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More Evidence Supports Barefoot Running

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If you're a runner, start striking with your forefoot. And wear those goofy minimalist shoes while you're at it. Your body will thank you.

Those are the findings of a pair of studies by Daniel Lieberman, a professor of human evolutionary biology at Harvard University. He found runners who use a forefoot strike face a significantly lower risk of repetitive stress injuries, and [barely there running shoes](#) produce more efficient movement than conventional kicks.

The two studies, published this month in the journal *Medicine & Science in Sports & Exercise*, come less than two years after Lieberman's earlier work found runners wearing minimalist shoes put less force into the ground, therefore less force on their bodies, when striking the ground with their forefoot versus their rearfoot.

The findings add to a small but growing body of research that suggests the best way to run is the way our forebears did: sans shoes. It's a controversial notion, one that has prompted no end of debate as many runners complain minimalist shoes led to injuries and problems.

First, to the rearfoot/forefoot breakdown. In "[Foot Strike and Injury Rates in Endurance Runners: A Retrospective Study](#)," Lieberman analyzed 52 collegiate cross-country runners to compare rearfoot (heel-first) versus forefoot (ball-first) strikes.

Of those, 36 runners (59 percent) used a rearfoot strike. Lieberman considered the injury history of each runner — examining the severity of past injuries and rate of mild, moderate and severe injuries per mile — and found rearfoot strikers twice as likely to experience a repetitive stress injury.

"Competitive cross country runners on a college team incur high injury rates," the report

concludes, “but runners who habitually rearfoot strike have significantly higher rates of repetitive stress injury than those who mostly forefoot strike.”

Neither type of foot strike was more likely to produce a traumatic injury, the study concluded, and Lieberman did not examine causal reasons why rearfoot striking proved more harmful. But he did develop an hypothesis for the results.

“The absence of a marked impact peak in the ground reaction force during a forefoot strike compared to a rearfoot strike may contribute to lower rates of injuries in habitual forefoot strikers,” the report states.

The study, “[Effects of Footwear and Strike Type on Running Economy](#),” lends further credence to the benefits of minimalist shoes.

Runners wearing minimalist shoes were 2.41 percent more economical in their movements when forefoot striking than those wearing conventional shoes and 3.32 percent more economical when rearfoot striking. All data was controlled for stride frequency and shoe mass.

In determining these stats, researchers measured the cost of transport (milliliters of oxygen over kilograms over meters, or mlO₂/kg/m) in people who typically wear minimalist shoes or run barefoot as they ran 3.0 meters per second on a treadmill. Force and kinematic data were collected in minimal and traditional running shoes to quantify differences in knee flexion, arch strain, plantarflexor force production and Achilles tendon-triceps surae strain.

The cost of forefoot and rearfoot striking was not significantly different for either minimal or standard shoe running. However, arch strain was much greater during forefoot striking than rearfoot among those wearing minimalist shoes. The same held true for plantarflexor force; Achilles tendon-triceps surae strain and knee flexion were lower in minimalist shoes.

Despite evidence supporting minimalist footwear, there are vocal critics of the trend. Lieberman’s latest studies are sure to renew the debate.

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