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Efficient Running Mechanics

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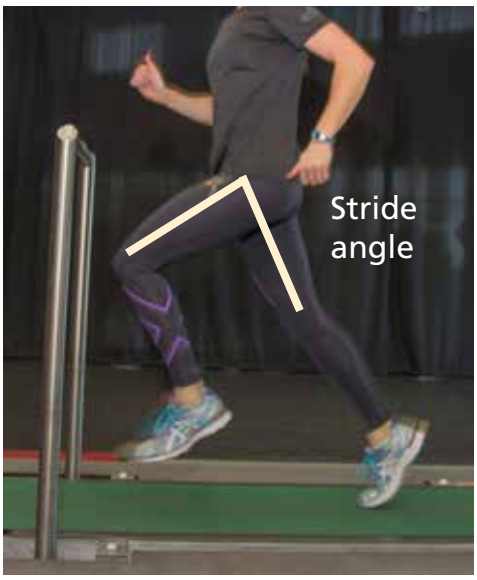
In my experience, most runners want to get the most out of each stride they take with the least amount of effort. In order to accomplish that, I like to start by teaching individuals how to develop efficient running mechanics.

Learning to run with proper technique generally means a person can run longer and run safer.

Below are my four priority areas of focus.



Stride angle.

This is the angle formed by your thighs at toe off. In the world of efficient form we like to see this angle as large as possible. Most professional runners have a stride angle of 80 degrees or larger. However, in recreational runners a stride angle between 60 to 65 degrees is considered adequate.

Since most people do not have a video or a photo of themselves running in this position, this most likely will not be measured for an exact number. However, there are still ways to open up a stride to be more efficient. Improved stride angle is accomplished through two key modifications; rear leg extension and a higher knee drive in the front leg.

Rear leg extension requires flexibility in the hips so you can extend to achieve a long push off. Good forward knee drive requires sufficient strength throughout the hips to drive the knees higher and in a linear path. This will also set the leg and foot up for an ideal foot strike position, which we will discuss in more detail below. Simple running drills like uphill repetitions, high knees, butt kickers and high skips will help to increase stride angle.

Arm carriage.

This is one of the most important components in developing efficient mechanics. This is vital since what happens in the upper body affects motion in the lower body. The good news is that correcting arm carriage is one of the easiest things to change. Movement of the arms and hands should come from the shoulder. The elbows should

be flexed between 90 and 110 degrees, which means the hand will brush past your waistband or hip with each swing. Ideally the hands are relaxed as they drive toward the hip on the back swing then propel up toward the shoulder or chin on the forward swing. The faster you run, the higher your hands will travel.

However, regardless of how fast you are running your arm movements should always come from the shoulder and follow the same directional path. The most important key is not allowing the hands to cross the midline of the body. Crossing over causes additional rotational motions throughout the body. Those rotation movements decrease running economy and may lead injury.

Foot strike has been extensively discussed in the world of running. Many coaches teach that mid- foot placement is a must. However, this is not always the case. If an athlete has a good shank (lower leg) angle upon contact it is equally safe and efficient for initial contact to take place at the heel or the mid-foot. An ideal shank angle is when the lower leg, or shin, is perpendicular to the running surface upon contact. When shank angle is adequate a runner will strike the ground while the foot is already moving in a rearward direction. The knee will also be slightly flexed in order to safely absorb impact forces. Because of the tendency for some heel strikers to contact the ground with a rigid knee, heel striking has been given a bad rap.

Another important component to foot strike is step width. Your feet should NOT cross the midline of your body at any time. Because the upper and lower body counter balance one another, cross over in the feet may lead to cross over in the arms. So, the benefit to the counter balancing act is that working on linear arm carriage tends to improve a narrow step width position.

One last consideration in foot strike is pronation and supination. Pronation and supination refer to the outward and inward motions of the foot throughout foot strike, the support phase and toe off.

Some pronation and supination are expected and are efficient. Upon contact a runner will strike more on the outside of their foot (supinated). The foot then rolls inward (pronation) to absorb forces and prepare for propulsion at toe off. With adequate pronation a runner can evenly push off the front of their foot. Because specific running shoes and orthotics have been made to help control the amount of pronation and supination a runner may achieve, many runners who have excess outward and inward movement find relief by trying a different shoe or an inexpensive orthotic.

The mid-section or trunk, pelvis and hips are vital to efficient running mechanics. The core of the body is responsible for increasing the amount of force runners develop to propel themselves forward. Also, stability in the trunk, pelvis and hips to eliminate rotational movements will decrease the risk of common running injuries. Keys to mid-section stability are strength and range of motion within the hips, muscular strength in the back and sturdy lower abdominals.

Changes from two to six degrees in the trunk are considered common and efficient. A runner's trunk should be more upright (running proud) during push off and more forward during the support phase.

The pelvis should be neutral and stable throughout the entire gait cycle. This is best accomplished through core strengthening exercises with the pelvis in the neutral position during each repetition.

Finally, the hips should be strong and flexible for adequate range of motion and to eliminate excessive motions that are inefficient.

Thinking about these four concepts and adapting where necessary will make any runner more efficient. Remember, running is a skilled movement pattern that should be evaluated on occasion no matter how talented or how experienced of a runner you are.

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