The Key to Strength Development:

Variety

By

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How many times have you been involved in a discussion (if not an argument) as to the most effective way of developing strength? We hear people saying, "Well, when I went to Joe's Gym I was told that this program was the best way of working out." Whereas, someone else would say he went to Jack's Gym and was told just the opposite. Someone else will say, "Well, I got my information through a professional strength coach, so therefore it must be the best way for developing strength." However, another person will speak up and say, "No, I got mine at one of these studios where they use the latest machines that have been proven to be the best for strength development." And so the discussions linger on.

The main reason that these discussions will continue is that each one will produce results in the beginning stages of strength development. In other words, every time you lift weights or overcome a resistance more than what you are accustomed to, regardless of how you do it, you will get stronger. It might be working out with essentially a concentric regime, or it might be isometric, or isokinetic or a combination of them. It might be through "dynamic tension", "total exhaustion", or "man, you gotta really hurt."

Today we hear much discussion about which is more effective—the machine workout or a workout with free weights. And then, not all machine manufacturers tell you to work out the same way. Nautilus will tell you two seconds in raising the weight, and four seconds in returning the weight. Universal, on the other hand, will say move the weight at a moderate speed. In the use of free weights, some advocate working at a slow rate of speed, some a moderate rate of speed, and some at a fast rate of speed. What should you believe?

There are even more discrepancies between weightlifters, bodybuilders, power lifters, and experts in weight training for sports, and instructors in health clubs. Each believes in different kinds of workouts and in different regimes of working. Who has the correct answer for development of strength?

If coaches or trainers do come to agreement on the best way to exercise for strength development, then they do not agree on how many sets, how many reps, and what percent of resistance should be used in the exercise! It is hard to find agreement on what constitutes a high-intensity workout—is it one to three reps, or is it one to ten? What is a medium workout? 10-20 reps? Resistance? What is a light workout? How many repetitions should be done in relation to the resistance and the number of sets? Should it be in relation to body weight, or of one's maximum strength for one repetition? Which kinds of sets and number of repetitions are best suited for the formation of motor skills?

Various Soviet researchers have studied these questions. Chervonak et al., (1) for example, used the total number of repetitions (for all exercise) to show "minimal", "light", "medium", "heavy", "superheavy", "maximal" and "stress" loads. On the other hand, Rodionov used the number of repetitions in relation to percent of maximum weight lifted to determine power, strength and technique learning. In addition, Rodionov and Ragozyan (5) found that there are significant changes in technique execution after a certain number of repetitions in different exercises.

How many exercises should be used in one training session? Many people today believe that work for the upper body should be done on one day and work for the lower body on the next day. Is this the best regime, or should it be a combination? Should the lifter do 15 or 20 exercises in one
session, or should he only do two, three or five? Will this vary over the course of a year? Vorobyev [6] found that the number of exercises varies greatly, depending upon whether it was in the preparatory, pre-competitive or competitive period. And then we might ask, “What is the proper sequence of exercises to be used?” Is it best to do fast movements early in the workout such as a power snatch, and then follow it with heavy weights and finishing up with the lightweights? Or should it be the reverse?

Before we can begin to answer all the questions raised, it is first necessary to examine what takes place during an exercise program. The development of strength is due mostly to adaptations in the nerve-muscle relationships. It is a well-established fact that the nervous system is the key to all learning and development. Perhaps this is why the Russians rarely refer to the nervous or muscular system by themselves. It is always the “nerve-muscle” system. Only the nervous system can stimulate the muscle in a particular manner to elicit a particular response. For example, when learning an exercise for the first time, whether it is the clean, snatch, or jerk or a simple exercise like the bench press or biceps curls, it is the nervous system that tells the muscles how they should contract.

When first attempting the exercise, the nervous system creates a pathway from the brain to the muscle and then back to the brain. After experiencing the exercise once or twice and being given corrections, the nervous system makes adaptations to the motor pathway. This will continue (with practice of the exercise) until the pathway is well-developed and the movement becomes automatic. This is now called a conditioned reflex: the person can do the exercise without any thinking, i.e., it is automatic.

