For Your Health

Ideal Running Form/Style Threshold

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For a competitive runner, it is well established that it is important to be efficient and economical. Running economy can be measured in different ways, but in most instances if a runner consumes less oxygen for a given distance, he is considered more economical. Scientists have identified a number of factors that may be associated with running economy including age, fitness, mechanical variables including running form, neuromuscular skill, ability of muscles to store and return elastic energy, and anaerobic threshold.

Studies have demonstrated that endurance training involving varying techniques results in improved running efficiency. A common training technique to improve running economy is "threshold runs." Threshold runs are based on running at anaerobic or lactate threshold. Running at an intensity which produces lactate (lactic acid) is thought to stimulate production of more mitochondrial enzymes, thereby raising the anaerobic threshold. Anaerobic threshold is considered to be running at 85% of one's maximum heart rate.

Running Form/Style and Economy

More recently, investigators have shown that a twelve-week training program designed to alter running form/technique can improve running economy (Dallam, GM 2005). Two matched groups conducted standard similar training programs but one group underwent specific instruction in running techniques in order to achieve an "idealized running form." The experimental group achieved a higher velocity before lactate threshold was reached. Translation: they could run faster and farther than the control group.

Just as there is a physiologic threshold where the body cannot access enough oxygen, I believe there is a threshold when the body cannot maintain ideal running form, that is, a threshold when the athlete can no longer maintain ideal movement patterns. Movement becomes less coordinated and less than ideal. It is easy to recognize a runner when he/she goes beyond a threshold and his/her smooth, efficient form deteriorates to sloppy struggling movement. This is the point when the runner starts to look bad. The threshold of being able to maintain ideal movement form/style is a function of physiological factors, neuromuscular abilities and our ability to concentrate.

Training to Improve Ideal Running Form Threshold

Endurance athletes can design their training to improve the anaerobic threshold and they can design their training to improve their ideal form threshold as well. To quote our own Richmond running guru Don Garber, "The marathon is every bit as much a mental challenge as a physical one."

In a classic study conducted in 1977, W.P. Morgan proposed the concept of associative and disassociative strategies relative to what long distance runners think about when running. Associative thinking is any thought that is relevant to task performance, for example; monitoring internal state or calculating mile splits. Disassociative thinking is thoughts that are not directly related to task performance, although they may or may not be connected with the task, such as day dreaming or observing the scenery or spectators. Morgan proposed that both strategies were beneficial. Elite runners tend to use associative thinking and non-elite runners tend to use disassociative thinking. Other investigators have demonstrated that the most economical runners report less disassociative thinking when compared to less economical runners (Smith AL 1995). Researchers studying runners in the 1996 London Marathon found that "hitting the wall" was linked with their thought patterns during the race (Clare DS 1988). In particular "the wall" is related to internal disassociative thinking. The more a runner can focus on the task at hand, the better they perform.

When practicing associative thinking, think about the task at hand and focus on running form/style. Check to make sure that foot strike is on the entire foot and not striking with the heel first. Check to make sure arm swing is not excessive, that arm swing is going forward and matches the stride length of the opposite leg. Keep things moving forward, not up and down and not side to side. Check to make sure movement is symmetrical between the right and left sides of the body; keep your head straight. Actively concentrate on minimizing muscular tension; keep your face and hands relaxed. Listen for your foot strike; strive to run like you are sneaking up on someone, run quiet.

The most likely time a runner will look sloppy is when fatigued, therefore, the most opportune and productive time to practice ideal running form is at the end of a work out when you have reached the fatigued state. Plan your workouts so that during the last third of a distance run or the last few intervals, you practice concentrating on maintaining ideal form/style. For some runners, fatigue and lack of concentration do not always occur at the end of the run. Concentration on maintaining ideal form can be practiced throughout the run.

Measurement and documentation of how ideal or faulty your running form is, can be done with photos or video recording. Race photos can help provide feedback to facilitate development of more efficient running form/style. Arrange for visual feedback during some of your training sessions, preferably with video recordings and better yet, with slow motion playback or frame by frame playback. Use of video technology for sports training has become commonplace in sports such as golf, baseball and tennis and has direct application to running technique. Ask training partners and coaches for feedback about your running technique/form.

Quite likely, the physiologic anaerobic threshold is reached at close to the same time the ideal running form/style threshold is reached; however, I believe it is possible to continue to maintain ideal form/style for some time despite the fact that you may have run out of sufficient oxygen. If you are "sucking wind" in the final stages of a run, endeavor to "look mahvelous" (Billy Crystal, 1976). Maintain focus on the task at hand; continue to look good and move well in order to be more efficient.