

# Fall Fitness Challenge 2013



## How Muscles Increase in Strength and Size

Adapted from [Intelihealth.com](http://Intelihealth.com)

A new program of aerobic exercise will increase a muscle's endurance and tone and make it slightly larger (by a small percentage). But if you wish to significantly increase a muscle's strength and size, you'll need to do resistance exercises with that muscle on a regular basis (one to three times a week). Resistance exercise (also called strength training) uses much heavier loads than aerobic exercise — loads so heavy that you can only lift them a limited number of times in a row.

A strength program usually involves lifting a weight 8 to 15 times (or repetitions), taking about 6 seconds per repetition. You can use free weights (barbells or dumbbells) or weight machines. The weight should be heavy enough to make the final repetition fairly difficult.

By stressing a muscle's anaerobic energy system in this way for several months, you'll produce changes in your muscles that are completely different from those produced by aerobic exercise.

The amount of local energy reserves is increased by anaerobic exercise. The nervous system adapts quickly to weight-lifting exercises by facilitating the desired movement while learning to "shut off" reflex mechanisms that might otherwise inhibit contraction.

Over time, repeated resistance training causes the protein filaments inside each muscle fiber to grow thicker and more numerous, increasing the diameter of exercised muscles. This size increase is more pronounced in men — probably because of the influence of higher testosterone levels. The tendons, ligaments and other connective tissues surrounding the muscle also thicken and become stronger. The bones attached to the working muscle may also increase their mineral content.

Interestingly, an increase in muscle size is not necessary for increased strength. The greatest strength gains are usually achieved in the first weeks of training — before any significant size increase occurs. And because the main strength gains come from the rebuilding of the muscle fibers between workouts, you should allow at least 48 hours between strength-training sessions.

