The First 10 Yards

Think of a sport – any sport. How often do you see an athlete sprinting at top speed for 40 yards? How about 400 yards?

The answer is - Almost Never. A high school basketball court is 28 yards long. To first base in baseball - 30 yards; softball-20 yards; volleyball to the net – 10 yards. How often does a football player actually run most of the field…same with SOCCER!

What you do see in sports competition is the majority of athletes accelerating and decelerating over, and over, and over again.

It has been said that the fastest 10m to 30m sprints in history have been performed by Olympic hammer thrower and shot putters. How can they be faster than a world-class sprinter? The solution becomes apparent when we examine what makes great acceleration take place. Acceleration requires huge force production over a longer ground contact than at top speed. Because of this, maximal strength is important for bodyweight. The shot putter may have the edge here. We also know that stride frequency and stride length are slower and shorter than at top speed. Because of this, the world-class sprinter cannot take advantage yet of their greater turnover. We know that upper body strength is also critical to great acceleration. Improved arm strength and mechanics are more important to driving the athlete forward than at top speed. This could also give the shot putter the edge. Now as the race goes on, acceleration becomes less and less as the athletes approach their top speed. At the 30m mark, science has shown that most athletes are at almost 95% of their top speed. Here the sprinter starts passing the shot putter.

The moral of the story? Kids have to run the best 10 yards at the beginning. They have to be fast at "getting going" -- that's where the game is played.

Many athletes only think of acceleration in terms of running straight ahead for a short distance. In reality, acceleration can take place in any direction. In actual play, athletes accelerate forward, backward, sideways, and diagonally. Many think acceleration occurs only from a static start. On the contrary, acceleration can also take place from a moving start at any number of speeds. For instance, a receiver in motion may have to accelerate quickly or decelerate quickly on the football field. Both of these are forms of acceleration, and both can be improved with proper training.

As I describe acceleration, I'll use forward acceleration from a static start as a common way to describe muscles and biomechanics. Remember that this is not always what happens on the sports field and that we have to prepare our athletes accordingly.

There are a number of physical and technical characteristics that can lead to poor acceleration. The first and most important characteristic is relative body strength. How strong an athlete is for how much they weigh is directly proportional to how well they can accelerate. Since acceleration is an athlete overcoming their own inertia with the force they produce, the leaner (less body fat) and the stronger they are at that weight are predictors of how well they will accelerate.

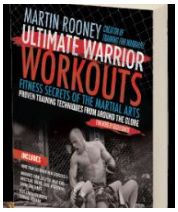
To look at the situation generally, the major muscle difference between acceleration and top speed, is that the quads are used more in acceleration, and the hamstrings and hip flexors are

more utilized during top speed. The most important areas to strengthen for acceleration are the gluteal and quadriceps muscles, the calves and muscles of the upper body, especially the anterior deltoid. Maximal strength is important here because ground contact times are much longer during acceleration than at top speed. Since there is a greater amount of time to produce force, the more absolutely strong a muscle coupled with great relative body strength, the better the acceleration. For acceleration training, more maximal weights can be used in exercises such as the squat, lunge walks, chin ups, pulls ups, calf raises, and step ups.

We know that acceleration has a longer ground contact, smaller stride length, less stride frequency, different technique and teaching cues and relies differently on the muscles of the body when compared to top speed. Since there are different muscle actions during acceleration and top speed, it is logical that there will be different cues used when teaching technique. For instance, for force production at foot contact, acceleration should be taught as a "pushing" motion.

For good acceleration, keep the center of gravity low and forward while trying to push out as long strides as possible. It is difficult for any athlete to learn to "lean forward," genetically we're programmed to keep our bodies from leaning forward and falling. (You fell, a large ferocious animal ate you – we learned.) Driving arm action is also critical to proper acceleration. The athlete should draw in breath right before the acceleration and hold it for the first few steps. This will allow for a Valsavla maneuver and a subsequent better opportunity for your nervous system to produce force.

Martin Rooney COO



Martin Rooney is an internationally acclaimed lecturer, author, and fitness expert with a Masters in Health Science. Martin was busy during May: he was in Las Vegas cornering Dan Miller at UFC 114 in his fight versus Michael Bisping, he has lectured in several states, been keynote speaker at a major summit, and squeezed in book talks and signings both in the West and here on the East coast. His work encompasses training National Champion High School teams, Olympians, and Professional teams. Martin has been featured on numerous television and radio shows including: ESPN, Fox Sports Net and Fox News, the NFL Network, NBC.com, and in publications such as the New York Times, Men's Health, Men's Fitness, The Sporting News ,and Sports Illustrated for Kids. Martin's latest book, **Ultimate Warrior Workouts, Fitness Secrets of the Martial Arts**, was released in May; you can find it on best selling sports books lists.

This article is brought to you by The Parisi Speed School

Gary Christopher 215-771-9680 gecfitness@aol.com