# Strength Training and Strength Exercises

## What is Strength Training?

Strength training is moving the joints through a range of motion against resistance, requiring the muscles to expend energy and contract forcefully to move the bones. Strength training can be done using various types of resistance, with or without equipment. Strength training is used to strengthen the muscles, tendons, bones and ligaments and to increase muscle mass. Strength training should be implemented as part of the conditioning program. The increase in speed, strength, agility and muscular endurance will benefit all individuals.

## Types of Strength Training

Strength training comes in a variety of formats. The type of resistance and equipment used defines the formats.

**Machine weights** - Machine strength training includes resistance exercises done using any of the various machines designed to produce resistance. These include machines with weight stacks, hydraulics, resistance rods or bands, and even the use of Thera-Band or resistance tubing.

The resistance (or weight) may be changed to increase the intensity of the exercise. The range of motion and position of movement is controlled by the machine. The resistance may be constant throughout the movement or may change due to the set-up of the pulley and cam systems. Machines often add a degree of safety but neglect the stabilizer, or helper, muscles in a movement.

**Free weights** - Free weight strength training involves using weights that are not fixed in a movement pattern by a machine. These include barbells and dumbbells. Also included in this group are kettlebells, medicine balls, ankle and wrist weights, and weight lifting chains.

The weight used, as with the machines, may be changed to increase the resistance of an exercise. The resistance at different points along the range of motion transfers to different muscles and due to angles may lessen at times. At the lockout of a joint the weight is transferred to the joint as the muscles simply stabilize the joint.

The range of motion and path of movement is not limited so the stabilizing muscles must work to keep the joints in line during the movement. *Due to the fact that the movement is not fixed poor form can become an issue.*

**Own body weight exercises** - Bodyweight exercises involve utilizing the individual's bodyweight as resistance during the exercise. As with free weights, the range and path of motion is not fixed by a machine. Exercises such as plyometrics, push-ups, pull-ups, abdominal exercises, even sprinting and jumping rope, fall into this category.

The weight used in these exercises is constant and only changes when the athlete's body changes. The changes in resistance during the movement are similar to those of free weight exercises.

The range of motion and path of movement does not follow a fixed path so stabilizing muscles come into play. *Form is again an issue with these exercises.*

The inability to change the weight used does limit the effectiveness for most individuals. Larger persons will be limited in the exercises they can perform and the number of repetitions. Smaller persons will quickly go beyond the desired repetition range for strength building.

## How does Strength Training prevent injury?

Injury prevention however, is one benefit that is often overlooked. Strength training is a very effective tool for injury prevention for a variety of reasons. Strength training improves the strength of the muscles, tendons, and even the ligaments and bones. The stronger muscles and tendons help hold the body in proper alignment and protect the bones and joints when moving or under impact. The bones become stronger due to the overload placed on them during training and the ligaments become more flexible and better at absorbing the shock applied to them during dynamic movements.

When an area of the body is used less during an activity it may become weak compared to other areas. This can become a problem when that area (whether a muscle, ligament, joint, or specific bone) is called into play suddenly during an activity. That area cannot handle the sudden stress placed on it and an injury occurs. Strength training, using a balanced program, will eliminate these weak areas and balance the body for the activities it is called to do.

Muscle imbalances are one of the most common causes of injuries in an individual. When one muscle, or muscle group, becomes stronger than its opposing group, the weaker muscles become fatigued quicker and more susceptible to injury. A forceful contraction, near maximal output from the stronger muscle can also cause damage to the weaker opposing muscle due to the inability to counter the force.

Muscle imbalances also affect the joints and bones due to an abnormal pull causing the joint to move in an unnatural pattern. The stronger muscles will cause the joint to pull in that direction causing a stretching of the opposing ligaments and a tightening of the supporting ones. These can lead to chronic pain and an unnatural wearing of the bones. A **balanced strength-training program** will help to counter these effects by strengthening the weaker muscles to balance them with their counterparts.

## Precautions for Strength Training:

Strength training is a great tool for injury prevention, however becoming injured during strength training obviously defeats this purpose.

**Firstly**, to avoid injury it is essential that proper form be used in all exercises. Keeping the body in proper alignment while exercising will minimize the injury chances. Starting with lightweights or resistance and **developing proper form** before increasing the resistance is important. When increasing the resistance it is important to do so in small increments and only when the desired number of repetitions can be performed in correct form.

**Secondly**, **rest** plays a crucial role in the efficiency and safety of a training program. Performing strength training exercises for the same muscle groups without adequate rest between the training sessions can lead to overtraining. Overtraining will result in the muscles being unable to repair properly and not

being ready for additional work. This can lead to acute or chronic injuries. The muscles repair and become stronger during rest, not during the workout.
**Thirdly**, a thorough and correct warm up will help to prepare the muscles and tendons for any strength training exercises. Without a proper warm up the muscles and tendons may be tight and stiff. Before any strength training activity, be sure to thoroughly warm up all the muscles and tendons that will be used during the workout.
**And lastly**, flexible muscles are extremely important in the prevention of strength training injuries. When muscles and tendons are flexible and supple, they are able to move and perform without being over stretched. If however, your muscles and tendons are tight and stiff, it is quite easy for those muscles and tendons to be pushed beyond their natural range of movement. To keep your muscles and tendons flexible and supple, it is important to undertake a structured flexibility-training program.
**Stretching is one of the most under-utilized techniques for improving performance and getting rid of those annoying aches, pains and misalignments.** Don't make the mistake of thinking that something as simple as stretching won't be effective.

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