

Technology of Drawing up an Individual Training Program of Power Orientation with Persons of Middle and Older Age

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Changes that are happening in society, and the associated intensification of work on the complex technical equipment and computerization of modern production has brought new increased requirements for both physical and mental qualities (concentration, volume and switching attention, emotional stability, siobhanrose the preparation of individual training programs of power orientation with persons of middle and old age.

The changes taking place now in society, and the associated intensification of labor on the complicated technical equipment and computerization of modern production have presented new increased requirements for both physical and mental qualities of a person (concentration, volume and switching of attention, emotional stability, the need to make responsible decisions, speed in action, specific endurance, agility, etc.), which can be improved by means of physical culture with a focus on harmonious human development.

Strength training is a mandatory component of health programs for training with middle-aged and older people. However, it is also the most traumatic. In this regard, it is necessary to consider the method of dosing the load

The key concepts in determining the dosage of strength exercises are:

- 1) Repetition - one cycle of movement with the projectile or on the simulator. For example, one rod lift above the head and return to the starting position.
- 2) Approach - a series of repetitions performed without stopping, without lowering the projectile, etc.
- 3) Arbitrary (repeated) maximum (PM). The maximum resistance (weight of the projectile, the number of loads on the simulator, etc.), which the student can overcome once, showing the maximum arbitrary muscle effort.
- 4) Muscle fatigue in the approach – in the process of performing the approach, physiological and biochemical processes occur in the muscles, which gradually lead to the inability to continue the exercise with the same parameters (pace, speed, amplitude) until the complete failure of the muscles to obey the signals of the brain.
- 5) «Refusal.» The state of inability to continue to repeat the approach because of the high (the limit for the resistance) the degree of fatigue of the muscles (say - approach "to failure").
- 6) The value (degree) of fatigue in the approach – in the process of performing the approach, the student gradually begins to feel fatigue in the muscles – from small to extreme. This feeling is subjective. Depending

on the health of the student and his motivation, the desire to "overcome" or "take care of themselves" the same degree of muscle fatigue can be perceived in different ways.

- 7) Compensated fatigue – the student feels tired, but by a strong-willed effort forces himself to continue the given movements.
- 8) Uncompensated fatigue – despite the utmost volitional efforts, the student is unable to perform the required exercise with the established biomechanical parameters.
- 9) The phase of exhaustion – after reaching uncompensated fatigue, the student, showing maximum effort, can continue the exercise with the help of a coach or partner until the muscles can not overcome even minimal resistance (for example, as in the method of forced approaches).
- 10) Phases approach. Suppose that the student performs the approach to the exhaustion phase (with the help of a coach) with a load of 65-70% of PM. An arbitrary failure occurred to 12 repetition. Complete failure (exhaustion) occurred to 15 repetition. The tempo is average - one repetition is performed in 3-4 seconds. The muscles are tense all the time - between the repetitions of the relaxation phase is completely absent. Then: 1st phase – from the beginning to the 6th repetition.

This phase of aerobic processes in the muscles. Slow and intermediate muscle fibers (MV) work. The muscles do not become fatigued, subjective fatigue, virtually none. Training effect – improvement of aerobic abilities, improvement of technique and intermuscular coordination. Improvement of power indicators practically does not occur. 2nd phase – from 7 to 10 repetitions. It is a phase of anaerobic processes in slow and intermediate muscle fibers. In these MV, accumulate the phenomenon of fatigue. The student feels easily overcome fatigue. The training effect is a moderate increase in muscle volume (mainly due to slow and intermediate muscle fibers), a moderate increase in muscle strength due to hypertrophy and improvement of neuromuscular. Phase 3 – 11 and 12 repetitions. The work involves all muscle fibers, even the most high-threshold (fast glycolytic). Throughout the muscle are anaerobic processes until the exhaustion of phosphagens and the point of reaching the near-maximum concentration of lactic acid, which leads to a sharp decrease in the power of work ("failure"). Training effect – the maximum stimulus to hypertrophy of the muscles and Kolomenskaya incentives to gain power at the expense of the neuromuscular component. 4th phase – 13-15 repetition (forced by). The

Volume 8 Issue 7, July 2019

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same is in the previous case. In addition, the "slew" aerobic appear in abilities of muscles. For well-trained athletes may have an additional incentive in the case of stagnation in the growth of muscle strength, but at a high risk of "kill" the whole muscle and get a breakdown of adaptation (overtraining). For clients of fitness clubs – a prohibited practice.

