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Toe Running: The Good, The Fad, and The Ugly

By: Molly Quinn-Shea

Compared to most other animal on the planet, humans are pathetic runners. We are not graceful like the deer nor fast like the cheetah. In fact, many have wondered why the homo sapien evolved into an upright figure since that posture is less efficient for running. Christopher McDougall, in his National Bestseller *Born to Run*, hypothesized that early humans were distance runners that outran their prey. *Born to Run*, which has been linked to the rise of the popularity of barefoot running, describes how humans do not use their Achilles tendon efficiently by striking with the heel of the foot.^{7, 8} In hopes of reducing rate of injuries, many runners have modified their running style so that the heel strike does not occur first or at all. Yet, as many have found out, this alteration does not always reduce injuries.

First, definitions on all the unique foot strikes must be clarified. Each style is named for which part of the foot hits the ground first. Therefore, heel strike occurs when the heel hits the ground first, midfoot strike occurs when the middle section of the foot hits first, and forefoot running occurs when the forefoot hits first.⁵ Toe running is one form of the forefoot strike yet with this style, the heel never actually reaches the ground.¹ The terms barefoot and forefoot running are used interchangeably because once the shoe is removed, runners naturally adopt the forefoot strike.³ Growing popularity of barefoot running and the minimalist shoes has led not only to an alteration of foot strike, but also an alteration of the biomechanics of the whole body.

One result of an adapted forefoot running style is a more flexed knee, which means the knee is more bent when the foot strikes.² Knee flexion combined with plantarflexion, which is pointing of the toes and foot, during landing leads to higher demands from the Achilles tendon and calf muscles.¹ Compared to a forefoot strike, leg stiffness significantly increases when the

heel strikes the ground first.⁴ Consequently, the ankles receive the impact from the ground and need to be stronger and more stable when a forefoot strike is adopted. In contrast, knees feel more of the impact when a heel strike strategy is adopted.

High repetitive vertical loading rates and high impact forces have been proposed to be the leading cause of running injuries.² The shorter the amount of time it takes to transfer your weight force onto your foot, the higher the impact force. These forces must be absorbed by the whole body and can cause injury to the body. Zoe Storck, a recreational runner from Seattle, Washington, started getting shin splints in high school and they quickly became so painful that she could not run. After transitioning to a toe-strike run, her shin splints pain went away and she continued with this style for three more years. Though a toe-strike worked for Zoe, research attempting to explain how different foot strikes alter loading rates and impact forces provide conflicting conclusions. An experiment studying the differences between vertical loading rates of the different running styles concluded loading rate with barefoot forefoot strike runners were about half of those who ran with a heel strike.⁵ Daniel Quinn-Shea, another recreational runner from Seattle decided to switch to toe-running after reading about its advantages. Yet, after a few months of transitioning to the toe strike, he started getting back pain which he attributed to the change in his running style. Many other runners, like Zoe and Daniel, altered their foot strike in hopes of reducing injuries, yet in a study of over 1600 runners, there was no significant change in rate of running-related injuries between foot strike patterns.⁹

Despite the lack of consistent conclusions on the effects of toe running, a growing number of runners are switching to a toe strike though 95% of endurance runners naturally heel strike while running.⁹ Shannon Stone Cribby, a physical therapist, states that she will instruct a patient to shorten their stride if the patient exhibits anterior knee pain for it will alter where the

force of running is distributed. Janet Morton, another physical therapist, also chooses to emphasize the cadence and stride length while working with runners instead of the foot strike. She says that she will not try to change a runner's gait unless it has a "significant impact on their injury." Some have hypothesized that toe running shortens the running stride and makes running more efficient, meaning it does not require as much energy as a heel strike while running.⁷ Although this may be true for a sprinter, if a runner does not maintain a 6:25 minute mile, there is no difference on efficiency between either foot strike. In fact, if that pace slows to a 7:36 minute mile, the heel strike is more efficient and requires less energy.⁹

The endless amount of conflicting information on injury rates, energy efficiency, and advantages and disadvantages of toe versus heel strike running has resulted in misinformation reaching the general public. It is no surprise that toe running gained so much fame, especially after The Activist Times named Skora Phase X, a shoe used while toe running, the best running shoe of 2013. Lack of consistent evidence supporting or opposing either style leads runners to turn to the media for advice. Yet after interviewing multiple physical therapists and recreational and competitive runners, it is clear that there is actually no universal best way to run. Instead of being guided by trends in the media, runners must focus on their own unique gait pattern and train for, develop and perfect whichever foot strike that is most natural to them.

Transitioning from one running style to another should be gradual as each foot strike alters the mechanics of the whole body. It is not just the foot strike that can be altered and strengthened, it is also the cadence, ankle and knee stability, hip alignment, core control, posture, and arm swing. Healthy running practices for a forefoot runner include strengthening of calf and foot muscles combined with stretches after running so that the Achilles tendon does not get too tight. However, healthy habits for a heel strike runner involve developing hamstring and gluteal

muscles, as they are often outbalanced by strong quadriceps muscles. Additionally, all runners and athletes need to practice core and upper body exercises to develop a stable upper body. Scott Jurek, a physical therapist and a champion ultramarathon runner, notes in his book *Eat and Run* that an important part of running that is often forgotten is posture.⁶ Running technique, just like every other sport, needs to be taught and trained. These healthy training practices, combined with tall posture and activated core, have proven to be the foundation of great running patterns. Toe running may turn out to be a short lived fad if runners do not apply a training plan to help them transition safely. If humans are born to run, we need to remember what Christopher McDougall said, “Running isn’t bad for you — but running poorly is.”⁸

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