, menstrual, diurnal and some others that have become widespreadin recent years.

These requirements express the general meaning of cyclicality. Its more specific content is revealed in a detailed analysis of the structural foundations of building the training process, which is the problematic of the special section "Building sports training".

##### The unity and relationship of the structure of competitive activity and the structure of the athlete's readiness

This principle is based on patterns that reflect the structure, relationshipsand the interdependence of the athlete's competitive and training activity.

The rational construction of the training process presupposes it strict focus on the formation of the optimal structure of competitive activity, ensuring the effective implementation of competitive wrestling. This is possible only if there are clear ideas about the factors that determine the effectiveness of competitive activity and the preparedness of an athlete. In this regard, it is necessary to clearly understand the subordination relationship between the components of competitive activity and readiness. Let's take a look at cyclic sports as an example:

1. the effectiveness of competitive activity is an integral characteristicwhat the preparedness of the athlete;
2. competitive activity consists of the main components (start, distance speed level, finish, etc.);
3. integral qualities determine the effectiveness of an athlete's actions when performing the main components of competitive activity (for example, in relation to the level of distance speed, such qualities are special enduranceand speed-strength abilities);
4. basic functional parameters and characteristics determine the level of development integral qualities (so, in relation to the level of distancespeed such characteristics are indicators of power and capacity of power supply systems, efficiency of work, stability and mobility in the activity of the main functional systems, etc.;
5. particular indicators that determine the level of basic functional parametersand characteristics (for example, in relation to maximum oxygen consumption - an integral characteristic of aerobic performance - such indicators are the percentage of slowly twitch muscle fibers, heart volume, minute volume of blood circulationgrowth, maximum ventilation of the lungs, the capacity of the capillary network, etc.).

In this case, it is necessaryIt should be noted that the integral qualities that determine the effectiveness of an athlete's actions when performing the main components of competitive activity show significantly greater variability than the main components of competitive activity, and less than the main functional parameters and characteristics that determine the level of development of integral qualities. This approach allows us to streamline the process of management of an athlete's improvement, to closely link the structure of competitive activity and the corresponding structure of preparedness with the methodology for diagnosing the functional capabilities of athletes, characteristics of models of the corresponding levels, a system of means and methods aimed at improving various components of preparedness and competitive activity.

##### Age adequacy of long-term sports activity

The essence of this principle is that in the process of many years of training withto take into account the dynamics of the age-related development of an athlete, to effectively influence the age-related dynamics of the abilities manifested in sports, in the direction leading to sports improvement and at the same time not conflicting with the laws of ontogenesis of the human body.

Despite the fact that this position is generally accepted, it is almost too often observeddeviations from it are given. To a large extent, they stem from the opportunistic subordination of children and youth sports to the needs dictated by the development of prestigious high-performance sports. This is expressed in the early narrow specialization of training children and adolescents, in the forced transition to increased training and competitive loads for the speedy achievement of sports results, and in similar phenomena fraught with contradictions with the natural laws of age development and ultimately preventing the full realization of the individual's potential sports capabilities. With this kind of practice of children and youth sports, it acquires essentially inhuman features (by the way, this is manifested, in particular, in the formulation of the problem of sports selection in relation to the mass sports of children: instead of solving the problem of an adequate choice of a sport for a child in relation to individual characteristics, inclinations, interests, they advocate the selection of a person for sport, that is, the problem is turned upside down). Overcoming these shortcomings of modern sports practice should be facilitated by the consistent implementation of the principle of age adequacy of long-term sports activity.

## Physical training

### Athlete strength

For the development of the absolute strength of athletes, the age periods from 14 to 17 years old are considered the most effective in terms of growth rates. This age coincides with the stages deepenedtraining in the chosen sport and sports improvement.

The main tasks of strength training for young athletes are muscle strengtheningof the entire motor apparatus, education of the ability to exercise the efforts of a dynamicand static in various conditions. At the same time, certain attention should be paid to strength exercises that allow you to selectively influence individual muscle groups that are important in the chosen sport. These include exercises that are similar in structure and nature of manifestation of neuromuscular efforts to the main (competitive) exercise, as well as exercises aimed at developing muscle groups that carry the main load when performing a competitive exercise.

For the development of muscle groups of the entire motor apparatus, as well as individual muscle groups, which largely determine the effectiveness of the athlete's efforts, dynamic and static strength exercises are used. Dynamic, in turn, are divided into two groups: the actual force, when performing whichthe muscle strength shown by the athlete increases mainly due to the increase in the mass moved and, therefore, due to the athlete's ability to maximize stressexercise of working muscles (for example, bench press and snatch of the bar; squat with a partner on the shouldersor with another burden, etc.); speed-power,when performing which, the strength of the muscles shown by the athlete increases to a large extent due to the acceleration imparted to the load or projectile.

In classes with young men, one should strive to ensure that the dosage of exercises from the pantsgoy and othersweights increased very gradually. At the same time, optimal conditions for strength training are created when not only the absolute value of the applied load increases, but also the ratio of this value to the load, which at this stage of training is the maximum for a young athlete.

The main methods of training muscle strength in young men at the stage of in-depth trainingnirovka are the following: a method of repeated performance of strength exercises with weights of small and medium weight; method of repeated performance of speed-strength exercise (method of dynamic efforts); re-execution method of staticpower effort. A relatively large amount of muscle work performed in the process of using the method of repeated performance of strength exercises with weights of small and medium weight leads to an intensive metabolism in the athlete's body. The activation of trophic processes has a positive effect on the development of strength in young men. In addition, when using this method, the danger of excessive straining, harmful to the athlete's body, is eliminated.

For the purpose of a more versatile impact on strength readiness of those involved and to increase the emotionality of the classes, it is necessary to use such exercises as pair and group exercises with resistance, the game "fight for the ball", acrobatic, gymnastic exercises on apparatus, etc. Positive emotions create favorable conditions for the manifestation and development of physical qualities, the formation and improving motor skills. Therefore, in order to increase the effectiveness of training sessions, it is useful, after strength exercises, to include training means more dynamically.

nature, contributing to the relaxation of muscle groups, as well as improving the emotional state of athletes (outdoor and sports games, exercises with stuffedballs, jumping, etc.).

In order to develop the entire muscles of athletes training at the stage of improving sportsmanship, it is advisable to use approximatelythe same set of strength exercises as in classes with young men studying at the stage of in-depth training, but use them in a gradually increasing volume, with an increasing weight of weights. The training load is adjusted by changing the amount of weight lifted, the number of approaches and barbell lifts in one approach. The pace of the exercise is also taken into account. If, for example, an athlete lifts the barbell with maximum speed and strength, then such a load will tire you more quickly.

An increase in the number of repetitions leads, as noted above, to the development of not so much strength as strength endurance. Only with an increase in the weight of the burden and the speed of movement of the load, the degree of muscle tension and, consequently, the level of developmentstrength. It was found that the greatest gain in strength is achieved by applyingexercises with a weight equal to 80-90% of the maximum result of a given practitioner. Therefore, it is necessary to know the maximum result of the athlete when performing a particular exercise with weights. The optimal weight of the weights increases as the maximum strength of the practitioner increases.

The need for training with maximum weight can be explained by the fact that the strength of an athlete manifested in a particular exercise depends on the degree of automation of the main reflex connection, which provides the most favorable concentration of excitation and inhibition processes in various motor nerve centers of the cerebral hemispheres. All other things being equal, an individual muscle (or muscle group) will show more strength if, during its contraction, the largest number of muscle fibers is involved with the highest degree of their tension. Different components of the training (the weight with which the exercise is performed, the number of repetitions of the exercise in one approach to the bar, the amount of resistance) will have a different effect on the nature of muscle contraction.

The main methods of building muscle strength are methods of maximum and repeated efforts with great weights. Weightlifters tend to use the maximum effort method (its effectiveness, however, largely depends on the place and time of application). Further rationalization of the strength training methodology will follow the path of a wider use of combinations of various methods of strength training.

Effective methods of training muscular strength among athletes aged 16–19 years are: the method of repeated performance of strength exercises with weights of average weight; the method of single and repeated performance of strength exercises with weights of near-limit and maximum weight (maximum effort method); method of repeated performance of speed-strength exercise (method of dynamic efforts); method of repeated execution of static strength exercise.

A significant place in the development of muscle strength in classes with young men should be given to the method of repeated performance of strength exercises with weights of medium weight. The method of single and repeated performance of strength exercises with weights of near-limit and maximum weight should complement the work on training muscle strength. Although the volume of such exercises is relatively small (for example, in training sessions of weightlifters, exercises with a large and extreme weight account for up to 30% of the total weight lifted in a session, they play an important role in training young men, contributing to the development of the ability to maximize the mobilization of volitional efforts and the ability to involve in the work all muscle groups involved in the movement. However, it should be borne in mind that the exercise

weight lifting with a barbell is associated with a large expenditure of nervous energy, and this prematurely leads to general fatigue.Excessive increase in such a weight when lifting the bar can lead to overexertion or even overtraining of young athletes. It is considered that the optimal (main) training weight is in the range of 75-85% of the best result of the weightlifter.

In classes with young men aged 16-19, more and more attention should be paid to the development of those muscle groups that are important in the chosen sport. At the same time, it is important to take into account not only the "structural correspondence" of strength exercises to the main (competitive) exercise. Some experts overestimate the need to match the training means to the main exercise mainly in terms of space-time characteristics and vector values ​​of strength and speed of movements. This, in principle, correct approach does not exhaust the whole problem of the correspondence of training means to the motor specificity of a sports exercise. Here, one of the essential criteria for this correspondence is not fully taken into account - the mode of muscle work.

However, to choose such means that at the same time would give high coachingthe same effect as in the form of movement, direction of amplification,and according to the mode of muscle work, it does not seem realistic. Therefore, in order to develop muscle strength, it is necessary, first of all, to pay attention to the selection of means adequate to the main exercise according to the mode of muscle work, reproduced under the conditions of an appropriate training load.

***Strength and gymnastics training.*** With the growth of sports results, significantlyincreases the load on the musculoskeletalapparatus. Strength training is faced with the task of increasing the absolute and relative strength of the athlete. For this, exercises with their own weight, dumbbells, simulators and a barbell are used.

The advantage is given to the means that make it possible to change the intensity from zero to infinity. Before gymnastic preparationthe task is to ensure the transformation (transfer) of the achieved level of strength into a motor action included in the main exercise - a jump or a final effort as separate elements and ligaments. For this, acrobatic exercises, exercises on gymnastic apparatus and rope are used. Means that develop strength are subdivided into exercises aimed at developing

tie of the upper limbs, muscle groups of the trunk and muscle strength of the lower limbs. As you move to a new level of skill, you should pay more attention to the muscle groups that are directly involved in the implementation of basic techniques, using conjugate and stimulating methods of influence. The main volume of powerwork is done no later than 8 weeks before the first start, and stress training or shock microcycle - 10 weeks before the first start.

To achieve shifts in strength, it is necessary to develop strength endurance, which is the basis for increasing absolute strength. The development of strength endurance is carried out by performing repeated work with weights equal to 45–55% of the athlete's maximum capabilities, with a further gradual increase in the weight of the weights. Number of approachesno more than 3, in the approach the number of repetitions is 7-10 times.

The increase in absolute strength is carried out by the method of maximum loads - a "slide", where the weight of the weights increases from approach to approach, and the number of repetitions decreaseseats. The number of approaches when working on absolute strength is within 3-4 times. The number of repetitions in the approach is from 4 to 10.

When working on strength, the following methods are used: repetitive - constant weight,weight lifting, - 7-10 times in the approach; mixed - the weight from set to set increases by 5-10%, the number of repetitions decreases from 7 to 5 (example: 10 kg × 7 times; 15 kg × 5 times); maximum - the weight in each approach increases, striving for the planned result, the number of approaches is 4–3, the number of repetitions is 3–1.

The development of an effective method of strength training is possible only on the basis of identifying muscle groups that play an important role in the chosen sport, and the selection of adequate training means that contribute to their development. The solution of the set task is possible by determining the correlation dependence between the indices of power readiness of those who go in for training and their sports results.

### Athletes' speed abilities

Quickness as a physical quality of a person is the ability to perform movements with great speed and frequency. The manifestation of speed is associated with the degree of mobility of the nervous processes and the strength capabilities of the athlete. In many sports, there is no exercise in which speed does not play a leading role. For example, in athletics: the faster the take-off in jumping and running, the higher the initial speed of the projectile released by the thrower, the higher the sports result. Even in marathon running, this quality plays a significant role.

Speed ​​is a complex motor quality, which is determined by three relatively independent forms:

* latent period of motor reaction;
* the speed of a single muscle contraction;
* maximum frequency of movements.

Elementary forms of speed, as a rule, are manifested simultaneously during the competition, however, for the effective education of speed qualities in an athlete in trainingIn the learning process, it is necessary to take into account the characteristics of each sport. The most blessinga pleasant time for the development of all forms of speed is between the ages of 7 and 14.

To perform the fastest possible movements, the following conditions are necessary: ​​a) the muscles before contraction should be somewhat stretched and not enslaved;

b) muscles that are not involved in a specific movement should not inhibit movements (work and rest of the antagonist muscles would alternate);

c) the form of movement must be rational;

d) the athlete's central nervous system is not tired and is able to alternate excitatory and inhibitory processesprocesses in one motor center (melancholic type of the nervous system).

Speed ​​as a physical qualityin comparison with other motor abilities - the most genetically determined ability and improvement is extremely weak.

Throwing lightweight shells (along with normal and weighted shells) is an excellent exercise for developing speed in throwers. This method is used by all outstanding throwers. Throwing shells of various weights is used both in the preparatory and competitive periods of training.

Let's consider the most typical age-related stages of training. An important condition forimproving the quality of speed are:

* high (up to maximum) intensity of movements;
* the duration of the impact of the exercises should be optimal (this is 1–2 s lessmaximum retention time of speed, ie 6–8 s);
* the density of classes is low, that is, the optimal recovery time after exercise for speed is 6–8 minutes;
* the volume of exercises for speed is small (up to 5-8 unidirectional exercisesin one lesson, no more than 2-3 times a week).

The main methods of speed training: playing, competitive,repetitive and variable.

The repeated method involves the use of the proper speed and speed-forceout exercises (method of dynamic efforts), when performing which it is necessary to strictlyobserve the time regimes of work and rest. Rest should provide recoveryheart rate up to 100-110 beats / min. In such pauses, various exercises are often performed (activerest), which does not require much effort.

The variable method provides for the alternation of speed exercises in difficultnormal, lightweight and normal conditions, for example:

* starts from a place from various starting positions: standing, sitting, lying down (performed bysound and visual signals);
* starts in motion (performed with maximum responsiveness);
* wall tennis ball and medicine ball exerciseswith a partner;
* running at a distance of 30, 60, 100 m;
* running uphill, downhill with weights;
* jumps up, long, multijumps;
* different types of relay races on short distances;
* various types of shuttle running;
* outdoor games ahead of the opponent.

The development of speed should be dealt with at the beginning of classes after an appropriatewarm-up.

The strategy for improving speed is such an approach in which there isdit the simultaneous improvement of special strength abilities and frequency of movements.

At the first stage of training, the main means for developing the quality of speed are: exercises in repeated running for short distances (from 20 to 50 m), carried out with an eyelimiting and maximum intensity; exercises with a frequency of movement, adjustedto the limit,jumping and various jumping exercises. All these and some other means, developing and improving the body, contribute to the growth of the quality of speed.

For athletes with experience in training, improvement is fastit is advisable to conduct companies throughbuilding up strength, using competitive, special, general developmental and game exercises.

*Preliminary preparation stage.* Effective means of upbringing speed are outdoor and sports games according to simplified rules; exercises,developing the ability to perform fast movements; running on short distances; relay races; jumping; gymnastic and acrobatic exercises, competitions, athletics exercises and exercises from other sports that solve the problems of versatile physical training. Moreover, competitive exercises are used both in the types of athletics and in other sports: sports games, cross-country skiing, gymnastics, etc. Due to the fact that in the preliminary training groups there is a significant dropout of students, the coach has a need to give outdoor and sports games (especially handball, basketball, etc.), gymnastic and acrobatic exercises; Competitions must take at least 1/3 of the total volume of classes in time. Funding for physical training and technical training should be approximately 60%.

The main method of upbringing speed is a complex method, the essence of whichrogo consists in the systematic use of outdoor and sports games, game exercisesnenii, a variety of speed and speed-strength exercises. Duringupbringing of speed, exercises are performed, as a rule, in separate series, while it is necessary to strive for the maximum increase in the rate of movements that do not require manifestation large muscle efforts, to ensure, if possible, the optimal amplitude of movement

and maximum relaxation of muscle groups not participating in the work.Preference should be given not to special exercises based on the artificial isolation of individual elements, but to natural movements. Abuse of special exercises leads to a loss of lightness and freedom of movement, their use in a large volume causes a violation of the foundations of the correct running technique. The most effective exercise is jogging, a natural human movement. One of the main means of training speed among beginners and junior athletes should be the use of the simplest speed exercises of a running character.

*At the stage of initial sports specialization* further development of physical qualities continues, but for various sports it already has a selective direction. In the types of athletics, ice skating, boxing, fencing and a number of other sports, the main focus of classes should be the development of speed-strength qualities, absolute strength, necessary to perform a competitive exercise of muscle groups: speed of movement, dexterity with a slightly smaller amount of funds, developing general and special endurance. During this period, you can use simulators, mainly of the general and local type, for the development of the muscular system, as well as other specific means.

Particular attention is paid to the education of the speed abilities of a young athlete. WITHrunning is widely used for this purpose. When working with children, they use a variety of running options.

The upbringing of the speed abilities of young athletes is carried out primarilyby using a comprehensive training method, which involves the use of outdoor and sports games, game exercises aimed on the development of physical qualities. With the age and the growth of the preparedness of the trainees, the leading role gradually begins to take the method of repeated performance of exercises in its various variants: the method of repeated performance of speed-strength exercises (the method of dynamic efforts) without burdening and with little burden; method of repeated execution of speed exercise with extreme and near-limit speed; the method of repeated execution of speed exercises in light conditions (it is advisable to alternate speed-strength exercises in difficult conditions and purely speed exercises, but in a smaller volume).

*At the stage of in-depth training in the chosen sport* at 14-16 years old, the period beginsthe most pronounced increase in strength, development of neuromuscular apparatus and endurance, which speaks of the maturation of the cardiorespiratory system. To educate speed qualities, an athlete should widely use directly speed exercises, speed-strength exercises, exercises without weights and with weights; special running and jumping exercises, medicine ball and sandbag exercises; exercises with a barbell, kettlebell, dumbbells; sprint running in all varieties, etc.

To avoid the stabilization of speed, the emergence of a "speed barrier", at the stage of in-depth training, it is advisable to use the following methods of training speedqualities:

* the method of repeated use of speed-strength exercises, structurally identical to the competitive exercise (the method of repeated dynamic efforts), with where the ultimate force voltage is provided by the movement of a relatively light cargo at maximum speed;
* method of repeated execution of the main speed exercise, in which the athlete specializes, at the fastest possible pace, while maintaining the optimal amplitudemovement (in standard conditions);
* method of performing speed exercise in lightweight conditions.

The leading role in the process of increasing the speed of movements should be assigned to the methodreuse of speed-strength exercises, structurally identical to sopinnovative exercise (method of repeated dynamic efforts).

In the process of fostering quickness, it is necessary to pay attention to muscle relaxation during exercise. It is very important that the trainees feel the difference.in muscle sensations between tense and relaxed muscles. For this purpose, it is advisable to apply the method of "contrasting" attempts, which provides for the performance of exercises with additional tension and maximum relaxation. Exercises with objects give a great effect.

Exercises with a predominant focus on fostering speed should used at the beginning of the main part of the lesson, then the exercises should be used to develop muscle strength and endurance.

Movement is of great importance for the effective education of speed of movements.ny and sports games. As you know, with prolonged monotonous muscle activity,as well as in the event of certain difficultiesprotective inhibition associated with a feeling of fatigue develops in children and adolescents earlier than in adults. Therefore, as noted above, children and adolescents better tolerate more varied content and short-term loads. Consequently, in classes with them, simultaneously with teaching sports technique, work should be carried out to educate speed and other physical qualities using a variety of means (including outdoor and sports games) and training methods.

When using the method of repeated dynamic efforts, the training program includesjumping and jumping exercises without weights and with weights are common; special running exercises; medicine ball and sandbag exercises; exercises with a barbell, weights and dumbbells. The use of speed-strength exercises alone does not significantly increase the maximum muscle strength, because their effect on the athlete's neuromuscular apparatus is relatively short-lived. In contrast, when performing strength exercises with greater resistance, although at a lower speed of movement, the maximum effort is manifested for a longer time, which contributes to more effective development of muscle strength.

Application of speed-strength and strength exercisesin an increased volume, it favorably affects the development of speed in athletes.

The main task in the development of speed is that, as noted above, the athlete does not prematurely specialize in any one exercise of a high-speed nature, so as not to include a large volume of the same type of repetition of this exercise. Therefore, it is so important that athletes use speed exercises as often as possible in the form of a competition or game. The training program should include a significant amount of such high-speed exercises as sprint running from the start and from the run, running with acceleration, long and high jumps with extremely fast take-off, throwing lightweight shells, outdoor and sports games, extremely quickly performed acrobatic exercises, and a variety of special preparatory exercises.

An effective method of upbringing speed, increasing the speed of those involved is the method of performing the exercise in difficult conditions, stimulating the active manifestation of the athlete's muscular activity (running uphill, running with weights, running on sandy ground). The method of alleviating the external conditions when performing high-speed exercises helps the trainee to master the ability to perform extremely fast movements. This is facilitated by a decrease in the length of the distance, the height of the obstacle, which makes it possible to perform movement with a speed exceeding a certain limit for a given athlete (by

use of lightweight shells, running on an incline, etc.). For increasespeed can also be used with the methods of sound signaling about the value of the accelerationniya.

Much attention needs to be paid education of the ability to perform movements without undue stress. This is achieved by repeated performance of exercises with efforts close to the limit, however, without distorting the technique of movements. For this purpose, running with hands down and extremely weakened should be included in the training program; running with half-closed eyes, with maximum relaxation of the shoulder girdle and arms; running with acceleration with a smooth increase in speed; mincing jogging with lowered, extremely relaxed shoulders and other exercises. Even typical barbell strength exercises can be used to improve muscle relaxation.

Important for the education of quickness and increasing the speed of movements isgood determination of the dosage of speed exercises. Those of them that are performed withmaximum intensity, are a potent agent that causes rapidswarm fatigue. The same applies to exercises aimed at increasing the speed of movement. Therefore, exercises performed at maximum speed should be used often, but in a relatively small amount. The duration of the rest intervals is determined by the degree of central nervous system excitability and recovery.

### Athlete endurance

*Endurance -*this is a complex of the most important physicala person's abilities, which determine his ability to fight in the process of competitive and training activities with the coming fatigue, to perform work of a given duration without reducing its effectiveness, to overcome distances of standard length in the shortest time, to maintain high performance of the body in a long training session, to fight against unfavorable environmental factors, affecting a person in the process of life and sports activity.

Endurance as a complex physical quality includes: the performance of energy supply systems, economization in the body's work, the ability to maintain the necessary power and speed characteristics of the motor act, the body's resistance to the action of unfavorable environmental factors, specific personality and psychological characteristics of the athlete.

Despite the complex of general factors that determine a person's endurance, this physical quality is always specific to a particular discipline and is determined by the contribution of each component and their relationship to each other. With an increase in the duration of a competitive exercise, the proportion of each of these components changes, however, the most important components of an athlete's endurance are the performance of energy supply systems and the efficiency of the body, including the technique of movements.

Maintaining high specific working capacity in the process of competitive and training activity is associated with overcoming the increasing fatigue. Therefore, the endurance of an athlete is characterized as the ability to withstand the coming fatigue (V.S.Farfel).

In connection with specific specific manifestations of endurance in various types, having different duration and structure of motor activity, different terms are used in practice: power, speed, stayer, marathon, static, coordination endurance. All these terms characterize certain types of an athlete's special endurance.

Therefore, special endurance is the ability to withstand fatigue under conditionsspecific competitive activity with maximum mobilization of functionsnational opportunities for achieving results in the chosen sport. However, in order to achieve high performance, especially in conditions of prolonged training activity, during the functioning of most muscle groups, manifested in the mode of aerobic energy supply, athletes must have the so-called general endurance, which should be understood as a set of functional properties of the body, which constitute the nonspecific basis of endurance manifestation in various types of activities. The main components of general endurance will be the capabilities of the aerobic energy supply system, functional and biomechanical economization.

To improve overall endurance, the following are used: cyclic exercises,performed in an aerobic mode of energy supply, lasting at least 15–20 minutes, hiking, walks in the mountains, sports games, as well as long training sessions with low intensity.

