



Overground vs. Treadmill Running: Do Runners Use the Same Strategy to Adjust Stride Length and Frequency While Running at Different Velocities?

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### Abstract

Running speed is determined by stride frequency and stride length. As running speed is adjusted, runners make greater adjustments in stride length at slower speeds with a shift to stride frequency adjustments at the faster speeds. The relationship between stride frequency and stride length is largely based on overground research which leads to the purpose of this study to analyze whether the connection of stride frequency and stride length will adjust similar due to changes in running velocity during overground and treadmill running. The protocol was recently approved by The Institutional Review Board and data collection is currently in progress; - thus the following present abstract does not contain data. In order to compare runner's gait pattern responses to velocity changes, two wearable technologies (Garmin Fenix2, Garmin, Kansas, USA; runScribe, Scribe Lab, San Francisco, USA) designed to measure stride length and stride frequency will be utilized. Subjects will run at a variety of velocities overground and then on the treadmill with speeds ranging from slow, preferred, and fast. The main dependent variables will be stride frequency and stride length. The null hypothesis is: The relationship between stride length and stride frequency is similar while running overground and on a treadmill at different velocities. The results of this study will be helpful to runners as well as development of wearable technology used to quantify run metrics.

### Keywords

Endurance running; wearable technology; kinematics; gait patterns



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### **ABSTRACT**

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