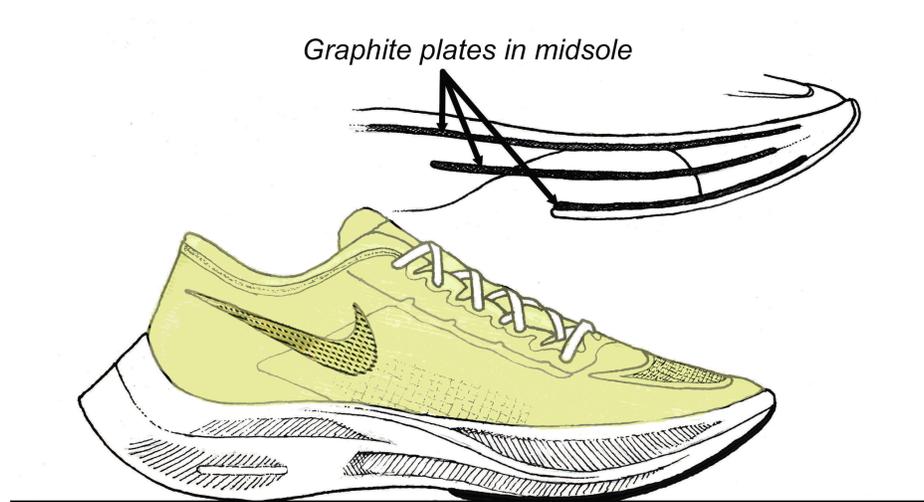


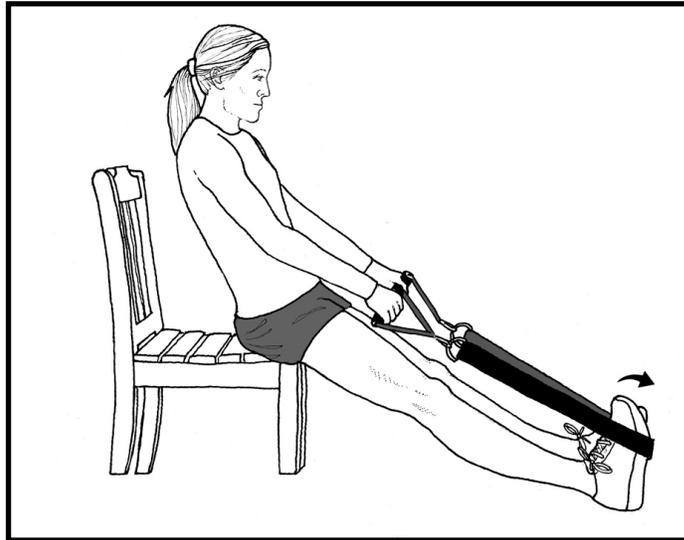
New Research Questions the Value of Running Super Shoes

Running super shoes are made with graphite plates embedded in the midsole of the forefoot, which were originally designed to function like the diving boards that bend and snap back to return the free energy during propulsion. Recent research shows carbon plates do not act as springs and play little to no role in improving running economy (1). The current theory is that graphite plates improve running efficiency by preventing the toes from moving upward during propulsion, which reduces the caloric expense of running by limiting activity of the toe muscles (2). **The problem with this theory is that the toes do a lot of important stuff during propulsion, and limiting their motion can cause problems elsewhere in the body.**



In a 2025 paper published in the *Journal of Biomechanics*, researchers from China (3) evaluated the effect of carbon plates by comparing 3D motion in athletes wearing regular shoes versus carbon-plated running shoes, both before and after fatigue. It turns out that blocking toe motion with carbon plates had serious biomechanical consequences. In a process they referred to as “distal restriction-proximal compensation” the authors discovered that unlike conventional running shoes, the carbon-plated shoes caused significant increases in frontal and transverse plane motion at the hip, particularly when fatigued. The excessive hip motion could greatly

increase the risk of an iliotibial band, iliopsoas, and/or adductor injury. The carbon-plated running shoes also decreased knee stiffness, increased ankle pronation, and increased vertical loading rates, particularly when the runner was fatigued.



Rather than wearing potentially dangerous and expensive super shoes to improve performance, several studies have shown that it is possible to improve running economy simply by performing heavy-resistance prolonged isometric contractions. Albracht et al. (4) recently had 13 runners perform a simple intervention in which they sat with their hips flexed 40°, their knees extended, and their ankle positioned in 5° of dorsiflexion. In this position, the runners were told to do five sets of four near full effort isometric calf contractions in which they spent three seconds building to peak force and three seconds relaxing after each contraction. This exercise was done on both legs, four times per week for 14 weeks. At the end of the study, compared to a control group, the group performing the contractions had a remarkable 16% increase in Achilles tendon strength, which translated into a 4% reduction in the rate of oxygen consumption while running.

Importantly, this 4% improvement in running economy occurred without stressing the hips, knees or ankles, and more than likely reduced the risk of future Achilles injuries. The irony is that researchers have known that tendons are capable of storing and returning significantly more energy than any running shoe, even the new super shoes. As stated by Hoogkamer, the original researcher to discover the 4% improvement associated with super shoes, **“regardless of the shoes worn, in human running, the vast majority of the mechanical energy storage and return occurs within our natural biological structures.”**

References:

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4. Albracht K, et al. Exercise-induced changes in triceps surae tendon stiffness and muscle strength effect running economy in humans. *European J Applied Phys* (2013): 1605-1615.