Note: this division of the approach into phases and description of training effects is valid for training with a weight of 50 to 75% of PM (or the number of repetitions "to failure" from 8 to 20) and in the case of compliance with the average rate of repetition and lack of muscle relaxation.

- 11) The rest interval between sets (acting). IO can be active or passive. Active IO can be filled with: stretching: tired muscles; stretching the muscles of antagonists; stretching the muscles of other segments of the body; unsaturated strength exercises on other muscle groups or aerobic exercise with moderate or low intensity.
- 12) Series – some exercises (approaches) on different muscle groups that are logically combined to solve a specific training problem.
- 13) Rest interval between series. Filled, usually with stretching, neotominae muscle or aerobic load. Less commonly used passive recreation.

When developing a training plan, the most important is the correct indication of the weight of the projectile and the number of repetitions in the approach relative to the maximum, since the training effect depends on the phase (see above) the client completes the approach.

There are two ways to specify them in a plan:

- 1) With a clear prescription of the weight of the projectile (20 kg, 35 pounds, 5 loads on the simulator, etc.) and the number of repetitions - 6,8,15, etc.
- 2) The weight of the shells is indicated roughly (e.g., 20-25 kg), and the number of repetitions is indicated so that working focused on their own experiences. For example, the approach lasts until reaching 2/3, 3/4, 5/6 of the maximum effort (that is, when there is a "failure"). In this case, even when choosing a non-optimal weight, the client will accurately fall into the phase of the approach in which he will receive the planned training effect for him.

The first method is simple, accurate, specific, easily controlled. However, it has three drawbacks.

- 1) Formalism and inflexibility. That is, for example, does not allow you to take into account the operational (in the process of classes) and the current (within 1-4 weeks) state of the student, which beginners (which includes up to 90% of clients of fitness clubs) is very variable.
- 2) Requires careful testing of each student on each simulator (projectile) to determine the weight with which the client should begin to engage and to determine the number of repetitions of this weight, so that the client falls into the target phase (see above). Otherwise, there is a high probability that the training effect will be different from the expected one.
- 3) With the development of technology and increasing the strength of the weight of the projectile must be changed,

usually in a big way, and the number of repetitions – less. In addition, there is another factor of uncertainty – what real progress has been achieved by the client at the time when it is prescribed to change the load. Thus, after 2-4 weeks of self-study, there may be a conflict between the requirements of the plan and the real possibilities of the client.

The second method is more complex, for example, requires an introductory lesson of special training to explain to students what "2/3, 3/4, 5/6" of the maximum effort, but has a number of advantages.

First of all, it is its physiology. The training effect is not "the number of repetitions and weight of the projectile", but metabolic changes in the muscles and nervous system during exercise (see "phases"). The latter are most directly related to the amount of arbitrary stress and the degree of muscle fatigue. Therefore, the ability to engage in self-control load based on their own feelings (the amount of arbitrary stress and the degree of muscle fatigue) - is a fundamentally important component of their ability to get a positive effect from training.

This method is universal, it is suitable for any strength exercises on simulators and shells, as well as for exercises performed with the weight of your own body. When planning classes it is possible not to paint all the variety of possible simulators for the study of this muscle group, which in real practice is very inconvenient (for example, with a large number of engaged in the hall of individual simulators may be busy), but simply indicate the sequence and mode of study of muscle groups with the provision of the student to choose

In addition, it is very important that with this approach, customers "do not process" and "do not finalize", as the skill to focus on their feelings will allow them to automatically adjust the load depending on their health and changing level of training.

It is useful to remember that in the big sport the ability to feel your condition subtly and, depending on it, to dose a training load for yourself is a sign of an "extra-class" athlete. On this indicator they differ simply from good "athletes". It is known that at the level of National teams of Russia (and earlier – the USSR), none, even the best training plan was not carried out more accurately than 30%. This Delta is an essential component of professional sports activities. It reflects the inherent variability and variability of any living organism. Therefore, "hard planning" (option 1) may not be considered the best option for the preparation of a training plan for clients engaged independently.

Table 5 shows the schematic diagram of load dosing for two categories of customers.

"Keys" to the table are as follows:

- 1) The Number of repetitions indicated on the basis that the "failure" occurs on the 12th repetition (weight 65-70% of PM).
- 2) "Approach ½ effort" (degree of fatigue in the approach) – the approach ends when the first signs of fatigue appear.

