

Running Gait Efficiency: The Importance of Cadence

The goal of most competitive runners is to run faster. But whether it's running, swimming or biking, one variable that helps make you faster is efficiency, or economy of movement. The more efficiently we move through the air or water, the less energy we expend and the faster we go. When running, one of a few variables you can control which will help improve your efficiency as well as reduce the risk of injury is cadence: how many steps you take during a particular period of time.

Running is a high impact activity and this impact is absorbed and distributed throughout the body via the joints of the feet, ankles, knees, hips, and back and all the muscles, tendons and ligaments in-between. Every time your foot hits the ground during a run it acts as a "brake" and serves to slow you down. Your foot strike is a resistance that must be overcome in order to move forward. The further out in front of your center of gravity your foot contacts the ground, the more braking that occurs. Conversely, the closer to your center of gravity your foot contacts the ground, the less the braking effect, the less resistance you have to overcome and the less energy you expend.

Generally speaking, it is a higher cadence, or shorter stride, that brings the foot strike closer to the center of gravity and improves your efficiency. This shorter stride also serves to reduce the risk of injury by decreasing the force of impact during running and decreasing the pronation, supination cycle time of the foot. By shortening this cycle we reduce the overall workload of the muscles responsible for controlling these movements thereby reducing the risk of overuse injury.

Elite runners and top amateurs have a cadence of approximately 180–186 steps per minute. Obviously not everybody is an elite or high level runner and not everyone is most efficient at 180 steps per minute. For some it may be 162 and others 186. Much depends on speed and other variables. The bottom line, however, is that for most of us a faster turnover rate will translate into a more efficient gait, less impact during the run and a decreased risk of injury. And everybody benefits from that.

Keep in mind that cadence is but one of many variables, albeit an important one, that contributes to greater efficiency of movement when running. By counting your steps and adjusting accordingly, you become a more efficient runner which will help reduce and manage the impact and stresses associated with running, decrease the risk of injury and help improve your times. All of this, of course, will increase your longevity towards an active, healthy and happy lifestyle.

Other variables that will help improve running efficiency include running with a "proud posture", limiting your vertical oscillation, adequate hip and knee bend, and maintaining relaxed shoulders and elbows.

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