

The Use of SOLE[®] Ultra Footbeds Reduces Pronation and Impact Forces in Worn Running Shoes



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Research Overview

This research examining the influence of SOLE Ultra Footbeds on running biomechanics in worn running shoes, demonstrates:

- *After only 100 miles of use, the running shoes provided less support for the foot as compared to the SOLE footbeds.*
- *The use of SOLE footbeds results in a positive maintenance of running gait mechanics.*
- *SOLE footbeds may represent a cost-effective strategy to increase shoe life without sacrificing arch support and stability.*

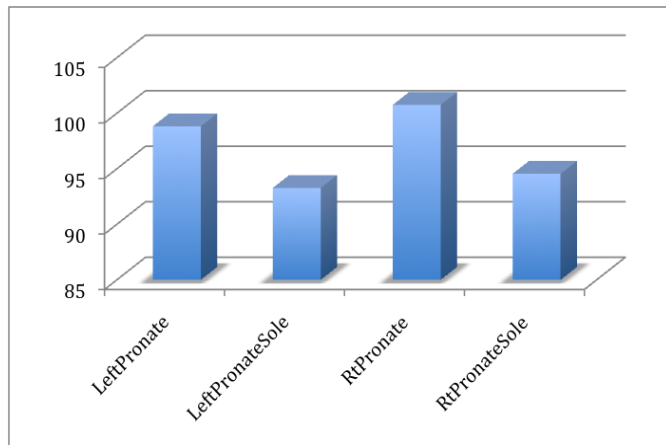
SOLE Footbeds

SOLE footbeds are moldable inserts promoted as potentially reducing foot dysfunctions or problems including plantar fasciitis, joint pain, back and neck pain, shin splints, over-pronation, and over-supination (see SOLE company website: www.yoursole.com). Foot discomfort or dysfunction is reported by a large percentage of the adult population. Fostering foot health and minimizing pain can be a valuable aspect of any exercise and activity promotion program. If these footbeds were demonstrated to provide functional benefits, they could be used to address foot problems in a cost-effective way.

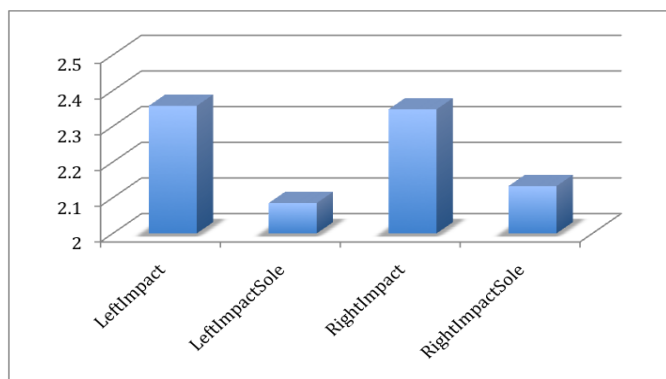
Case-Series Study

To examine the impact of the SOLE Ultra Footbeds on running mechanics, 4 experienced competitive runners were recruited to perform testing in two separate conditions. Each subject had been previously fitted for neutral running shoes, having demonstrated normal pronation during initial testing. Each subject was found to have a slightly low arch. Subjects selected a running shoe comfortable and consistent with their previous use (Nike (1), Adidas (2), Saucony (1)). Subjects were then prescribed a running routine consisting of 20 miles per week for 5 weeks for a total of 100 miles. Following the 5-week running program, subjects were tested in the RACE Rx Academy of Exercise Sciences lab in two separate conditions. For both conditions, pronation and ground impact were measured via Dartfish video analysis and the IDEEA Mini-Sun. Dartfish allows for computer-aided video analysis of gait, in this case pronation during the stance phase, while the IDEEA consists of measurement sensor for movement placed in the arch of the foot. The first condition consisted of running at a comfortable pace for 20 minutes while wearing the running shoe without the SOLE Ultra footbed. For the second conditioning, completed on a separate day, the same condition was repeated with the SOLE footbed inserted in place of the factory insert. Data were then analyzed for differences between the two conditions.

The data demonstrated that, after only 100 miles of use, the use of the SOLE footbed decreased pronation and ground impact forces. Pronation was decreased by 6% while ground impact forces were diminished by 10% when using the SOLE footbed in place of the factory sole insert.



Evaluation of Pronation with and without the SOLE footbed



Evaluation of Ground Impact Forces with and without the SOLE footbed

Implications for Use

The SOLE footbed represents a unique orthopedic application. The footbeds are custom fitted through a process of heating the mold, then placing them in the shoes. The person immediately puts their shoes on, then stands up straight, with feet shoulder width apart for a few minutes. The EVA base layer of the mold shapes to the individual contours of the foot, without allowing the arch to cave in. Because it is molded, runs the entire length of the foot, and has a padded top layer, the SOLE footbed is different from standard orthotics worn by many individuals with foot dysfunctions.

The data collected in this case-series shows that the SOLE footbeds offer superior support as compared to worn running shoes. While testing of the factory shoe sole and arch support were not conducted, and a pre-test measuring pronation and impact in the running shoe when new was not measured, the differences in pronation and impact with the SOLE inserts after only 100 miles of use is dramatic. Both measures represent important findings regarding the value of the SOLE footbeds.

The foot naturally pronates during the running motion; however, excessive pronation can lead to pain and dysfunction in the foot and ankle. An additional factor in healthy function of the foot is the maintenance of the arch. Most people require good arch support, especially during exercise, to avoid long-term arch pain and problems. When the arch falls, numerous foot mechanics begin to be altered. In running, one common change in mechanics that occurs when the arch begins to fall is greater heel impact. This impact creates greater forces on the ankles, knees, hips, and back during running. It also slows the runner down through “breaking forces” that are generated as the heel makes contact slightly in front of the center of gravity.

SOLE footbeds appear to have a positive impact on both pronation and impact forces, especially in shoes that are slightly worn. They represent a cost-effective pro-active approach to fostering foot health by providing optimal support during exercise. The first functions of running shoes that generally diminish with wear are the arch support and stability (to prevent over-pronation). Other components of the shoe may last 2-3 times longer but the shoe must be replaced as the arch support and stability begin to diminish. With one pair of SOLE footbeds, shoe life can be extended saving money and fostering foot health over time.

About the RACE Rx Academy of Exercise Sciences

The Academy was founded in 2009 by Dr. Matt Rhea and is based in Logan, Utah. Dr. Rhea completed a Master’s degree and PhD at Arizona State University, has completed and published over 50 studies in exercise science, and has received international recognition for his innovative research. He also has over 10 years of experience in the fitness industry focusing primarily on sports conditioning and performance enhancement, consulting some of the world’s most elite athletes and organizations. In his work with the Academy, Dr. Rhea directs and coordinates research on a variety of exercise science topics, with a focused interest in examining products related to health, fitness, and performance. Not only does it conduct research, the Academy also offers a variety of educational avenues to ensure that research information is disseminated to health and fitness professionals in an accessible, comprehensible, and applicable manner. See the Academy page at www.race-rx.com for updated information regarding courses, seminars, and studies.

This was an independent research study conducted by RACE Rx Academy. No financial benefits were provided for this research.

Disclaimer

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