Many times when people first begin lifting, they experience great gains in the first few weeks or months. These gains, however, are not due to any actual changes in the muscle itself. They are due to the person learning how to do the exercise. In other words, it was all nervous system learning. In order to get any physiological benefits from a weight training program, the person must work out at least three to four months. This is why the Soviets work their athletes on a year-round basis with three cycles. This first cycle is the preparatory period (the period to get “in shape” in order to do the work necessary in the sport). It usually lasts 3-4 months, the minimum period for sufficient development before beginning “serious” training. According to Medvedev, et al. [3] it. . . “should not be shorter than necessary to acquire competitive form.”

When first beginning a training program or learning a new exercise, the nervous system is usually in a state of excitation and responds with a high energy level enabling the lifter to learn and/or adapt to the physiological changes occurring. However, after a certain period of time, the nervous system actually becomes stagnated (inhibited) and further gains will not ensue. This is why we must change our exercise regimes and/or exercises.

For example, we all know that there must be overload, in order to develop strength, whether it be in the form of increased resistance, increased repetitions, increased amounts of work, or more work in the same amount of time (faster work rate). Each time we create an overload (after the body has adapted to the previous load), the nervous system responds with renewed excitability. If the workout program remains static for more than several weeks or months and in some cases, years, the nervous system gets deadened and the physiological gains will not occur.

How effective an exercise is over a length of time depends on the exercise and the muscle group. For example, Ivanov, et al. [1] found that there were actual strength decreases when doing the same workout in the bench press after 4 weeks. However, in the squat, with a weighted barbell on the shoulders, strength continued to increase after 4 weeks but at a much slower rate.

One way to alternate the program, of course, is to do a different exercise to develop the same muscles. An example of this would be doing an exercise with free weights and then doing the exercise on an exercise machine. Although the exercises appear to be identical, they are not; they still require almost all of the same muscles to work in basically the same manner. But because of the slight change, the nervous system gets renewed. A more common way is to change the resistance, reps and/or sets or to do variations in exercise execution. Rodionov and Ragozin [2] found that top lifters such as Alexeev, Rigert and Rakhtov include many different exercise variants in their training.

According to Vorobyev [6] the training load must be varied because the body adapts to a specific stimulus fairly rapidly. Having adapted to a specific stimulus, the body responds in the future to such a stimulus with a limited reaction, i.e., further development does not occur. The more monotonous the training load and the more frequently it is applied, the faster the body becomes accustomed to it and the less effect it has in producing desired qualities.

All of you have probably experienced the fatigue and boredom from doing one thing over and over the same way in the same routine. This is what happens to the nervous system when one exercise is repeated in the same manner all the time. Because of this, as explained above, for the most effective development of strength your training program must show variability.

When a coach is trying to determine the best kind of workout for strength development, he must consider the level of the athlete; this is an essential factor. The sameness, variability, and specificity of exercise has to be adjusted for different levels. For example, a person who is just beginning strength development, or someone who has been off weights and inactive for over six months, or an athlete whose sport did not maintain his previous strength level will make gains in strength, simply due to skill learning and basic physiological development.

However, if we are looking at an athlete who has been in serious training for several years, then we must deal more with exercise specificity. In other words, the exercise must be similar to the sport. It is well-known that some sports require strength as needed in explosive power (football, track and field), some that are isometric or static in nature (as in some aspects of wrestling), or some that involve many repetitions as in cyclical type sports (cycling, swimming, running). The exercise program needs to reflect these differences. An athlete should do specific training prior to the season, and, in some cases, during the season if participation in the sport is not sufficient to maintain the developed level of strength. In the off-season, it is possible

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deadened, and a decrease in effectiveness could occur. On high levels, specificity is also very important and must be taken into consideration.

There is no way to insure the most productive program. The coach must constantly be aware of what is happening with the athlete to make necessary changes at the optimal times. Only in this way will the athlete be able to develop to his highest potential.

References


