

The Basis of Modern Training Process Periodization in High-Performance Athletes for Year Preparation

Author's Contribution

A – Study Design
 B – Data Collection
 C – Statistical Analysis
 D – Data Interpretation
 E – Manuscript Preparation
 F – Literature Search
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Abstract

Lately the Olympic sport has been subject to considerable changes. It is rivalry at the Olympic arenas that has grown very much both in connection with professionalization – commercialization and with an intensive development of highly effective systems of sport in China, Japan, France, Australia and some other countries. Constant expansion of a sports competitions schedule, mainly at the expense of the commercial part, which is of special attraction for federations, athletes and coaches, significantly impeded the process of systematic athlete training for main competitions and increased a risk of injury and professional diseases.

These changes in modern Olympic sport require serious efforts for further improvement of athlete training. The most important directions for the improvement of the system of athlete preparation are the following:

- a sharp rise in volume of training and competitive activities;
- overcoming of early sport specialization and high speed preparation in children-youth sport;
- removal participation in a great number of competitions during a year from the 4-year Olympic cycles and yearly preparation;
- development of methods aimed to extend a period of an athlete's successful performance at the final stages of a sportive career;
- a sharp increase in volume of additional and particularly special training in a total volume of training work;
- systematic analyses of functional preparedness, adaptation responses to training and competitive loads for the purpose of finding concealed functional reserves and ways of preparation efficiency increase, prevention of functional systems overstraining;
- a strictly balanced system of training and competitive loads, rest, nutrition, means of rehabilitation, stimulation, work capacity and mobilization of functional reserves;
- expansion of non-traditional means of preparation.

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Lately the Olympic sport has been subject to considerable changes. It is rivalry at the Olympic arenas that has grown very much both in connection with professionalization – commercialization and with an intensive development of highly effective systems of sport in China, Japan, France, Australia and some other countries. Constant expansion of a sports competitions schedule, mainly at the expense of the commercial part, which is of special attraction for federations, athletes and coaches, significantly impeded the process of systematic athlete training for main competitions and increased a risk of injury and professional diseases. One-sided and having no serious scientific grounds, the WADA policy, founded on total prohibition of practically all pharmacological means capable of stimulating work capacity, regenerative and adaptive athlete's responses and of preventing injuries and diseases, has not only resulted in the appearance of serious organizational and legal problems but has also complicated the process of scientific and medical provision of athlete preparation process.

These and other significant changes in modern Olympic sport require serious efforts for further improvement of athlete training. This is more than actual, because proceeding from all the practice of successful preparation to the Olympic Games, the most important factors predetermining individual and team success are the qualitative methods of training based on the sport science achievements, advanced world experience and constant search for innovative decisions on its variables. In this connection, the present paper characterizes in brief the most important directions for the improvement of the system of athlete preparation that contains the main reserves to increase its quality.

Direction I

Here we have with a sharp rise in the volume of training and competitive activities. At present, the value of principal indices determining this variable of an athlete training process has exceeded the data of 1960s by 2-4 times. It especially concerned the volume of competitive activities in connection with a sharp growth of a number of competitions, particularly the commercial ones.

Tendencies for a further increase in volumes of training and competitive work still remain strong. In particular, experts from various countries recommend in the nearest years to increase the work volume spent on elite athlete preparation up to 1500-1700 hours per year at 340-360 days of trainings and competitions (now these figures do not usually exceed correspondingly 1100-1400 and 300-320). However, the practice of preparation of athletes and teams in different countries showed that this direction of improvement in the preparation system in many sports and separate events practically exhausted its capacities. A great number of athletes and whole teams who excessively increased training work volumes did not received expected results; overtraining and burnout of body functional systems sharply increased and resulted in injuries; the terms of performance at the elite level shortened because of exceptionally high physical and psychic loading, and the exhaustion of athlete's organism. Excessive work volume came into conflict with other training load components that negatively affected the efficiency of the process of the special physical and technical athlete preparation.

Direction II

This direction deals with overcoming of a faulty practice of early sport specialization rooted in sport and a high-speed preparation in children-youth sport, forwarded to a demonstration of high sports results to the detriment of systematic long-term preparation oriented to a maximum use of an athlete's potential for the purpose of obtaining highest sports results in optimal for a particular sport athletic disciplines and competitions beyond the age limits.

