

Damien Howell Physical Therapy

Too long a stride can cause injury

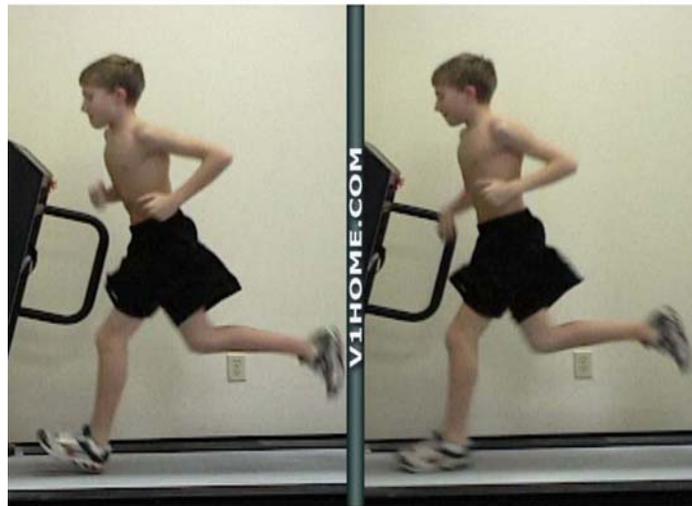
There are two mechanisms we can use to run faster, a longer stride length or increase the cadence of strides lengths. Stride length is the distance between sequential point of initial contact by the same foot. Stride length is a function of the stature, of the runner's legs, the longer the legs the greater the potential for a longer stride. The amount of motion available at the hip and knee joints affects the stride length. Short hamstrings and/or hip flexor muscles can limit stride length,

Other factors, which directly influence stride length, are the physiological conditioning, level of fatigue, and neuromuscular coordination. A stronger runner can hold the optimal stride length for longer periods. A fatigued runner has difficulty achieving and coordinating optimal stride length.

In my experience novice runners or beginning runners have difficulty identifying the most efficient and optimal stride length. As novice runners strive to find the optimal stride length two mistakes can occur, too long a stride or too short a stride. The more frequent error a novice runner makes is too long a stride.

Too long a stride is highly correlated with the development of shin pain, stress fractures, knee pain, heel pain, and hip/low back pain.

Too long a stride occurs when the foot strikes the ground in front of the knee. The foot leads way out in front of the center of gravity of the body, usually with the heel striking the ground first. If the foot is in front of the knee when it strikes the ground, the knee is usually straight making it very difficult to absorb force.



On the left is faulty form too long a stride. Foot strike is a heel strike. Foot strike is in front of the knee. On the right is optimal stride length. Foot strike is the entire foot and under the knee.

A simple experiment will demonstrate the adverse effects of too long a stride. Run in place. Next run in place and purposely land on your heels first. Immediately, you recognize this is very uncomfortable. It feels very jarring, hard on the heels and strains the shins in order to hold the foot up. This is analogous to running with the heel strike instead of landing on the whole foot, often described as landing on mid-foot.

A simple solution for too long a stride is to avoid landing on the heel, and land on the whole foot or mid-foot. As a youngster I remember coaches telling me if you are going to run longer than 800 meters you are suppose to land on your heels and roll up on to the toes. This is a myth and incorrect. The same coaches told me “don’t drink water when you exercise it will give you cramps”.

Most runners will revert to too long a stride when fatigued. An interesting study filmed elite runners in the Boston Marathon filmed runners during the first 5 miles when they were running 4:50 minutes/miles, and the filmed them in the lasts 5 miles when they were running 5:05 minutes/mile. You would expect that when running the faster pace that their stride would be longer, but when the runners were running slower pace in the last 5 miles is when their stride was longer. It makes sense when fatigued that we have greater difficulty holding correct form. Therefore, even experienced runners are susceptible to over striding when fatigued.

To become a better runner it is necessary to practice correct running form. Learning correct running form is enhanced with feedback. Focus on foot strike and avoid striking ground with heel first. Watch your running form in a mirror when running on treadmill. Increase the incline on the treadmill. It is difficulty to heel strike running up hill. It is a challenge to avoid heel strike when running downhill. Seek feedback from your running buddy as to whether you are heel striking or not. The best form of feedback is slow motion video either delayed or real time. With digital technology video feedback can be projected on wall in front of treadmill while you are running in order to provide real time feedback of what running form looks like from a side view or from behind.