The efficiency of the energy supply of work is associated with the use of three sources: aerobic, anaerobic glycolytic and anaerobic alactic (Table 20) and is characterized by power, that is, the rate of energy release, and capacity, that is, the volume of substrate funds (fats, carbohydrates, glycogen, ATP, creatine phosphate) and the permissible volume of metabolic changes in the body (N.I. Volkov, 1976).

The most important component of energy supply in all sports is the aerobic capabilities of the body, which provide the necessary share of energy in the process of work.and contribute to the rapid recovery of performanceorganism after a load of any duration and power, providing the fastest removal of metabolic products.

One of the main criteria for the level of aerobic capacity of an athlete's body is the indicator of maximum oxygen consumption (MOC).

The same important criterion for the effectiveness of aerobic processes is considered anaerobicthreshold (ANP), which is an indicator of the balance of activities: oxygen transport and oxygen-modulating (muscular) systems. According to the concentration of lactate in the blood, ANP is equal to the conventional indicator of 4 mmol / l.

Anaerobic alactic energy sources play a decisive role in maintaining performance in exercises of maximum intensity with a duration of up to 15–20 s.

The criterion for alactate the capacity of the body is the corresponding fraction of oxygen debt (2.5–5 l); the concentration of creatine in the blood.

*Table 20.***Characteristics of energy processes**



Anaerobic-lactacid sources are the main sources of energy supplywork lasting from 20 s to 5–6 minutes.

The main criterion for anaerobic (glycolytic) performance are indicators of the concentration of lactate in the blood from 5 to 25 mmol / l. Additional criteria can be the values ​​of oxygen debt (up to 20 liters) and its lactate fraction, shifts in the acid-base balance in the blood and, in particular, the concentration of hydrogen ions PH and excess buffer bases BE (respectively, up to 6.9 and - 0.24 meq.).

Functional and biomechanical economization are essential components of an athlete's endurance. Energy resources (substrates) in the body are almost always limited either due to their small volume or due to factors that complicate their consumption, therefore the body seeks to do the work at the expense of a minimum of energy consumption. At the same time, the higher the readiness of the athletes, the higher the efficiency of the work they perform.

Economization has two sides: mechanical, or biomechanical, depending on the level of technique or rational tactics of competitive activity; physiological-biochemical, or functional, which is determined by what proportion of the work is performed due to the energy of the aerobic oxidative system without the accumulation of lactic acid.

Body resistance or functional stability.

In the process of intense training, high-class athletes are faced with the wholea number of unfavorable changes in the body under the influence of external and internal factorsWednesday.

These shifts reduce performance and are associated with developing fatigue. Therefore, an athlete must have both general and specific resistance, which will provide him with a higher level of special endurance.

The personal and psychological component of endurance determines the combination of the necessary personal and psychological qualities associated with a mental attitude, endurance and,most importantly, the ability to "endure" unfavorable changes in the internal environment of the body.

All this is supported by such personality traits,as ambition, having emotional control, the ability to concentrate for a decisive leap, etc.

##### Fundamentals of the methodology for improving the specialendurance

The strategic direction of training the specific endurance of athletes specializing in cyclic types is the construction of a specialfoundation of preparedness. It takes many years to create the required level, adequate to the planned results, and in the macro cycle - several months. It takes only a few weeks for its implementation in sports results, which determines the ratio of partial volumes of training loads.

A functional system characterized by a high level of specialment of readiness can be characterized by the following indicators: high levelit has VO2 max, high speed of movement and oxygen consumption at the ANP level within 85–95% of VO2 max, high functional and biomechanical economization, effective sports technique, the necessary level of muscle strength, providing the motor act, and its utilization in competitive activity.

The basis of training programs aimed at creating a special foundation is training loads at the level of the anaerobic threshold (3-5 mmol / l), more than 50% of the total annual volume, and exercises for strength endurance, which are an adequate stimulus for the development of working hypertrophy of muscles performing main job in covinnovative exercises.

All specific remedies are performed by methods of continuous exercise (equaldimensional and variable) and methods of interval discontinuous exercise (interval andrepeated).

Strength training used in the training of athletes should be consideredas a means of intensifying the work of the muscular system in a specific motor mode.

To develop strength endurance, use:

* weighted exercises on special simulators in a dynamic mode;
* jumping exercises;
* basic competitive exercises performed in difficult conditions (with burdening, braking, moving uphill).

When raisingstrength endurance recommended range of weights from 20 to 40% of the maximum.

Improvement of sportsmen's special endurance is associated with the use of sufficiently high total volumes of training loads, as well as the choice of optimal intensity, or, in other words, partial volumes of the most intense means. In meIn the summer cycle, the total volume of the load and its intensity increase graduallyand in parallel. The more volume training, the higher the volume of the most intensive means. The more intense and strenuous the work performed, the more it requires restorative means in the form of a low-intensity load, characterized by an aerobic regime of energy supply. Therefore, the intensification of the training process in a long-term cycle should take place without reducing the total volumes of training loads achieved in previous years.

One of the directions in the intensificationthe training process is an increase in the private volumes and speed of the competitive exercise in individual zones of intensity.

An increase in the volume of funds carried out in the mode of alactate energy supply,favorably affects the increase in the aerobic capacity of the athlete. However, newtheir volume is limited by the state of the musculoskeletal system.

Increase in loads in the zone of anaerobic glycolytic energy supply in absoluteDespite the growth in sports results, it is insignificant in retrospect.

The volume of loads in a mixed supply area is usually proportional to the increase in the total volume.

Priority increase in the functional state, which is based onhigh speed of the anaerobic threshold, which is the main thing in improving the specialendurance in running and walking, i.e. increasing training speeds.

##### Fundamentals of methods of improving endurance in speed-strength sports

The development of special endurance in speed-strength sports consists inupbringing of the ability to maintain and increase the power of efforts in the course of the competition, discretely lasting for several hours, while maintaining the high technique of performing the exercise.

This is due to savings in energy consumption. So, for highly qualified athletes, when performing specific exercises, energy consumption is about 20% less than for dischargers.

The special endurance of athletes is not only about maintaining the speed of running and the power of take-off or throw, and also to the stability of the technique throughout the competition. This requires the use of intense training funds in significant amounts. From an energy point of view, the special endurance of sprinters over the entire range of distances is due to the power and capacity of anaerobic energy sources.

An increase in anaerobic alactan capabilities is carried out by increasing the amount of ATP and CrF in the muscles, which provide a motor act. This occurs under the influence of repeated work (lasting from 5 to 10 s), performed at maximum speed, with sufficient rest intervals for recovery.

Increasing the capabilities of the alactate energy supply mechanism among sprinters and jumpers, maintaining a high speed of running is associated with overcoming segments at a speed of 90–100% of the maximum, lasting from 10 to 20 seconds in interval mode with rest pauses, ensuring the body's recovery.

Improving glycolytic anaerobic capacity is associated with the use ofsegments with a duration of 20–90 s with an intensity of 85–95% of the maximum speed on the used segment, both with shortened rest intervals and providingthe necessary recovery in the rest pause (heart rate up to 120-130 bpm).

In order to improve the aerobic abilities of athletes, exercises of longer duration are used, performed in a continuous mode for 10 or more minutes. The volume of these exercises should be determined in connection with the dynamics of anaerobic indicatorsfoot threshold.

##### The basics of improvementendurance in all-around

These sports have special endurancemuch the same endurance as sprinting, jumping and throwing.

The approach to improving special endurance is strictly individualized and associated with an emphasis on the implementation of genetically most highly developed abilities (systemspower supply of work).

Sustainability of technical skills in conditions of unfavorable factors of the external and internal environment (hypoxia, fatigue, weather, etc.) requires a certain development of the system of aerobic energy supply, the level of which also provides recovery processes after a series of exercises and in the intervals between competitive types and days. A high level of technical skill largely depends on the tolerance of unfavorable changes in the internal environment of the body and the high capacity of alactate mechanisms of energy supply.

The most important factor in increasing special the endurance of all-round athletes is the fight against the coming sensory and emotional fatigue, which requires a wider amount of means of mental relief.

The main means of improving general and special enduranceare the increased volume of specific (competitive) exercises performed in training sessions, the total amount of time spent on training tasks, strength endurance exercises performed in the competitive activity mode, as well as long-term cyclic exercises (walks, crosses, swimming) used in training days and weeks not loaded with a large volume of specific speed-strength exercises.

### Flexibility and coordination of movements

*Flexibility -* joint mobility, the ability to perform movements with a large amplitudethere.

The ability to perform movement with the optimal amplitude, direction and muscle tension is determined by the mobility in the joints, the elasticity and elasticity of the ligaments andmuscles.

From the point of view of the morphofunctional properties of the musculoskeletal system, the following forms of flexibility are distinguished: active, passive, mixed. A distinction is also made between general and special flexibility. Human flexibility depends on the component level of variationsomatotype.

Develop flexibility through exercises with an increased range of motion (stretching exercises for muscles and ligaments). Such exercises are classified not only by active, passive or mixed form of performance, but also by focus, as well as by the nature of muscle work. Therefore, there are dynamic, static and mixed somatodynamic stretching exercises.

Flexibility depends on many factors:from the structure of the joints, the elastic properties of ligaments and muscles, as well as from the nervous regulation of muscle tone, from the general functional state of the body, from external conditions; time of day, muscle and environmental temperature, degree of fatigue.

Flexibility also depends on age. In general, the mobility of large parts of the body increasesIt lasts up to 13–14 years of age and, as a rule, stabilizes by the age of 16–17, and then has a steady downward trend. If you do not perform stretching exercises before the age of 13-14, then flexibility may begin to decline already in adolescence. Its significant deterioration is noted in people over 50 years old and sharp - after 60 years.

Therefore, the only way to keep it is to constantly train movement.the stiffness of each joint. Flexibility exercises in one lesson are performed 2-3 times. In the preparatory part of the lesson, flexibility exercises are included in a special warm-up, after a good warm-up of the body in a general warm-up - 6-8 exercises to prepare the muscular-articular joints of the arms, trunk, legs, which are primarily involved in

main partclasses. Each exercise is performed 10-15 times in sequence: for arms, trunk and legs.

In the main part of the lesson (after strength exercises), flexibility exercises (8–10 exercises) are performed in series (4–5), alternating with the main focus. For example, with strength training. If the development of flexibility is one of the main tasks of the lesson, then stretching exercises are separated into a separate load block, which is performed in the second half of the main part of the lesson. Relaxation exercises should be done between the series. A set of exercises can consist of 10-12 exercises of a passive (with the help of a partner, a gymnastic wall, etc.) or active (performed with the help of one's own muscular efforts) character.

In the final part of the stretching exercise (8-10 exercises)combined with relaxation exercises and self-massage.

Particular attention should be paid to stretching the muscles when performing strength exercises, given their possible negative effect on flexibility.

In the process of performing any motor activity by a person, the human bodydeals not with individualmuscle contractions, and in the aspect of motor manifestations it is a motor functional system, which is coordinated by the cerebral cortex. The effectiveness of the motor functional system is largely determined by the age maturation of the motor and vestibular analyzers.

This is how muscles are involved in the direct processes associated with the implementation of coordination of movements, and the nervous system controls these processes based on information from various senses and individual experience.

The connection between the central nervous system and effector organs is bilateral. Mechanismfeedback plays a major role in the formation and improvement of motor coordination. Thanks to this mechanism, the central nervous system receives continuous feedback from the muscles and the result of perfect movement. Feedback contributes to the transformation of the motor system into a controlled one.

Therefore, the effectiveness of teaching basic movements, that is, the formation is necessaryof motor skills and abilities, provide, first of all, motor-coordinationnew abilities that simultaneously have a significant impact on the mental development of the child. From here it is impossible to bring up a harmoniously developed, healthy personality.without solving the problem of the development of motor-coordinating abilities even in preschoolnom age.

N. A. Bernshtein(1991), defining the coordination of movements as overcoming the excessive degrees of freedom of a moving organ, indicates its transformation into a controlled system. He substantiated the proposition on the multifunctional and hierarchical structure of psychomotor activity of a person and identified five levels of construction of movements on the part of various parts of the nervous system: the level of tone (actions poor in higher automatisms - examining, feeling, comparing and choosing objects, etc.); the level of muscular-articular linkages (level of synergies); lower sublevel of space; upper sublevel of space (small and precise finger movements - threading a needle, sharpening a pencil, etc.); the level of actions (the level of objective actions, semantic chains).

This approach made it possible for N.A. Bernstein to assert that different sides, properties of movement are controlled by different nervous structures, in their own specific way and at the same time.

Since the 30s of the last centuryexperts from different countries have proven the illegality of reducing dexterity to only a few abilities. As a result, in today's literature, from 2-3 "general" to 5-7-11-20 and more special and specific

demonstrated coordination abilities: coordination of the activity of large musclesgroups of the whole body, general balance, balance with and without visual control, balance on an object, balance of objects, speed of restructuring of motor activity. The abilities related to the coordination area are also called: the ability to spatial orientation; fine motor skills; the ability to differentiate, reproduce, measure and evaluate the spatial, power and temporal parameters of movements; rhythm; vestibular stability; the ability to voluntarily relax muscles, etc.

V.I. Lyakh (1995), giving a definition of coordinating abilities, considers them as the capabilities of an individual, which condition his readiness for optimal control and regulation of motor action. The author distinguishes the following types of coordination abilities: special (a person's capabilities, which determine his readiness for optimal control and regulation of motor actions similar in origin and meaning), specific (the individual's capabilities, which determine his readiness for optimal control and regulation of individual specific tasks "for coordination" - "For balance", "rhythm", "orientation in space", "response",

"Restructuring of motor activity", "coordination", "differentiation of parametersmoat of movements ”,“ preservation of statokinetic stability ”, etc.) and general (potential and realized capabilities of a person, which determine his readiness for optimal control and regulation of motor actions, different in origin and meaning).

It is now known that each of the above-mentioned coordinationability is not homogeneous, but has a complex structure. VI Lyakh gives the following interpretation: the ability to orientate is the ability of the individual to accurately determine and timely change the position of the body and to carry out movements in the desired direction; the ability to differentiate the parameters of movements determines the high accuracy and efficiency of spatial (positions of angles in the joints), power (the state of tension in the working muscles) and temporal (high sense of microintervals of time) parameters of movements; the ability to react allows you to quickly and accurately perform a whole, short-term movement to a known or unknown signal in advance with the whole body or its part (arm, leg, trunk); the ability to rebuild motor actions is the speed of transformation of the developed forms of movements or switching from one motor actions to others in accordance with changing conditions; the ability to coordinate - connection, subordination of individual movements and actions into integral motor combinations; the ability to balance - maintaining the stability of the posture (balance) in certain static positions of the body (in stands), in the course of performing movements (in walking, while performing acrobatic exercises, in the fight with a partner); the ability to rhythm - the ability to accurately reproduce a given rhythm of a motor action or to vary it adequately in connection with changed conditions; vestibular (statokinetic) stability - the ability to accurately and stably perform motor actions in conditions of vestibular stimuli (somersaults, throws, turns, etc.); voluntary muscle relaxation - the ability to optimally coordinate the relaxation and contraction of specific muscles at the right time.

The results of scientific research allow the main criteria for assessing coordinationability to consider correctness, speed, rationality and resourcefulness with theirqualitative and quantitative characteristics. In this regard, a child can manifest his coordinating abilities only through one property; for example, this is the accuracy of hitting the target; speed of implementation of complex coordinationmovement; economical movement and expenditure of physical forces in difficult environmental conditions; stability of motor skills fulfillment in unforeseen

confusing influences, etc. Most often, such complex assessment criteria are indicators of efficiency (effectiveness) of fulfillment of holistic purposeful motor actions or a combination of these actions, presenting a demand for the child's coordinating abilities.

When assessing coordination abilities, the teacher should keep in mind that the above criteria in some cases can characterize explicit (absolute), and in others - latent, or hidden (relative, partial), indicators of coordination abilities.The main method for diagnosing the coordination abilities of children is motor tests. Experts from different countries have identified the main theoretical and methodological provisions that should be taken into account when choosing tests; selected tests suitable for the assessment of absolute and relative indicators characterizing the level of development of motor-coordinating abilities of all age-sex groups; a testing methodology has been developed; good, reliable and informative tests have been installed; for a number of them, standards have been developed taking into account the age and gender of children; prepared recommendations

Real-life test guidelines.

Summarizing the above, it should be noted that the objectivity of the criteria usedriev, their specificity and availability make it possible to obtain urgent information on the results of actions. This allows you to independently adjust the parameters of movement, analyze the preparatory and basic actions, find and correct mistakes both with the help of a teacher and on your own. Thus, the success of physical culture and health-improving work is due to the timeliness and systematicity of control, the objectivity of the assessment of quantitative and qualitative indicators of the assimilation of educational material, the completeness of accounting for the final work for a certain period of time. Objective and systemic control helps the teacher to more accurately manage the process of physical improvement of children, adolescents, boys and girls.

## Technical training

Technical training should be understood as the degree of mastering the system by an athlete movements (technique of a kind of sport), corresponding to the peculiarities of this sports discipline and aimed at achieving high sports results. Technicaltraining cannot be considered in isolation, it is a component of a single whole, in which technical solutions are closely interconnected with the physical, mental, tactical capabilities of the athlete, as well as the specific conditions of the external environment in which the sports action is performed. It is quite natural that the more techniques and actions an athlete possesses, the more he is prepared for solving complex tactical problems arising in the process of competitive wrestling. He can resist the attacking actions of the opponent and at the same time put the latter in difficult positions.

Central challenge sports and technical training is to ensure the formation of such skills for performing competitive actions that would allow an athlete to use his capabilities with the greatest efficiency in competitions.

In the early stages of the multi-year preparation in competitions of athletes of relatively low qualifications, the level of technical skill and sports results in general are determined primarily by the perfection of basic movements and actions. At the level of mastery, additional movements that determine the individuality of a particular athlete can be a decisive tool in wrestling.

In the process of sports and technical training it is necessary to obtain from the athlete that his technique meets the following requirements.

The effectiveness of the technique is determined by its efficiency, stability, variaefficiency, economy, minimum tactical awareness for the opponent.The effectiveness of the technique is determined by its compliance with the tasks being solved and high final results, compliance with the level of physical, technical, mental training.

food.

The stability of the technique is associated with its noise immunity, independence from the conditions, the functional state of the athlete. Should be considered,that modern training and especially competitive activity is characterized by a large number of confounding factors. These include active opposition of opponents, progressive fatigue, unusual style of refereeing, unusual place of competition, equipment, unfriendly behavior of fans, etc. The ability of an athlete to perform effective techniques and actions in difficult conditions is the main indicator of stability and largely determines the level of technical readiness in general. ...

The variability of the technique is determined by the athlete's ability to operatively correct motor actions, depending on the conditions of competitive wrestling. Experience so farcalls that the desire of athletes to preserve temporal, dynamic and spatialspecifications movements in any conditions of competitive wrestling do not lead to success. For example, in cyclic sports, the desire to maintain stable movement characteristics until the end of the distance leads to a significant decrease in speed. At the same time, compensatory changes in sports technique caused by progressive fatigue allow athletes to maintain or even slightly increase their speed at the finish.

Even more meaning is variabilityHe has techniques in sports with constantly changing situations, an acute time limit for the fulfillment of motional actions, active opposition of opponents, etc. (martial arts, games, sailing, etc.).

The efficiency of technology is characterized by the rational use of energy when performing techniques and actions, the rational use of time and space. All other things being equal, the best variant of motor actions is the one that is accompanied by minimal energy consumption, the least stress of the athlete's mental capabilities. The use of such variants of technique allows to significantly increase the effectiveness of training and competitive activities.

In sports games, martial arts, complex coordination sports, an important indicator of efficiency is the ability of athletes to perform effectiveactions with their small amplitude and the minimum time required for their executionneniya.

Minimumthe tactical informativeness of the technique for the opponent is an important indicator of the effectiveness in sports games and martial arts. The only technique that can be perfect here is that it allows you to mask tactical intentions and act unexpectedly. Therefore, a high level of technical readiness provides for the athlete's ability to perform such movements, which, on the one hand, are quite effective to achieve the goal, and on the other, do not have clearly expressed informative details that unmask the athlete's tactical intention (V.N. Platonov, 1987, p. 2014).

The technical readiness of an athlete is largely determined by the ultimate goal, onthe achievement of which the corresponding motor action is directed. This end goal is not the same across different sports. So, sports equipment in high-speed power sports is associated with the creation of prerequisites for the development of maximum power indicators andwith effective use of functional reserves, external forces and inertia for this. Technical improvement in cyclic sports associated with the manifestation of endurance requires high efficiency of standard, repetitive movements and especially their efficiency. In complex coordination sports (gymnastics and rhythmic gymnastics, diving, figure skating, synchronized swimming, etc.), technical readiness is determined by the complexity and beauty of movements, their expressiveness and accuracy, since it is these characteristics that determine the level of sports results. Technical equipment in sports games and martial arts is related both to the breadth of the technical arsenal,

### Tasks and sections of the technical training of athletes

The main task of an athlete's technical training is to teach him the basicstechniques of competitive activity or exercises that serve as training means,as well as the improvement of the forms of sports equipment chosen for the subject of the competition. An athlete's technical training is a process of managing the formation of knowledge, motor skills and motor skills.

Motor skill - this is the ability to perform motor actions on the basis of certain knowledge about his technique, the presence of appropriate motor prerequisites with a significant concentration of attention of those involved in building a given pattern of movements. In the process of developing motor skills, the search for the optimal variant of movement with the leading role of consciousness takes place. Multiple repetition of motional actions leads to gradual automation of movements, and motional skill turns into a skill characterized by such a degree of technique mastery, in which the motion control occurs automatically, and the actions are highly reliable.

In the process of sports training, motor skills have an auxiliary functiontion. It can manifest itself in two cases:

* + - 1. when it is necessary to achieve a simple mastering of the technique of the corresponding motor actions, the formation of skills is a prerequisite for the subsequent formationniya motor skills;
			2. when it is necessary to master the lead-up exercises for subsequent learningmore complex motor actions.

A large number of different motor skills that an athlete performs is a good prerequisite for effective technical improvement and,due to the fact that in the process of mastering them, he develops the ability for creative thinking, analysis of the movements performed, specialized perceptions are improved, the ability to combine simple movements into more complex ones.

To do this, he must master the theoretical foundations of sports technology; the ability to simulate individual forms of movement techniques that correspond to their capabilitiesnoses; to form the skills and abilities necessary for successful participation in competitions, with the subsequent transformation and updating of their forms and content. All this refers to the content of special sports and technical training. The necessary prerequisites for the implementation of these tasks are provided by the general versatile motor training of the athlete, including the general technical training, which consists in replenishing, restoring the fund of skills and abilities (school of movements), which are a prerequisite for the formation of technical skills in the chosen sport. General technical training also includes teaching the technique of exercises selected as additional means of physical training. In parallel with the development of skills, the development of motor-coordinating abilities should take place,

### Stages of technical preparation

In the course of improving the technique of competitiveactions, consolidation and improvement of the formed skills are used by many varieties of exercise methods (methods of dismembered constructive and holistic exercises, standard-repeated and variable exercises), depending on the peculiarities of the technique of the chosen kind of sport.

Means and methodsverbal and visual teaching in the methodology of technical training of an athlete is supplemented with new ones every year. In most cases, they are associated with the use of hardware devices for the formation of visual representations, programming of motion parameters, urgent information in the course of the movement and error correction.

The effectiveness of sports and technical training is influenced by the level of preliminary readiness, individual characteristics, peculiarities of the chosen kind of sport, generalthe structure of the training cycle and other factors.

Mastering new forms and optionstechniques, their consolidation and improvement occur depending on the patterns of acquisition, preservation and further development of sports form within the framework of large training cycles (annual or semi-annual). The stages of technical training should follow the general structure. In each big cycle, a progressive athlete has 3 stages of technical training.

*Stage I* coincides with the first half of the preparatory period for large trainingcycles, when the entire training of an athlete is subordinated to the need to becomesports uniform. This is the stage of creating a model of a new technique of competitive movements (its

improvement, practical mastering, learning individualelements that are part of competitive actions) and the formation of their general coordination basis.

1. *stage.* At this stage, technical training is aimed at in-depth mastering and consolidation of integral skills of competitive actions as components of a sports form. It covers a significant part of the second half of the preparatory period of large training cycles (special preparatory, pre-competition stages).
2. *stage.*Technical training is built within the framework of direct pre-competitive training and is aimed at improving the acquired skills, modeling competitive programs, increasing the range of their appropriate variabilityand the "degree" of reliability in relation to the conditions of the main competition. Start this stagefrom the final part of the preparatory period and applies to the competition period. In the case of a long competitive period, technical training basically retains the features that characterize it at stage III, and only partially changes depending on the characteristics of the competitive period.