About 5-6 reps of 12, that is, the beginning of the actual training phase. This load is given only with the development of technology or in poor state of health of the client.

- 3) "Approach 2/3 effort" – after the first signs of fatigue client makes another 2-3 repetition (with more weight 1-2 repetition, with less – 3-4). About 7-8 reps of 12, that is, the middle of the actual training phase. This is the normal mode of retracting training (21-3 weeks) after the start of classes.
- 4) "Approach 3/4 effort" – the approach ends with obvious signs of fatigue, but when the client is still able to do 1-2 repetitions without the help of a coach. Roughly 9-10 iterations from 12. This is the optimal mode of developing training for beginners. Sufficiently effective and safe for multi-articular exercises (a large mass of muscles involved in the work).
- 5) "Approach to failure" – the client makes 12 repetitions, after which he is not able to lift the weight on his own (to perform another cycle of exercise) even with maximum arbitrary efforts. In this mode, the maximum training effect is achieved both in terms of muscle mass gain and in terms of improving the neuromuscular mechanisms of muscle strength.

This mode can be applied:

- For multi-storey exercise – only training adequately prepared, regularly training clients;

- For isolated exercises (relatively small mass of muscles involved in the work) – in the training of clients who have passed the retracting stage (4-6 weeks) and do not have medical contraindications (eg, hypertension)
- For any exercise and any healthy clients after 1-2 weeks of retraction, if the weight of the load does not exceed 40-50% of PM, and the exercise is performed smoothly, without jerks and without muscle relaxation in the cycle of movements during the approach.

Characterization techniques of isotonic exercises

Isotone is a system of health-improving physical culture developed in the Problem laboratory of the Russian state Academy of physical culture in 1991-1993 under the leadership of V. N. Seluyanova [47]. Isotone training as its ultimate goal involves improving health, physical health, appearance (body shape, body composition), performance, social, household and labor activity of men and women of a wide age range.

The name "Isotone" system received the type of physical exercise that occupies a Central place in the activity – isotonic, i.e., in which the muscle is maintained a constant voltage.

Isotone is an integral complex of health effects, each element of which is logically connected with others.

Table 5: Sample lesson plan

Level of Preparedness	A week after beginning of the training	% PM	Number of repeating of the training	degree of fatigue	number of approaches	Interval rest (min)	Character of Rest
Beginner (1-6 weeks of training)	1-3	50-60	12-20	2/3-3/4	2-3	2-3	Act
	4-6	60-70	10-15	3/4 - 5/6	2-4	2-3	act/pas
Experienced beginner 2-3 months of training	1-3	50-60	12-20	2/3-3/4	2-3	2-3	Act
	4-6	60-75	10-15	3/4 - 1	3-4	2-3	act/pas

Note: act, active; pas, passive

1) Isotone as a system composed of several elements:

The combination of the following types of physical training:

- a) Isotonic training, which uses isotonic, statodynamic and static exercises, ie those in which there is no phase of muscle relaxation. Isotonic training is used to increase or decrease the volume of muscles, change their strength and endurance, improve hormonal mechanisms responsible for the reaction to stress; reduce body fat, creating a General anabolic background to ensure positive changes in the body; reflex and mechanical effects on the internal organs in order to normalize their work; training of vascular reactions and improving tissue nutrition; improving trophic intervertebral discs and reducing hypertonicity of the deep muscles of the spine, creating a muscular corset to prevent its damage, etc.;
- b) Aerobic training of different types: cyclic exercises, basic, funk-, step - and other types of aerobics, sports games, etc. Aerobic training is used to improve aerobic muscle performance, enhance metabolism, improve coordination of movements, choreographic training. Aerobic training – recommended, but not mandatory part of the system, the optimal load involves the use of two aerobic training per week for 30-50 minutes at the comfort threshold (heart rate – 110-150 UD./min);

isotonic training is applied on separate days from aerobic or the same day, but after it;

- c) Stretching as a means of improving flexibility, elasticity of muscles and tendons, joint gymnastics, relaxation, a method of regulating the volume of muscle and fat mass, the activity of the endocrine glands, internal organs and the nervous system by reflex;
- d) Asanas(poses), which are borrowed from Hatha yoga and adapted to the requirements of the training program in isotone. Used to regulate the activities of the Central nervous system, cardiovascular system, internal organs and psychoneurosis;
- e) Respiratory pregnancies private for normalization of work of organs of the abdominal cavity, prevention of lung diseases, psychoneurosis.

