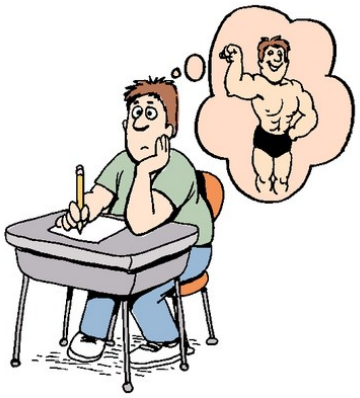
Muscular Fitness

Muscular Strength and Endurance

Muscular Fitness includes two health-related components of fitness: muscular strength and muscular endurance. Muscular strength is the ability of a muscle group to apply a maximal force against a resistance at one time. This term resistance in weight training simply refers to the weight lifted. Muscular endurance is the ability to repeat muscle movement over a period of time.
Strong, healthy and fit muscles help you to perform daily physical activities. Additionally, fit muscles help you to reduce fatigue, avoid back pain and prevent muscle injuries and muscle soreness.

Myths About Weight Training

You may have heard that weight training makes a person muscle bound or inflexible. Also, there is the myth that muscular fitness is only good for boys and not for girls. Still some may say that muscles will turn into fat when you stop training. *None of these myths are true!*
First of all if weight training is performed properly in conjunction with a good stretching program, becoming muscle bound is not a problem.
Next, girls can realize all the benefits of weight training without worrying about muscle bulk and definition. Good muscular fitness is just as important for women as it is for men.



Finally, a major misconception about weight training is that muscles will turn into fat when you stop lifting weights. Muscle is muscle and fat is fat. What really happens is that when you stop your weight training program and stop working your muscles they ***atrophy*** or they become smaller. Muscle atrophy can best be seen when an arm becomes thinner after having been placed in a cast for a number of weeks. An increase in fat will only occur if you continue to take in more calories than you burn.

Muscle Fiber Composition

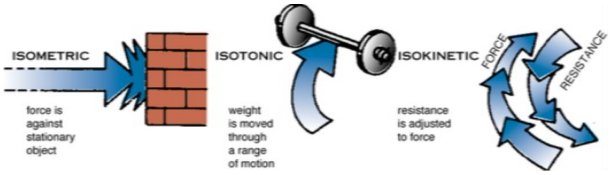
While muscular strength and endurance are closely related, they are separate components of health-related fitness. To understand how to apply the three principles of training:

- Principle of Overload
- Principle of Progression
- Principle of Specificity

To strength and endurance, you must first understand that different muscle fibers are involved in these two health-related components.
Skeletal muscles are attached to bones by tendons. When they contract or shorten, they produce movement. There are three type of skeletal muscle fibers:

- Slow Twitch Fibers
- Intermediate Twitch Fiber
- Fast Twitch Fibers

All three types of fibers are found in skeletal muscles. Heredity determines how many of these types of fibers you possess. However, you can improve both the fitness and performance level of each kind of fiber with appropriate exercise.
Slow Twitch Fibers - These fibers are slow to contract but have the ability to contract for long periods of time. These fibers are best suited for aerobic or muscular endurance activity since they do not tire easily. These fibers enable certain individuals to run long distances or repeat muscular tasks many times.
Intermediate Twitch Fibers - These fibers possess a combination of fast twitch and slow twitch fiber characteristics. Specifically, these fibers are capable of contracting at a faster speed than slow twitch fibers, but slower than fast twitch fibers. In addition fatigue occurs much slower in these fibers than in fast twitch fibers.
Fast Twitch Fibers - These fiber contract quickly, allowing explosive muscular contractions and lend themselves more readily to anaerobic or strength related activities. An example of a person who needs a large number of fast twitch fibers is a sprinter. This athlete must react quickly to the sound of the start. Also, fast twitch fiber fatigue easily and quickly.