## Tactical training

This aspect of sports training is associated with the ability to conduct sports wrestling.in the process of specific competitive activity. Tactical readiness closely related to the use of various techniques, methods of their implementation, the choice of offensive, defensive, counterattacking tactics and its forms (individual, group or command).

The structure of tactical preparedness follows from the nature of the strategic tasks that determine the maindirections of wrestling. These objectives may relate to the athlete's participation in a series of starts in order to prepare and successfully participate in the main competitions of the season and thus be promising in nature. They can also be local, associated with participation in individual competitions or in a specific fight, fight, race, swim, game, etc.

The specificity of the sport is a decisive factor that determines the structure of an athlete's tactical readiness. For example, the main component of tactical readiness in cyclic, speed-power and complex-coordination types is the choice of a rational tactical scheme and its use regardless of the actions of the maincompetitors.

The complexity of tactical actions in sports games and martial arts is determined by whono difficulties in perceiving the situation, making decisions and implementing them due to the wide variety and frequent change of competitive situations, lack of time, limited space, insufficient information, the opponent's disguise of his real intentions, etc.

High tactical skill of an athlete is based onat a good level of technical, physical, mental aspects of preparedness. The basis of sports-tactical mastery is made up of tactical knowledge, abilities, skills and the quality of tactical thinking.

An athlete's tactical knowledge means information about the principles and rational forms of tactics developed in the chosen sport. Find tactical knowledgegive practical application in the form of tactical skills and abilities. In unity with the formation of tactical knowledge, skills and abilities, tactical thinking develops. Its main components are expressed in the ability of an athlete to quickly perceive, evaluate, isolate and process information that is essential for solving tactical problems in a competition, to anticipate the opponent's actions and the outcome of competitive situations, and most importantly, to find, among several possible solutions, the most likely one by the shortest path. would lead to success.

In the process of improving tactical thinking, an athlete needs to develop the following abilities: to quickly perceive, adequately realize, analyze, evaluate a competitive situation and make a decision in accordance with the created situation and the level of his preparedness and his operational state; anticipate the actions of the enemy; build your actions in accordance with the goals of the competition and the task of a specific competitive situation. The main specific method of improving tactical thinking is the method of training with both a real and a conditional enemy.

The basis of tactical training is the study of the general provisions of the tactics chosensport, refereeing techniques and regulations on competitions, tactical experience of strongthe best athletes, ways of developing a tactical plan (schedule of movement on

distance), etc. All this constitutes the necessary prerequisites for the study of tactical actions, the development of tactical skills and abilities, the formation of tactical thinking.

The value of the theoretical and methodological provisions of sports tactics makes it possible to accurately assess the competitive situation, to adequately select the means and methods of competitive activity, taking into account individual characteristics, qualifications, the level of preparedness of the opponent and partner. Nevertheless, it should be remembered that simply the accumulated knowledge of tactics, not supported by the athlete's personal motor experience, by itself cannotpositively influence athletic performance.

Therefore, along with training and improvementthe basics of sports tactics, it is necessary:

* constant replenishment and deepening of knowledge about the laws of sports tactics,its effective forms;
* systematic "intelligence" (collection of information about sports rivals), developmenttactical intentions;
* updating and deepening sports and tactical skills, schemes, etc .;
* education of tactical thinking.

Thus, in the process of tactical training of an athlete, the tasks of immediate and prospective, educational and upbringing, general preparatory and special preparatory ones are combined. The highest practical form of sports and tactical underthe cooking is a competition. As a practical section of the training content, tactical training is most fully presented at the stages immediately preceding the main competitions, and at the stages between the main competitions.

### Means and methods of tactical training

The practical implementation of tactical preparedness involves solving the trailtasks: creating a holistic view of the fight; formation of an individual style of competitive wrestling; decisive and timely implementation of the decisions made, thanks to rational techniques and actions, taking into account the characteristics of the opponent, environmental conditions, refereeing, competitive situation, own state, etc.

*"Tactical exercises" in training.*

Specific means and methods of tactical training are tacticalforms of performing special preparatory and competitive exercises, so calledknown "tactical exercises". What distinguishes them from other training exercises is that:

* the setting for these exercises is orientedprimarily for solving tactical problems;
* in the exercises, individual tactics and situations are practically modeledsports wrestling;
* if necessary, the external conditions of the competition are also modeled.

Depending on the stages of preparation, tactical exercises are used: in facilitatedconditions; in difficult conditions; in conditions as close as possible to competitionviable.

Facilitate the conditions for performing tactical exercises in trainingusually it is necessary when forming new complex skills and abilities or transforming previously formed ones. This is achieved by simplifying the learned forms of tactics, dividing them into less complex operations (with the emphasis, for example, of actions of attacking, defensive, counterattacking tactics in sports games and martial arts, positional wrestling at a distance, etc.).

The purpose of using tactical exercises of increased difficulty - ensuring the reliability of learned tactics forms and stimulating the development of tactical abilities. Some of the relatively general methodological approaches embodied in such exercises include:

a) approaches associated with the introduction of additional tactical countermeasures from the side of the "enemy". At the same time, the athlete (team) is faced with the need, solving tactical problems, to overcome more significant opposition than in competition conditions. For example:

* implement the intended tactical plan in a training encounter with severalrivals (alternatelychanging during the fight), in playing exercises and training games "one against two", "three against five", etc .;
* overcome the opponent's resistance with the specified technical and tactical methods, who is allowed to use a wider arsenal of techniques;

b) approaches associated with limiting the spatial and temporal conditions of action;

c) approaches associated with the mandatory expansion of the tactical options used

tov;

d) approaches associated with limiting the number of attempts provided to achieve

competitive goal.

At the stage of direct preparation for a responsible competition, the tactical training methodology should, first of all, provide the most complete modeling possible.the study of those integral forms of tactics that will be used in this competition. The purpose of modeling in this case is to test the developed tactical concept and plan in conditions that coincide as much as possible with the conditions of the upcoming competition.

The main way to gain competitive experience, which is practicalthe foundation of an athlete's tactical skill is the path of systematic participation in competitions of various ranks. The directed use of competitions for the purposes of tactical training also presupposes a special organization of competitive practice, in particular:

* the formation of tactical attitudes in accordance with the individual, groupor a team training plan for competitions of various ranks;
* organization of additional meetings, corresponding in terms of timeline, composition of participantsand the degree of responsibility to the specifics of the main competitions.

### Tactical training in various sports

The grouping of sports in accordance with the characteristics of tactics and tactical subcooking can be distinguished by the following features:

* the peculiarities of the method of wrestling;
* the specifics of "combat" contact with the enemy;
* the power of work in the course of the performed competitive activity;
* psychological difficulties in achieving victory.

In accordance with these characteristics, the bulk of sports can be subdividedLena into several groups.

Group I. This group includes sports in which the conditions of the competition are characterized by the fact that athletes perform separately from each other, without direct contact, in the sequence determined by the draw.

Specific features of competitive wrestling consist in the creation of an athlete's predominant concentration of consciousness on the very process of execution. By virtue of

relative constancy of conditions in these sports, there is a high stabilitytechnical ways of performing actions.

The sports in this group are subdivided into two subgroups:

a) requiring skillful performance of actions, in which the highly coordinated control of movements in space and time comes to the fore, as well as their expressiveness, aesthetic appeal, emotional coloring, artistry. These include: artistic gymnastics, figure skating, diving, ski jumping, acrobatics, synchronized swimming, etc.

The tactical tasks of an athlete in these sports are to be able to correctly, inaccording to their physical and technicalthe ability to draw up a program for the competition, assess the capabilities of the opponent, the features of his program and, depending on this, determine the nature of his performance, make a favorable impression on the judges and spectators.

One of the decisive elements of tactical training in these sports is the developmentthe ability to continue the exercise; if there is a breakdown in the elements of the program, change the elements in combination, simplifying or complicating it depending on the situation, etc .;

b) sports of an acyclic nature in which athletesstrive to achieve the maximum result, expressed in precise measures of strength or space (athletics jumping and throwing, weightlifting).

Tactical tasks here concern, in particular, the choice of the initial effort, the distribution of forces between attempts, behavior between attempts. One of the tactical options can be a mindset to achieve a high result on the first try in order to stun the enemy. Tactical training, along with working out the appropriate options for tactics, includes the education of observation, intelligence and self-confidence.

Group II. Sports of a cyclical nature, associated with overcoming the distance. Vunder these conditions, relatively close contact between rivals is possible and someinteraction between teammates. Depending on the competitive goal, the athlete is required to carefully observe other competitors; the manifestation of endurance and self-control; proactive decisions taking into account the planned plan of overcoming the distance and its correlation with the actual situation during the competition; their capabilities and state.

This group of sports can be divided into two subgroups:

a) sprint sports, in which the rivals compete on separate lanes, and therefore there is no close contact between them (track and field running 100, 200, 400 m, relay races, skating 500 m, swimming 50, 100 m, rowing kayaks at 500 m, cycling200 m, 1000 m from the spot and from the run, 1000 m tandem). In these sports, the athlete, having reached the maximum speed, tries to maintain it until the finish line, despite progressive fatigue.

Features of tactical training are, in particular, in educationthe ability to feel your speed, to maintain ease of movement, despite emotional excitement and increasing fatigue. This is a great art, on which victory at sprint distances largely depends;

b) sports of a cyclical nature, requiring the manifestation of endurance (easyathletic running from 800 to 42 195 m, skating from 1500 to 10 000 m, rowingat 2000 m, rowing and canoeing at 1000 and 10 000 m, swimming from 200 to 1500 m, cycling from 4 km to 200 km, cross-country skiing), in which the opponents compete on one track (highway), and therefore contact between them is possible, as well as interaction with teammates.

In these sports, two tactical tasks are solved: the regulation of efforts at a distance in order to achieve the best result and the determination of one's behavior, taking into account the actions of a partner in a race or race. It is necessary to cover the distance at a speed close to the environment.her, avoiding a sharp drop in speed towards the end of the distance. At the same time, speed fluctuations do not exceed 3-5% of the average.

The most common competition tactics are:

* passing the distance for a pre-planned high result in a relativelyan even pace, regardless of the behavior of competitors;
* a tactic designed to win with a sharp spurt at the finish line by imposing on the opponent a “distribution of forces” regime that is unfavorable for him. A sharp change in pace at a distance creates psychological difficulties, being associated with a waste of energy. An athlete who is not ready for this method of overcoming the distance will be among the defeated.

The athlete must be prepared tactically versatile and possess sufficientan arsenal of techniques that would allow him to show high results in any variant of tactics dictated by the course of the competition. For success, in addition to excellent traness it is necessary to master the art of tempo switching, to be able to choose the most profitableposition at a distance, react in time to emerging situations and quickly finish.

In the process of tactical training, this is achieved, in particular, by the following tasksyami: overcoming segments of the distance at a strictly specified speed, quick start with the subsequent selection and retention of a place in the group at the distance; leading and overtaking the enemy in various situations; finishing throw practicing; changing the pace of passing the distancetions according to a given program; training spurts, etc.

Skillful allocation of effort in competition is of particular importance for success. The longer the distance, the more difficult it is to accurately and correctly distribute your forces. In this group of sports, tactical actions are reduced to the preliminary drawing up of a schedule of the speed of overcoming the distance segments, taking into account their own state, the composition of opponents, meteorological conditions and the tasks of the competition. The options for changing the speed are determined with the appropriate actions of the enemy, the points where it is necessary

"Lead" the enemy, where to follow him, where to start to finish. At the same time, it is necessary to think not only about the options for the distribution of forces that are beneficial for the athlete himself, but also about options that are unfavorable for the opponent. In this aspect, the following can be distinguishedother options for the distribution of forces at a distance (V.L. Utkin, 1984):

Option I - the speed of movement along the distance is practically unchanged from start to finish;

1. option - the speed of movement gradually or jumps decreases over the coursethe entire distance, with the exception of the starting acceleration;
2. option - the speed of movement along the distance repeatedly increases and decreaseshangs around;
3. option - the speed is above average at the beginning and at the end of the distance and below average in the middle of the distance;
4. option - the speed gradually or jumps increases throughout the entire distance;
5. option - the speed is constant in the first half of the distance and then gradually lowerhugs right up to the finish line;
6. option - the speed exceeds the average distance at the beginning of the distance, then belowshrinks and remains unchanged until the finish line;
7. option - after a short starting acceleration, the speed decreases foralmost the entire distance, then increases at the end;
8. option - the speed is constant at the beginning and middle of the distance, then it decreases and the restit remains unchanged until the finish line.

Under certain conditions, the option with a strong start with an excess of 8–9% of the average is also justified. Preparing for competitions with equal competitors, it is important to master all tactical options and be able to increase the pace at the finish. Tactical training in the sports under consideration is especially organically combined with physical training, since all tactics options are directly based here on the general and special endurance of the athlete.

1. group. Combat sports, which are characterized by direct interaction with the opponent. In these sports, tactics determines, in essence, all sections of preparation.athlete. Well thought out tactics can sometimes bring victory over even morequalified, technically and physically better trained athletes, a stronger team. The behavior of athletes, the techniques they use, are directly dependent primarily on the actions of the opponent. In these sports, the tactics of attack and defense are distinguished. The attack has its beginning, development and improvement. Attacking actions are always preceded by reconnaissance, maneuvering, and various deceitful movements.

The complexity of tactical activity in these sports is determined by the difficulties of perception, decision-making and implementation of actions due to their wide variety, lack of time, space, information, masking of real intentions by the opponent, uncertainty of the moment of the beginning of actions, etc. These difficulties are deliberately created by the opposing opponent. All this makes it difficult to correctly assess the current situation, to make optimal motor decisions, makes increased demands on the activity of the neuromuscular apparatus, increases mental tension.

1. group. Competitors participate in the team lineups; between the participants

There is a relationship between "own" teamgame mutual assistance, and between different teams - the relationship of opposition, with individual elements of martial arts (with the exception of volleyball). The psychological characteristics of this struggle are determined by the degree of complexity of situations and the urgency of solving problems, the number of participants, the size of the playground, the speed of movement, and power contacts.

Tactical training in this group of sports goes mainly in three directions: improving the ability to correctly distribute one's strength in the process of competition, maximally mobilizing one's capabilities in decisive phases and correctly combining periods of intense activity and relative relaxation; improvement in the flexible use of the team's mastered tactical systems, combinations and their variants.

To successfully solve these problems, certain methods and techniques are used:

* inclusion in the workout special tasks for the exact implementation of the selected system of competitive actions, maintaining a certain pace with overcoming

Confounding factors;

* consistent introduction to competitive and training games by the restedpartners or athletes from the reserve;
* the allocation of a specific task to an athlete in the general tactical scheme of the competition, whichhe must decide on his own, creatively;
* purposeful complication of the external conditions for conducting tactical techniques andtheir combinations;
* switching from one tactical combinations and options to others depending onfrom predetermined signals or situations;
* the introduction of sudden changes for the athlete in the environment of the competition, requiringquick and creative decision making;
* holding control competitions with different opponents, I significantly differdiffering from each other in character, style and methods of conducting tactical combat.
1. group. All-round events belong to this group. All-around tacticsconsists of tactics in its individual types and the general tactical plan of performance throughout the entire competition.

In the process of tactical training of all-around athletes, the main types of all-around are usually distinguished, on which the strength and attention of an athlete is periodically concentrated, taking into account his individual qualities and abilities. The all-around is recommended to participate in separatecompetitions in these types together with the strongest athletes, specializingMishya in them. In the process of preparing an all-around, they often choose a path in which firsta solid base of readiness is created in the "strong" types of all-around, and then concentrated training is conducted in the "lagging" types. This takes into account the positive

"Transfer" of skills and qualities in the process of training in various types of all-around.

A separate group is made up of sports in which a person drives a car, shoutinglivelihood, horse (auto, motor sports, sailing and equestrian sports, shooting).In these sports, tactical training has many similarities with the above disciplines, but is also associated with the technical state of the mechanism, weapons and the functional state of the animal.

### Factors influencing tactics competitive activity of athletes

*Competition rules.*Competition rules in some sports are subject to changes from time to time; this in turnmakes appropriate adjustments to the tactics of the competition. For example: the introduction of three-point shots in basketball; reducing the duration of the fight in Greco-Roman and freestyle wrestling; allowing the transfer of hands over the net during a block with an attacking blow in volleyball, etc.

*Competition Regulations* also determines the choice of tactics of the competitive figureexpedient the alignment of forces within the team, the number of persons performing in each type of competition program. Tactics can be structured in such a way that sometimes it is more profitable to lose the personal primacy of individual team members in order to contribute to the victory of their team or the victory of the leader.

*Environmental conditions accompanying sports competitions.*

Change of competition venues, lighting, meteorological and otherconditions determines the need for a conscious change in the way of solving a motor task, influences the choice of sports technique and tactics. For example, changes in the distance profile and meteorological conditions in skiing make it necessary to change the modes of movement or the pace of movement. In sports games in bright sunny weather, the sun hits the eyes, this forces you to abandon long-range passes, shots on goal, etc.

A holistic view of the tactics of competitive activity is formed andchanges over the course of many years of sports activity.

Important components of a holistic view of a sports duel are: a) an athlete's awareness of his own technical and tactical equipment, especially

individual mannerism, strengths and weaknesses of preparedness;

b) understanding the relationship between preparatory activities and basicby means of wrestling;

c) understanding the nature of the initiative in a duel, the place and significance of such tactical elements as surprise, maneuver, timeliness, etc .;

d) understanding the need for endurance and reasonable risk, knowledge of behavior options at various moments of the fight, the ability to warm up and regulate the mental stateyanie;

cam;

e) mastering the ability to counteract rivals of different styles and strengths

f) a clear idea of ​​the goals of training, participation in individual competitions, in

a separate fight;

g) about the possibility and reality of achieving the set goal and individual tasks.

The practical implementation of tactical preparedness ultimately presupposesthe formation of a certain style of conducting fights.

When preparing for and during the competition, athletes are constantly looking forand improve ways of countering specific opponents,equally familiar from previous competitions, training, stories from coaches and teammates. The development of models of upcoming fights is carried out taking into account the comparison of one's own skills and the characteristics of opponents, goals and possible results of the upcoming competitions.

## Mental preparationathlete

One of the decisive factors for success with relatively equal levels of physical andtechnical and tactical readiness is the mental readiness of an athlete to compete, which is formed in the process of mental training of a person. Hence,mental training is aimed at forming an athlete's attitude to competetive activities and to create conditions for adaptation to the extreme conditions of such activities. This is due, on the one hand, to the uniqueness of the conditions of the competition, and withthe other - by the uniqueness, individual originality of the athlete's personality.

Mental preparation helps to create a mental state that is comfortable.promotes, on the one hand, the greatest use of physical and technical readiness, and on the other hand, it allows to resist pre-competition and the competitorconfusing factors (lack of confidence in their abilities, fear of possible defeat,stiffness, overexcitation, etc.).

It is customary to highlight general mental training and mental training for a specific competition. General training is solved in two ways. The first one involves teaching an athlete universal techniques that ensure mental readiness for activities in extreme conditions: methods of self-regulation of emotional states, levelactivation, concentration and distributionattention, methods of self-organization and mobilization for maximum volitional and physical efforts. The second way presupposes teaching the methods of modeling in the training activity the conditions of competitive struggle by means of verbal-figurative and natural models. Preparation for a specific competition involves the formation of a mindset to achieve the planned result against the background of a certain emotional excitement, depending on motivation, the size of the athlete's need to achieve the goal and a subjective assessment of the likelihood of its achievement. By changing emotional arousal, adjusting the value of the need, the social and personal significance of the goal, as well as the subjective probability of success, it is possible to form the necessary state of the athlete's mental readiness for the upcoming competition.

Training sessions and, moreover, competitions of high-class athletesare subject to such physical and mental stress thatbring tension to the limits of individual capabilities.

In the conditions of long-term training of an athlete, there is a need for social and psychological adaptation to both competitive activity and the concomitant conditions of a person's life in sports. This is specifically reflected in the developed system of mental preparation of an athlete for a long training process.

Division mental preparation for general and special (for a specific competition) is rather arbitrary. In real life, a specialist can form the necessary mental state long before the competition and solve the issues of educating an athlete's character directly during the competition. It all depends on the specific conditions, the tasks set and the individual characteristics of the athlete himself.

Mental preparation in the form of successive influences is one of improvement management optionsan athlete, in the case of the use of influences by the athlete himself, it is a process of self-education and self-regulation.

Management in the first stages, before the period of the immediate pre-competition undercooking, is meant as a purposeful and systematic application of methods aimed at:

* optimization of the conditions of training activities for the formation of decision skillsoperational tasks;
* development of strong-willedand mental qualities determined by the ability to solve these problems;
* regulation of mental states accompanying the solution of these tasks.

Such training is directly included in the training activities of athletes.exchange or is carried out in the form of specially organized events. In the process of general training, the properties and personality traits (motivational orientation, mental stability), mental qualities are improved and corrected, mental states are optimized.

In the daily training process, mental training is, as it were, included in other types of training (physical, technical, tactical), although it has its own goals and objectives. If the goal of mental training is the realization of the potential capabilities of a given athlete, ensuring effective activity, then the variety of particular tasks (the formation of motivational attitudes, the development of volitional qualities, the improvement of motor skills, the development of intelligence, the achievement of mental stability to training and competitive loads) leads to the fact that any a training tool in one way or another contributes to the solution of mental training problems.

We can talk about special methods of mental training in everyday training in cases when it becomes necessary to prevent or, if this was not possible, to reduce mental overstrain as a result of excessive training loads.

In the case when mental training is carried out in the period immediately preceding a responsible competition, the formation of readiness for highly effective activity at the right time is put to the fore. Hence, such particular tasks as an orientation towards social values, the formation of an athlete or a team of mental "internal supports", overcoming "barriers", psychological modeling of the conditions of the upcoming struggle, forced optimization of the "strengths" of the athlete's mental readiness, attitude and program of actions, etc. e. At this stage, the influence of the environment, the state of the places of employment and recovery, the work of the media, the attention and behavior of sports fans also bear a special mental load.

The content of mental training, its construction, means and methods are determinedthe specifics of the sport. They are more different than in common. Little to say about psithe physical training of an athlete in general, but a lot - a basketball player, a skier, a shooteretc.

Thus, the mental preparation of an athlete (team) is the process of strengthening his (her) potential mental *opportunities in objective results adequate to these opportunities.*

Mental preparation is a time-based process. The subject here is an athlete or a team, which is not the sum of its members, but an independently functioning social and psychological formation. Suffice it to cite as an example the football club "Spartak" (Moscow), which is always distinguished by its peculiar character, no matter what players come to the team. The purpose of such training is to increase the athlete's potential, and for some sports (for example, cyclic) the basis of the potential is a functional reserve, for others (games, martial arts) - the level of mental qualities that determine tactical thinking, for others (weightlifting) - the level of mobilization on extreme volitional efforts. Finally, we are talking about adequate results because that mental training can give a positive effect only if the athlete's capabilities match their level. Often, the reasons for failure are sought in poor mental preparation, while the athlete simply did not have enough skill.

Thus, specialization is the guiding principle of mental subcooking.

It is uncritical to suggest mental stress relief exercises specifically for gymnasts or a horse for use by football or basketball playerskobezhtsev. In practice, psychoregulation options should always be used, even taking into account the specifics of the activities of representatives of narrow roles, for example, defendersor attackers in games.

Planning is one ofthe most important elements in the system of mental training of an athlete or a team, it determines not only its specific content, but also the construction of a control system for this process.

In relation to the system of mental training, the following class can be proposedsification of planning actions:

* depending on the subject of planning, it can be from outside (that is, planning is carried out by a psychologist, coach) or autogenous, when the athlete himself plans; of course, a case of general planning with the participation of the athlete himself is quite likely;
* depending on the timing of upcoming events in relation to the main start, they distinguish between perspective (for the Olympic four years, macrocycle, competitive period) and urgent (for a stage, microcycle, training session, competition) planning;
* depending on the direction of planning actions in relation to the tasks of mental training, planning for a certain period is distinguished (aimed at achieving the optimal level of preparedness necessary for effective training and competitive activity) and planning of mental training for a specific competition.

Schematic diagram planning the stage of mental preparation includes the following basic steps: collecting initial data; selection of controls; terms of implementation; selection of controls; ways to assess the effectiveness of this section of mental training; "Channel" of implementation.

*Psychological control* usually carried out in three main areas: 1) psychological and pedagogical; 2) mental; 3) psychophysiological. In the first case, we are talking about fixed observations, questionnaires, self-assessment tests, conversations with athletes ona special scheme, some personality tests; in the second case - about the techniques that allowwho diagnose the level of mental qualities (for example, in sports games and uniformbattles are informativeindicators of quickness and accuracy of reaction, quickness and accuracy of operational thinking; in complex coordination types - stability of attention, accuracy of musculo-motor differentiations, accuracy of motor perceptions, etc.); in the third case - about the methods reflecting the psychophysiological state of the athlete in training or competition (the most common methods for registering tremor or galvanic skin response before and after exercise).

