

# ***Orthotics and Performance Enhancement: Can a properly fitted orthotic enhance athletic performance?***

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Many athletes know that orthotics can help to “fix” an injury, but that person who just blew past you may be using them to increase their performance!

There exists both clinical and scientific evidence that custom fit orthotic inserts can reduce and/or prevent movement-related injuries, especially those caused by cumulative trauma sustained in activities such as endurance running. On average, the literature reports that between 70% and 80% of athletes respond positively to treatment of a variety of injuries with orthotics. These stats alone should entice athletes to consider the use of this treatment modality. Recently however, scientific research has shown that orthotics may not only help symptomatic injury, but they may also play a role in enhancing performance in athletes!

Traditionally, one of the main reasons for orthotic prescription was to align the skeleton, thus removing joint stress. However, many recent studies suggest much uncertainty about the ability of inserts or orthotics to align the skeleton. It appears that changes in skeletal alignment due to orthotics are extremely minimal. In fact, foot and ankle alignment seems not to be a predictor of increased susceptibility for movement-related injury.

Current evidence based theories suggest that the presence of orthotics produce adjustments in the muscular response of the locomotor system. Quite simply, when the foot strikes the ground a force is transmitted through the shoe into the lower extremity. This produces a neural signal that is transmitted to the spinal cord and then up to the brain for processing. From there a signal is sent back down to the muscles of the body, including those in the foot and leg, as to how they should respond to this force in order to optimize the mechanics of movement.

The use of orthotics, specifically their material properties, produces adjustments in this muscular response such that it will result in a minimization of muscle activity by two mechanisms. The first is by helping to stabilize the joints (so the muscles don't take on this sole responsibility), and the second is by minimizing soft tissue vibrations that occur as a result of the force that must be reduced by muscular contraction. Therefore in a sense, they function by altering the incoming input signal or by 'tuning' the muscles for the task at hand. Based on the above concept, a properly fitted orthotic would reduce muscle activity (therefore sparing some energy to be used elsewhere during an event), add comfort, and increase performance.

Does this mean that orthotics are suited for everyone? No. Are all orthotics created equal? ... Absolutely not! As an athlete, you should be aware of selecting practitioners who are properly trained in sports injury management to properly assess your biomechanics in order to help you determine your need for an orthotic and how it should be made. By doing so, you can ensure proper fit, comfort, and possible enhancement in your performance at your next event.