St. Francis
Physical Therapy

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Young Athletes: Do You Feel the Need for Speed?

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There is one common ability required for just about every sport that separates average, above average, and elite athletes. This ability is **speed**. If you are slow compared to the other athletes in your sport, you are already at a disadvantage, especially if your sport relies solely on speed.

There are two primary factors that determine your speed. They are 1)stride length (the distance you travel between steps) and 2)stride frequency (the amount of steps taken during a period of time). A third factor that also determines your stride frequency and ultimately your speed is the amount of time your foot is in contact with the ground. Less time spent in contact with the ground will result in increased stride frequency and increased speed as long as stride length remains constant. If you work solely on increasing your stride length, you will most likely increase your ground contact time and decrease your stride frequency. However, if you work solely on increasing stride frequency, your stride will shorten and your speed may show little to no improvement. To be more efficient and promote maximum speed and efficiency you should focus on smaller increases in both stride length and frequency at the same time.

Some sports require intermittent short bursts of sprinting with jogging/walking in between those short speed bursts (e.g. soccer, basketball, tennis, football, baseball…). In these sports there is another key element which is your ability to get up to top speed as quickly as possible called **acceleration**. Acceleration requires more than just the ability to run fast. It requires a lot of strength and power as you try to overcome inertia (the weight of your body).

There are several different methods to develop speed and acceleration. You can just work on repeat sprints on level ground, with resistance (parachute, pulling a sled/weight, etc.), or on a treadmill at a steep incline. The latter of the three has been adopted by many individuals as the most effective way to develop speed and acceleration. Sprinting at a steep incline promotes several things: 1) forward body lean which enhances your ability to drive yourself forward while accelerating/sprinting, 2) a powerful leg drive to increase strength, power, and stride length, and 3) a decrease in ground contact time which results in an increase in stride frequency. Though stride length decreases when running at an incline, once you return to running on level ground you will be able to maintain your increased stride frequency and stride length will also increase because you are no longer running at an incline.

Incline treadmill sprinting should always be done with a spotter for safety reasons. You should also vary your workouts to prevent injury and work on improving your body's different energy systems (phosphagen or quick burst, anaerobic, and aerobic). Coaches interested in speed/acceleration training for your athletes, please contact Blake Butler, PT at St. Francis Physical Therapy (763)753-8804.