Mental fitness planning does not have to include all of the predefined toolbox. Everything is determined by the specifics of the sport, the specifics of a specific team, a specific athlete (it is also necessary to take into account the capabilities of the psychologist working in this team).

At the same time, obviously, there is a need to indicate the most typicalsports are the sections of mental training that should be included in the planningrationing:

1. formation of a microenvironment, team building, stimulation of the development of an optimalpsychological climate in the team;
2. the use of educational influences to solve the main problems of formationathlete's personality;
3. formation (maintenance) of achievement motivation among athletes;
4. socio-psychological adaptation in the team of new athletes;
5. training athletes in self-control and self-regulation techniques;
6. psychological counseling and training of trainers in methods of psychological and pedagogicalimpact;
7. prevention of neurotic reactions in athletes;
8. means and methods of mental recovery;
9. management of the mental state of athletes in training and competition using auto and heteroregulation;
10. identification of the most likely voltage sources in preparationteams for the main start of the year;
11. determining the most likely factors of success and failurein the competitive activity of the team or individual athletes in the annual cycle.

### Competitive motivation and training activities

High sports results are impossible without a certain motivation to achieve. In general, a motive is an incentive to activity associated with satisfaction.noisy needs.Going in for sports, a person seeks to satisfy the need to overcome the difficulties of competitive struggle, to overcome his own shortcomings, and finally, to overcome rivals. As a result, this makes sports performance a source of pride for the athlete. Such pride drives his activities.

Sports activity is distinguished by a fairly wide and varied range of motivation, of which the most characteristic for it, as a specific activity aimed at achieving victory, is alternative motivation. The term "alternative" means choice. Along with such widespread alternative motivations as the motivation for achieving success and the motivation for avoiding failure, there are other alternative motivations: operational-tactical, demanding-evaluative, normative-ethical, reflecting the corresponding aspects of competitive activity.

*Operational-tactical* alternative motivation is associated with the choice of the composition of the used actions and techniques in the course of a sports fight. The choice of certain actions is based on an assessment of the emerging competitive situation, taking into account skill, technicalmental and mental readiness of a particular opponent.

For an operational-tactical alternativemotivation is characterized by a discrepancy between the planned action plan and actions directly used in the process of wrestling. At the same time, the discrepancy between the one and the other can relate to both the types and nature of the actions themselves (for example, to attack or counterattack, attack or defend, use previously worked out techniques in the form of "homework" or follow the path of situational improvisation, rely on your favorite crowns or take the risk per experiment), and the time parameters of their implementation - to start actions immediately or a little later.

In general, such motivation is determined by the degree of features of the emerging competition.innovative situation and the athlete's attitude to it.

*Required-evaluative* alternative motivation is associated with goal-setting, whichthe swarm is expressed as a level of aspirations and self-esteem, suggesting a conscious choiceactions by which the athlete seeks to achieve the intended result. Uro-

the line of claims is relatively stable, associated with promising goals; it is influenced to a greater extent by the individual psychological characteristics of the personality than by the situations of struggle. Self-esteem, on the other hand, is more mobile. She is able to change from the result, even in the course of a sports fight, being in close connection with emotional experiences arising from success or failure. An athlete can simply assess his current capabilities and understand that there is no opportunity to win today.

In general, this motivation determines the degreealternatives between the level of aspirations and self-esteem, they have different grounds, and therefore, different directions of action.

Compliance with the level of self-esteem increases opportunities for achieving success in competitive activity, because it contributes to the formation of an optimal state of readiness. However, a clear discrepancy between them, especially if it has become protracted, leads to inappropriate behavior, increased anxiety and uncertainty in their actions.

*Normative and ethical* alternative motivation is associated with moral and ethicalaspect of competitive activity, with what is customary to refer to the norms of sports ethics. Normative and ethical alternative motivation is expressed in the attitude of the athlete to the regulations, rules and conditions of the competition; it manifests itself in the appropriate forms of behavior towards the opponent, judges, spectators and other participants in the competition.

The normative and ethical alternative motivation is characterized by a discrepancy between the alleged actions of the opponent and his real actions, between the objectively emerging picture of the ongoing fight and its assessment by the judges, between the expected reaction of the “fans” and their actual behavior. This leads to a mismatch between the intentions of the athlete to conduct a "fair" fight and his real actions. He is faced with a choice: to be either restrained or aggressive, or to remain correct, or to provoke the enemy into rudeness. The strengthening of alternativeness is significantly influenced by encouragement and censure, group norms and attitudes, value orientations, and other social factors.

The basis of such motivation, related to the alternative choice of means of achieving the goal, is the alternative between the goal and the ways determined by the rules of competition.her achievements. Of your extreme expressionsuch motivation is achieved by using any means that can lead to extremely important goals. An effective balance between goals and means of achieving them presupposes that the success of the activity is assessed both by the end result and by the process itself, and the received moral and material satisfaction would result both from the achievement of the intended goals and from the use of honest ways to achieve them.

### Means and methods of mental preparation

The content of specific means and methods used by both domestic and foreign psychologists is revealed by the following classification.

*By target*the use of the means and methods of mental training are divided into:

1. mobilizing;
2. corrective ("correcting");
3. relaxing ("relaxing").

*By content -*into the following groups:

1. psychological and pedagogical;
2. predominantly psychological;
3. mainly psychophysiological.

In turn,in the first group the following can be distinguished: 1) convincing; 2) guides (both are mostly verbal); 3) motor; 4) behavioral and organizing tools. In the second: 1) suggestive (suggestive); 2) mental (combining influence by word and image); 3) social gaming facilities. In the third: 1) instrumental; 2) psychopharmacological; 3) respiratory; 4) combined (for example, respiratory-motor). By the sphere of influence: 1) means aimed at correcting the perceptual-psychomotor sphere (i.e., the qualities associated with the perception of the situation and motor actions); 2) means of influencing the intellectual sphere; 3) means of influencing the volitional sphere; 4) means of influencing the emotional sphere; 5) means of influencing the moral

specific sphere.

*By addressee:* 1) funds aimed at mental training of the coach; 2) fundsdirect control of an athlete or a team.

*By application time:* 1) warning; 2) pre-competition; 3) competition

body; 4) post-competition.

*By the nature of the application:* self-regulation (self-action) and heteroregulation (actionthe consequences of other participants in the pedagogical process - trainer, psychologist, doctor,massage therapist, etc.).

The choice of specific means and methods is significantly influenced by the time factor, the place of the competition, the socio-psychological climate in the team, individualfeatures of the athlete.

*Mobilizing funds* and the methods are aimed at increasing the "mental tone", the formation of the mindset on the active intellectual and motor activity of the athlete. This includes such verbal means,as self-orders, beliefs; psycho-regulatory exercises such as “psycho-regulatory training” (PRT, option “mobilization”), concentration exercises; physiological effects such as the exciting version of acupuncture, stimulating massage.

*Corrective agents* usually categorized as verbal and are in the form of goetheimpact.They can be various options for sublimation (the athlete's thoughts about the possible outcome of the competition are displaced in the direction of assessing their own technical and tactical actions), ways of changing goal-setting; the “rationalization” technique (when the mechanism of the onset stress is explained to the athlete, which makes it less dangerous); “Gymnastics of feelings” according to the system of KS Stanislavsky (when an athlete is deliberately asked to portray anger, rage, joy, doubt, etc.).

*Relaxing agents* should reduce the athlete's level of arousal and easethe process of mental and physical recovery. Examples include PRT (calming option), progressive relaxation (sequential muscle tension and relaxation), psychoregulation pauses, and soothing massage.

*Psychological and pedagogical means*belong to the competence of not only a psychologist, but alsotrainers, are based on verbal influence and are aimed primarily at moralny and moral sphere of the athlete. Skillful usewords are the most important means of mental preparation.

*Psychophysiological* conventionally called means physiological in technology, but carrying a mental impact, mainly indirect. Such means can be called the already mentioned acupuncture and massage, warm-up, especially if it is psychologically competently built and pursues the goal of forming the necessary mood in the athleteenia.

##### Questions and tasks for self-examination

1. In what period of the annual cycle are the selected competitive exercises used?niya, special preparatory and general preparatory?
2. List the methods used in sports training. In what period of the yearcycle do they apply?
3. Give characteristics to five zones of training and competition loads.
4. Tell us about the components of training loads.
5. How important are the principles of sports training?
6. Give the main characteristics of the training of athletes: technical, tactical,physical, mental.
7. What motivations for competitive and training activities do athletes use?

# Chapter V. Sports training in extreme conditions of mountainous, hot, cold climates and changed time zone

Holding the largest competitions in various countries and cities, in various climatic-geographical and time-zone conditions, as well as preparing for them in these conditionsis a feature of modern sports. Participation in these events involves crossing up to 7-11 time zones, movingfrom the harsh northern regions to hot regions and vice versa, with an ascent to heights of up to 3000 m (and sometimes higher) above sea level.

During such transfersand flights, a number of factors influence the athlete's body and the state of his preparedness: the composition of local water and surrounding soil, magnetic fields and storms, specific living conditions, local cuisine, etc.

Tosuccessfully perform in competitions in new unusual conditions, it is necessary to undergo temporary, altitude or climatic adaptation, and in most cases their combination either directly in the venues of these competitions, or in regions with similar climatic and geographical parameters.

Simultaneously in the system of training athletes in order to improve sports performanceability and sports achievements in familiar conditions, training is used indifficult conditions, in mountainous areas (1000-3000 m above sea level), in a hot dryor humid climates.

It is known that the growth of sports results in the process of many years of training is associated withcontinuous increase in training and competition requirements. It can be waspIt can be done in two ways: 1) by increasing the external parameters of the load: total and partial volumes, intensity and speed of exercise performance, etc., causing the corresponding shifts and subsequent restructuring in the functional systems of the body; 2) due to measures and procedures that directly affect these systems, complicating or facilitating their activity (pharmacological drugs, masks, breathing mixtures, pressure chambers with high and low oxygen partial pressure, high and low temperature and humidity of the environment, etc.).

Training in the difficult natural conditions of a mountainous or hot climate givesthe ability to combine both paths, using the total impact of difficult climatic and geographical factors, terrain relief and changing parameters of training and competitive loads on the body of athletes.

## Mountain sports training

Training in difficult climatic conditions in the middle and high mountains has become an integral part of the training system in most sports. In various countries of the world, special mountain bases have been built at altitudes from 1200 to 2500 m above sea level to prepare representatives of summer and winter sports for competitions.

At present time, a large practical and experimental material has been accumulated, which allows us to assert that training at an altitude of 1500-2300 m is quite effective for both beginners and experienced highly qualified athletes specializing in cyclic sports that require endurance, speed-strength sports, martial arts , sports games and all-round events.

The growth of sports achievements on the plain after returning from the mountains is associated with an increase in the productivity of aerobic and anaerobic sources of energy supply, biomechanical and functional economization, resistance to hypoxia, general and special resistance of the organism to the action of unfavorable environmental factors. A number of adaptive rearrangements take place in the body: the number of blood capillaries in the muscles, the number of mitochondria and their mass increase.

In mid-altitude conditions (1200–2500 m), the absolute strength, the speed-strength abilities of the athlete to manifest explosive efforts, all elementary forms of speed are significantly increased, new, more subtle neuromuscularcoordination, contributing to overcoming the "speed barrier" in connection with a decrease in external air resistance. At the same time, the increase in speed-strength indicators in the middle mountains reaches a maximum by 12-14 days of adaptation. The reactions to a moving object are improved, the accuracy of throws and strikes, the number of ball interceptions, accurate passes, and the number of attacks increase.

After returning from the mountains, positive shifts remain at a sufficiently high level for about 40-50 days, which also contributes to the high-quality implementation of training programs and the achievement of higher sports results. At the same time, the greatest gain occurs in the development of those physical qualities (in comparison with a similar training on the plain), which are targeted by the selection of appropriate exercises in the process of training in the mountains.

Training in the mountains allows you to identify a weak link in the functional systems of the body, which is especially important for young athletes, as it allows the coach and doctor toit is wise to plan their further training and adjust the load.

When climbing mountains, a number of specific climatic factors act on a person:reduced atmospheric and partial oxygen pressure, humidity and temperatureair; increased ultraviolet radiation, air ionization, ozone content, as well as a constant wind rose and, possibly, other not yet fully identified physical factors. The following altitude levels are distinguished: low mountains (foothills) - up to 1200 m, middle mountains or moderate heights - from 1300 to 2500 m and high mountains - over 2500 m.Special experts divide the middle mountains into a lower tier - up to 2000 m and an upper tier - up to 2500 m above

levelseas.

The transition from low mountains through middle mountains to high mountains cannotbe represented as discontinuous changes in geographic areas, since changes in environmental conditions are actually continuous. However, for the most part, people most noticeably experience the negative impact of altitudes starting from 2500-3000 m.

In sports practice, it was noted that at the same altitude levels, but in different mountain systems, far from the same human reactions to the action of the main

climatic factors (for example, in the Tien Shan and the Caucasus). Conversely, the same functionsNational shifts can be noted at different altitude levels. This is due to two reasons: the specific impact on humans of different mountainous regions, which have their own geographic characteristics, and a combination of environmental factors, as well as wide individual differences in athletes' tolerance to these conditions.

The most difficult for athletes to endure the impact of climatic factors in the first days of stay in the mountains in the phase of "acute" "emergency" acclimatization. Of greatest importance are the change in the partial pressure of oxygen, temperature and humidity of the air, the combination of which is called "effective height", and since at different times of the year andin different mountain systems, the ratio of these parameters is different, thenthe absolute height does not always coincide with the "effective" one. This is related to the differences in the physiological and mental reactions of the body in different mountain systems at the same altitudes when performing the same training loads.

The fundamental question concerning the results of the statements made by the representatives of thepersonal sports in mountain conditions is that these conditions put athletes in an unequal position depending on two factors - the speed of movement and the duration of work. A decrease in air density as one rises to altitude leads to a decrease in aerodynamic resistance, but at the same time reduces the supply of the body with the necessary amount of oxygen. Therefore, in those kinds of sports where the speed of movement is high, and the share of aerobic processes in the energy supply of activity is insignificant (for example, in sprint), sports results improve in medium-altitude conditions. In the same sports, where it is the aerobic mechanisms of energy formation that play the main role, and the speed of movement is relatively low (in stayer disciplines), sports results deteriorate. These changes are taking place in a strictly logical manner.

A somewhat more complex picture is observed in sports such as speed skating and cycling, where both the speed of movement and the current consumption of oxygen are high. In these species, the positive effect of midlands, expressed in a decrease in energy consumption to overcome air resistance, is of greater importance than the negative, expressed in a decrease in energy production due to a decrease in oxygen consumption by the body (F.P.Suslov, EB Gippenreiter, 2000). This contributes to the achievement of better results than on the plain.

Currently, in our country and abroad, to prepare for the competition, masteredthe level of 1600–2400 m. At the same time, heights over 3000 m, as a rule, are used only for improving technique, active rest, and increasing speed-strength readiness.

Skiers from different countries regularly train on Alpine glaciers. However, only glaciers located at an altitude of 2500–2800 m above sea level are used for this purpose.

In most cases, when training at an altitude of more than 2500 m, athletes are accommodatedin hotels and bases located below - from 800 to 2200 m above sea level.

With a gradual increase in height above sea level (over 3000 m) in the human body, when performing intense and prolonged physical work, phenomena develop that inhibit the deployment of physiological functions and biochemical reactions that ensure high sports performance, and in some cases these phenomena pose a danger to the health of athletes.

Thus, with a significant climb in the mountains, we meet with a particular manifestation of a more general principle, which is that an increase in the intensity of the functioning of the physiological systems of the body is always associated with an increase in power

braking mechanisms that ensure the demobilization of these systems and, thus, their highfor reliability (F.Z. Meerson, 1973).

Improving the effectiveness of sports training in mid-altitude conditions is always associatedit is done with a clear delineation of its tasks. There are three options for using mountain conditions: the first is training in the mountains in order to prepare for performance in competitions on suchsame or close to her height; the second - training in the mountains in order to increase sports achievements in competitions taking place on the plain or in the foothills; the third - training in mountainous areas in winter sports in connection with the wide international calendar held in the plains, foothills and midlands (stages of the World Cup, competitions on mountain skating rinks, etc.).

Therefore, there are three features of the construction of trainingin the middle altitude and its use in the annual cycle:

1. Preparation for competitions held in mid-mountainous and high-altitude conditions.In this case, the longer the mountain experience of the athlete, the better for the adaptation of the organism. Therefore, several trips of 20-28 days are required. It is necessary to plan a gradual increase in the intensity of training loads at the mountain stage. This will ensure a gradual adaptation of the body to the action of climatic factors, competitive and training loads.
2. Preparation for competitions held in plain or foothill conditions is associated with less frequent trips, with an increase in loads from collection to collection, especially in intensivesti. To this end, for athletes specializing in competitive disciplineslasting up to 2 hours, it is recommended in an annual cycle up to 4 trips to the mountains.from 7 to 28 days each; specializing in disciplines lastingover 2 hours - up to 5 trips per year, each lasting from 7 to 45 days.
3. Preparation for a series of competitions held at different altitude levels requiresis given in additional scientific justification.

*Acclimatization period.*In the first days of being in the mountains, there is a significant deterioration in well-being during work, old injuries appear, andshortness of breath, bowel disorders and other negative symptoms, there is a decreasesports performance in tests and competitions, which is associated with a decrease in pulmonary ventilation, maximum and remote oxygen consumption,the level of the anaerobic threshold, an increase in the pulse cost of work (up to an altitude of 2500 m), a decrease in oxygen debt indicators at the maximum load of submaximal power, impaired coordination of movements, the speed of a simple and complex motor reaction.

However, the dynamics of the volume and intensity of the training load performed in the phase of "acute" acclimatization in the first days of climbing the mountains has the greatest influence on the athletes' performance both in the mountains and after returning to the plain.

In the preparatory period, when the training loads are quite high in volume and moderate in intensity, as a rule, athletes have almost no acute negatives.valuable symptoms. Performance after a slight decrease in the first days of adaptation is restored and graduallyreaches the initial level or even exceeds it by the end of the third week in the mountains.

In the competitive period, with its generally moderate volume and higher intensityintensity, when building a workout in the first microcycle without the necessary decrease in intensity, a second "wave" of acclimatization arises, usually on days 13–17, which is associated with a deterioration in well-being and performance. In this regard, in the first microcycle, an increased volume of aerobic loads is recommended (heart rate - 140–160 beats / min, blood lactate concentration - less than 4 mmol / l). At the same time, the total volume of the load has a much less effect on the process of adaptation of the organism to the mountain climate. Only significant

exceeding this indicator can lead to negative consequences of trainingin the mountains.

At the mountain stage of preparation, almost all microcycles encountered in practice are used, however, the sequence of their use is always associated with the general orientation of the adaptive processes occurring in the body, and corresponds to the tasks of the stage of frictionrocking. Conducting training sessions with a change in altitude has a positive effect on the adaptation process in mountain conditions.

At the same time, at altitudes above 3000 m, there is no increase in heart rate in work in comparison with similar modes performed in the middle mountains, which indicates a developing inhibitory process. The regularities of the dynamics of loads during the acclimatization period are given in Table 21.

###### *Table 21.*The main physiological changes that ensure adaptation tomountain climate (up to 3.5 km)

With a short stay in the midlands before the competition (6-10 days), you can turn on intensive training means much earlier - from the third day.

The studies of the performance of athletes of various qualifications and age have repeatedly confirmed that the most important factors affecting the speed of adaptation and the possibility of increasing training loads are mountain experience and the degree of fitness of the trainees.

*Re-acclimatization period.* Research and numerous long-term statistical observations for the preparation of athletes specializing in cyclic and speed-strength sports, they show that working capacity, expressed in sports results and test indicators during the re-climatization period after a 2-5-week stay in the mountains, has a wave-like character.

Unstable performance in the first or second days after the descent is most often associated withwith road difficulties, change of time zone, temperature difference,air humidity, etc. From the third to the sixth-seventh days, the first phase of increased performance is observed, then, at the beginning of the second week, a phase of decrease in sports results often occurs in relation to the first days, although their level can sometimes remain high. In this phase, it is difficult to achieve high sports results, although the possibility of successful performances is not excluded.

Gradually, from 12-13 days, sports performance begins to increase and reachThe highest rates are expected on the 18-24 day of the re-acclimatization period.

During the fifth week, performance stabilizes or decreases slightly,and then, 36–46 days after the descent from the mountains, a new increase in sports results is observed, recorded in runners, swimmers, and wrestlers. The increase in athletic performance in these cases is due to the cumulative effect of using mid-altitude mountains and subsequent training on the plain.

Phase the dynamics of sports performance is associated with the level of training loads during the entire training period in the mountains. Volumetric, low-intensity work significantly reduces fluctuations in working capacity during the re-acclimatization period, high-intensity training work increases them, and in some cases significantly shifts the above average phases. The more intense the training work in the mountains, the later the terms of achieving the highest sports results during the re-climatization period can come. In some cases, the first and even the second phases of increasing efficiency may not be observed (3–6 and 14–24 days).

*Training at mid-altitude in an annual cycle.*Mountain training at all stages and periodsthe annual cycle should take place in unity with the previous and subsequent training andsolve certain sequentially related tasks. In preparation for the competitionniyam held in mountainous areas should not limit the number of trips to the mountains.

In preparation for the starts on the plain, from two to five fees can be plannedin the mountains, and each trip should be considered as a mesocycle aimed at the most effective solution to the specific tasks facing the athlete or team. At the same time, a trip to the mountains can completely coincide in duration with the corresponding stage of training (shock, pre-competition) and even a period (transitional), or be an integral part of a longer stage (basic, direct preparation for important competitions, etc.). Research shows that the optimal collection time is between two and four weeks. Longer camps often do not result in the desired performance improvement. Shorter camps can be used in the competitive period to conduct shock training without reducing training loads or for rehabilitation. At the same time, the combination of the duration and frequency of collecting in the mountains requires further research. In some sports, training camps of 2 × 10 days with a week break, 2 × 20 days also with a week break, and other combinations have been successfully tested.

During the transition period, it is advisable to use training in the middle altitude, especiallyon mountain resorts. An active motor regime, supplemented by moderate hypoxia of the mountain climate, contributes to the maintenance of the level of aerobic performance and strength qualities, and the restoration of working capacity is much faster than at sea level.

In the preparatory period, training in the mountains is advisable to useat the basic stage, when athletes on the plain reach maximum training loads in terms of volume, which contributes to a further increase in endurance or strength qualities. An increase in working capacity occurs by increasing aerobic performance, expanding the functional capabilities of the body's vegetative systems, achieving efficiency, developing resistance to hypoxic factors, as well as for the development of other physical qualities, especially strength.

Staying in the midlands is advisable at the end of the preparatory period, ending with the "pre-competition" stage, during which the transition to training takes place.high intensity and psychological stress.

In the competitive period, training in the middle altitude is used at the stage of preparation for the most important starts. It can also be related to the preparation for the main qualifying competition, usually planned for 3-6 or 14-18 days after the descent. In thatIn case, participation in the main start of the season should be scheduled for 40-45 days.

In the process of many yearsexperimental and training work in a number of cyclic sports before major competitions, the structure of the stage of direct preparation for important competitions, consisting of several phases, was tested.

*Unloading phase -*one week after the qualifying starts.

*Mid-altitude preparation phase* (2-3 weeks) - an increase in special workableSTI on the principle of "shock" training.

*The phase of leading up to the main start of the season* (2-3 weeks) - training on the principle of nonmedium preparation for important competitions (re-acclimatization period) in ecological conditions as close as possible to the place of these starts.

*Main Event Phase* sports season (3-7 days) - 18-25 daysafter descending from the mountains.

In the event that the main competitions are held in mid-mountain conditions, the preparation phase in the mountains should last 2.5-3.5 weeks, after which a descent should be planned no morethan 2-3 days for a flight to the competition site.

The lead-up phase to the main start should take place in adequate altitude and climateunder natural conditions, but cannot be shorter than 13–14 days.

To maintain the effectiveness of training in the mountain conditions with each new tripto the mountains follows:

* gradually reduce the duration of the first microcycle of training, correspondingthe phase of acute acclimatization, from 5-9 to 3-4 days;
* gradually decrease the duration of the second microcycle in which the exit occursto the required level of loads, from 5-7 to 3-4 days;
* keep in the first and second microcycles of training in the mountains the total volume of training loads usual for flat conditions;
* increase the intensity of training loads, especiallyin the second and subsequent microcycles, due to a decrease in the rest intervals, an increase in the speed of exercise performance, the inclusion of full distances and combinations, an increase in the proportion of competitive loads, control exercises, assessments, etc.;
* gradually increase altitude levels, rising to conduct trainingclasses up to 2400-3000 m above sea level.

