Strength Training for Elite Athletes

Part V: Periodization

Presented at the American Swimming Coaches Association

By Strength Sensei CP
Publication Date: 1987
Photo by Tim Scott, LiftingLife.com

In this seminar, I will cover the main methods of strength training: Bodybuilding, maximal weights, eccentric training, isometrics, electrostimulation, isokinetics, strength-endurance, speed-strength, plyometrics, and periodization.

Periodization of Strength Training

It's beyond the scope of this section to make up a periodized strength training plan that applies to every swimming stroke and level of athlete. I can only offer you general concepts and guidelines. We shall look at periodization through the two main phases of training, the preparatory and competitive periods.

Guidelines for the Preparatory Period

For energy system events requiring strength-endurance, such as swimming, the preparatory phase should be used to achieve the levels of optimal strength appropriate for the swimming stroke. In sports requiring high levels of maximal strength, such as the hammer throw, the preparatory period should be used to provide the groundwork for the high intensity work encountered in the competitive period. Here are some guidelines for this period:

-- Training methods most appropriate for the preparatory period are strength-endurance and bodybuilding. Once the desired levels of muscle cross-section and strength-endurance are reached, methods should be used to enhance the innervation of the newly-created muscle mass. These methods include maximal weights, eccentric, and isometric.

-- Strength training programs lose their effectiveness after two weeks. Faster improvement in strength occur if the loading parameters (i.e., sets, reps, rest intervals, speed of contraction, exercise selection, and order of exercise) are changed after two weeks. This approach not only eliminates boredom and the physiological causes of stagnation but boosts the motivation level of athletes.

-- If an athlete has difficulty recovering from a strength training session, decrease the volume of work (number of sets) by 30-40 percent but do not decrease the intensity (percent of maximum). It's the volume of training primarily responsible for overtraining, not the intensity.

-- Strength training exercises of a general nature should train not only the prime movers but also the antagonists and stabilizers.

-- Core muscle groups (spinal erectors, abdominals, and obliques) should receive special attention in the preparatory phase because they are involved in power transfer.

-- Eccentric exercise should be performed in a slow, controlled fashion. It should not comprise more than 20 percent of the total volume of strength training in this period.

-- Isometrics and electrostimulation may be used to overcome sticking points. As a rule of thumb, isometrics should not make up more than 10 percent of the strength training volume in the preparatory period.

-- Strength training should not interfere with skill training. If strength training precedes skill training, six hours should be allowed between these two training sessions.

-- Because muscle soreness may interfere with skill development, athletes should be eased into strength training.

-- Aerobic work interferes with strength development, reducing gains by as much as 20 percent, particularly when strength is measured at high speeds. When maximal strength and speed-strength are the major qualities to be developed in a particular training period, endurance training should be avoided.

Guidelines for the Competitive Period

After the preparatory period, the athlete moves into the competitive period. Here are some guidelines for this period:

-- If strength is an important component of your sport, strength training should not be discontinued for more than 10-12 days before the yearly peak. In sports with a relatively high endurance component, strength training can be discontinued as much as 15 days before the yearly peak. Fatigue masks fitness.

-- Once optimal levels of strength are reached for the annual plan, athletes should focus on improving the rate of force development with speed-strength methods.

-- Modes of contraction should become more specific in the competitive period. For example, the gymnast may perform plyometrics, whereas the swimmer may do isokinetic work.

-- Eccentric work of a slow nature should be avoided because it negatively affects the rate of force development. Although all the evidence has yet to come forward, fast eccentric work (plyometrics) has minimal application to swimming. Plyometrics has more transfer to sports where the stretch-shortening cycle predominates.

-- If plyometrics are performed, they should be discontinued 10-14 days before a major peak due to the stressful nature of plyometric work.

-- If the preparatory period has been well planned, few exercises are needed. For example, incline press work and its variations are more useful to the shot putter

than dips or bench presses in the competitive period, and leg presses are a better choice for a rower than squats during that period. The swimming coach should select exercises that involve the primary movers of each swimming stroke.

-- The volume of work for the antagonists and stabilizers should be reduced to 1-2 sets per exercise to facilitate recovery.

-- Strength acquired through muscle mass increases can be maintained for longer periods than strength gained through nervous systems training (i.e., maximal weight methods). Perform 1 to 2 sets per muscle group of 8-12 reps once a week to maintain the muscle mass acquired in the preparatory period.

Thank you,

Charles Poliquin