

EXERCISE AND SPORT SCIENCES REVIEWS



ESSR Journal Club

Covered Article: “What We Can Learn About Running from Barefoot Running: An Evolutionary Medical Perspective” by Daniel E. Lieberman
Exercise and Sport Sciences Reviews. 40(2):63-72, April 2012.

Journal Club Author: Walter Herzog

1. In his paper, Dr. Lieberman contrasts running forms for barefoot and shod running. What are some of the conceptual differences in the mechanics of barefoot and shod running that have been observed?
2. It is argued that about 30%-70% of runners get injured each year. What are the most common running injuries? And although there is little consensus on the actual causes of running injuries, what are the most common causes associated with stress related running injuries?
3. The running injury rate has remained remarkably stable over the past 30 years. What are some of the proposed reasons why running injury rates have not declined despite intense efforts in running shoe development and biomechanical research on running injuries?
4. Dr. Lieberman puts forward a series of hypotheses why running barefoot might cause less injuries than running in shoes. What are some of these hypotheses? How were they tested? And have they provided unequivocal answers to the proposed hypotheses? Also, what are some of the advantages/disadvantages in terms of performance between barefoot and shod running?
5. Dr. Lieberman studies running from a medical evolutionary point of view. In that context he mentions the mismatch hypothesis. What is the mismatch hypothesis? Give examples for how it relates to running in modern running shoes? And give examples how it might relate to phenomena other than running? What other evolutionary pressures (aside from the proposed medical evolutionary view) might have been in place to have formed the technique of how we run?

Continued on next page

EXERCISE AND SPORT SCIENCES REVIEWS



6. Runners can be divided into two basic categories in terms of how they place the foot on the ground during the stance phase: rear foot (or heel) strikers and mid-(fore-) foot strikers. The former strike the ground with the heel first at touchdown, while the latter strike the ground first with the mid- (or fore-) foot. What are some of the basic biomechanical differences between heel and mid- (fore-) foot strikers, especially in terms of the ground reaction forces, and the stride length/stride frequency relationship? What kind of stress-related running injuries would you expect for a heel strike runner and a mid (fore-) foot strike runner? What are some of the injuries that might occur when a heel strike runner switches to a fore foot running technique? Why do you think most world class long distance runners are fore foot strikers while in the general population, most people strike the ground with the heel first?
7. Dr. Lieberman argues that running form might be an important predictor for running injuries. What factors are likely to affect running form and can, to a certain degree, be controlled by runners?
8. According to Dr. Lieberman, one of the most significant changes in the modern running shoe (compared to older versions of minimal running shoes) is the cushioned and elevated heel. How does a cushioned and elevated heel affect running form? And how might this change in running form affect the rate of running injuries?