THE ROLE AND SEQUENCE OF USING DIFFERENT TRAINING-LOAD INTENSITIES

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Various ranges of intensity, such as maximum, near-maximum, medium, weak, and moderate, are used in speed-strength sports. These zones reflect the intensity of the training on the individual's body. We measure the training effect in running by the amount of work done per unit of time; in throwing events, by the distance of throws; in barbell exercises, by the amount of weight lifted.

A weak or medium-intensity training load develops needed physical abilities and also benefits restorative processes.

If we did not have such quantitative and qualitative load categories, we would not be able to analyze an athlete's training objectively. Different training-load intensities have different effects on learning technique, on improving technique, on the development of the needed physical abilities, and on restorative processes.

In Ozolin's opinion, the tasks that need to be accomplished over the course of year-round training are the following:

1. To achieve the super-compensation effect (restoration of the body and raising its functional potentials to a level higher than the pre-existing level);

2. To strengthen the functional potentials and the morphological and biological changes at the athlete's achievement level;

3. To acquire motor abilities and skills in sports techniques and tactics;

4. To strengthen motor skills in sports techniques and tactics;

5. To actively recover from physical exercises, training sessions, and competitions (active rest).

Each of the above goals can be accomplished by using one intensity level or another. Thus, a weak or medium-intensity training load develops needed physical abilities and also benefits restorative processes.

The benefit of weak and medium-intensity training loads on restorative processes is explained differently in both cases, and the mechanisms are totally different

from each other. The restorative processes that follow weak-intensity loads produce weak irradiation of the basic neural processes.

As a result, the neural centers are dis-inhibited from the previous load. A medium-intensity training load produces a concentration of stimulating and inhibiting processes and restoration occurs because of concentrated inhibition.

Medical-biological studies done on hammer throwers of different qualification levels show that a weak or medium-intensity training load produces moderate cardio-vascular and central nervous system changes and the restorative processes occur faster than after maximum-intensity loads. A medium-intensity load actively influences biochemical processes in muscles and tissues. Thus, repeating a medium-intensity load after a short rest reduces the blood's lactic acid level, et al.

Its effect is also undiminished when the technique of individual sports is being learned and improved, because the movements performed at weak, medium, and maximum speed (intensity) differ because of their dissimilar physiological characteristics. The biggest differences lie in the fact that it is hard, at maximal speeds, to make sensory corrections while actually performing the movement—the reflex arc is not able to operate.

Performing complex movements at high speeds is fraught with difficulties. Exercises performed at sub-maximal levels allow technique to be better controlled, which is particularly important for beginners.

A weak-intensity training load benefits speed-strength abilities in athletes with low qualifications, where the effectiveness of the training methods does not depend on the magnitude of the external effects. In light of this, we recommend that novices and lower qualified athletes use weak-intensity training loads. Besides developing their strength, using these loads will facilitate a broader, fuller sense of the movement's rhythm.

Medium and maximum-intensity training loads play a major role in the training of highly qualified athletes, when we are speaking of physical development. Lower-intensity training loads inhibit improved performances in speed- strength sports.

Exercises performed at sub- maximal levels allow technique to be better controlled.

The abuse, or misuse, of intense loads, especially in young athletes, leads to over-stress and overloading, which are detrimental to health. For this reason, the amount of maximum-intensity work should be individually determined for each athlete.
Thus, a varied-intensity training load helps an athlete to learn and improve technique, develops the needed physical abilities, and aids restorative

processes. We advise using a weak-intensity training load for lower qualified athletes, without completely eliminating medium and maximum intensities. For highly qualified athletes, we recommend medium and maximum-intensity loads plus weak-intensity loads in small amounts (for special warm-ups).

The Sequence of Using Different Intensities

When Pavlov studied the activity of the central nervous system, he noted that weak stimuli provoke weak irradiation; maximal stimuli, strong irradiation; and medium stimuli, a concentration of stimulation and inhibition processes. Weak irradiation dis-inhibits the cerebral cortex (more correctly, certain of its neural centers).

The presence of these processes in the central nervous system's complex and many-sided activities suggests that there are different levels of activation. They arise in certain cerebral structures under the influence of different stimuli. Activation is highly specific. There are several activation systems. Each system has an independent substrate.

It seems natural that different stimuli (their complexes), by influencing a given central nervous system structure in a certain way, would surely influence the processes of learning and improving throwing technique, developing the needed physical abilities, and so on.

Weak-intensity exercises help novices learn technique, improve technique, and develop speed-strength. Weak-intensity exercises prepare the athlete for the next sports activity in each training session; however, for highly qualified athletes, weak-intensity exercises provide a special warm-up.

We suggest (and we have substantiated this in experimental studies) that near-maximum and maximum-intensity loads be used after weak-intensity loads if they have been planned in a given workout. This sequence should be followed for the following reasons:

1. One stipulation for achieving strong performances is to systematically use near-maximum and maximum-intensity exercises, while striving to exceed one's top speed in training;

2. The greatest effect from maximum intensity exercises can be gotten only if the body is in good condition and is not fatigued from previous work. According to the studies of Leshkevich, Makarov, Popov, Rogozkin Chagovets, and Yakovlev, the optimal state (as a result of warming up) occurs only during the main part of the workout, and this period is the best for establishing conditioned reflexes, which are basic to the learning of technique;

3. Speed exercises require highly intense muscle contractions, good mobility, and strong stimulation and inhibition. Hence, the needed movement coordination may be maintained if significant fatigue is absent. This proviso also applies when the focus is on developing strength;

4. Maximum-intensity loads are followed by medium-intensity loads, which have a positive influence on learning and improving the technique of individual sports and on developing speed-strength;

5. Medium-intensity loads that are done at the end of a workout support and bolster restorative processes.

We are convinced (supported by the experience of the top athletes in the nation and in the world) that loads of different intensities should be used in the workouts of highly qualified athletes in each session during the preparatory and competitive periods.

Skillful alternation of these loads will help the athlete to learn and improve technique, develop the needed speed-strength and obtain the best post-workout restoration. The sequence is as follows: weak- intensity loads, then maximum-intensity loads, and last medium-intensity loads.