Direction III

Removal from 4-year Olympic cycles and yearly preparation of a contradiction, which is intensively appearing in the recent years, between a system of target preparation for the Olympic Games and an existing in many sports practice of participation in a great number of competitions during a year (first of all the commercial ones) aimed to obtain the highest result. Naturally, such a practice leads to a considerable decrease in a probability for an athlete to reach a peak by the main competitions of the year. In separate events (first of all in track-and-field athletics), marked for their vast schedule of commercial tournaments, in the late 1990s and at the beginning of the present century, the percentage of demonstration of the year-best results by the strongest athletes during the world cham-

pionships and the Olympic Games considerably reduced (by 2-3 times) in comparison with the 1970s-1980s and don not exceed 15-20%. It leads to a distinct reduction of attractiveness and prestige of these big competitions.

Of course, the question here is not about a subordination of the whole schedule of competitions only to the task of preparation for the main competitions. It is necessary to look for such schemes of building up the preparation that could make it possible to successfully participate in a great number of competitions during 8 – 10 months a year and would simultaneously provide the basic laws of systematic training for the main competitions of the year. The latest research and practical experience cogently prove a possibility of such an approach.

Direction IV

A development of methods aimed to extend a period of an athlete's successful performance at the final stages of a sportive career.

Commercialization-professionalization of Olympic sport sharpened the interest to prolong of successful sports careers of outstanding athletes that favored their successful performance in a great many of various sports far beyond the optimal age span to achieve the highest results. There are a lot of examples when athletes demonstrated outstanding results at the age of 30-35 and even at 38-40 not only in team sports but in light athletics, cycling, various kinds of combat events, and other sports. Even in competitive swimming, which is historically considered as a sport of youth with the upper age limit of not over 22-24, there are plenty of great 28-32-year-old athletes who successfully compete with their younger rivals. This trend has appeared lately and should be seriously studied in terms of improvement in the system of athlete's long-term preparation at its final stages.

Direction V

This direction is devoted to a strict accordance of an athlete's long-term preparation system to specific requirements of the selected sport that is expressed in a sharp increase in volume of additional and special training in the total volume of training work. General preparation acquires distinctly expressed basic character and becomes closely interconnected both by the objectives and contents with a supplementary (half-special) and special preparation. General preparation as non-specific in its traditional meaning stopped to play a significant role in elite athlete training and is used mainly as a means of an active rest.

Even at the early stages of long-term improvement a strict interrelation of training means and methods is necessary, correlation of work of different directions with requirements of a narrow specialization planned further. It is convincingly proved that great volumes of general preparation work done by the athletes in childhood and adolescence which don not meet the requirements of their future specialization are capable of suppressing natural dispositions of young athletes and prevent them from achieving high results.

Direction VI

The direction concerns the maximum orientation onto individual dispositions and capabilities of each particular athlete for selecting a sports specialization, building up the whole system of long-term training, determining a rational structure of competitive activities that requires focusing on selecting and orientating athletes at all stages of many-year improvement, on elaborating of individual and group models of preparedness and competitive activities, individual preparation programs, efficient combination of individual and group forms of work.

Direction VII

The direction deals with an orientation of an athlete's preparation system at early stages of long-term improvement. The system should be designed to create technique-tactic and functional grounds corresponding to the optimal structure of competitive activities in a particular sport. It should be considered that in a structure of elite sport competitive activities the components which did not attract a coach's and an athlete's attention at the early stages of long-term preparation could often be met.

When building up a functional fundament at the stages of preliminary and specialized basic preparation, it is necessary to be guided by those variables which can ensure success at the elite level. It is hard to compensate for committed errors at the stage of maximum realization of individual capabilities.

Direction VIII

This direction concerns systematic analyses of functional preparedness, adaptation responses to training and competitive loads in order to find concealed functional reserves and ways of preparation efficiency increase and to prevent overstraining of functional systems. Lack or insufficient effectiveness of work in this direction leads to the work in the directions in which the reserves for improvement are absent, which makes the preparation not only inefficient but can be a serious factor of risk, overstraining of functional systems and sport injuries.

