

NEW SERIES OF JUST DO IT

GREAT ATHLETIC TRAINING EXERCISE SERIES

Do it Right!
Exercises you Should Do

Some People think they do not need to strengthen their legs because they run. That is wrong. Many of the forthcoming exercises in this series are leg strengthening exercises. To prevent injury and improve performance you need to strengthen the muscle. Running alone will not achieve the same results. The amount of muscle growth that you can achieve from just a standard running program is limited. It may occur to a fair degree in novice and older runners. High Intensity Interval Training (HIIT) running and cycling has been shown to increase muscle mass similar to strength training, but they too have limits when it comes to muscle growth. When doing aerobic exercise solely you only strengthen some muscle through limited range of motions. **Considering this I would suggest strength training that works a variety of lower body muscle groups through multiple motions to build tissue capacity in order to improve performance and prevent injury.**

Many of my runners just want to run. I get it. Yes, if you are new to running it may strengthen the lower body to a point, but strength gains are limited where some muscles may get stronger to a point, while other muscles not utilized while running or worked through a limited motion may not. The other issues is that when you run the forces placed on the muscle is for many short instances (fractions of a second), which may not be enough stress/load on the muscle to strengthen it and to cause significant muscle growth. Typically to strengthen a muscle the tissue is under load for several seconds for multiple repetitions to almost failure. So even though the muscle is only worked while strength training for 30 to 90 seconds (10 to 15 repetitions at a 2 second to 3 count with each repetition), a much shorter time than running, it is overloaded maximally for a longer sequence. In other words when strength training the muscle is typically maximally overloaded to volitional exhaustion with each set, while the muscle during running is exposed to high and fast amounts of low level stress. (See more details next page)

As mentioned in previous issue it is very clear that strength training may help in run performance. A [2016 meta-analysis](#) of multiple studies on the impact of strength training on running found a “large beneficial effect” on running economy — the ability to use less oxygen at the same pace — three to four percent less, which is considerable in terms of performance.

Besides improving running economy strengthening increases muscle and tendon mass which increases their respective capacities, which helps prevent injury.

I am not saying that aerobic exercise does not build muscle, I am saying it is limited at building. Although muscle mass growth is limited from running studies suggest it may occur in older runners to a degree (study). One form of running can build muscle, which largely depends on the intensity and duration. In one study, which was the first to demonstrate hypertrophy of the vastus lateralis in a young population following a running protocol, 12 recreationally trained college students completed high intensity interval training (HIIT) involving 4 sets of running at near maximum capacity for 4 minutes followed by 3 minutes of active rest (Study). After 10 weeks of HIIT workouts 3 times per week, they showed close to an 11% increase in the (all out effort) muscle fiber area of their quadriceps (located at the front of the thigh), compared with the control group. Anaerobic workouts like sprinting may benefit muscle growth.

Aerobic exercise like running is thought to build muscle by inhibiting proteins that interfere with muscle growth and decreasing muscle protein breakdown (MPB). On the other hand, long-distance running can significantly increase MPB and thus hinder muscle growth. For example, in a study in 30 male amateur runners who ran 6.2, 13, or 26.1 miles (10, 21, or 42 km), all of the groups experienced significant increases in markers of muscle damage. Levels of these markers rose in tandem with the distance and remained elevated even 3 days afterward. These results suggest that high intensity, short duration running builds leg muscles, while long distance running causes significant muscle damage, inhibiting muscle growth. Summary High intensity, short duration running like sprinting may build muscle, while long distance running may inhibit it. Other forms of aerobic exercise can elicit clearer muscle growth. Greater than 70% of all investigations utilizing cycle ergometry as the mode of exercise have observed an increase in skeletal muscle mass in cohorts of apparently healthy younger, middle and older-aged men and women. The authors suggest that the effectiveness of aerobic exercise training to induce skeletal muscle hypertrophy most likely depends on obtaining sufficient exercise intensity (70-80% HRR), duration (30-45 minutes) and frequency (4-5 days per week) to achieve a large number of muscle contractions that places a high-volume, low-load on skeletal muscle. The authors suggest that studies observing skeletal muscle growth after aerobic exercise training observe an average increase of over 7% (mostly cycling, not in running, except in older subjects), which is comparable to the hypertrophy after resistance exercise training