



The Barefoot Running Phenomenon

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LAST SUMMER CHRISTOPHER MCDUGALL CAME TO TOWN TO GIVE A TALK ABOUT HIS BOOK “BORN TO RUN”. THIS IS THE BOOK THAT GAVE RISE TO THE BAREFOOT RUNNING CRAZE AND SPURRED THE POPULARITY OF PRODUCTS LIKE THE VIBRAM FIVE FINGER® SHOE/SOCKS, NEW BALANCE MINIMUS® RUNNING SHOES AND FUELED A NEW (OR OLD) REVOLUTION IN RUNNING TECHNIQUE AND SHOE CONCEPTS. ABOUT A MONTH AFTER MR. MCDUGALL’S VISIT THE MAIN CHARACTER IN THE BOOK, MICAH TRUE, CAME TO BOISE AND GAVE HIS VERSION OF THE STORY OF THE TARAHUMARA TRIBE IN MEXICO AND ABOUT HOW THESE AMAZING ATHLETES COULD RUN ALL DAY, APPARENTLY INJURY FREE, IN JUST A PAIR OF SANDALS MADE FROM OLD CAR TIRES. MY DISCUSSIONS WITH THESE MEN BROUGHT TO LIGHT A FACT THAT MANY IN THE PEDORTHIC COMMUNITY HAVE KNOWN FOR YEARS, THAT ELEVATING THE HEELS ON RUNNING SHOES MAY CREATE RISKS FOR RUNNERS.

While we know it is possible for some runners to train themselves to be able to run minimally shod over great distances, this begs the question “why would you, what is the benefit?”

The trend toward barefoot and minimal running, championed by McDougall’s book, has created some passionate debate, new shoe designs and at least a couple of studies including the “Harvard Study” by Daniel E. Lieberman, Madhusudhan Venkadesan, Adam I. Daous and William A. Werbel. In this piece, underwritten by Vibram, the authors make the point that humans can and did run barefoot and that habitually barefoot runners avoid heel striking thus minimizing impact transients that may cause injury.

So, here are few things we know:

1. If you remove your shoes and run unshod on the pavement you will generally not heel strike. This is because there is no spring mechanism in the calcaneus and the fat pad is not sufficient to dissipate the resulting shock.
2. The natural technique of running barefoot tends to be a mid to forefoot strike.
3. If you are going to heel strike while running, the shoe needs to provide enough cushioning to reduce shock. This is why many modern running shoes have 10 to 12mm of heel rise, to allow for shock absorption, using air, gel, peanut butter, tofu or what ever to absorb the impact.

While it can be claimed that activities like running barefoot can be helpful in developing muscle tone in the feet and improve running form, as a pedorthist who treats overuse injuries all day, I believe it is only a matter of time before an injury will occur. Consider this; there are virtually no Americans who run or walk barefoot all day. Even our elite ultra-marathoners are not runners like the Kenyans.

These world class athletes get up in the morning, have a cup of coffee, read the paper and then may go out for a nice long run, possibly in minimal footwear. After the run they likely sit at a desk or on the couch or in the car. They do not run all day long and when they are not running they are probably in traditional footwear.

While we know it is possible for some runners to train themselves to be able to run minimally shod over great distances, this begs the question “why would you, what is the benefit?” The fundamental issue is not if we can run barefoot but rather what we can glean from this new movement that will help us to reduce the injury rate among runners and pedestrians alike. My anecdotal conclusion as a pedorthist is that wearing footwear that provides protection and support for the foot has distinct benefits over barefoot or minimally shod feet.

The other epiphany is that shoes in general should have little if any heel rise. I routinely recommend the new Altra “Zero Drop” running shoes as an alternative to conventional walking and running foot attire. I also suggest Birkenstock sandals for people to wear as house shoes. I have found that by reducing heel height in our daily footwear we reduce the excessive pronatory motions in the closed kinetic chain and promote stretching in the posterior compartment thus reducing the risk of injury.

Pedorthists know that the higher the heel height on a shoe the greater the load on the fore foot. This is considered when treating issues like neuromas and bunions. It is also known that walking around with elevated heels promotes a shortening of muscles and tendons in the posterior compartment that can contribute to injuries like plantar fasciitis and Achilles tendonitis. Perhaps the greater risk, however, may be the acceleration of the pronatory motion and internal tibial rotation that occur during the midstance phase of the gait cycle.

When the heel meets the ground the foot moves from a condition of supination toward maximal pronation. The force and intensity of this motion is directly affected by how early the heel comes in contact with the ground. Elevating the heel of a shoe

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by a mere 8mm to 12mm, the heel rise in most conventional running shoes, can cause premature heel strike among all but the most pronounced toe runners and walkers.

When the initial foot contact with the ground is the heel, a lever arm is created with the calcaneus as the fulcrum. As the center of mass moves distally from the fulcrum the force increases which exaggerates the speed and intensity of the pronatory motions of eversion, adduction and dorsiflexion. It is this tri-planar motion of the foot that cause the internal rotation of the tibia which, in turn, can cause exceptional knee and hip motion. Excessive internal rotation in the closed kinetic chain is the cause of such common running

injuries as shin splints, Iliotibial band inflammation and hip pain.

As a pedorthic practitioner, I describe virtually every foot related problem as an over use injury. I justify this because it is our activities that likely caused the problem. I explain that there are three things that contribute to the over use injury: age, weight and activity; any one, two or all three of the above. Once we have identified the cause(s) we can start to discuss the appropriate footwear for different activities. This puts the issue of heel height, support and protection squarely in the middle of the footwear discussion and encourages patients to consider appropriate footwear for the activities they are designed for. ■



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