2) Organization of rational nutrition

The combination of physical training and nutrition, organized in a certain way, is the key point of the system. The principle of nutrition is as follows: the selection and dosage of exercises determine, first, the object of influence (i.e., on which system of the body, muscle or part of the body the impact is directed), and secondly, the conditions for the synthesis or catabolism of tissues are created; the

organization of power, in turn, ensures the flow of processes that provide "ordered" changes. For example, various tasks can be set (normalization of the work of a particular system of internal organs, reducing the fat component, reducing muscle volume, increasing muscle volume, increasing muscle strength and endurance without changing their volume and fat layer above them, etc.), which can be solved with the same set of exercises, but with different selection of food. Regulation of nutrition in isotone usually involves not just limiting the amount of food and its caloric content, and a certain selection of products and their combinations to ensure, first, a balance in the flow of various food ingredients (mainly essential amino acids and fatty acids, vitamins and trace elements), and secondly, to stimulate and ensure the required adjustments in the body.

Extra-training isotone components:

- a) Means of psychological relaxation and adjustment;
- b) Means of physiotherapy (massage, sauna, etc.);
- c) The hygienic cleaning and tempering of the event.

Methods of control of physical development and functional state (anthropometric testing to determine the Constitution, type of addition, tissue composition (bone, muscle, fat), body proportions; functional testing to assess the state of the cardiovascular system, muscle endurance). The guaranteed effect is achieved only when all the requirements of the system are met. Central to the system is isotonic (statodynamic) training, which distinguishes isotone from other systems related to health-improving physical culture, and provides its high efficiency. Selection of exercises in isotone, the entire system of movements and poses provide consistent elaboration of all major muscle groups. Exercises are local in nature, i.e. at the same time not a lot of muscles are involved in the work. The lower the fitness, the fewer muscles should be involved in each exercise.

In all exercises, muscle tension remains within 30-60 % of the maximum. Mode of muscle contraction – isotonic, static-dynamic or static (the latter sometimes), that is, without relaxing muscles. This is achieved by a slow pace of movements, their smoothness, but constant preservation of muscle tension.

Exercises are performed "to failure", i.e. the inability to continue due to muscle pain or inability to overcome resistance (this condition is the main factor in creating stress). This has to come strictly in the range of 40-70 s after the beginning of the exercise. If fatigue does not come, technique exercises wrong (perhaps the presence of phase relaxation of muscles). If the "failure" occurred earlier – the degree of muscle tension above 60 % of the maximum.

All major muscle groups are consistently exposed. Exercises in each series (8-25 min) are performed without pauses for rest. Rest between series is filled with stretching. The duration of training is 15-75 minutes.

During exercise, attention is focused on the working muscle group. Breathing during the whole complex is carried out strictly through the nose, deeply, with maximum use of the diaphragm muscles (stomach breathing).

Stretching of muscles in the form of stretching, as a rule, is performed before the development of muscles (to warm up and increase their elasticity, increase mobility in the joints). To reduce the weight of fat and muscle by increasing the intensity and duration of pain, stretching is used after working out this muscle group. However, it should be borne in mind that this option is a way to create a catabolic effect, so it is not recommended to get carried away with it during isotonic training, so as not to injure the muscles.

Physical exercise can actively affect all organs and systems of the body. Sufficiently high energy cost of health training, its impact on the whole body determine the indications and contraindications for its use. As contra-indications to employment by improving training are limitations in the adaptation to physical loads. However, it does not exclude the use of physical therapy.

Compliance with the principle of individualization is one of the main requirements of health training. It is important to remember that there is no physical activity large or small, there is a load corresponding or not corresponding to the capabilities of the body. Therefore, the principle of individualization is excluded in strict accordance with the physical activity of the functional capabilities of the body involved. Rational dosing of physical activity in health training is based on taking into account the physical and functional capabilities of the individual, which is revealed by testing physical qualities and determining the working level of heart rate.

The principle is based on the doctrine of trace phenomena in tissues and regulatory formations. A. A. Ukhtomsky compared a single nerve impulse with a comet, the tail of which becomes the cause of trace processes after various stimuli, including physical exertion. The principle of repetition involves the systematic use of exercise in accordance with the functional capabilities of the body involved.

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