## Sports training in terms of temporal adaptation

Transmeridial (latitudinal) movements of athletes after several hoursbelts either lengthen the day (movement to the west), or shorten them (movement to the east). This leads to a violation of the usual biological rhythms (dysynchronosis), since about 300 physiological processes occur simultaneously in the human body, which are characterized by daily cyclicity.

The daily (circadian) frequency is associated with changes in illumination and ambient temperature. Time sensors that set this rhythm are usually reinforced by developed work-rest cycles. The more the latter correspond to cycles

"Light - dark", the more effective the sports activity is.

Thus, the daily rhythms of activity and rest, wakefulness and sleep in humans are closely related to the daily rhythms of physiological processes (heart rate, body temperature, the rate of conduction of excitation along nerve fibers, resistance in stressful situations, physical performance, blood pressure, hemoglobin concentration, etc. ). Crossing four or more time zones leads to a change in the usual rhythm

"Day - night", which cannot be rebuilt in a short flight time. Therefore showingThe bodies of a person's biological (internal) clock in the first days of adaptation to a new place of residence do not coincide with the local astronomical time. There is a mismatch or desynchrosis of the cycles, which continues until the person adapts to the local time and both cycles are not synchronized.

The synchronization of these rhythms after a flight to the west occurs at a speed of 92 minutes per day, and after a flight to the east - 57 minutes per day. However, the time required to restore the rhythm of individual biochemical, physiological, mental and other processes differs significantly. It can be conventionally considered that when flying to the east through three time zones, it takes three days for a person to adapt, and two days to the west; when crossing seven time zones - about seven and four and a half days, respectively. Thus, the adaptation of a person when moving to the east is more difficult and time-consuming than when moving to the west. The adaptation of athletes to new conditions and the restoration of the average level of their working capacity occurs somewhat earlier than the period of complete adaptation of the organism,

In preparation for major competitions held in distant regions (intersectionfour or more time zones), it is inappropriate to restructure the daily rhythm at home, as it can lead to nervous exhaustion. Such a time shift atUnder normal conditions, it is justified for no more than 2 hours.

The belt and the corresponding climatic adaptation when flying over five or more time zones has three stages.

The first, initial (2-4 days) - violation of the usual regime of psychophysiological functions and biological needs of the body. This condition is due to the fact that training, competitions, meals, cultural events held in local time will take place during a period that does not correspond to the usual daily regimen.The second stage - an active restructuring of the psychophysiological functions of the body - begins on the second or third day and ends after 8-10 days. During this time, the existing disorders of sleep, appetite, mood, well-being in most athletes can gradually disappear, while the indicators of the functional state of the neuromuscular

system, especially vegetative functions, physical performance increases.

The third stage is the stabilization of psychophysiological functions. Starts in 7-8, and with an increase in the number of crossed time zones - 9-11 days after arrival at the destination. Psychological comfort, relative stabilization of the new daily rhythm of most physiological processes, is characteristic of this stage, although according to a number of indicators (oxygen consumption, body temperature), especially after muscular work, the rhythm of permanent residence is still possible. It should be emphasized that in the first week, there may be an activation of diseases compensated for in conditions of permanent residence, especially chronic ones.

The experience of moving athletes in the western and eastern directions shows thatthe most important in the process of temporary adaptation are the regime and human activity in the first and second days after the flight, especially the forced first night's sleep and the first training sessions. Therefore, already during the flight, it is necessary to immediately switch to a new diurnal rhythm (Table 22).

When flying to the east, forced sleep is required at least after 14-16 hours of wakefulness and 1-2 training sessions in the morning and evening hours. Therefore, it is better to fly to the east in the morning local time, when it is still after midnight at home. Departure should be scheduled for the evening. It is advisable that the athletes sleep on the plane.

A flight to the west is advisable in the first half of the day with an arrival in the evening, when it is already deep at night at home and the athletes want to sleep. Placement of athletes, light workout and dinner can successfully combat drowsiness and postpone bedtime until the evening hours local time. It is advisable to lie down (sleep) until 5-7 am local time. Then you should charge with a small load.

###### *Table 22.*Mode recommendations during temporary adaptation

From the second day, it is necessary to strictly subordinate the training sessions to the new dailyrhythm, that is, to conduct them during the hours when the competition is planned.

Among the factors affecting the rate of adaptation to new time conditions, there areindividual personality traits, age and sex differences are determined. The analysis of competitive and training activity during the adaptation period indicates a varied change in working capacity in various sports when flying over 5-10 time zones.

*In athletes specializing in sports with a predominant manifestation of endurance,*there is a relatively low reactivity of autonomic functions compared towith representatives of other groups. The second stage (the process of the formation of a new daily rhythm) lasts longer, which affects the timing of the entire adaptation period. Sports performance in the first two days changes insignificantly, in the next two or three days its level decreases.

After a short-term increase in efficiency, there follows, as a rule, a secondarynaya wave of an unstable state (7-9 days), consisting in significant drops

parameters of systems functioning against the background of an upward trend. Then comes a long stage of improving the state and sports performance, which, depending on the number of crossed time and climatic zones, can begin at 11-12or 14-16 days of adaptation. At the same time, representatives of these sports can observegiven an increase in the incidence.

The peculiarities of adaptation in representatives of speed-strength and complex coordinationsports are a pronounced individual character and high reactivity of autonomic functions. There is a violation of the coordination of movements, the appearance of errors during the first stage. In the second stage, the process of adaptive restructuring takes placemore actively and ends on the 8-10th day after the flight with the formation of a new diurnal rhythm.

Sports performance in the first two days does not change, for 3-4 days it significantly decreases. During this period, it is not recommended to use heavy loads (in terms of volume, intensity and psychoemotional tension).

Representatives of sports games are approaching by the type of adaptation to the athletes of the previousthe next group. Their feature is a faster adaptation of the functional state of the neuromuscularsystem and leading physical qualities. The formation of a new daily rhythm occurs relatively quickly - within 8-10 days. This is due to the experience of adaptation acquired by the teams during repeated moves to contrasting climatic zones in accordance with the calendar of domestic and international competitions.

In martial arts among athleteswhen changing the temporal regime, as a rule, there is an increased reactivity of autonomic functions. This is due to both the specifics of the sport and the predominant use of the means and methods of direct preparation for the competition. The degree of weight reduction and pre-start reactions are of some importance.

At the same time, accumulatedexperience allows us to give a number of general recommendations for the construction of sports training in the conditions of climate-temporal adaptation (Table 23). It must be remembered that too high or low load worsens the process of adaptive restructuring in the body, which negatively affects performance.

###### *Table 23.*Features of training in conditions of climatic-time adaptation



The structure of training loads in the last microcycle at home before departure is of paramount importance for the effectiveness of the training process during the period of climatic-temporal adaptation.

It is necessary to use high volumes of training and competition for this stage.innovative loads, which will ensure their variability due to a decrease in the first days of the adaptation period.

Two days before departure, the training load should be significantly reduced, sincethe flight itself is a significant burden for the body.

## Sports training in hot climates

Training athletes in hot climates (both humid and relatively dry), limiting physical performance and, thus, the ability to achievezheniya high sports results, is usually used in two versions: for preliminary adaptation to new climatic conditions, adequate to the conditions of the main competitions of the season, and to increase the functional capabilities of the body of athletes, regardless of the conditions for the main starts, since the training itself and participation in competitions in hot climates make increased demands on the functional systems of the body.

In certain sports characterized by a short-term competitive actionefficiency (speed-power, difficult-coordination) in a hot dry climatemata, sports results can be even higher than the initial ones shown in the usual conditions. In endurance exercises and outdoor sports, performance decreases, and the more, the higher the temperature and humidity of the environment. At the same time, insufficient thermal acclimatization is the cause of various thermal injuries (up to fatal thermal strokes) in runners, cyclists, football players, walkers, etc. Studies conducted by Japanese scientists in marathon running have shown that the optimal temperature for this sport is + 14-15 ° C. Every 3 ° C increase in temperature leads to a decrease in the athletic performance in the marathon by 1 minute.

Accumulated scientific data and practical observations indicate thatin a hot climate, deep physiological, physicochemical and morphological changes occur in the human body.

In conditions of high ambient temperatures, the human thermoregulation system acts in such a way as to maintain body temperature in relatively narrow boundaries.tsakh. An increase in temperature and especially air humidity makes it difficult to heatrecoil, which can lead to overheating of the body.

Competitive and training loads in conditions of increased eye temperatureThey cause a stressful effect on the thermoregulatory system and the cardiovascular system.Heat transport to the skin increases. So, in comfortable conditions, the blood flow in the vessels of the skin is 5%, and at high ambient temperatures it reaches 20% of the minute volume of blood. This leads to an increase in stroke volume, heart rate and systolic volume, and the respiratory rate increases. Heat stress decreases maximum blood flow, which leads to a decrease in BMD and an increase in muscle and blood lactate concentration. It is generally accepted that the most effective muscle work performed at an internal body temperature of 38–39 ° C. Therefore, in these conditions, a significant increase in the intensity of the load is not recommended to maintain a steady state.

Exists classification of the intensity and intensity of work according to the results of measuring the rectal (in the rectum) temperature: light - up to 38.1 ° C; severe - from 38.1 to 39.4 ° C; very hard - more than 39.4 ° C. The change in both rectal and skin temperature is influenced by air humidity and wind speed.

Decreased athletic performance at high temperaturesand air humidity is associated with the simultaneous effect of overheating of the body, rapid and significant moisture loss (more than 2% of the body weight), a decrease in the oxygen transport capacity of the body. When the outside temperature exceeds the temperature of the skin, the direction of heat transfer is reversed, which reduces convection. The body begins to receive heat from the environment (and not give it away, as at temperatures below 30-35 ° C), and the sun

radiation creates additional thermal stress, which can lead toto heatstroke.

During physical work, the main role in heat transfer is played by the evaporation of sweat from the surface.skin stiffness affected by relative humidityair. Therefore, muscle activity at high temperatures and low humidity is less difficult for the athlete. Evaporative heat exchange with respiration during aerobic exercise accounts for about 50% of the total heat transfer, decreasing with increasing humidity.

At high temperatures and relatively low air humidity, rapidevaporation of sweat from the surface of the skin. High humiditysweating increases, and perspiration is ineffective. The process of sweating increases with the increase in the speed of air movement. With calmness, the intensity of perspiration slows down, which leads to a more rapid development of body hyperthermia.

Acute thermal work dehydration is one of the most severe consequences of increased sweating in a hot microclimate. Together with moisture loss, which can range from 1200 to 2800 grams per hour, the body's content of electrolitas and the concentration of salts increases. With a decrease in body weight by 3% in connection with thermal work hydration, a decrease in working capacity occurs, for the restoration of which it is necessary from 24 to 48 hours (L.A. Ioffe, 1984).

Dehydration leads to a decrease in blood plasma volume and an increase in its viscosity, and the volume of intercellular and intracellular fluids also decreases. Violation of the water-electrolytic balance in cells impairs the contractility of skeletal muscles and myocardium. Measurements carried out during long-term competitive activity showed that, despite an acute deficiency of fluid in the body (from 4 to 6 liters), athletes drink no more than 3 liters of water (marathon), since the maximum rate of gastric emptying is lower than the loss of water with sweat. ...

The body of young athletes is not only less economical in comparisonwith the body of adults, but it also tolerates higher temperatures worse, adapts more slowly to hot climates. Therefore, in conditions of intense and prolonged training and competitive activity in conditions of high temperature and humidity, a certain caution and appropriate prophylaxis are necessary.

Moisture loss and overheating of the body can accompanied by heat lesions, which include convulsions, heat exhaustion, heat fainting, heatstroke.

Disorders in the mental sphere will lead to the loss of the ability to adequately assess their actions.

Overheating can lead to thermal fainting, which is characterized by shock, delirium, and hallucinations.

With heatstroke, the body temperature rises to 41–41.5 ° C, sweating stopsdivision, the functions of the central nervous system are impaired, blood pressure decreasesup to 60 / 40–80 / 50 mm Hg. Art. The heart rate is 100–160 beats / min. Muscle spasms can turn into general convulsions.

With heat exhaustion and heatstrokefirst of all, it is necessary to cool the body to 38–39 ° C. Delay in the onset of cooling at one hour halves the chances of recovery. Cooling is efficient with blowing fans. This promotes perspiration and the movement of cooled layers of air over the skin (convection). Cooling with ice pads is less effective. A cold bath is contraindicated, since redistribution of blood can lead to vasospasm of the skin vessels and a progressive increase in deep temperature.

Improving thermal stability is, in essence, providing the ability to compete and train in heat with a high efficiency factor.

action. This is facilitated by the systematic stay in climate conditions with highwith a certain air temperature, since thermal acclimatization noticeably increases the effectiveness of the training and competitive loads performed.

An increase in thermal stability is due to a number of adaptive shifts: increased sweating, its faster onset, a decrease in temperatureexternal and internal environment; a decrease in heart rate, an increase in the volume of circulating blood during work, a decrease in the basal metabolism, the oxygen cost of standard work (an increase in functional economization). At the same time, there is a close relationship between heart rate and skin temperature of the body.

The process of acclimatization to the hot climate, as well as the change of the time zone, almost completely ends in 12-14 days, and the most intensively adaptivechanges in the body also occur within 4–7 days.

The cycle of training sessions in high temperature conditions promotesdecrease in body temperature for a standard load, energy cost of work (5%) even in the usual normal conditions. It is also advisable to use the combined effects of mid-altitude and heat hypoxia (hypoxia has a hypothermic effect). However, it should be borne in mind that training under these conditions imposes very strict requirements on the body.

Sports training in conditions of adaptation to hot and humid climates obeys the same laws as in conditions of adaptation to a change in the time zone and partlyto the mountain climate.

In the first microcycle (5-7 days), it is necessary to reduce the intensity of the load and, to a lesser extent, its volume. Competitive loads, control starts and exercises are not recommended. In the second microcycle - a gradual increase in all parameters of the load with the inclusion of intense competitive exercises. In the following microcycles - the usual training in accordance with the stage of the annual cycle.

However, it is necessary to take into account the specificity of thermal acclimatization. Adapting to dry heat does not guarantee an increase in heat tolerance at relatively high humidity. The most important condition for maintaining high performance in hot climates is the elimination of water and electrolyte deficiencies with increased sweating. This prevents dehydration and decreased performance. Before performing prolonged physical activity, it is necessary to saturate the body with water. During training and competition, you should also regularly drink fluids (preferably cold water). Before the marathon distance, it is advisable to drink up to 800 ml of water in portions of 150 ml. Athletes' clothing should be lightweight, made of a single layer of fabric, in order to ensure the evaporation of water and to expose the skin surface as much as possible; sweaty clothes

it is necessary to replace the dry one more often.

In hot conditions to maintain thermal stability and high performancedrinking is especially importantmode. Unfortunately, it is still widely believed that drinking abstinence is necessary, since water supposedly has a "relaxing" effect, creates an additional load on the circulatory system, etc. Dehydration that develops during work reduces the athlete's performance if the water loss is more than 2 % of body weight. The intake of cold liquid during work is accompanied by an increase in its efficiency. With the intake of liquid in the process of work, the possibilities of additional introduction of carbohydrates into the body are created, since the depletion of glycogen in the working muscles limits the working capacity. However, the evacuation of fluid from the stomach slows down with an increase in the concentration of the solution. Therefore, the sugar content in a cold solution should not exceed 5 g per 100 ml of liquid (5%).

Controlling fluid intake while exercising is better off feelingthirst, and by weighing the athlete before and after classes, as well as in the morning after sleep. The liquid should be consumed in small amounts, but relatively often.

## Sports training in cold climates

In the course of evolution, man in a purely biological sense has become extremely sensitiveto cooling, it is easily exposed to various disturbances under the influence of cold (V.P. Kaznacheev, 1982). The widespread use of artificial means of protection from the cold significantlyexpanded the range of external temperatures, atwhich a person can work and live, but at the same time it caused a negative effect: it demobilized his own defense mechanisms that ensure the constancy of body temperature.

In a harsh cold climate, the body of an athlete performing intense training and competitive activity is in a rather difficult stateyany.

This is primarily due to the fact that at low temperatures moisture freezes out of the air, and air becomes dry. At -40 ° C and relative humidity

90% absolute humidity - the amount of water vapor - is only 0.16 g / m3 of air, and with heat at +40 ° C and 20% relative humidity, the absolute humidity is

10.18 g / m3. In a temperate climate, this figure is 6–8 g / m3. Dry airhelps to increase the loss of fluid from the body during respiration and through the skin. At the same time, evaporation through the skin is twice as high as in temperate climates, which is accompanied by heat loss. In this regard, thirst arises in the process of work.

The increased excretion of fluid through the lungs is accompanied by functional blood filling of the lungs and their more intense activity. This causes shortness of breath, which often occurs even with moderate intensity work. A significant loss of fluid leads to the loss of trace elements and vitamins. At low temperatures, increasesinsulating ability of the skin due to vasoconstriction by 5-6 times.

In the process of training sessions and competitions, it increases significantlyenergy consumption, which is used to ensure the operability and heating of the inhaled air. The adaptation of the body to the effects of cold, hypoxia and physical activity has common mechanisms associated with a lack of energy, which activates the genetic apparatus of the cell. All this leads to certain morphological and functional adaptive changes in the body.

Under the influence of low temperatures in the body, a certain phase sequence of adaptive reactions occurs.

* + 1. *phase.* In the skin and mucous membranes of the respiratory tract, a spasm of small superficialvessels, as a result of which the transfer of heat decreases.
		2. *phase.* Reflexively, through the neuroendocrine system, metabolism increases, energy production in various organs increases, blood supply increases,the vessels of the skin ripple, the number of functioning capillaries increases.
		3. *phase*is already a consequence of overvoltage and breakdown of regulatory and protective furnizms. The blood flow in the skin slows down, the skin acquires a bluish tint (the so-called "goose bumps"), an unpleasant "chill" is felt. The appearance of this phase isa sign of hypothermia, which, with systematic repetition, leads to a breakdownadaptation.

This sequence of the body's reaction to the action of low temperatures completelyconsistent with stress theory. Due to the loss of water by the body and an increase in energy consumption during training sessions in cold weather, beverages should be taken every 20 minutes containing a glucose concentration of 2.5–5%, a volume of 100–200 g of a drink per dose, with a liquid temperature of 25–30 °.

During the competition, it is necessary to drink from 200 to 500 g of liquid before the start in combination with good warming up of the body.

The colder the weather, the more concentrated the solution should be (up to 5%). Drinking during competitions on the terrain when passing stayer distances should be taken on flat areas, before descents, every 20-30 minutes.

In places where athletes are accommodated in hotels and hostels, in cold weather outside, air humidifiers should be available. Clothing must be such that the athlete cando not experience for a long time neither the feeling of cold, nor excessiveheat, that is, to correspond not only to the ambient temperature, but also to the duration of stay in it, as well as to the nature of training and competitive activity in this weather.

In connection with the above, it should be considered that holding training camps, as well as responsible competitions in areas characterized by low temperatures (below 20 ° C), is inappropriate for two reasons: reduced sports performance and the risk of getting colds.

In conditions of the need to hold competitions at low temperature conditionsswing, their program should be changed - to reduce the length of the distance or the duration of competitive activity in time. With a sharp change in temperature, which usually occurs when representatives of winter sports move to the north from places with a temperate climate in order to increase the periods of snow or ice training, the structure of training in conditions of temperature acclimatization practically corresponds to the structure of training during the period of adaptation to mountainous and hot climates, both in terms of dynamics training loads, and the use of basic training means. The lower the ambient temperature, the longer the adaptation phases and the duration of the corresponding training microcycles.

In conclusion, we can state that acclimatization andthe training of athletes in the conditions of mountain, time and climatic adaptation has many general laws and must certainly be taken into account by the coach and the athlete in the specific conditions of the venue of the competition and training camps.

##### Questions and tasks for self-examination

1. For what purpose do athletes go to train in the mountains?
2. What are the three options for the use of mountain conditions athletes use to improvehow to improve the effectiveness of sports training in mid-altitude conditions?
3. How long does the increased functional state of the sports last?exchange when moving to the plain?
4. What are the three stages of climate adaptation when flying for fiveand more time zones?
5. What is the difference between a flight to the west and a flight to the east?
6. What are the guidelines for training athletes at a high pacethe environment?
7. What are the ways to increase the thermal resistance of athletes in preparation for competition in hot climates?
8. What should athletes do in the context of the need to hold a competitionat low temperatures in a harsh cold climate?

# Chapter VI. Building sports training

## The structure of long-term training of highly qualified athletes

The process of training highly qualified athletes can be conditionally divided intothree interrelated components: building a process, its implementation and monitoring the progresspreparation.

In the process of building sports training, the integrity of the training processis provided on the basis of a specific structure, which is relativelya stable order of combining components, their regular relationship with each other andgeneral sequence.

The training structure is characterized in particular by:

1. the order of interconnection of the elements of the training content (means, methods of general andspecial physical, tactical and technical training, etc.);
2. the necessary ratio of the parameters of the training load (its quantitativeand qualitative characteristics of volume and intensity);
3. a certain sequence of various links of the training process (individual lessons and their parts, stages, periods, cycles), representing the phases or stages of this process, during which the training process undergoes regular changes.

Depending on the time scale within which the training process takes place, there are: a) microstructure - the structure of a separate training lesson, weekscycle; b) mesostructure - the structure of training stages, including a relatively complete series of microcycles (for example, a monthly cycle); c) macrostructure - the structure of large training cycles such as semi-annual, annual and long-term.

The problems of the optimal construction of training consist precisely in the fact that, based on the objective laws of the training and competitive processes, to give them the forms that most fully ensure the solution of the intended goals and the conditions for their implementation.As the multi-year training process unfolds in time, its structure is constantly becoming more complicated, since the tasks, age, level of preparedness of athletes, as well as their narrow or broad specialization within the sport, change. In general, the long-term process of sports training from a beginner to the heights of mastery can be presented in the form of stages associated with the age and qualification indicators of athletes,

namely:

* initial training (1-3 years);
* initial sports specialization (2 years);
* in-depth training (3 years);
* improving sports skills (3 years);
* higher sportsmanship;
* sports longevity.

It should be noted that in certain sports there are no clear boundaries between the stages of manythe summer process, as well as the strict time frame of these stages.

The rational construction of long-term sports training in the form of sports is carried outis based on the following factors:

* optimal age limits, within which the highestresults;
* the length of systematic training to achieve these results;
* the predominant focus of training at each stage of the long-term traininggoods;
* passport age at which the athlete startedto classes, and the biological age at which the special training began;
* individual characteristics of an athlete and the growth rate of his skill. The long-term process of training and competition of an athlete is based on the following

of the following methodological provisions.

1. A unified pedagogical system that ensures rational continuity tasks, means, methods, organizational forms of training for all age groups. The main criterion for the effectiveness of long-term training is the highest athletic performance.tat achieved within the optimal age range for this sport.
2. Target orientation in relation to highersportsmanship in the process of many years of age training.
3. Optimal proportionality of various aspects of an athlete's fitness in proprocess of many years of training.
4. A steady growth in the volume of general and special training, the ratio of whichgradually changes.
5. Increasing the volume and intensity of training and competitive loads, theircompliance with biological age and individualthe capabilities of the athlete.
6. Upbringing of the physical qualities of an athlete at all stages of long-term training with the predominant development of the dominant quality and taking into account sensitive periods.

To rationally build a long-term training process, one should take into account the time required to achieve the highest sports results. Able sportsmen achieve their first big successes (fulfillment of the master of sports standard) after 7-9 years from the beginning of classes, and the highest achievements (fulfillment of the master of sports standard betweenfolk class) - after 9-12 years.

This chapter discusses the construction of sports training at the stages of highersportsmanship and sports longevity.

In the practice of sports, it is customary to distinguish four-year cycles associated with targeted preparation for the main competitions - the Olympic Games, and for young athletes - for the Games of the peoples of Russia, held once every 4 years. Having traditionally emerged as an organizational category, four-year cycles began to have a significant impact on the construction of long-term training (L.P. Matveev, 1977).

And although the patterns of the structure of the training process within the framework of the Olympic cycle have not yet been studied enough, a retrospective analysis of the training of outstanding athletes of our country who participated in one or three Olympics allows us to propose certain options for constructing four-year macrocycles, characterized by certain patterns. The achievement of maximum results in these cycles is accompanied, as a rule, by the maximum values ​​of the parameters of the training load and individual competitive practice among highly qualified athletes.

The whole process of sports training is aimed at adapting the body to these loadskam, to improve technical and tactical skills and subsequenttheir implementation in competitions in strict accordance with the requirements of the chosen specialization. This causes an increase in the share of the most specific and high-intensity special-preparatory and competitive exercises, which cause a significant activation of adaptive reactions.