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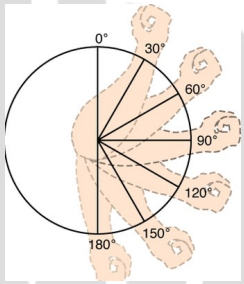
Methods of Developing Muscular Fitness

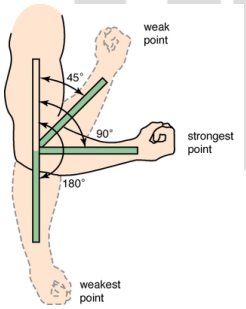
As in strengthening the heart, which is a muscle, skeletal muscles become stronger when they work harder than they are accustom to working. Muscular movement against a resistance during training is generally categorized into three major types of action: **Concentric Movement** is when the muscle contracts and becomes smaller, **Eccentric Movement** is when the muscle lengthens, and **Static Movement** refers to a muscle that is contracting against a stationary object such as a brick wall. *You must remember that muscular strength and endurance results anytime you make muscles fibers work beyond everyday activities!* Therefore attention should be given to both lifting and lowering a weight.

Concentric (shortening) and Eccentric (lengthening) exercises should be incorporated into most muscular fitness training programs. There are three types of exercise resistance programs that will make your muscle groups work harder for the purpose of developing muscular fitness:

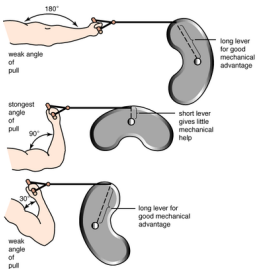
Isometric Exercises - In these types of exercises you contract or tighten your muscles but do not change their length. This is a static contraction because you do not shorten or lengthen your muscle. To perform an isometric exercise you push against a stationary object.



Isotonic Exercises - These are exercises in which you shorten and lengthen the muscle through a full range of movement while working against a resistance. The resistance maybe in the form of a barbell (weight training) or against your own body weight (calisthenics). With isotonic exercise the actual amount of weight the muscle is able to lift varies throughout the range of motion.



Isokinetic Exercises - A muscle has different levels of strength while moving through a complete range of motion. In other words, the angle at which the muscle is pulling on the bone determines the amount of weight you can lift. Isokinetic exercises with the use of specifically designed machines can overcome the disadvantages of isometric and isotonic exercises. An isokinetic machine mechanically allows you to overload a muscle with maximum resistance throughout the muscles entire range of movement at a constant speed. The obvious advantage of this method is that maximum resistance is provided at the stronger angles, while less resistance is provided at the weaker angles.



Application of the Training Principles

The type of exercise and equipment you use influences the method in which you apply training principles to muscular strength and endurance. Since isometric exercise have many disadvantages and isokinetic exercises require expensive equipment not readily available, the application of the training principles is limited to isotonic exercise. Also, keep in mind that to develop the different type of muscle fiber you can perform many of the same exercises. The primary difference between muscular strength and endurance training lies in the amount of weight lifted and the number of times (repetition) the weight is lifted.

The Principle of Overload

Like other health-related components, overload can be placed on the body to increase muscular strength and endurance through the application of the FIT principle. Most experts agree on the following

Frequency - with muscular fitness training you should work out every other day.

Intensity - The intensity weight training program is referred to as resistance which is determined by the amount of weight you lift

Time - This refers to the number of times the exercise is performed. A repetition is the completion of a single full range movement of the body part exercised.

The Principle of Progression

In order for the body to improve muscular strength and endurance you must overload your muscles. Since your body adapts to lifting the same amount or weight you must *gradually* increase the amount of weight. If you try lifting too much weight too soon, you run the risk of muscle or joint injury.

The Principle of Specificity

It must also be mentioned that you have to overload the specific muscle you want to improve with a specific exercise. The more you can isolate the muscle you want to improve the better results you will have.

Muscular Fitness ~ Key Terms

1. **Atrophy**
2. **Slow Twitch Fibers**
3. **Intermediate Twitch Fibers**
4. **Fast Twitch Fiber**
5. **Concentric Movement**
6. **Eccentric Movement**
7. **Static Movement**
8. **Isometric Exercise**
9. **Isotonic Exercise**
10. **Isokinetic Exercise**