



Resistance training to develop muscular strength and muscular endurance also helps improve physical appearance by controlling body composition. As resistance training increases muscle mass, a part of fat-free mass, fat mass decreases. Because muscles use calories to work, the more muscle mass a person has, the more calories that will be used. Using more calories reduces the number of calories stored as fat mass. Therefore, building muscular strength and muscular endurance is a lifelong habit needed to maintain or improve physical appearance.

**Flexibility** is the muscles' ability to move a joint through a full range of motion, and staying flexible is important to health and performance. As the body ages, the muscles, tendons and ligaments stiffen, lose elasticity and become less flexible. As a result, a person's ability to perform movements may be hindered and he/she may be at an increased risk of injury. Improving flexibility decreases a person's risk of injury, prevents post-exercise pain and helps relieve emotional tension.

Daily activities such as combing hair, tying shoes and participating in athletics require flexibility. Golfers need flexibility in the hips and shoulders to allow them to rotate the golf club farther and in turn hit the ball a greater distance. Softball and baseball players need flexibility in their shoulders and arms so that they can bring the ball back farther, which allows them to throw the ball harder.

Flexibility is required for everyday movements, from tying shoes to throwing a ball. If a person does not perform activities that improve flexibility, then one day he/she may not be able to perform those activities. Therefore, activities to improve flexibility should be performed daily.

Dynamic and static stretches are safe and effective methods to improve flexibility. **Dynamic stretches** involve moving parts of the body continuously while gradually increasing reach, speed of movement or both gently throughout a full range of motion. **Static stretches** involve stretching a muscle to the point of mild discomfort for an extended period of time. These stretches can be performed as part of the warm-up and/or cool down phases of a fitness program or as a separate flexibility program.

**Body Composition** is the combination of fat mass and fat-free mass, including fat, bones, muscles, organs, and water. Healthy levels of fat mass are essential for insulation, the protection of organs, the absorption of vitamins, nerve conduction and as an energy source. Having too much or too little fat mass can become a health risk, lower performance and detract from appearance. Therefore, body composition is usually referred to as a percentage of body fat.

A healthy level of fat mass for men is between 10% and 20% of total body weight and a healthy level of fat mass for women is between 15% and 25% of total body weight. Improving and maintaining body composition at healthy levels will reduce the risk of heart disease, Type 2 diabetes, high blood pressure, strokes, certain types of cancer and obesity.

The percentage of fat a person has is affected by two factors; the number of calories consumed (energy in) and the amount of activity performed and calories used (energy out). Both of these factors are controllable. A combined effort of eating a healthy diet (energy in) and increasing physical activity (energy out) is the best approach to maintaining a healthy level of body fat and improving overall body composition.

The benefit of understanding cardiorespiratory endurance, muscular strength, muscular endurance, flexibility and body composition, known as the Five Components of Fitness, is immeasurable and is important for improving health, performance and appearance for a lifetime.

## TYPES OF STRETCHING

- **Static Stretching** – The most common type of stretching. Assume a stretch position and hold it for 30 to 60 seconds. No bouncing or rapid movement. Feel only pulling, but no pain, especially in the joints.
- **Passive Stretching** – Relaxed stretching and the same as static stretching only with a partner or apparatus of some type.
- **Dynamic Stretching** – Controlled leg and arm swings that gently take you to the limits of your range of motion. No bouncing or rapid movement. Just slow, controlled movements. Examples are leg swings, arm swings and torso twists.
- **Ballistic Stretching** – Trying to force a part of the body beyond its normal range of motion by bouncing into a stretched position. Example, trying to touch your toes. Mainly used by highly conditioned athletes.



Understanding **cardiorespiratory endurance, muscular strength, muscular endurance, flexibility and body composition**, known as the **Five Components of Fitness**, is important for improving health, performance and appearance.

**Cardiorespiratory endurance** is the ability of the heart, blood, blood vessels and lungs to supply enough oxygen and necessary fuel to the muscles during long periods of physical activity. Participating in aerobic activities is the best way to improve cardiorespiratory endurance because they require the body to use large amounts of oxygen for sustained periods of time. With the increased need for oxygen, the heart must beat faster to pump more blood throughout the body. In turn, over time, the heart, which is a muscle, will become stronger and will be able to pump more blood with each beat, therefore, beating at a slower rate while circulating the same amount of blood. This increased efficiency enables a person to work, exercise and play more often and more vigorously for longer periods of time without getting tired.

Training to improve cardiorespiratory endurance also improves appearance by toning the body and reducing body fat, which helps to improve body composition. As personal appearance improves, a sense of well-being and a positive self-image is created.

**Muscular strength** is the ability of muscles to push or pull with total force. Increasing muscular strength allows a person to lift, push, or pull with more force. This is a benefit in any athletic situation, but it is also important for other life situations like when the car has a flat tire or when the door is stuck.

**Muscular endurance** is the ability of muscles to repeat a movement many times or to hold a position without stopping to rest. Improving muscular endurance allows a person to increase physical activity. A person with improved muscular endurance can accomplish more physical work by moving longer and taking fewer breaks.

Muscular strength comes before muscular endurance. Before the brick layer can stack hundreds of bricks a day, he/she must have the muscular strength to lift the first brick. Once he/she has the initial strength to lift the first brick, the brick layer can begin to build muscular endurance.

One of the best ways to build muscular strength and muscular endurance is through **resistance training**, or activities that place an additional force against the muscle or muscle group. Some examples of resistance training include **weight training, push-ups and crunches**.

Muscles react **positively to strenuous activity and negatively to inactivity**. Therefore, the old adage, "Use them or lose them", is true. When the body is inactive, a large percentage of strength is lost over time. Likewise, as the body ages bone density tends to decrease which can lead to weak bones (**osteoporosis**). While resistance training, along with engaging in an active lifestyle, improves muscular strength and muscular endurance, it also can improve bone density. Therefore, building muscle provides health benefits that can last throughout life.

Physical performance will also be enhanced through the development of muscular strength and muscular endurance. As muscles become stronger and gain endurance, a person will be able to work, exercise or play more often, with more power and for longer periods of time.



Key vocabulary words that will be introduced during this unit are:

- **Body Composition** – The combination of fat mass and fat-free mass, including fat, bones, muscles, organs, and water
- **Cardiorespiratory Endurance** – The ability of the heart, blood, blood vessels and lungs to supply oxygen to the muscles during long periods of physical activity
- **Flexibility** – The muscles' ability to move a joint through a full range of motion
- **Muscular Endurance** – The ability of the muscles to repeat a movement many times or hold a position without stopping to rest
- **Muscular Strength** – The ability of a muscle or muscles to push or pull with its total force
- **Static Stretches** – Involves stretching a muscle to the point of mild discomfort for an extended period of time.
- **Dynamic Stretches** – Involves moving parts of the body continuously while gradually increasing reach, speed of movement or both gently through a full range of motion.
- **Resistance Training** – An activity that places an additional force against the muscle or muscle group.