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# Periodization & Specificity: Resistance Training and Endurance Athletes

Many endurance athletes frown upon lifting weights because they fear it will make them too bulky and slow them down. Still others believe it's acceptable as long as it involves low weight and high repetitions. The truth is neither of these statements is correct. Whether or not resistance training is beneficial for endurance athletes is more about periodization and specificity than anything else.

During an endurance activity, you are contracting your muscles at a low to moderate force repeatedly for a long duration. Resistance training, especially strength and power training, involves just the opposite: high intensity and high force output for a short duration. On paper, it would seem that intermingling the two types of training would be of no benefit, or are even counterproductive. Yet modern science has proven that implementing resistance training programs into endurance athlete training protocols can be highly effective as long as periodization and specificity are taken into consideration (1).

Specificity refers to ensuring your program is customized to your unique needs. Many people think performing 2 sets of 15 to 20 repetitions using light to moderate weights is best for endurance athletes. However, this type of training does not necessarily condition the neuromuscular system for long distance events (1). Conversely, strength training should be the foundation for any endurance athlete's program. This makes sense because the greater an athlete's maximal strength, the greater their potential for strength endurance by improving the amount of force they are able to apply for a prolonged period of time (1). Distance athletes need to have adequate strength-endurance to avoid the deterioration of their form as they begin to fatigue (4).

Heavy strength training has also been shown to improve exercise economy in endurance athletes (2). The term "exercise economy" is used to express the oxygen consumption required to perform a given exercise workload, whether it be spinning, running, or any other endurance activity (2). Moreover, strength imbalances and lack of flexibility are two reasons why endurance athletes get injured(3). Training to improve overall strength—and increase flexibility—is fundamental to any endurance athlete's resistance training program.

Timing is everything when it comes to incorporating resistance training programs for endurance athletes. Periodization is an organized approach to training that involves progressive cycling of various aspects of a training program during a specific period of time (3). The best time to begin a resistance training program is in the off-season. This is because in the short-term, incorporating resistance training may decrease performance in one's sport. This can come from muscle soreness as well as having to adapt neuromuscular control due to rapid increases in strength (3). However, honing your endurance sport skills as you adapt to your newfound strength will limit this potential side effect (4). Periodization is also important to decrease the likelihood of overtraining. Endurance athletes need to find a balance between high volume training and required rest and recovery.

Tips for incorporating resistance training into the endurance athletes training program:

1. Taper off (reduce) your resistance training immediately before your endurance event

2. Don't start a new resistance training program while "in-season"

3. Perform your resistance training before your endurance training, so technique is not significantly compromised due to fatigue.

4. Perform your resistance training on your lighter, lower intensity days

5. Incorporate full body workouts performing bilateral movements that create symmetry, enhance flexibility, and improve your overall strength

6. Make sure you continue to focus on honing your endurance-sport skills while incorporating a resistance training program ■

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