Tri4Fitness.net

What are you trying to do for fitness?

Looking for a Change in Running Performance?

Tired of the same regiments to try to improve performance, try adding in some uphill and downhill training.

When you break running performance down and look at the speed of an individual, it is the interaction of stride frequency and stride length. Stride length is determined by many factors, such as body height and leg length, but has been seen thru research to be a factor that can be improved. When looking at sprinters, novices achieve maximal stride length at about 27 yards, whereas elite sprinters continue to increase stride length until about 49 yards.

Stride frequency, or stride rate, the measurement of how often the leg cycles and strikes the ground to propel the individual can also be improved. Stride frequency is thought to be the more important factor as individuals reach maximal speeds and the more trainable factor. Stride frequency involves many more components of running from impulse production, speed of force generation, support phase, flight phase and recovery phase.

Traditionally, research has focused on either uphill training or downhill training individually to improve running performance. Uphill training focuses on speed-strength and improvement of stride length. Downhill training focuses on improving stride frequency. Regardless of uphill or downhill training, it is recommended not to use a slope that affects speed by more than 10% either direction. A slope of 3 to 7 degrees can normally help achieve ample downhill assisted speed.

Recently, a study from The University of Athens and Leeds Metropolitan University was published in the International Journal of Sports Physiology Performance that looked at using uphill and downhill training together. The subjects using uphill and downhill training together ran 80 meter sprints starting with 6 sets, 3 times per week in week 1-4, building up from 6sets by 1 additional set per week to 10 sets, 3 times per week in week 8. The subjects ran 20 meters on flat surface followed by 20 meters of uphill running followed by 10 meter on flat surface, 20 meters of downhill running and finally 10 meters on flat surface.

Results comparing subjects training on flat surface to the uphill and downhill subjects showed significant change in improved stride frequency, decreased contact time, increased maximal running speed and decreased step time. All of this to suggest that the incorporation of the two methods together can have a significant effect on running performance.

Baechle. Earle. (2000). *Essentials of Strength Training and Conditioning*. IL; Human Kinetics.

Paradisis, GP, Bissas, A, and Cooke, CB. Combined uphill and downhill sprint running training is more efficacious than horizontal. *Int J Sports Physiol Perform* 4:229 – 243. 2009.