Direction IX

This direction is devoted to an aspiration for a strictly balanced system of training and competitive loads, rest, nutrition, means of rehabilitation, stimulation, work capacity and mobilization of functional reserves. At present we can observe excessive enthusiasm for training and competitive loads, means of workability stimulation and, at the same time, there is underestimation of valuable rest, nutrition, and rehabilitation endeavors. It is here, especially in rational nutrition corresponding not only to specifications of a particular sport but to directions of loading in each structural components of the training process, where we can find considerable reserves to increase its efficiency.

No less significant reserves are related to the optimization by means of a pharmacological system in order to induce effective adaptation and rehabilitation responses to prevent over-fatigue, overstraining of functional systems and sports injuries, and at the same time not to contradict the principles of sport ethics, the anti-doping policy of the IOC and sports federations. Scientific and practical activities in this sphere have become exceptionally complicated lately in connection with one-side and not always meeting the requirements up-to-date athlete preparation, sports medicine and theory of adaptation policy of the World Anti-Doping Agency (WADA).

Direction X

This direction considers the conformity of the preparation system to the main competitions and geographical and climatic conditions of the places of their conducting. It should be always taken into consideration that conducting competitions in such conditions as a hot or cold climate, altitudes, under considerable time zones change could have a great influence on the level of an athlete's performance. Consideration of these factors in the system of preparation makes it possible to neutralize their negative effects and to obtain the highest results at the competitions in unusual climatic and geographical conditions.

Direction XI

Expansion of non-traditional means of preparation: application of apparatuses, equipment and methodological approaches make it possible to open in a full measure the athlete's functional reserves; use of exercise machines to provide conjugated improvement of various motor qualities (e. g.: strength and flexibility), physical and technical improvement; altitude training which allows intensifying processes of adaptation to factors of training coercion, to increase efficiency of immediate preparation before main competitions.

Direction XII

This deals with an expansion, concretization and partial re-construction of knowledge and practical activities in some parts of an athlete's preparation (move qualities development, planning loading in different structural parts, mastering some sports technique elements, use of ergogenic means, etc.) in the direction of provision of conditions for sports injury prevention.

The fact is that in consequence of an exceptionally high level of training loads in modern sport and a sharp expansion of competitive practice, a problem of sport injuries has lately become one of the

most serious ones in the modern Olympic sport. Sports injuries break career of many talented athletes – they do not allow them to realize their capabilities on a full scale, significantly reduce longevity of their performance at the highest level, and lead to serious health problems.

Analysis indicates that most of injuries (nearly 70-80%) is the consequence of an insufficient level of coaches and athletes' knowledge in the field of sports injuries prevention, who as a rule do not have special education in sport medicine. The imperfection of some statements of theory and methods of athlete preparation also make their negative contribution to the problem of sports traumatism.

The conclusion described above one can see quite clearly from the analysis of the development of both: general theory and methods of athlete training, and theory, methods and – especially- practice of athlete preparation in various sports. Methods of motor qualities development, technique improvement, load planning, and the use of out-of-training and other factors were historically rarely considered in the aspect of provision of maximum training effect in relation to the improvement of these components of an athlete's preparation and the analysis of risk factors related to professional diseases and injuries, especially the stress ones was practically ignored. As a result, many statements in methods of preparation are fraught with the threat of getting diseases and traumas. It is especially true for methods of flexibility and speed-strength development, increased concentration in some structural parts of the training process with the inclusion of one-sided, biomechanically closed wide range of exercises with high activation of a speed-power potential, volume and nature of warming up, preparation in difficult climate-geographical and weather conditions, etc. Thus, with a definite correction of some statements from both a general theory and concrete methods of athlete preparation, there are substantial reserves to reduce traumatism and to enhance the qualities of the preparation process and the longevity of an athlete's successful career.

Direction XIII

Dynamics of a preparation system, its operational correction on the basis of a constant study and evaluation of both general trends of the Olympic sport development and the peculiarities of development of its particular kinds – change of competition regulations and the terms of their conducting, application of new stock and equipment, expansion of competition schedule and alteration of the significance of various competitions, rivalry in sports events, separate disciplines and kinds of competitions.

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