Since the durationperformances of athletes at the level of the highest achievements in different disciplines is different and ranges from 1 to 3-4 Olympic cycles, a strictly individual approach is required. Practice shows that athletes who are at the stage of highest achievements are well adapted to the most diverse means of training influence and, as a rule, previously used options for planning the training process, methods and means fail not only to achieve progress, but also to keep sports results at the same level. ... Therefore, it is necessary to vary the means and methods of training, apply complexes of exercises that have not been used before, as well as new training devices, additional means that stimulate the working capacity and the effectiveness of the fulfillment of motor actions.

Achieving the highest results in the last year of the four-year cycle is possiblewith different variants of the dynamics of training loads:

* first - a smooth gradual increase in the total volume and volume of the load is increasednoise intensity. A special case of this variant is a significanta jump in total workload in the last year of the cycle;
* the second - stabilization of the total volume of training loads while stabilizing the volumethe load of increased intensity in the fourth year of the cycle;
* the third is the undulating dynamics of the total volume and private volumes of intensive funds with their increase in the last year of the cycle;
* the fourth is stabilization, and then a decrease in the total volume of loads with a significantincreasing the private volumes of the load of increased intensity.

The first variant of the structure of the four-year cycle is recommended for young athletes,preparing for their first Olympics or sports days and have not yet exhausted the possibilities of increasing training loads. A special case of this option - a sharp increase in volume in the Olympic year - can be used by athletes with very high functional capabilities who have sufficient training experience. However, after using this option, sports achievements often stagnate in the next one or two years. The second option is used, as a rule, by experienced athletes, whose organism

rykh adapted to very high training loads, after a longperiod of their growth. In this variant, the competitive loads are increased.

The third option is observed in experienced athletes, "veterans" preparing for the WTOswarm or third Olympiadwith significant changes in loads in certain years of the cycle. In this case, the last rise, as a rule, coincides with the highest sports results.

The fourth option is found in practice among athletes who in previous years had high total volumes and insufficient partial volumes of the load of increased intensivesti.

All four variants of load dynamics can be considered as successive phases of long-term training for 10-12 years, starting already at the stage of sports improvement.

## Building a workout in annual cycles

##### Factors determining the structure of the annual cycle

The tendency to expand the general calendar of sports competitions, including from 2 to 4 most important, distributed more or less evenly throughout the year,forced specialists to build a one-yeara cycle of several macrocycles. This was facilitated by the improvement of the material base. The appearance of arenas, cycle tracks, winter stadiums, a wide network of swimming pools made it possible to abandon the seasonality in many sports. This is how 2-3 macrocycles appeared during the year in cycling (track), athletics, swimming, skiing. At the same time, in sports related to long-term, intense competitive activity or requiring a lot of time for preparatory work, single-cycle planning is still preserved.

The peculiarities of the calendar in sports games largely determine the construction of the trthe leveling process throughout the year. Along with annual macrocycles (in football, hockey)there are six-month training macrocycles (in basketball, volleyballand etc.).

Thus, in the preparation of highly qualified athletes, there is a construction of a one-year training based on one macrocycle (one-cycle), on the basis of two macrocycles (two-cycle), three (three-cycle), etc.

In each macrocycle, three periods are distinguished - preparatory, competitiveand transitional. With two and three cycle construction of the training process, variants are often used, which are called "double" and "triple" cycles. In these cases, transition periods between the first, second and third macrocycles are often not planned,and the competitive period of the previous macrocycle smoothly turns into the preparatoryperiod following. The described options for constructing an annual cycle in various sports proceed from the basic laws of the dynamics of a sports form and its alternationphases.

Sports form is understood as the state of optimal (best) the athlete's readiness for achievement, which is acquired under certain conditions in each macrocycle. The sports form expresses the harmonious unity of all sides (components) of an athlete's readiness to achieve (physical, mental, sports-technical and tactical) (L.P. Matveev, 1991).

In its development, a sports form goes through a number of phases: formation, stabilization and temporary loss.

The state of stabilization of sports form in a certainthe least long enough (from 1 to 4–5 months) and depends on the duration of the formation phase. Generally, the shorter the formation phase, the shorter the stabilization phase. At the same time, in sports practice, the term "peak of sports form" is used, which can be characterized as the operational state of an athlete who is in sports form and who has achieved the highest results due to the coincidence of many favorable external and internal conditions (weather, equipment, competition, support of spectators , objective refereeing, good conditions of accommodation, nutrition, well-being, the easy nature of moving to the place of the competition, the correct method of connecting to the start, etc.). Thus, in a state of fitness, an athlete may have several such peaks.

The duration of the phase of formation of sports form in the majority of indie athletesusually - from 2 to 8 months and depends on the reactivity of the body systems and the dynamics of the training means used (shorter in case of complex and longer in case of selective alternate solution of the main tasks of training). Replacing one set of training influences with others can also increase the duration of each of the two phases. In this case, the above sequence of phases of the formation of a sports form is optional. The results of experimental studies (A.P. Bondarchuk, 2007) indicate that the process of developing a sports form can have a different sequence. So, in cases of the simultaneous use of certain complexes of training influences after a transitional period, some athletes have a classic alternation of the phases of formation, stabilization and loss. In another combination of loads, the formation of a sports form is preceded by a phase of loss. In the representatives of the third group of athletes, the alternation of phases (after the transition period) occurs in the following sequence: the phase of stabilization, the phase of loss, etc.

Since the goal of all training in the annual cycle is to achieve the highest results inthe main competitions - the Olympic Games, World Championships, Europe and Russia, the level of sports form with which the athlete will approach them should be the highest precisely by the time of the main start. In this regard, the number of completed triads (formation, stabilizationlization and temporary loss of sports form) in the annual cycle should be such thatensure the highest level of readiness within a given time frame.

In this regard, we should talk about a unidirectional structure of training per year.period of time, despite two, three or more competition periods, since some of them should have only a subordinate value.

For example, with a three-cycle planning for the training of high-class athletes, the first macrocycle is mainly of a basic nature, it presupposes mainly complex training and performance in competitions that are less responsible,than the main competition of the season; in the second macrocycle, the training process becomes more specific, provides for directed preparation for performance in important competitions of the cycle; in the third macrocycle, aimed at achieving the highest results in the main competitions of the season, the intensity of specific training and competitive loads reaches its maximum values. At the same time, in the same sport, some outstanding athletes build their training in a one-year time interval, including one, two, and three macrocycles, which indicates the need for an individual approach to the structure of sports training.

*Preparation period* is aimed at developing a sports form - a lasting speciala social foundation for further preparation for the main competitions and participation in them, improvement of various aspects of preparedness. In the competitive period, the stabilization of the sports form is carried out through the further improvement of various aspects of readiness, integral training is provided, direct preparation for the main competitions and the competitions themselves are carried out. Transition period

- temporary loss of sports form - aimed at restoring physical and mental potential after high training and competitive loads, at preparing for the next macrocycle.

The duration and content of periods and their constituent stages of preparation within an individual macrocycle are determined by many factors. Some of them are associated with the specifics of the sport - the structure of effective competitive activity, the structurethe preparedness of athletes, the system of competitions that has developed in this sport;others - with a stage of many years of preparation, patterns of formation of various qualities and abilities, etc .; others - with the organization of training (in a centralized sub-

cookingor locally), climatic conditions (hot climate, midlands), material and technical level (simulators, equipment and inventory, remedies, special meals, etc.).

All this variety of factors determines the orientation of the training processand, as a consequence, the structuremacrocycles, periods, stages and smaller formations. Dividing into periods and stages helps to plan the training process, more effectively arrange its content by tasks and by time.

A large number of factors that determine the structure of macrocycles, and the essential role of each of them in achieving the final result, determine the exceptional complexitybuilding the training process in macrocycles. For example, recommendations to ensure long-term unidirectionality of training loads during whole periods or stages of training can find some application in microcycles or individual mesocycles in sports with a limited arsenal of technical and tactical actions, mental tasks, a relatively narrow structure of physical fitness (for example, in speed-strength disciplines), but are not acceptable in single combats, games, complex coordination sports, many sports of a cyclical nature, since the unidirectionality of the loads causes the unidirectionality of readiness, the structure of which is characterized by multifactorial character.

Depending on the kind of sport, the stage of long-term preparation, the timing of the main competitions, the duration of various periods and stages within the macrocycle may vary.beat in a wide range. For example, the duration of the competition period in cyclePhysical endurance sports can be 1.5–2 times shorter than sports games or cycling.

Seasonal sports are characterized by a longer preparatory durationand less - competitive periods.

Significant increase in annualthe number of competitions cycle, which currently span a period of 9-10 months, requires top athletes to compete for virtually the entire year.

A trend characteristic of modern sports is the use of participation in competitions.niyah as one of the most effective methods of training high-class athletes,well adapted to normal training loads, created the appearance ofthat the existing system of periodization of sports training came into conflict with advanced sports practice. A number of specialists began to reject the presence of preparatory, competitive and transitional periods with their inherent specific tasks and content, introduce monthly and step-by-step planning of the training process with preparation for each more or less responsible competition, use a variety of new designations of the structural formations of the training process (stages of accumulation and realization of potential , "Spirals", blocks), etc. Some specialists are even trying to eliminate the existing periodization and suggest considering the training process as a continuous chain of direct training and participation of athletes in various competitions.

A serious analysis of the training system and the results of participation in competitions stronger thanmost of the world's athletes, specializing in various sports, are convincinglytestifies to the scientific groundlessness of the position denying modern periodization, andits negative impact on the theory and methodology of sports training in general.

Analysis of the structure of the training process of successfully performing weightliftersindicates the presence in their preparation of two or threemacrocycles throughout the year with clearly defined preparatory and competitive periods, and the first macrocycle is characterized by a general preparatory orientation, the second and third (in the case of

periodization) - a specialized focus and relatively shortpreparatory period. This pattern is clearly visible in other types.sports in which there is a desire to demonstrate high sports results infor a large part of the year in severalmajor competitions (V.A. Platonov, 1987, 2014).

An analysis of the world championships, which have already been held four times in winter and summer, shows that the winners of the winter championship in the summer manage to repeat their success only 15–20% of the time. Among the winners in winter and summer there are only athletes who have been

“Head and shoulders” stronger than their rivals. 75-85% of winterChampions in the summer performed worse and did not win the top title. An even more depressing picture is observed among the winners and finalists. All this indicates the need for a strict periodization of the annual cycle.

##### Characteristics of the preparatory period

Modern training of athletes, regardless of age and qualifications, in the preparatory period should create physical, mental and technical prerequisitesfor the subsequent more specialized training. The exception iscases when the level of physical fitness requires a more significant development of individual muscle groups or functional systems of the body to eliminate "weak links". This assumes the widespread use of a variety of general preparatory exercises. During the preparatory period, the composition of the means and methods changes: the proportion of competitive and special-preparatory exercises, close to the competitive ones in form, structure and nature of the effect on the body, increases.

The preparatory period is divided into two to four stages. The ratio of their continuatornosti largely depends on the duration of the macrocycle and the qualifications of the athlete. For example, with two-cycle planning ("double" cycle), the first macrocycle is characterized by a longer base stage and a relatively short-term special-preparatory stage; in the second macrocycle, the relationship is opposite. When preparing highly qualified athletes in sports games with one-cycle planning, the duration of the preparatory period is very short and most of it is occupied by the basic stage. At the same time, the tasks of the special preparatory stage are largely solved at the beginning of the competitive period, which can be considered as a combined special preparatory stage and the stage of early starts.

##### General preparatory,or basic stage

The main tasks of the stage are to increase the level of physical fitness of athletes, improve the physical qualities that underlie high sports achievements in a particular sport, study new complex competitive programs. Durationthis stage depends on the number of competitive periods in the annual cycle and is, asusually 6-9 weeks (in some sports there are variations from 5 to 10 weeks). The priority name of the stage is "basic", although in practice there are other names.The stage consists of two, in some cases - of three mesocycles. The first is a long-term

stu in 2-3 microcycles (MC) - retraction, is closely related to the previous transition period and is preparatory to the implementation of high-volume training loads.The second - lasting 3-6 weeksmicrocycle - aimed at solving the main tasks of the stage. In this mesocycle, the increase in the total volumes of training means, unidirectional private volumes of intensive means, which develop the basic qualities and contribute to mastering new competitive programs, continues. Training intensity

the development process is at an average level. When buildingtraining on the principle of one annual macrocycle usually consists of 2 basic mesocycles of 3-4 microcycles each. At the same time, the level of volumetric loads gradually increases over the course of 12-15 weeks. In the future, it stabilizes, and the intensity increases. It is desirable to carry out this increase through the inclusion of new training tools and methods of their implementation. When using a two-cycle structure, the total volume is increased over 8-10 weeks.

At the end of each mesocycle (except for the retractor), it is necessary to use an exercisenii of a competitive orientation and special tests asmeans of monitoring the progress of preparation.

##### Special preparatory stage

Aimed at synthesizing (in relation to the specifics of competitive activity) the qualities and skills of athletes achievedin the previous stages. The duration of this stage is 4 MC, in some cases there are variants up to 6 MC. It consists of one mesocycle and can end with competition or simulation of competitive activity in training conditions.

At this stage, the volume of the training load stabilizes, the volumes aimed at improving physical fitness, and increasesintensity by increasing the technical and tactical means of training.

##### Pre-competition stage

Aimed at preparation and participation in the first competitionsseason or in the first series of competitions, to eliminate certain deficiencies in the sections of training and the development of sports form. Stage duration - 4 MC with variations of 3–6 MC. The stage consists of one mesocycle and is characterized by a decrease in the total volume of training loads and an increase in intensity due to an increase in the speed (power) of the exercises, the magnitude of efforts, the number of complete combinations and programs, and bilateral games.

In some sports, especially in multi-cycle construction, this stage is often not highlighted. Partially his tasks are solved at the previous special preparatory stage or in the subsequent competitive period.

In some sports with single cycleplanning one more stage is highlighted

* competitive, which is associated with participation in competitions, both internal and betweenfolk calendar with starts of various ranks - from match meetings to championships and World and European Cups; in the absence of official championships in a number of sports, a cycle of control competitions and testing is carried out (skiing, biathlon, etc.).

Stage duration - from 2 MC (weightlifting) to 4-5MC (athletics).

An analysis of the construction of training in various sports shows that the stages described above, repeating from two to three times, as a rule, constitute the structure of the preparatory periods of macrocycles included in the annual period of time.

##### Characteristics of the competitive period

The main tasks of the competitive period are to increase the achieved the level of special preparedness and the achievement of high sports results in competition

innovations. These tasks are solved with the help of competitive and related special preparatory exercises.

The organization of the process of special training in the competitive period is carried out in accordance with the calendar of the main competitions, of which qualified athletes in most sports usually have no more than 2-3. In this case, all conspecific features of these competitions,starting from the tasks facing the athlete, and ending with the composition of the prospective participants. All other competitions are both training and commercial in nature; special preparation for them, as a rule, is not carried out. They themselves are important links in the preparation for the main competition.

The methodology of direct preparation for the competition is influenced by the duration of the main competitions, the number of starts in them, due to both the specifics of the sport andand the individual abilities of athletes.

Competition periodmost often divided into two stages: early starts or development of sports form and direct preparation for the main start.

The stage of development of sports form usually includes a series of competitive starts and is used in the annual structure in speed-strength,cyclic sports and sports games with a long competitive period. At this stage, duration 4–6 MC, the tasks of increasing the level of readiness, getting into a state of sports form and improving new technical and tactical skills in the process of using competitive exercises are solved. At the end of this stage, a main qualifying competition is usually held.

The stage of direct preparation for the main start (ENP). Often in sports litasThis stage is equated with a separate final macrocycle. However, this is rimgiven only if its duration is more than 10-12 weeks. Therefore, the ENP should be considered as the final one in the competitive period. It represents a combination of basic, special preparatory, pre-competition and competitive stages. The stage of direct preparation for the main start is usually used only once. ENP to the main start is not an analogue of the pre-competition stage, at which there is a transition from volumetric average intensity of training loads to high-intensity competitive exercises, but has its own clearly expressed structure and specific tasks:

* restoration of working capacity after the main qualifying competitions and the championonats of the country;
* further improvement of physical fitness and technical and tacticalskills;
* creation and maintenance of high mental readiness in athletes due to regulation and self-regulation of states;
* modeling of competitive activity for the purpose of bringing to the start and monitoring the level of readiness;
* ensuring optimal conditions for the maximum use of all aspects of readiness - physical, technical, tactical and mental - in order to transform it into the maximum possible sports result.

In recent years, in various sports of a cyclical nature (primarily playthe structure of the ENP for the main competitions of the season. Depending on the interval between the main qualifying start and the main competition, the duration of the direct preparation stage ranges from 5-8 weeks. It usually consists of two mesocycles. One of them, with a greater total load, is aimed at improving the qualities and abilities that determine a high level of sports achievements, the other is at bringing the athlete to participate in the main competitions.

competitions taking into account the specifics of the sports discipline, the composition of the participants, organizational,climatic and other factors. The ENP has a somewhat longer duration in some sports games, in wrestling, boxing, weightlifting, which is explained by the specifics of their preparation.

So, in sports games, it is important to form a team, determine the starting lineups,teamwork of individual links and the entire team as a whole.

In boxing, wrestling and weightlifting, athletes receive a lot of mic during the selection process.rotrauma, for the treatment of which additional time is required.

The stage of direct preparation for the main start in a number of sports in miniatureresembles an annual cycle with micro-preparatory and micro-competitiveperiods.

If the main competition coincides in time with the end of the short competition period and there is no need to carry out additional work to restore the morningqualities, it is possible to carry out a shorter ENP lasting up to 3-4 weeks (for example, in artistic gymnastics). In this case, the 1st, 2nd and 3rd microcycles are planned as basic and model (shock), and the last microcycle is planned as a lead one. The 2nd and 3rd microcycles account for the largest amount of elements and combinations, the gymnast is required to exceed the competitive requirements.

Experience in conducting ENP in cyclicsports allowed to develop its following structure.

1. Basic mesocycle (3-5 MC): recovery and retraction - 1-2 MC (6-10 days). Purpose: to restore the physical and mental energy expended in the past competitions.

Impact training - 2-4 MC (14-28 days). Purpose: increasing efficiency through the use of high volume, intensity (or combined) training loads.

May be held in midlands for 3 weeks for sports relatedwith the manifestation of endurance, and 14-15 days for speed-strength sports.

1. Pre-competition mesocycle: directleading to the start - 2-3 MC (14-21 days). Purpose: bringing to competitions by reducing individual parameters of training loads, adapting to competition conditions.

The division of the stage of direct preparation for the Olympic Games, the World Championship into two mesocycles, which are often held at home and abroad, as well as the use of mid-altitude mountains before departure, force us to carefully think over the structure of the entire stage, taking into account as much as possible the patterns of climatic-temporal adaptation and re-climatization after training.in the middle mountains.

Thus, during several weeks, the training of athletes is characterized byhigh loads on a rather tense mental background.

During this period, you should plan the highest loads on those days and hours of the week, which are the main starts.

The second, pre-competition mesocycle of the stage of direct preparation to the main start is held both at home and in the conditions of the venue for important competitions. It consists of 2-3 microcycles.

Particular attention should be paid in the first days to the intensity of the training load.and her mental tension. DecreaseThese indicators are necessary in connection with the adaptation of the organism to the climate and time zone and to the new socio-psychological atmosphere abroad.

In practice, another scheme of direct preparation for the competition is often used. The duration of this stage in this case is 6 weeks. He subdivides

lasts for two three-week mesocycles. In the first mesocycle, there is no general preparatorypart, the work is specific,the volume of the load gradually decreases from microcycle to microcycle, and the intensity reaches its maximum values. Particular importance is attached to the comprehensive recovery of the athlete.

In a number of disciplines (cycling, skiing, etc.), shorterkie ENP. The bottom line is that the main qualifying competitions (national championship)are held shortly (usually 2-4 weeks) before the main starts. After that, the athletes who are on the team spend two weeks training, built on the principle of pre-competition mesocycles.

##### Characteristictransition period

The main tasks of the transition period are good rest after thleveling and competitive loads of the past year or a macrocycle, as well as maintaining a certain level of fitness to ensure the athlete's optimal readiness for the beginning of the next macrocycle. Particular attention should be paid to full physical and especially mental recovery. These tasks determine the duration of the transition period, the composition of the tools and methods used, the dynamics of the loads, etc.

The duration of the transition period usually ranges from 2 to 5 weeks and depends from the stage of long-term training at which the athlete is, the system of building training throughout the year, the duration of the competitive period, complexity and responsethe nature of the main competitions, the individual abilities of the athlete.

In practice, there have been various approaches to the content of the transition period. Firstthe approach involves a combination of active and passive rest. The second approach involvesjust a few days of active or passive rest, followed by a training session based on the principle of the retracting mesocycle of the first stage of the preparatory period. This approach is intermediate and is associated with the widespread use of recreational facilities, as well as non-specificphysical loads to ensure the maintenance of the main components of trainingbaths.

Each of these options can be effective. For example, the first, although it leads to a certain extinction of the athlete's functional capabilities, which requires a fairly long recovery in the future, however, allows you to fully restore the capabilities of the mental sphere. This approach is advisable when planning the training process of high-class athletes. The second option is useful for athletes who, for one reason or another (for example, due to injury), did not complete the programs of the previous macrocycle. However, it is advisable to use it, as a rule, in special cases.

Transitional training is characterized by the smallest cumulative volumework and light loads. Compared to, for example, the preparatory periodhouse, the amount of work is reduced by about 3 times: the number of occupationsduring a weekly microcycle does not exceed, as a rule, three to five; classes with heavy loads are not planned, etc. The main content of the transition period is made up of various means of active rest and general preparatory exercises.

At the end of the transition During the period, the load gradually increases, the amount of active rest means decreases, the number of general preparatory exercises increases. This makes it possible to make the transition to the first stage of the preparatory period of the next macrocycle smoother.

With the correct construction of the transitional period, the athlete not only fully recoveredsets strength after the past macrocycle, tunes in to active work in the preparatory period, but also reaches a higher level of preparedness compared towith the same period of the previous year.

The structure of the annual cycle with one, two, three or more macrocycles, the main elements of which are the periods, stages and mesocycles described above, leads to the development of athletes' fitness and an increase in their sports results.

One of the conditions for the development of adaptive rearrangements in the body is an increase in training loads both in terms of the total volume, the volume of individual means, and in terms of individual parameters of intensity. At the same time, a change in means, methods, loads is an incentive for reaching a new level of preparedness, accompanied by an increase in the functional capabilities of both individual systems and the body as a whole. If, in the process of carrying out the corresponding stage, certain indicators characterizing the growth of these capabilities and the necessary technical and tactical skills are not achieved, which is confirmed by the methods of complex control and sports results, then a further increase in the intensity of loads is inappropriate and one should look for a way out of this situation in the change of means or some or training techniques,

The following specifics of the structure of the annual cycle should be noted. In sports that build an annual cycle of three or more macrocycles, individual stages merge into a singleby tasks and used means, which reduces their number.

In sports games, the duration of all stages associated with the preparation of athletes fora long competitive period is significantly reduced.

However, the following circumstances must also be taken into account: the multi-cycle construction of the yearThis period of time is often associated with team planning, and in the main competitions, sometimes different athletes compete. If we consider the training of each leading athlete separately, then, as a rule, he is seriously preparing for 1-3 important competitions of the year, so the stages of his training will be longer, and individual planning differs significantly from the team one. Such cases are found in all types of wrestling, weightlifting, athletics, sports games and other types, when teams at major international competitions act in different compositions.

## Building a workout in meso and microcycles

**Mesocycle -**this is an average training cycle of 2 to 6 weeks, including a relatively complete series of microcycles. The construction of the training process on the basis of mesocycles allows it to be systematized in accordance with the main task of the period or stage of training, to ensure the optimal dynamics of training and competitive loads, a reasonable combination of various means and methods of training, the correspondence between the factors of pedagogical influence and restorative measures, to achieve continuity in the upbringing of various qualities and abilities.

External signs of the mesocycle are:

* repeated reproduction of a number of microcycles (usually homogeneous) in a single sequence, or alternation of different microcycles in a certain sequentialsti.

At the same time, in the preparatory period, they are more often repeated, and in the competitive period they are more oftenalternate;

* often the change of one direction of microcycles by others characterizes the change of mesocycle;
* the mesocycle ends with a recovery (unloading) microcycle, competitivelytests or control tests.

The following factors influence the structure of mesocycles:

* working regime andlife;
* content, quantity lessons, total load and individual start calendar;
* individual characteristics of an athlete, his ability to recover;
* the place of the mesocycle in the structure of the large training cycle;
* cumulative training effect managementcarried out a series of microcycles, providing high rates of fitness development, and ensuring adaptive restructuring in the body;
* circa monthly biorhythms (lunar, physical, intellectual, emotional,menstrual).

