



Running ability, skill and overall technique is known as biomechanics, of which foot strike is just one component.

Michelle Lacey, of Physiotherapy Works, Naas, explains what foot strike means and describes its varying forms

Michelle Lacey
Chartered
physiotherapist,
Physiotherapy
Works



Strike Pose



So, we all know how to run – we do it as soon as we, well, learn how to run! Some research has indicated that when we learn, we naturally try to run with the best efficiency, known as optimal running economy. However, some runners may have been told to modify their foot strike to improve running economy and overall performance. Running ability, skill and overall technique, known as biomechanics, have numerous components and foot strike is only one of these.

Categories

Foot strike is the part of the foot that first makes contact with the ground as a runner goes through the running cycle. It can be divided into three categories:

- » Rearfoot strike, in which the heel contacts the ground first (heel-toe running);
- » Mid-foot strike, in which the heel and ball of the foot contact the ground simultaneously; and
- » Forefoot strike, in which the forefoot or ball of the foot contacts the ground first.

There is huge variety in runners' biomechanics and, therefore, there is no one-size-fits-all when it comes to having the perfect foot strike. Running instructors and coaches may encourage runners to change to a forefoot running technique, however, there is little evidence to conclude that changing to a forefoot strike will result in fewer injuries.

Patterns

It has been demonstrated that the majority of endurance runners have adopted a rearfoot strike pattern. This may be due to an attempt to minimise energy used and that faster runners tend to adopt a forefoot strike pattern, which may be due to an attempt to run faster while using more energy. Therefore, foot strike pattern may be task-specific and an individual's foot strike may vary depending on surface, distance, and essentially the goal of each run. It cannot be generalised that one type of foot strike is better than another or that one is right or wrong, rather that they load the tissues in different ways.

There is evidence to suggest that different strike patterns will place stress on different parts of the body, for example a forefoot strike will load the foot and ankle more, whilst a rearfoot strike will load the hip and knee more.^{1,2,6} With a rearfoot strike we will see increased activity in the front of the shin (the tibialis anterior muscle) and with the forefoot strike we will see increased activity in the calf complex (gastrocnemius and soleus muscles).

Changing pattern

If a runner was to change strike pattern it will simply shift the load to another part of the body. Injury rates may be similar across different foot strike patterns however it may be that we see different types of injury for different strike patterns. For example, you may be more likely to get a knee injury with a rearfoot strike and a calf, foot or ankle injury with a forefoot strike.

There may be an increased risk of injury if we suddenly change our foot strike pattern, so if we move from one to another. This is because we would be suddenly loading tissues with significantly more in a different area. It is this sudden shift in strike pattern, along with a multitude of other training variables that may cause injury, not the foot strike itself.

here are numerous factors that can contribute to injury, however, a sudden change in any of a runners' training variables (such as volume of training, frequency of training, intensity and type of training) will generally be a contributing factor.

Safer

Depending on a runner's reason for changing their foot strike, there may be safer and more effective ways to achieve a change in running technique. For example, if a runner wanted to place less stress on the knee, rather than adopt a forefoot strike they may benefit from decreasing stride length. Should any runner decide they want to change foot strike pattern it is advisable to do so slowly and seek the advice of a physiotherapist to guide you through the process. Remember all runners have their own form and pattern, what suits one runner may not suit another, and with each comes a possible risk but also a possible reward.

References are available on request.

