

## Tips for Improving Running Speed

Sprinting speed is an essential element to most sports and a key evaluator of athletic performance. Genetic giftedness is an important factor that contributes to world-class speed and it cannot be altered. There are certain individuals that are born with muscular qualities that make them faster simply because of the structural and biochemical properties of their skeletal muscle. However, anyone can increase their speed.

The two extrinsic, trainable factors associated with speed are mechanical efficiency (technique) and force production. Mechanical efficiency in sprinting is a skill that must be coached, like swinging a bat, shooting a basketball or throwing a football. When mechanics are perfected, the only way to increase speed is to develop the ability to generate force at greater magnitudes and rates. Sprinting is essentially a game of physics. The athlete who can strike the ground harder and faster (i.e., the more powerful athlete) will propel himself farther down the field, track or court with each step and will thus be faster. Perhaps one of the biggest misconceptions in speed training is that fast sprinters “run light.” In reality, world class sprinters “run violently.” Pound for pound, world-class sprinters are some of the strongest, most powerful athletes in the world and it is that power that separates them from the field.

Listed below are seven tips to help develop power and improve your sprinting speed.

### **Use exercises where the foot is in contact with the ground on stable surfaces to develop speed.**

Because sprinting involves reaction forces against stable surfaces, sprinting speed is best developed using exercises in which the foot is in contact with the ground and reacts against an immovable surface. Back squats, front squats and deadlifts are exercises that fit into this category. Additionally, the movements in these exercises (i.e. extension of the hip, knee, and ankle) are movement specific to the skill of sprinting.

### **Incorporate single leg exercises.**

In sprinting, force is generated against the ground on a single leg. Therefore, an ample number of single leg exercises where the foot is in contact with the ground should be incorporated into your program. Lunges, single leg squats and step-ups are all exercises that involve triple extension on a single leg and can be used to develop specific sprinting power.

### **Use Plyometrics for power training.**

Plyometrics, or jumping exercises, are one of the best ways to improve sprinting speed. Data from the Memorial Hermann Sports Medicine Institute and the Human Performance lab at the University of Houston Clear Lake suggests that vertical ground reaction forces (i.e., vertical jump height) are the most important predictors of running speed. Plyometrics utilize rapid eccentric and concentric muscle contractions and the forces generated during these exercises are quite similar to sprinting. At first, perform only a few sets and reps of plyometrics (i.e., 30-50 contacts). Advanced athletes can progress to 100+ contacts in a single session.



## Utilize and execute weightlifting (i.e., “Olympic lifts”) properly.

Perhaps the most effective exercises for the development of speed are the weightlifting exercises (clean, Jerk and snatch). When used correctly, athletes can generate enormous amounts of power using exercises from the sport of weightlifting. Research suggests that an athlete can generate four to eight times more power using Olympic weightlifting exercises than other traditional exercises. Additionally, the power generation during the clean, jerk and snatch are functional, in that the primary movements of the exercises are triple extension of the hip, knee and ankle, the foundational movements of sprinting. Because of their similarity to jumping, a recent study showed that training using the clean, jerk and snatch was more effective in improving vertical jump in high school males compared to traditional lifts <sup>(4)</sup>.

## Begin a periodized resistance exercise program.

Strength training is the most efficient and effective way to improve strength and power. However, strength training is something that must be planned and progressed to avoid training plateaus and injury. Periodization is the purposeful planning of the sets, reps, speed of lifting, etc. in a strength training program to induce specific performance changes. In order to develop strength and power, you must first acquire a conditioning base (general preparation phase of training) and improve connective tissue strength (hypertrophy or anatomical adaptation phase of training). Conditioning base is developed through higher repetition, low intensity and short rest period training (2-3 sets x 12-15 reps at 50-70 percent of the maximal amount of weight you can lift one time (1-RM). Connective tissue strength is developed with high volume, moderate intensity training (four to six sets of eight to 12 reps at 60 to 80 percent of 1-RM). Completing eight to 12 weeks of this type of training before transitioning to heavier weight training will help provide a base that will improve efficiency and reduce injury risk with heavy weight training.

## Develop a base of strength before training for power.

A reasonable amount of strength is necessary to develop power. After completing the general preparation and hypertrophy phases of training, complete four to eight weeks of medium strength to maximum strength training before transitioning to power training. In the strength phase of training, utilize heavier weights and lower repetitions (three to four sets of one to six reps at 85 to 100 percent of 1-RM).

## When training for power, utilize a variety of loads.

Power is the product of force and velocity and it exists on a spectrum (Figure 1). The greatest amount of power is generated at 40 to 60

percent of 1-RM in most traditional lifts (i.e., bench press, squat, leg press, etc.). For example, if you can squat 450 lbs., you would generate maximum power at loads between 180 and 270 lbs. Different sports require different type of power. An offensive lineman in football may need more low-velocity power and thus his training program would be biased toward heavier resistance training. So, if his squat 1-RM were 450 lbs., he might want to lift at a velocity specific to his position (i.e., 315 to 410 lbs.). However, sprinting is primarily a high velocity to peak power skill. If you have a 1-RM of 450 lbs. on the back squat, use loads ranging from body weight (i.e., no load) to 270 lbs. to develop sprinting specific power. Regardless of the load, lift the weight as fast as possible during the upward phase of the lift during the power phase of training and lift a variety of loads to improve all aspects of the power spectrum.

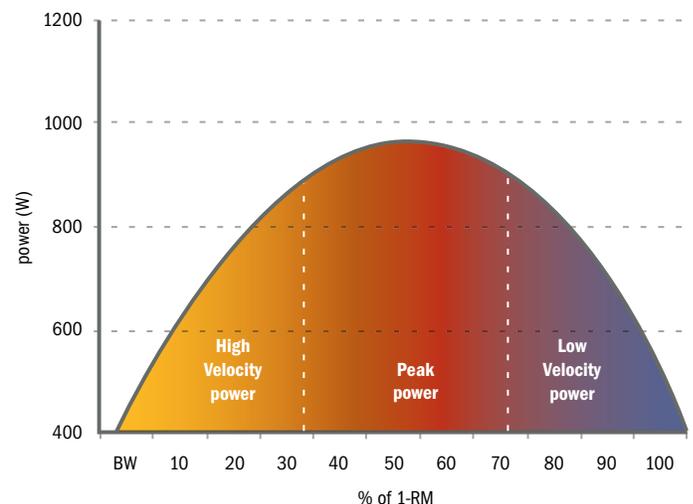


Figure 1: Relationship between power and load during most traditional lifts.

Following these seven tips will help you to achieve your genetic potential with respect to running speed. Remember that consistency is the most important variable in training. The old cliché says Rome was not built in a day. World-class speed is not built in a day, either. Commit to long-term development, commit to developing mechanical efficiency, and commit to training to push the ground harder and faster!

1. Channell BT, and Barfield JP. Effect of Olympic and traditional resistance training on vertical jump improvement in high school boys. *Journal Of Strength And Conditioning Research / National Strength & Conditioning Association* 22: 1522-1527, 2008.

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