An increase or decrease in training or competitive loads in microcycles included in the structure of the mesocycle in accordance with the content of training provides adaptationorganism and the level of preparedness rises, in connection with which there are medium waves - the structural foundations of the mesocycle, which helps the athlete and the coach to solve the main and intermediate tasks of the training system.

Training analysisprocess in various sports allows you to identify a certain number of typical mesocycles: retraction, basic, control and preparatory, pre-competition, competitive, recovery.

Retracting mesocycles. Their main task is to gradually guide athletes to the effective implementation of specific training work. This is ensured by the use of exercises aimed at improving or restoring performance.athletes.

Basic mesocycles. They plan the mainwork to improve the functional capabilities of the main systems of the body, improve physical, technical, tactical and mental fitness. Basic mesocycles form the basis of the preparatory period, and they are included in the competitive one in order to restore physical qualities and raise the level of special preparedness of athletes.

Control and preparatory mesocycles. A characteristic feature of the trainingprocess in these mesocycles is the widespread use of competitive and special-preparatory exercises, as close as possible to the competitive ones. These mesocycles are characterized, as a rule, by a high intensity of training loads, corresponding to competition or close to it. They are used in the second half of the preparatory period and at the beginning of the competition period.

The pre-competition (feed) mesocycles are designed for the finalformation of sports form, improvement of technical skills. Purposeful mental and tactical training occupies a special place in these mesocycles. An important place is given to modeling the mode of the upcoming competitions. These mesocycles are typical for the stage of direct preparation for the main start and are important when an athlete moves to new climatic and geographical conditions.

Competitive mesocycles. Their structure is determined by the specifics of the sport, the features of the sports calendar, the qualifications and level of preparedness of the athlete. Typically, this type of mesocycles consists of one lead and one competitor.microcycles. In these microcyclesthe volume of competitive exercises has been increased.

Restorative mesocycles form the basis of the transition period and are organizedspecially after a tense series of competitions. The volume of the competition and speciallypreparatory exercise is greatly reduced.

Depending on the tasks solved in the mesocycles, they may include microcycles and means, the orientation of which contributes to an increase in the level of individual sides of preparedness, the implementation of comprehensive training, recovery and the creation of conditions for the course of adaptation processes after large total loads, which can vary widely. So, in the basic MZTs the total volume can reach 80-100% of the maximum planned for the year for microcycles, in the control-preparatory and retraction ones - fluctuate within 60-90% of the maximum, and in the rest - be at the level of 40-80%.

The intensity of the load will be the highest in the control and preparatoryjealous and competitive mesocycles. It should be noted that modern frictiontraining of qualified athletes in the most intense mesocycles is characterized by the summation of the loads of individual microcycles and progressive fatigue from onemicrocycle to another. It promotes ultimate mobilizationthe capabilities of the functional systems of the body, makes high demands on the mental sphere of the athlete. However, the required effect will be achieved only if, after several microcycles, each of which aggravates the fatigue caused by the previous one, a relatively unloading microcycle follows, allowing to restore functionality and ensure the effective course of adaptation processes. Ignoring this position inevitably leads to physical and nervous overwork.

Mode of operation in which the load of onemicrocycle is layered on the pronounced aftereffect of the previous one, it is acceptable only when training highly qualified and well-trained athletes.

**Microcycle.** The first structural unit is a microcycle - this is a small cycle of threenirovka, most often with a weekly or about a weekly duration, including fromtwo to several sessions. The construction of the training process on the basis of microcycles allows, in accordance with the tasks to be solved, to ensure the optimal dynamics of training or competitive loads, an appropriate combination of various means and methods of training, the correspondence between the factors of pedagogical influence and rehabilitation measures, and to achieve continuity in the upbringing of various qualities and abilities of an athlete.

In practice, the most common 7-day microcycles, which, coinciding in propositions with a calendar week, are in good agreement with the general mode of life of a personcentury. Microcycles of a different duration are usually planned during the competition period,what is connected with the need to form a specific rhythm of working capacity in accordance with the specific regulations of the upcoming competitions.

External signs of a microcycle are:

* the presence of two phases in its structure - stimulation (cumulative) and restorative (unloading and rest). At the same time, equal combinations (in time) of these phases are found only in the training of novice athletes. In the preparatory period, the stimulation phase significantly exceeds the recovery phase; and in the competitive environment, their ratios become more variable;
* often the end of the microcycle is associated with a recovery phase, although it occursand in the middle of it;
* regular repetition in the optimal sequence of exercises in different directionslaziness, different volume and different intensity.

The following factors influence the structure of microcycles:

* the mode of work, study, rest and the dynamics of working capacity caused by them duringcalendar week;
* content, number of lessons (from 3 to 20 in a weekly cycle),total load, individual start calendar; sports specialization;
* individual characteristics of an athlete and the level of his preparedness, the ability to complete and incomplete recovery after training competitive loadsa certain focus;
* the place of the microcycle in the structure of the training mesocycle, since the structure of the microcycle ischanges numerically in certain details in the course of the development of readiness from the stages and periods of the macrocycle; the regulations of the competition have a significant impact on the structure of the microcycle;
* possible coordination of the phases of biorhythms (lunar, physical, intellectual, emonational, menstrual).

The structure of microcycles is constantly changing due to an increase or decreasetraining or competitive loads, by alternating exercise complexes, in accordance with the content of training, to ensure adaptation of the body and increase the level of preparedness, in connection with which small waves appear - the structural foundations of the microcycle.

Microcycle types

In the practice of sports training, it occurs from four tonine different types of microcycles.

The retraction microcycles are characterized by a low total load and directionleans to bring the athlete's body to intense training work.

Basic microcycles (general preparatory) are characterized by a large totalvolume of loads and constitute the main content of the preparatory period.

Control-preparatory microcycles are divided into special-preparatory and model, are used at the final stages of the preparatory and competitiveperiods.

Lead-in microcycles. The content of these microcycles can be varied. It dependsfrom the system of bringing the athlete to the competition, the peculiarities of his preparation for the main starts at the final stage.

Recovery microcycles usually complete a series of intense baseline, controll-preparatory microcycles, as well as they are planned after a tense competitionactivity.

Competition microcycles have a basic mode corresponding to the program competitions. The structure and duration of these microcycles are determined by the specifics of competitions in various sports, the number of starts, throws, jumps and pauses betweenthem.

In the practice of sports, microcycles are widely used,dubbed drums. They are used in cases where the preparation time for a certain competition is limited, and the athlete needs to quickly achieve certain adaptive rearrangements. In this case, the impact element can be the volume of the load, its intensity, the concentration of exercises of increased technical complexity and mental tension, training in extreme environmental conditions. Percussion can be basic, control-preparatory and competitive microcycles, depending on the stage of the annual cycle and its tasks.

The alternation of loads and rest in a microcycle can lead to three types of reactions: a) the maximum increase in fitness; b) preserving or maintaining it; c) overwork of the athlete. The first type of reaction is typical for all cases when the microcycle includesthe optimal number of classes with large and significant loads, which are rationalalternate both with each other and with activities with lower loads. If a microcycle includes an insignificant number of exercises with loads that can serve as a stimulus for an increase in fitness, a reaction of the second type occurs. And, finally, the abuse of heavy loads or their irrational alternation can lead to fatigue of the athlete, that is, to cause a reaction of the third type.

## The stage of direct pre-competition preparation for the main competitions of the year

The stage of direct preparation (EMP) can be considered as an independentmacrocycle, especially in the year of the Olympic Games.

Considering that the end of the season and the winter calendarremain traditional in terms of timing, the period from March to the start of the Games can be considered the final stage in the preparation of athletes for them. This stage represents the second half-year macrocycle for most specializations. In the process of its implementation, it is necessary to ensure a normal training process aimed at increasing the level of the athlete's readiness. It is necessary to take part in the optimal number of competitions that provide athletes in a state of sports form, and then, during the qualifying starts, win a place in the Olympic team and bring the athlete to the beginning of the Games in an optimal state to achieve their best results.

Preparation for the Olympic start consists of six stages:

* + the first stage - special preparatory - 7-9 weeks;
	+ the second stage - pre-competition - 3-5 weeks;
	+ third stage - early competitions (includingcommercial) - 3-5 weeks;
	+ the fourth stage - qualifying competitions - 1-2 weeks;
	+ the fifth stage - direct preparation for the Olympic start - 4-6 weeks;
	+ the sixth stage - participation in Olympic competitions.

The fifth stage is the stage of direct preparation. Can be recommended in this conIn a particular case, the following structure of the ENP:

* *first phase.*Recovery from qualifying events and retraction,duration 4-6 days. From the second part of this phase, preparation should be carried out at a centralized collection. By the end of this phase and the beginning of the next, the total load reaches the maximum values ​​for this stage;
* *second phase.* Includes intense (tense) training before flying to the Olympic Games. As a rule, it is made up of intensive model or specially prepared microcycles lasting 5-7 days. It is possible to turn on a 3-4-day microcycle after the retraction phase - the basic orientation, characterized by a high volume of load and medium intensity. Participation in one start is possible in this phase. The last two days before departure are devoted to organizational activities and training with moderate stress;
* *third phase.* The flight and the "acute" adaptation period are characterized by reduced loads for 4–6 days;
* *fourth phase -*is leading: within 5-6 days passes directlynaya liner to the first start.

Thus, during the ENP training of athletes is characterized by variable loads on a rather tense mental background, which requires individual training.course to each member of the Olympic team.

During this period, high loads should be planned on those days of the week on which the Olympic starts fall, and upon arrival at the place - at the same hours. The final part of the ENP for the Olympic Games is carried out taking into account the competitive regulations in the form of 1-2 microcycles lasting from 5 to 6 days each.

Based on the results of experimental studies shown above, several fundamentally different strategies for preparing athletes for the Olympicand other starts in which the main emphasis is on narrowly targeted use

certain moments in the development of temporal and climaticadaptation or their complex application in the preparation process at the final stage (ENPP).

1. Acute adaptation strategy.

This variant of preparation for the competition provides for arriving at the competition site right before the start, so that participation in the competition falls on the first 2 days, when the negative consequences of "acute withdrawal" (N. I. Volkov) of the daily regimen and exposurethe effects of specific climatic and geographical factors have not yet reached that criticalthe level beyond which it becomes impossible to compensate them by mobilizing reservethe capabilities of the body. The activation of immune functions during this period allows you to maintain a sufficiently high tone of vital activity and maintain a normal level of performance.

For this option of preparation, it is extremely important to choose the right tactics for the behavior of athletes during the flight to other (Australian, Asian, American, etc.) continents with a quick inclusion in a new mode of activity (optimization of the daily routine) immediately after arrival, as well as the use of special measures to normalize sleep on the eve of important starts.

The strategy of such an acute adaptation with the greatest effect can be realized only in speed-power types and individual sports disciplines, characterized by the transience of tournament wrestling.

1. Long-term adaptation strategy.

In contrast to the above option of training athletes with high qualifications, the strategy of long-term adaptation involves early arrival at the places of preparation and competitive activity (for example, in Sydney or other cities of Australia, in Salt Lake City, in Beijing, etc.) with the required amount of training work before the main starts and the implementation of special events, accelerating the development of adaptation to new conditions of stay.

To complete a long-term adaptation to new conditions of motor activity will require at least 1–1.5 weeks of preparation (it is advisable when changing a fairly large number of time zones - up to 6 and more).

This option of training with the greatest effect can be implemented in sports.with a predominant manifestation of endurance in sports all-around(athletics, all types of rowing, triathlon, cycling, etc.).

1. Separate adaptation strategy.

In this variant of preparation for important starts, advance is used.moving to the continent of the competition (N. I. Volkov, A. I. Kolesov) for trainingin the same time zone, but in more favorable climatic conditions (for example, as was the case in the cities of Adelaide, Melbourne, Brisbane and others during the Games of the XXVIII Olympiad in 2000 in Sydney. Arrival directly to Sydney in this case was planned for 2-3 days before the upcoming starts).

This training option requires strict coordination of plans and training programs at the first stage of adaptation (during the period of acute temporary acclimatization) with subsequent activities and the timing of their implementation in the period of immediate preparation for the starts, so thatavoid a decrease in performance "during the development of adaptation to local conditions." But it should be noted that in addition to this, this preparation option is also associated with large matereal and financial costs.

1. Re-adaptation strategy.

The option of re-adaptation of athletes to new conditions of training and competitionactivity involves repeated trips for training and participation in competitions

novations in the area, similar in their geographic and climatic characteristics to the expected conditions.

Full coincidence of time zones with this training option is not required. The necessary development of adaptation to new conditions of stay with this option is achieved if the duration of stay in specific conditions at each next trip to training camps or to participate, for example, in pre-Olympic test competitions will be at least 1.5-2 weeks ...

Experimental studies have shown that a pronounced effect of repeatedadaptation is achieved when the number of such trips is at least 2-3 times. The intervals between these trips should be of the order of 3-4 (5) weeks, so that with each return to the usual climatic and geographical conditions, re-acclimatization could be successfully carried out. In this case, an active training effect of adaptation is formed (N. I. Volkov, E. A. Razumovsky, F. P. Suslov et al.).

It was found that athletes with experience of re-acclimatization to new conditionsstay, are characterized by a more stable state of most physiological functions and experience less fluctuationsperformance upon arrival on a new continent than athletes who used different training strategies at the ENPP.

1. Integrated adaptation strategy.

This type of adaptation of athletes is based on the fact that in preparation for Olympic and other important starts, the principle of transferring positive adaptive changes in the body, achieved in response to previous stressful influences of a different nature, and not only to extreme changes in environmental parameters, can be used. trend and other factors.

For this purpose, preliminary mountain training can be used with success.terrain (conditions of medium mountains),training using heat and pressure chambers, special hypoxicators, as well as specialized training using physiotherapeutic, dietary and pharmacological agents (N.I. Volkov et al.). This option of training at the ENPP is the most complex organizationally. Its implementation becomes possible only with the availability of technical means and pharmacological preparations (adaptogens), as well as a certain experience in carrying out special events under close medical supervision.

##### Questions and tasks for self-examination

1. How many stages of long-term training should a beginner go through before completing the normtiva MSMK?
2. List the main methodological provisions of the long-term training process.
3. What are the dynamics optionstraining loads should be used to achieve the highest results in critical starts?
4. In what cases is the construction of an annual cycle: one-cycle, two-cyclehow, three-cycle planning?
5. What is the structure of the preparatory and competitive training periods?
6. What options for pre-competition training do athletes use when teachingin the main competitions of the season?
7. What is the number of typical micro and mesocycles used by trainers when building yearsports training cycle?

# Chapter VII. Management of training of highly qualified athletes

XX century experienced a powerful influence of ideas of management (management) on all aspects of lifesociety. It was during this period that the management was formedas a function and process, art and science. The principles, forms and methods of management have spread to the spheres of business organizations, science, education, health care, sports, etc.

The basis for the management of elite sports and preparation for the Olympic Games, which allows taking into account many factors that affect the success of national teams, isstrategic planning, including concepts and a master training plan, which are drawn up by senior managers of the Olympic training management (OlimPisk Committee of Russia, Ministry of Sports of the Russian Federation).

Development of programs, plans and methods for the implementation of the Olympic strategy, definingmaking the necessary changes related to the peculiarity of sports is the task of the goalcomplex programs (ICP), in which the implementation of strategic problems is solvedat the next level of management through the practical aspects of preparation and participation in the next games. The development and implementation of the Center for Collective Use of Russian national teams is carried out by sportsfederations for sports. ICUs usually include the following sections:

1. The initial state and level of development of the sport in Russia.
2. Goals and objectives of preparing national teams for the upcoming Olympic Games.
3. Forecast of the results (achievements) of the participants in the Olympic Games.
4. The main provisions of the training system in the Olympic cycle.
5. The system for the selection of athletes and the formation of national teams.
6. Model characteristics of competitive activity and the level of physical fitness of candidates for the national teams of the country, focusing on achieving the forecastthe results to be measured.
7. System of scientific, methodological and medical support.
8. Training conditions and bases used.
9. Professional development of trainers and specialists.
10. CCU control system.

On the basis of the CCU, coaches develop individual plans for the preparation of candidates for national teams. The CKP reveals in detail the quantitative parameters of competitive practice and the parameters of training activity by years of the Olympic cycle.In conclusion, each CCU contains the main tasks of the work of the head coaching council, material, technical and financial support for the preparation of the national team

country.

The development and successful implementation of a modern strategy for the development of high-performance sports should be based on such organizational structures as the values ​​of sports, personnel and management style, which correspond to new tasks and methods of solving them, expressed in the advanced development of the system of sports training in the country.

## Predicting the preparation of athletes

The planning and management of the training of qualified athletes follows theviewed as a multifactorial process, consisting of four main stages:goal, making a forecast, making a program, its implementation. Loss of one oflinks in this chain makes the process uncontrollable.

Purposefulness is one of the common features of management in all spheres of human activity.

The goal is perceived as the athlete's achievement of the highest possible sports result. More reasonably and specifically, the goal should be defined in the forecast of both the main training parameters and the athletic results that an athlete can achieve under certain conditions for the planned period of time.

When setting long-term and immediate goals, the coach and his student (team) mustadhere to the following basic provisions:

* the goal should be specific and quantified;
* it should be understood why this particular goal was chosen;
* the goal should be difficult to reach, but attainable;
* the time and effort required to achieve the goal should be calculated;
* it is necessary to believe in the achievement of the set goal and to formalize this goal in writing;
* outline intermediate (control) sub-goals and dates for their implementation.

To achieve this goal, it is necessary to foresee, predict the future,expressed by a number of indicators. This is done in the processthe next operation is forecasting.

The forecast of sports achievements allows you to scientifically plan the training of individualathletes and the team as a whole to the largest competitions of the season. The more detailed the forecast (the more information it contains), the more accurately you can draw up a plan and detail it. Based on the forecast and the set goal, a long-term training plan is created, in which the basic training concept must be incorporated, the most significant parameters of the training and competitive process parameters and the ways to achieve them are indicated.

It can be seen from the foregoing that the issue of choosing quantitative assessments of the athlete's condition is closely related to the methodology for predicting results at certain largest betweennational competitions (Olympic Games, World Championships, etc.).

The most important areas of forecasting in sports that should be taken into accounttrainer and athlete are:

* forecasting the development of elite sports, related groups of sports, individual types and disciplines of the Olympic program in connection with scientific and technological progress, the growing popularity of sports, its commercialization and professionalization, changes in the rules;
* predicting personal sports achievements, which are based on the level of previouscurrent results; this should take into account the recordachievements of various levels (world, regional and republican, etc.) in certain sports and the achievements of individual athletes and teams that are the main rivals;
* to predict team results it is important forecasting the balance of forces in individual sports (for world championships, continents, countries, etc.) and for a complex of types (Olympic Games, Universiade, Spartakiad, etc.).

Predicting future record results has been inherent in sport almost since its inception. In sports with quantifiable results

mathematical methods of forecasting are widespread, when, on the basis of knowledge of the dynamics of record results for a certain period of time in the past, using specially developed mathematical equations, a record result in a given sport is extrapolated to a certain moment in the future. However, even the most accurate mathematical formulas do not guarantee that the forecast will necessarily coincide with reality. For example, the 100m run by W. Bolt in 9.58 s in 2009 at the World Championships in Berlin was far ahead of all existing forecasts.

In sports with a qualitative definition of a sports result, in the presence of subjective refereeing, the forecast of sports achievements is carried out mainly by an expert. This also applies to sports games. For example, in artistic gymnastics, before all major competitions, the main rivals draw up lists of prospective finals.sheets in each type of all-around and the sequenceplaces in the final they will take. Without this, it is impossible to effectively select athletes for a team, the order of their entry to the apparatus and a number of other important aspects of training.

In team sports, predicting the places that willthe leading teams of the world at the world championships, Europe, etc., to one degree or another, all sports fans are involved.

A forecast of the balance of power of the main rivals in the world sports arena is necessary when preparingnational teams of the country for the largest international complex competitions, such as the Olympic Games, etc., taking into account the inevitable unofficial scoring. However, it should not be considered that this is the only reason for making such predictions. Any forecast, to one degree or another, allows a more objective assessment of one's strength, capabilities, and a more rational use of economic and human resources.

The most common quantitative assessment of model characteristicsusing forecasting. In this case, various kinds of mathematical extrapolations are used.

Prediction of the model characteristics of the strongest athletes is understood asthe formation of a probabilistic judgment about the level of competitive activity, consistingthe main aspects of special readiness and leading systems of the athlete's body, able to achieve the planned results necessary to win a certainfuture competitions.

The tasks of predicting model characteristics are:

* setting the goal of preparing an athlete (team) for major competitions(Olympic Games, World Championships, etc.) in the future;
* determination of the best ways and means to achieve the goal;
* determination of the required resources.

The object of predicting model characteristics is the state of an athlete (the level of competitive activity and readiness), which ensures the achievement of the planned result.

The forecast of model characteristics is based on the forecast of sports achievements.

With any of the above methods for the development of specific quantitativevalues ​​of model characteristics in practice are used: permissible ranges of values; averaged values; minimum required; maximum sufficient; maximum values. The most rational is to determine the acceptable quantitative ranges covering the possible variations in the indicators of the state of the prospective future champions.

Prediction of model characteristics (competitive activity, special readiness, functional capabilities of the body) of athletes at various

stages of annual and long-term training is aimed at forming a probabilistic judgment about the ability to achieve the planned results required for certainthe biggest competitions in the future.

The accumulation of the necessary statistical material is carried out in two ways:with the help of long-term observations of individual top-class athletes in the period of one hundredimprovement of their sportsmanship and through a series of observations of homogeneousgroups of athletes of various qualifications.

When using the first method - studying the experience of training leading athletesand their sports biographies - the main patterns are most fully revealedpreparation.

The second method can be used to develop model characteristics for sportsmen of various qualifications and ages. Model characteristics created with

"Method of slicing" are more adequate, modern, because for adult qualified athletes, they are created at the same time and by the same modern methods and means. At the same time, this method has serious disadvantages. With its help, athletes of various qualifications are simultaneously examined; and in order to develop quantitative estimates for these skill levels, it is necessary to assume that the athletes who were the best in the early stages of training remain so in the subsequent stages. But this situation is quite rare. Success is achieved by athletes who were both winners and "middle peasants" and even outsiders in youth competitions.

In addition to mathematical methods and an expert survey, forecasting usesa number of even simpler methods available to the trainer: historical analogy and intuitiveforesight.

When applying graphic methods of forecasting are used "extrapolation", which consists in the dissemination of conclusions (results and other indicators) obtained from observations of one previous part of the phenomenon (previous sports practice) to another part of it (future sports activity).

## Modeling as a process of managing the training of an athlete

In the course of sports training, an integral model of an athlete is needed. Resultmodeling is a "model of the athlete's state", which can be represented by a complex of certain quantities, interrelationships and dependencies between them, etc. If a real phenomenon is a training session conducted by a coach and athletes, then its model

* it is a synopsis, plan, program. Modeling a training cycle, stage, etc. is a search for some options for constructing these structures that are optimal for a given criterion. In this case, the entire modeling process will be reduced to comparing the values ​​of the load components and the criteria for its effectiveness.

Currently, two groups of model constructions in the theory and methodology of sports can be distinguished. The first includes models of competitive activity, special readiness and morphofunctional state of the body, with emphasis on individual Vedusfunctional systems, subsystems and elements in this discipline.

In the second - models of structural formations of the training process, different in duration and content - macrocycles, periods, mesocycles and microcycles, individualoccupations and their parts.

The models of the first group arose primarily for the formation of the goal of the trainingprocess, since in sports training it reflects not just a sports record, but a complex of interrelated factors characterizing the state of an athlete at the moment of achieving this record result (both personal and higher).

The structure of this model is determined in the most general form, taking into account the following afterconsistently subordinate relations in three main levels - "competitive figurenosti "(I level)," special preparedness "(II level) and" functionalof the body ”(level III).

This nature of the relationship of the main components of the "models of the strongest athletes ”is quite obvious. Indeed, the analysis of a sportsman's competitive activity can state certain shortcomings in the sportsman's actions at competitions, while the reasons for these shortcomings can only be revealed when analyzing the components of the second level of the model - special physical, technical and tactical readiness. On the other hand, the reasons for the deficiencies in these types of readiness can be finally established only after an in-depth analysis of the morphological, functional and mental characteristics of an athlete, taking into account his age and sports experience (third level).

One of the important problems of modeling in sports is the development of quantitativeestimates of model characteristics.

The question of choosing quantitative estimates of model characteristics is closely related to the methodwhat their forecastingand measurement of indicators in competitive and training activities and during testing of athletes.

