

RUNNING FORM: PAUL LANGER, DPM

“Am I Running Wrong?”



The running form debate has become almost as hot as the barefoot debate recently. On one side are those who are perfectly content and comfortable running with no thought on form and on the other are those who believe that better running form can decrease the risk of injury and improve running performance. Like most issues with two diametrically opposed viewpoints the truth might lie somewhere in the middle. Human movement patterns are highly unique. The ways we walk and run are as singular as our signature. What we all have in common though is that our bodies are programmed to move in the most efficient manner.

There are benefits to certain running form changes. For example, shortening the stride will automatically decrease impact forces and promote a mid- or forefoot landing pattern. This can be beneficial for some runners. But making wholesale changes to running form has not been proven to decrease risk of injury and can actually decrease running efficiency. There are some interesting studies on walking and running that can shed light on the topic.

Noted biologist McNeil Alexander's research has shown that we move in the manner which uses the least amount of energy. This is a universally accepted fundamental of human

gait that needs to be understood and appreciated by anyone who works with runners. Our neuromuscular system will automatically select the most efficient movement patterns for the given conditions. Gait patterns are dependent on such factors as neuromuscular coordination, joint range of motion, fitness level, and body mass index among other things. Even culture and mood are known to influence human movement patterns. Movement patterns are highly variable from person to person. What may be efficient for one may not be for another.

Biomechanist Benno Nigg proposed the “preferred

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movement pathway” (PMP) to build on Alexander’s work. The PMP is a theory based on the premise that each individual has a unique strategy for moving efficiently. Each of our joints has a preferred movement path and anything that causes deviations from that path such a shoe, insole or different running style may cause fatigue and/or increase the risk of injury. Our bodies are very capable of adapting to changing conditions

but will always strive to keep the joints working within a narrow range within the preferred movement pathway. PMP theory helps to explain why runners do not always respond in predictable ways to shoe and insole or gait alterations. When runners are faced with a change such as a different shoe, insole or running form, they will make alterations to compensate for those changes in order to maintain their preferred movement pathway.

A pilot study done at the University of Massachusetts last year incorporates a respect for Alexander’s and Nigg’s work by instructing runners to alter their gait but allowing the runners to select their own manner for doing so. Previous studies have shown that while running form can be changed those changes tend to be lost as fatigue sets in and over time without periodic reinforcement with biofeedback.

This study looked at altering running gait for runners with a history of stress fractures. Previous research has suggested that runners who are vulnerable to tibial (the long bone between the knee and ankle) stress fractures land with higher impact forces than non-injured runners. These impact forces can be measured in the lab using accelerometers and treadmills embedded with computerized pressure sensors.

Because walking and running is so unique there is no clinical definition of normal or ideal gait.

The researchers in this study made a point of not telling the runners how to reduce the impact other than instructing them to “run softer.” The runners were not given any instructions on cadence, stride length, heel/toe landing pattern, arm swing etc. While running on the treadmill the runners then watched a video monitor which gave them feedback on the impact of their footstrike. They had been instructed to try to keep the impact below a set level. It was expected that the runners would self select

the movement pattern that was most efficient for them – which they did. The study showed that the runners were able to lower the impact forces of running by approximately 50% over the course of a 30 minute run. This was a small study on one specific type of running injury so large scale conclusions cannot be drawn from it but it does suggest that this form of gait alteration shows promise for those with a risk of stress fractures.

Recently some footwear manufacturers and retailers have begun offering running form instruction. Most of these running form programs proclaim decreased risks of injury and increased running efficiency. They also promote an idealized running form that we should each be expected to strive for. Because walking and running is so unique there is no clinical definition of normal or ideal gait. Despite the fact that runners come in all shapes and sizes, have varying levels of fitness an running experience, most of these programs

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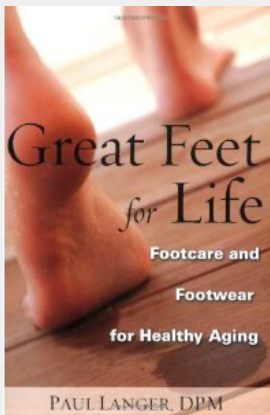
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expect that all can be taught to run in a manner that mimics some idealized running technique.

I use high speed video in my clinic as a gait assessment tool. The video can allow us to see great detail that is missed with the naked eye. When an inexperienced or an injured runner asks me if they are “running wrong” or if they should change something about their gait based on what the video shows I often give them some small things to change such

as shortening their stride if they are injured. But I also cite the above studies and explain that there is no such thing as running wrong. For newer runners I emphasize that running form changes naturally as power develops, running economy improves and speed increases. If they are patient and diligent in their training their gait will naturally evolve but making changes consciously will not necessarily reduce their injury risk or improve running efficiency. ■



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“Great Feet for Life: Footcare & Footwear for Healthy Aging”

Dr. Paul Langer is a podiatrist in practice with Minnesota Orthopaedic Specialists in Minneapolis, MN.

He is a clinical faculty member at the University of Minnesota Medical School and has lectured and been published nationally on lower extremity health and footwear. He is a clinical advisor of the

American Running Association, and a member of the American College of Sports Medicine. Dr. Langer has completed more than 25 marathons and an Ironman triathlon.

While his initial interest in medicine was sparked by his passion for running and endurance sports, he became inspired by the active lives that many of his patients over age 40 were living. Because he received so many questions about foot care and footwear he set out to find a good resource to guide his patients on self care so Dr. Langer spent 2 years researching and writing Great Feet For Life.

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