

Running barefoot may increase injury risk in older, more experienced athletes

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In recent years there has been an explosion in barefoot running, as well as the purchase and use of "minimalist" running shoes that more closely resemble barefoot running by encouraging the balls of the feet, between the arch and toes, to hit the pavement first. A new study presented today at the 2015 Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS), found that a significant number of experienced runners, age 30 and older (40 percent of men and 20 percent of women), maintained a heel-first running pattern—which naturally occurs when wearing a shoe with an elevated heel—when running without shoes. Maintaining a heel-toe pattern while running barefoot or in a minimalist shoe may lead to more frequent injuries.

"Previous studies have demonstrated that an adolescent runner's foot strike is heavily influenced by their [running](#) shoe," said orthopaedic surgeon Scott Mullen, MD, the lead author of the study. "Young [runners](#) quickly adapt to a forefoot strike pattern when running barefoot, whereas a heel strike is normally associated with wearing large-heeled training shoes."

In this study, a team of researchers from the University of Kansas Department of Orthopedics and Sports Medicine measured the heel-to-toe drop of 26 runners, all age 30 or older with at least 10 years of running experience, when each ran in a traditional running shoe, and again when barefoot. The heel and forefoot thickness was measured at running speeds of 6, 7 and 8 miles per hour (mph) for women, and 7, 8 and 9 mph for men. A motion capture system was utilized to analyze

foot strikes by a single blinded examiner skilled in the use of the camera system and running mechanics.

Heel-to-toe thickness of the running shoe did not significantly correlate with a change in heel strike, nor did alterations in speed. Running barefoot resulted in a significant drop in percent heel strike at all speeds; however, 40 percent of the men and 20 percent of the women persisted with consistent strike patterns across all speeds with and without shoes.

"Our study indicates that older runners (age 30 and older) are not able to adapt as quickly to running barefoot," said Dr. Mullen. "The inability to adapt the foot strike to the change in shoe type may put these runners at increased risk of injury. Older runners should be cautious when transitioning to a more minimalist type of shoe."

Provided by American Academy of Orthopaedic Surgeons

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