Modeling predetermines the need to predict the dynamics of the athlete's state during a certain training time. Due to the well-known ambiguity (often multidirectional) of the deployment in time of various characteristics of the state under the influence of training loads, this is a very complex and, until now, difficult to accomplish in practice task. Its solution in real conditions of planning the sports training of a specific athlete for a specific period of time requires significant simplifications. The theoretical basis for such models is the regularities of building sports training in cycles of different duration.

For modernthe theory and methodology of sport is characterized by a transition from empirical approaches to program-targeted planning of the training process using models that reflect the structure of competitive activity and physical fitness of athletes.

Modeling of the training system predetermines the need to foresee the dynamics of the athlete's state within a certain time. Due to the well-known heterochronism of the development in time of various characteristics of the state under the influence of physicalLoads Solving Simulation Problemsthe training process in the practice of planning sports training requires significant simplifications and taking into account the specifics of the sport.

The ultimate goal of modeling complex systems is the creation of mathematical models that allow: a) to calculate the normal programs of the system, necessary for day-to-day management; b) determine forecasts for the further development of the system, which are necessary for long-term planning. As a result, it becomes possible to probabilistically calculate the purposeful control of the system (in particular, the athlete), which is designed on the basis of the present and proper state of the system, the timing and available volume of impact on it.

Creation models usually go through several stages: 1) identifying the elements of the system, their interrelationships, building a block diagram, determining the units of measurement; 2) determining the quantitative characteristics of the components of the model, the choice of methods of mathematical data processing, the selection of essential variables; 3) calculation of the behavior of the entire system as a whole.

The management of the training process based on the assessment of model characteristics is carried out taking into account the greatest possible number of levels of the "athlete's model" during complex control. It should be noted,that without taking into account the characteristics of competitive activity, the data of a sportsman's special physical readiness cannot serve as the final basis for recommendations on the correction of the training process. On the basis of this, it became possible to construct block diagrams of "models of the strongest athletes" (BN Shustin, 1995).

This diagram can be detailed in relation to the main groups of sports.So, in cyclic types of athletics, the main components of the competitiveactivities are: start, distance speed level, finish, etc. Integral qualities characterizing special physical fitness and determining the effectiveness of an athlete's actions, for example, in relation to the level of distance speed, are special endurance and speed-strength abilities. The main functional characteristics that determine the level of development of integral quality - special endurance - are indicators of power and capacity of power supply systems, efficiency of operation, stability and mobility in the activity of the main functional systems, etc. maximum oxygen consumption - an integral characteristic of aerobic performance,

Determination of quantitative estimates of model characteristics requires the involvement ofvarious methods of mathematical statistics. Surveys for the accumulation of the necessary statistical material can be carried out in two main ways: with the help of long-term (longitudinal) observations of individual extra-class athletes during the formation of their sportsmanship and with the help of a series of simultaneous observations (slices) of groups of athletes of different qualifications.

When using the first method, the main laws are most fully revealed.training. Such observations sometimes make it possible to reveal more than experiment gives.mental research.

The second way to obtain quantitative estimates of model characteristics is cross-sectional examination, i.e., simultaneous examination of athletes of different qualifications and age. If long-term research monitors the athlete from the start of sports toachieving maximum results, then the cross-sectional survey covers the athletes over a short period. This method has a number of advantages over the longitudinal one. With its help, you can develop model characteristics much faster. This method allows you to update them much faster. Model characteristicssticks created using the slicing method are more adequate, since for qualifor athletes, they are created using modern methods and means.

Considermethods for constructing quantitative estimates of model characteristics. Among them, four main groups can be distinguished: mathematical extrapolations, expert assessments, norms, modeling on research stands. Methods of mathematical extrapolation and expert assessments are widely covered in special literature and textbooks. One of the promising methods for the development of quantitative estimates of model characteristics is the construction of norms, that is, the boundary values ​​of the result, which serve as the basis for attributing an athlete to a particular qualification group. Of greatest interest are the proper norms that characterize the level of a complex of indicators of an athlete, necessary to complete the task. The construction of proper norms can be based on both long-term observations of individual elite athletes, and simultaneous observation of promising athletes of various qualifications. In sports with objectively measurable results, such as athletics, on this basis, it is possible to determine how much strength or speed should be shown, or what energy is expended.

tit to show the planned result.

Among the main methods for developing quantitative estimates of model characteristics can also be considered their modeling on specialized research stands. In the course of sports exercises fulfillment on the indicated stands in the modes corresponding to the record ones, it becomes possible to assess the majority of the aspects of competitive activity and special readiness.

## Programming and planningcomponents of sports training

In the management system for the improvement of athletes, the final fragment,identifying a direct connection from a coach to an athlete is programming.

The subject of programming the process of training athletes is the solution of various planning procedures based on the development of structure, typing, modelingusing standard algorithms andinformation data banks on the construction of training in training cycles of different duration.

Under planning as the most common the form should be understood as the compilation of specific training documentation based on the patterns of construction, which is a concept of a higher level, since it provides a description of the structure of training in macro-, meso and microcycles, identifying certain relationships between these structures and various components of loads, the composition of training means and individual start calendar.

In modern conditions, when the majority of coaches do not yet have access to a solution to programming problems due to the insufficient amount of data that generalizes the system of training highly qualified athletes, available in information banks, the main and most common procedure for managing an athlete's improvement is planning the training process, which is associated with the anticipation of the expected result and its development at a certain interval time.

In this case, the choice of time intervals, in the calculation for which specific planning is carried out, is of fundamental importance (L.P. Matveev, 1988).

The planning process of sports training also has its own contradictions: the longer the planned time interval, the longer the plan is developed, the more difficult it isit is possible to foresee what the concrete features of this process will be in reality.

To overcome this contradiction, training plans are usually developed, as a ruleforcibly, in three time intervals: long-term perspective (4-12 years), annual and shorter-term (current and operational).

The main parameters that determine the planning process and structuredifferent cycles of training highly qualified athletes, in general terms are:

* determination of target indicators, both final and intermediate (current), according towho will be judged on the implementation of the assigned tasks;
* determination of the general order of building a competitive and the training process in various stages and training cycles;
* alternation of training and competitionloads and their indicators, as well as a system for restoring working capacity and other support measures aimed at achieving main and intermediate goals.

An athlete's or team's training plan, drawn up by a coach, is often probabilistic and usually at odds with actual practice. The degree of their conformity dependssits on many factors: the condition of athletes, the skill of the coach, environmental conditions, material and technical, scientific and methodological, medical and biological support, etc. Therefore, planning training, especially in macrocycles, must meet a number of requirements

forging:

* the presence of objective grounds for determining the real value of the increase in disputestive result and level of special performance of the athlete;
* the presence of an objective instrumental method for assessing a sports result orthe level of the athlete's special performance;
* the presence of certain theoretical knowledge and practical experience necessary for the correct choice of an individual start system, training focus,volume and intensity of the load.

Scientific and methodological prerequisites for planning (programming) prepareTraining in each sport must be the following knowledge:

a) for long-term and annual macrocycles - about the individual characteristics of the development of the sports form of an individual athlete, and in team sports - the team as a whole; about the specific features of long-term adaptation of the body to this type of muscle activity;

b) for a separate stage (mesocycle) - fundamental tendencies in the dynamics of the statean athlete in connection with the assigned training load, including depending on its content, volume, intensity and alternation;

c) for a microcycle - expedient forms of combining short-range training effects of loads of various sizes and predominant orientation: timing and completeness ofthe formation of a special working capacity of the body, depending on the volume, intensivethe direction and direction of the assigned loads.

It is necessary to distinguish between team plans, developed, as a rule, for national teams and expressed in the form of complex target programs, which are more prescriptive, and individual plans, which are methodological in nature and take into account the individual characteristics of the athlete (age, experience, the achieved level of skill, patterns the development of his sports form, the main shortcomings, target and normative attitudes to a specific macrocycle and other factors).

Long-term planning begins with determining the time limit for athletes to conduct training, components that require significant financial costs and clarifying the preliminary organization of work: the calendar of sports competitions, trainingleveling fees, as well as issues of material and technical support. Only after specifying these components of the plan is the planning of sports training carried out.

When drawing up the competition calendar as a goal-formingfactor in planning all aspects of training, it is necessary to take into account the principle of subordination: international (official and commercial), republican, regional, regional, city championships and other competitions of various organizations, including sports clubs, physical education groups, etc.

Calendar of the largest international complex competitions, such as: OlimThe PII Games, Universiades, Regional Games, as well as calendars for specific sports, including world and European championships and cups and traditional international competitions, are drawn up, formed and approved by international sports federations, as a rule, for 4 years.

The planning system for the long-term training of athletes involves the establishment ofgoals, objectives and determination of the main indicators sequentially for each year: sports results, control standards, parameters of the main training and competitiveactive loads and supporting, including restorative, measures. Scientificallyinformed plans must take into account the patterns of good sporting practice andindividual characteristics of the trainees, the conditions for organizing and conducting the educational and training process, centralized and decentralized training, the presence of a specialized sports base, material and technical support, climatic conditionsviya, as well as a complex of restorative, cultural and educational activities.

The planning of an individual educational and training process should contain the main provisions reflecting the development of the multi-year training system.

The most common of them are manifested both in the growth of the main indicators of the plan, and in chaptersin the same way, and in the dynamics of their ratios, the growth rates of sportsmanship of those who go in for training, and, to a lesser extent, in the methods and organization of training. As sportsmanship grows, the proportion of individual forms of training and greater independence for qualified athletes increases.

Long-term long-term preparation plans are drawn up individually for onean athlete (who has reached the I category and higher results).

The main content of the long-term plan for the training of an athlete, a team includes the following sections (most of which are broken down by individual years of training):

* brief description (athlete, team) and their time limit;
* the goal of many years of preparation, the main tasks by year;
* the structure of the multi-year cycle and the timing of its macrocycles;
* the main focus of the training process by the years of the cycle;
* main competitions and main starts of the individual calendar plannedresults in each year;
* control sports and technical indicators (standards) by years;
* the total number of training days, classes, days of competition and rest by years undercooking;
* general and specific parameters of the training load;
* system and terms of complex control, including medical examination;
* training camp schedule andplaces of employment.

The group plan should contain data that outline the perspective and main direction of the preparation of the entire group. It should reflect the trend towards an increase in demand.requirements for various aspects of an athlete's training, and specific indicators of the plan for years - correspond to the level of development of athletes in this group.

An individual long-term plan contains specific indicators that the coach outlines together with the athlete based on the analysis of previous training experience(the athlete's actual performance of the sections of the groupplan), taking into account its individual characteristics.

Definition goals and objectives in individual long-term plans should be based on a comprehensive consideration of the athletes' capabilities and conditions for their full manifestation.

An important aspect of planning training in the annual training cycle is the tendency to simplify the programming process, using the block principle of selecting training means and their formalization. Separatenye physical exercises or a number of them, combined on the basis of solving a certain pedagogical problem. In this case, the training task (TK) cards are filled in with a cipher. Additionally, a diagram of the operational plan is drawn, then, based on the main task of the training, technical specifications are selected. In the lower column of the plan, the total value of the load is presented. This allows you to accurately dose loads (their volume and intensity) and keep accurate records.

The training process programming is based on:

* specificity of motor-technical activity;
* features of calendar competitions;
* the strategy and regularities of the process of adaptation of the body to training loads;

cam;

* their individual characteristics associated with the dynamics of the development of motor sp-

capabilities (growth rates, the nature of relationships and retention time);

* the relationship of special physical and technical-tactical training.

The quality of modern the training process of qualified athletes is determined by a number of provisions:

1. The most important condition for the successful management of the training process is the goalorientation, long-term planning of educational and training work in full compliancewith the model characteristics of athletes.
2. The use of high physical activity is the main way to increase the general andsocial performance of athletes. Application of various meansfrom other sports significantly increases the ability to successfully solve the problems of developing the necessary qualities of an athlete.
3. Determining the focus of special physical training in individual trainings, the trainer should widely use modern methods - conjugate, interval, repetitive, alternating, circular in order to increase the load and intensity of training. It can be stated that the improvement of the training system in a number of sports is largely associated with an increase in the quality of training programming in the most important - the competitive period. It is advisable to divide the competition period, depending on the competition calendar, into large mesocycles (40-45 days each) in preparation for the important and main competitions of the season, and there are usually no more than 3-4 of them.

The modern practice of the development of many sports determines the transition to the program principle of organizing training. The program-target principle provides for the modeling of loads within the framework of individual stages, for example, the stage of direct preparation for the main start of the season. The question of the structure and content of such stages may depend on a number of reasons, to which it is advisable to include the following:

* rest interval between two main starts of the season;
* the optimal duration of the training impact of a specific directionto achieve a significant effect; a rational combination of multidirectional training influences in order toachieving specific effectiveness of the structure of special physical and technical readiness;
* the ratio of means and methods of physical training.

Within the framework of the theoretical aspects of the development of the problem of programming the process of training athletes, the questions of the relationship between the training effects of physical loads of various predominant orientation and the possibility of unidirectional influences as a method of purposeful development of motor qualities are of great importance.

Using a methodological approach, which consists in concentrating the volume of unidirectional physical activity at certain stages of the annual cycle, was reflected in the long-term studies of Yu. V. Verkhoshanskiy (1985, 1986). The fundamental novelty of this technique lies in the creation of a massive training effect on the athlete's body for a limited time (stage). The value of this methodological approach for highly qualified athletes has been proven in a number of studies.

An important element when planning complex classestaking into account the interaction of urgent training effects of exercises of various physiological and pedagogical orientation. At the same time, without taking into account the urgent training effects of individual exercises and without their rational combination, it is impossible to significantly increase the level of an athlete's fitness.

It should be noted here that training planningloads should be constructed so that loads of the same direction are switched on only after a time interval sufficient for the onset of over-recovery of the leading function, and others would not slow it down.

The use of selective classes for the development of certain aspects of readiness and the complex construction of loads are important in the system of training.gramming of the training process of highly qualified athletes.

The choice of this or that approach in the organization of the training process in terms of its complex or selective orientation should be determined primarily by the goal, for the sake ofwhich the training program is formed, the stage of the formation of sportsmanship andindividual characteristics of the structure of the athlete's readiness.

The results of numerous works formed the basis for modeling the training of athletesnew in the preparatory period of training.

1. The increase in the volume of loads is accompanied by long-term adaptive changes that cause significant restructuring of not only functional, but also structuralcharacter. The increase in the intensity of the load causes a steep rise in sports workcapabilities. The amount of work is associated with a more significant delayed transformation thanintensity.
2. By varying the structure and content of microcycles, it is possible to achieve levelingnegative deviations in the development of fitness andthe general progressive tendency of the training process.
3. At the first stages of the preparatory period (general preparatory stage), the effect

"Transfer" of physical qualities in sufficientdegree is proportional to the volume and intensity of general preparatory exercises, which can be presented to a much greater extent than at the subsequent stages of the training cycle. As the adaptation processes deepen, the selectivity of the "transfer" of physical qualities increases, which is limited and becomes more specific. Hence, the need arises, on the one hand, to gradually limit the amount of nonspecific means, and on the other, to expand and update the complex of general preparatory exercises with the beginning of a new cycle in order to create new prerequisites for sports improvement, including new functional connections.

All of the above justifies the need to use at the first stages of the preparatory period of a wide range of general preparatory exercises of various orientations in order to expand the fund of nonspecific skills and abilities, as well as to improve the skills and abilities that are part of the sports equipment.

At the special preparatory stage of the preparatory period, the composition of general preparatory means decreases somewhat and the proportion of exercises increases, approximatelyzhennyh to special preparatory.

1. At all stages of the preparatory period when performing a competitive exerciseit is necessary to observe the principle of conjugation of physical, psychological and technicaltraining. In this case, it is advisable to carry out specialized loads, which will provideensures the effective development of leading qualities and allows you to increase the intensity of these exercises from microcycle to microcycle without prejudice to technique.
2. If at the end of the preparatory period there is a stage of concentratedcooking, the duration of the delayed training effect can be traced for 30–45 days of the competition period.
3. At the stages of the preparatory period, it is advisable to combine microcycles to developnurturing (10-15 days) and supportive (3-5 days) character. Developmental microcycles should have a specific predominant orientation and be located in the following sequence: retraction stage - mainly aerobic orientation; general preparatory - mostly mixed orientation; special preparatory - anaerobic-glycolytic and anaerobic-alactic; precompetitive - mixed.
4. The sequence of developmental microcycles should be planned after recovery.renewal and increase of the aerobic performance of the organism. In other words, aerobic capacity is the basis for the development of physical qualities. Supportive micro-cycles following high-intensity work cycles acceleratethe rate of increase in physical qualities.

In each microcycle of a certain direction, it is necessary to use the mosteffective methods of organizing the load.

The above provisions are the basis for the development of a training modellong period of training highly qualified athletes.

Current and operational planning.

These types of planning involve drawing up training plans for a stage, mesocycleand a microcycle, and in some cases - for a month, a week, a separate training session. It is carried out on the basis of an annual plan and is more effective if the latter is drawn up on a weekly basis. In the work of trainers, training planning for one month has become widespread. In the monthly plan, as well as in the plan for the mesocycle, the main provisions of the annual plan are concretized. The selection of training means, dynamics of the volume and intensity of training loads, control standards are given in the most detail. When drawing up operational and current plans, it is necessary that the orientation of the training sessions clearly correspond to the tasks solved in a given segment of a certain training cycle.

A detailed weekly prepared annual training plan allows you to quite simply create monthly, weekly plans and outline plans for individual training classes taking into account the condition of the athlete, the level of his preparedness at the moment, means of recovery and other factors.

## Comprehensive control in the sports improvement management system

Management in its most general form is the transfer of an object (process, phenomenon, etc.) from one state to another, predetermined. This definition is largely consistent with the goals of training, which is to transfer the athlete from one state to another. In most cases, this will be the achievement after a certain time and higher sports results. The training system is controlled according to the three-stroke principle: direct connection from the control subsystem (coach, doctor, psychologist, etc.) to the controlled subsystem (athlete, functional systems of his body); feedback (from the state of the athlete and his systems to the coach); correction of the feedforward based on its comparison with the indicators obtained on the basis of feedback.

In the management process, direct communication is information about what and how to do in order to achieve the set goal.

Feedback is information obtained during the control of training by comparing the achieved indicators and the conditions for their implementation with the parameters of direct communication andmodel characteristics.

Based on the comparison of direct and feedback indicators, a decision is madein the form of correction of training programs that regulate the further content and orientation of the competitive and training processes in various cycles of trainingrocking.

Management is carried out in three main directions: operational, current and staged. Operational management is associated with the need to influence the operational state of athletes, and therefore it is carried out within one training session or start.

The task of the current management consists in such influences at which the structureloads would correspond to the current (everyday) fluctuations in the condition of athletes.Usually these vibrationsare cyclical, and one completed cycle corresponds to a training microcycle. Therefore, the current control is carried out, as a rule, within a microcycle. Management of "stable" states (staged) is carried out in longer cycles.

Operational management of competitive activity is carried out according to the resultscontrol over the behavior of the athlete both directly during the competition and as a resulttate analysis of individual, already performed by athletes races, attempts.

***Comprehensive control -***it is an assessment of various indicators in training cycles in order to determine the level of an athlete's readiness (pedagogical, psychological, biological, sociometric, sports-medical and other methods and tests are used).

Based on the tasks of managing the training of an athlete, distinguish between operational, currentand stage control.

The complexity of control is realized only when three groups are registered indicators: training and competitive influences, functional state and readiness of an athlete, registered in standard conditions of externalher environment.

By comparing the values ​​of the indicators of different groups, it is possible to establish the cause-and-effectstrong connections between training and competition loads and results achievedtrained in competitions, taking into account all environmental factors (weather, state of sportsbuilding, equipment, behavior of spectators and judging).

After such a comparison and analysisyou can evaluate sports achievements and make corrections to the existing training documents and personal competition calendar.

General provisions, structure of complex control, requirements for testing outwives in special textbooks. Therefore, in this manual, thesethe problems are outlined very briefly.

Comprehensive control in most cases is implemented during testing, or the procedure for measuring results in tests.

*Control over the results of the competition* is to assess the effectiveness of the protrusionparticipation in competitions in a certain (most often one-year) training cycle. The dynamics of indicators of competitive activity in the training cycle is often used as a criterion to assess the state of an athlete's sports form. Information about the structure of competitive exercises seems to be extremely important, because on the basis of it, training exercises and their load are evaluated. However, it is necessary to choose from the set of indicators of competitive activity only informative ones, which should be used in the course of control.

*Control over training influences* consists in the systematic registration of the quantitative values ​​of the characteristics of the training exercises performed by the athlete. The same metrics are used both for monitoring and planning loads.

The main indicators of the volume of the load are: the number of training days; number of training sessions; time spent on training and competitornew activities; number, mileage of specialized exercises.

Indicators of the intensity of the load are: concentration of exercises in time, speed, power of exercise.

In the process of monitoring the load, the volume of specialized exercises is summed up; exercises performed in separate zones of intensity (power); exercises aimed at improving general and special physical, technical and tactical readiness; the volume of exercises of a restorative nature, performed in microcycles, monthly and in an annual cycle. Comparison of these indicators with the dynamics of sports results allows the trainer to identify rational relationships between individual types of training loads, the timing of achieving the highest results after their peak values, the period of delayed transformation of training loads into high sports results.

Control over the state of preparedness of an athlete is carried out during testing or in the process of competition and provides for the assessment of a special physicalreadiness, technical and tactical readiness, assessment of the psychological state and behavior at competitions.

The assessment of the state of health and the main functional systems is carried out, as a rule, by medical and biological methods. The methodology for this control is given in special textbooks.

*Assessment of special physical fitness* consists of individual level ratings basic physical qualities: strength, speed, endurance and flexibility. At the same time, the main attention is paid to the leading physical qualities for this sport.

*Technical readiness assessment* is to determine the quantitative and qualitative parameters of an athlete's action technique when performing competitive andtraining exercises.

Technique control is carried out visually and instrumentally. Criteria for technicalsportsman's skills are: the volume of technique, its versatility and efficiency.

The amount of technique is determined by the total number of exercises that the athlete performsin training sessions and competitions.

The versatility of the technique is determined by the degree of variety of motor actions,that the athlete owns and uses them in competitiveactivities. The effectiveness of the technique is determined by the degree of its proximity to the individually optimal variant. An effective technique is one that achieves the best possible result.

Sports result is an important, but not the only criterion for the effectiveness of technology.Methods for assessing the effectiveness of technique are based on the implementation of motorthe potential of the athlete.

Especiallythe indicators of the efficiency of technology are important, since there is an inversely proportional relationship between the level of technical skill and the magnitude of efforts, physical costs per unit of an indicator of a sports result (a meter of path).

*Assessment of tactical preparedness.* Control over tactical readiness consists in assessing the appropriateness of the athlete's actions aimed at achieving success in the competition. It provides for control over tactical thinking, for tactical actions.

Usually the control of tactical readiness coincides with the control of the competitor.noisy activities.

Control over environmental factors is necessary to make the rightdecisions based on the results of integrated control; it is necessary to take into account the conditions in which the competitive and training activities took place, as well as the fulfillment of control standards.

In practice, it often happens that environmental factors do not allow showing sportsme a high result.

These factors include:

* climate specificgeographical area and the degree of adaptation to these conditions (temperature and humidity of the environment, intensity of solar radiation, wind direction, atmospheric pressure);
* the state of the sports facility (coverage, illumination, dimensions, microclimate);
* the quality of sports equipment and equipment and the objectivity of refereeing;
* spectator behavior and socio-psychological the situation in the places where athletes are accommodated;
* duration of travel, conditions of accommodation, meals and rest.

Evaluating the influence of these external factors on the course of competitive and training activities, it is possible to get a complete picture of the level of the athlete's readiness.

*Making decisions about the level of an athlete's readiness and making adjustments to training programs.*Solving all the tasks of managing the training of an athlete requires educationprocessing and analysis of information obtained as a result of integrated control. Based on the comparison of these indicators with the parameters of models and programs, various options for alternative solutions can be prepared, and then the most optimal one can be selected. Thus, the decision-making process is a complex of various operations performed most often by the collective efforts of an athlete, coach, doctor, etc.

In its most general form, the final control operation is a cycle consisting of three phases mutually transiting into each other: decision making; adjusting the competition and training program; organization of the execution of the adjusted programs. Decision making is an integral, organic part of the sports training management process.

##### Questions and tasks for self-examination

1. What are the fundamental provisions when setting long-term and near-term goalsthe coach and his student (team) must adhere to?
2. How do you predict future record results?
3. What are the main tasks for predicting model characteristics?
4. What are the model characteristics of competitive activity?
5. How is the management of the training process based on the assessment of modelcharacteristics?
6. What are the requirements for athlete training planning, especiallyin macrocycles?
7. What is the difference between team training plans for athletes from individual ones?
8. What is the modeling of the training of athletes in the preparatory period?workout dress?
9. What is the complexity of control?

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