Some answers about orthotics: Researchers examine effectiveness of shoe inserts

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It's one of those mysteries that has baffled runners and running doctors for decades: Why do orthotics work?

Orthotics are commonly prescribed for painful conditions like plantar fasciitis, and, anecdotally, people swear by them, however scientists aren't exactly sure how they work. A recent study by University of Calgary Faculty of Kinesiology researcher Reed Ferber, PhD, published in the *Journal of* Foot *and Ankle Research*, suggests that to this point, scientists have been measuring the wrong thing.

"This was the first orthotics study to use a multi-segment foot model," explains Ferber, who is also the Director of the Running Injury Clinic. "We modeled the plantar fascia and measured strain, with and without orthotics. All previous orthotic research has really only involved rear foot motion, putting markers on the heel, and studying the rear-foot. What we found was that an over the counter orthotic reduced plantar fascia strain by 34%. This is the first paper to suggest a potential mechanism by which orthotics work."

The plantar fascia is the thick connective tissue that supports the arch, running from the heel to the ball of the foot. When it becomes inflamed, it is the source of the painful condition plantar fasciitis that affects an estimated one million Canadians annually. Ferber's study modeled the plantar fascia and compared the strain between two points, with and without an over the counter orthotic, (donated and manufactured by SOLE Footbeds.) The study found that 17 out of 20 subjects had an average reduction in strain of 34%.

"This is obviously a significant reduction and I think it's going to help improve treatment," Ferber says. "Right now, a doctor would look at a person's feet and say, 'Oh that's a normal foot, and you're probably not going to do well with a pair of orthotics.' Now we have evidence that they actually would benefit because we know those orthotics are not just designed to control heel motion, they also reduce strain on the plantar fascia," Ferber explains. "The study should also educate the public a little more about the benefits of orthotics and suggests that a $50 pair of orthotics could potentially be as effective as a $400 - $500 pair."

Ferber says that future studies will examine the effects of insoles on people suffering from plantar fasciitis and for people with abnormal arch structure - for example people with extremely flat feet.

"This research helps us to optimize our rehabilitation of injured runners," Ferber says. "By understanding the relationship between foot structure, strength, mechanics and flexibility, we can analyze this scientific data and determine the best treatment for you, which is why we do this research in the first place."

More information: The paper "Changes in multi-segment foot biomechanics with a heat-mouldable semi-custom foot orthotic device" by Reed Ferber and Brittany Benson is available online at: www.jfootankleres.com/content/4/1/18

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