

# In sports, it all starts with the feet

A journey of 1,000 miles starts with "that first step." So it is with sports.

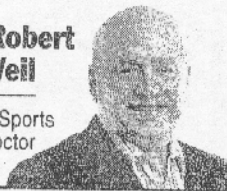
It starts with the feet — running, jumping, starting, stopping and balancing. Virtually all movement involves your feet and their ability to do some amazing things. Often taken for granted, the foot is a mechanical marvel designed to perform some specific functions during the so-called gait cycle.

The terms pronation and supination describe normal positional changes in the foot and ankle that we'll define as follows: every step you take when walking can generate about half to two-thirds of your weight up the feet and legs. When running or jumping, those forces can be multiplied by three to five times. The ability of the foot to dissipate these forces as the body's first major shock absorber is extremely important.

Pronation is the positional changes that the foot attains to loosen up the joints under the ankle to allow this shock absorption. Pronation also allows the foot to adapt to the ground surface. Once the body passes over the foot this loose bag of bones (pronation) becomes a stable structure as the foot becomes a rigid lever to propel the body forward.

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This lever position is called supination. Many so-called overuse injuries like plantar fasciitis (arch and heel problems), shin splints, runners or jumpers knee tendonitis) are related to abnormal forces associated with foot position changes.

Flat feet, many times associated with too much foot pronation, can cause the expected push off or supinated phase to be either too late or absent totally. Abnormal strain to the structures of the feet and legs can result from this. Since inward rotation of the lower leg accompanies pronation of the foot, problems with shins and knees can result from this increased torque caused by excessive foot pronation.

Examination of the individual standing, walking or running can reveal specifics about these foot positions and mechanics. Identifying weak links in the alignment of the foot, ankle, knee and hip structures can be very valuable in preventing overuse injuries. Stability

tests like single leg balance and squat positions can give good information.

Why does one person over pronate and can be prone to overuse injuries while another functions more normally and is less prone? Often it's genetics or inherited foot structure. Blame your parents if you have excessive pronation. Women, because of their hormonal make-up, have a tendency to be loose jointed. Because of this laxity of ligaments, also often inherited, excessive pronation can be a problem even with good foot structure. High arch feet can also cause problems related to over supination. Limited shock

absorption can cause strain to ankles, knees, hips and back. This foottype also is often inherited from mom and dad.

By far the best method to properly deal with these timing of foot position abnormalities is with the use of prescription in shoe orthotics. Made from positional molds of the feet, these devices allow the

optimum alignment of the foot and lower legs to be obtained. Orthotics can help to get the feet in the proper position at the proper time. If the foot supinates (becomes a rigid lever) at the right time, then speed, stability, balance and function improve. When excessive pronation is controlled, strain to the foot, shins and knees are lessened.

In the past, orthotics were often confused with

arch supports. The thinking was that supports would "hold up" flat feet. If the feet didn't hurt, they weren't considered. Today, we understand that it's not support but alignment and positioning that counts and that's the role of prescription

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orthotics. Often people, athletes or not will ask, do I need orthotics? It's better to ask would I benefit? Almost all athletes do.

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