

Muscular Strength and Muscular Endurance

Objectives:

1. The student will understand the principle of **muscular strength fitness**.
2. The student will recognize the principle of **muscular endurance**.
3. Each student will comprehend the **FITT** principles of muscular strength/ muscular endurance i.e. frequency, intensity, time, type.
4. Students will need to develop an understanding of three **principles of strength gain**. I.E. Overload, progression, specificity.

Muscular strength and muscular endurance are important components of a physical fitness program but they do not improve the cardiorespiratory system. It is, however a key component of your overall health. You should make muscular strength and muscular endurance a part of a regular fitness plan. Besides the obvious general strength gains, bone density is increased, delaying the development of osteoporosis, more muscle is developed and you burn fat more efficiently, and you reduce your risk of injury.

For years the myth has been perpetuated that weight training produces abnormally large, bulging muscles in women, making them look unfeminine. Numerous studies have demonstrated that women may increase their muscle strength substantially without an accompanying increase in bulk. The capacity to increase muscle bulk is genetically determined by the amount of the male hormone, testosterone, present within the body. The level varies among individuals. On the whole, females have very small amounts of testosterone present and are therefore very unlikely to develop massive muscles. Men, however, appreciate the benefits of the hormone testosterone and enjoy the muscular changes in their bodies. The benefits of weight lifting are immeasurable.

There are two forms of weight training: **strength weight training**, which uses heavy weight and few repetitions, the number of times a weight is lifted or the muscle is contracted, 10-12 repetitions, at 60-80% of maximum weight, and **endurance weight training**, lifting a lighter weight, 60% and less, with many repetitions, to exhaustion. With weight training several principles must be recognized, **FITT**. **Frequency**: How often should one weight train; every other day, 3 days a week, alternating a day of rest with each workout day to facilitate adequate recovery from the previous session. **Intensity**: How hard; strength lifting 60-80% of maximum, 10-12 reps. and endurance training less than 60% to exhaustion. **Time**; minimum of 20-30 minutes. **Types**: **Circuit training**, lifting a weight on different apparatuses with running type activities between exercises, and **interval training** exercises performed at a high intensity (maximum power) for a short period of time with a brief rest period in between exercises.

There are three basic principles of strength development:

1. **Overload principle**: to increase strength you must increase the workload of a particular muscle to a level above that to which it is normally accustomed. Use full range of motion to obtain optimal gains. This means that the overload must be applied through out the full range of motion. Pre-stretched position (stretched past the relaxed position) and ending in a fully contracted position.
2. **Principle of progression**: workloads need to be progressively increased in order to continue the development of strength. If the workload is not progressively increased to keep pace with newly won strength, there will be no further strength gains. To improve

strength add more weight, do more repetitions, or add another set of repetitions to your workout. Increase the weight or work load by no more than 10%.

3. Principle of specificity: muscular strength will only improve on those muscles used during the strengthening exercises.

Before beginning a weight training program, when weight apparatuses are used, it is important to learn how to use the equipment for proper performance and safety. Briefly, you should always work with a spotter, use proper lifting techniques, breath when lifting, and allow for a 24 hour interval of rest between work outs.