



Strength Training for Young Athletes

What Children and Their Parents Need to Know

What is strength training?

Strength training, or resistance training, is a form of physical conditioning used to increase the ability to resist force. By increasing muscle strength, strength training can improve sports performance in young athletes. Different types of exercises are used in strength training in young athletes, including weight machines, free weights, and exercises that use a body's own resistance. By using different combinations of exercise repetitions, ranging from 1 set of 10 repetitions to 5 sets of 15 repetitions, young athletes can achieve increases in strength from 30% to 40% over an 8- to 12-week training program.

How does strength training work in young athletes?

Prepubescent children cannot increase the amount and size of their muscles as adults can, because children do not have enough hormones. It is thought that strength increase in children who participate in strength training involves changes in the muscle that already exists. A muscle works by nerve firing, and strength training in children and adolescents changes the way the nerves fire, in that more muscle fibers are activated by each nerve. This increases muscle strength in children without changing the composition of the actual muscle.

Why should strength training in young athletes be encouraged?

An increasing number of children and adolescents are participating in sports, with competition beginning as early as 5 years of age. Strength training is a noncompetitive means of conditioning to prepare young athletes for the rigors of organized sports. Encouraging activity in children and adolescents serves many functions, including the following:

- Promoting a healthy lifestyle, starting at an early age and continuing into adulthood
- Increasing cardiorespiratory status, building a healthy heart
- Increasing bone mineral density, developing strong bones
- Reducing the risk of disease in adulthood

- Providing psychological benefits, including increased self-esteem, self-confidence, and discipline
- Improving strength and coordination in a noncompetitive setting and in a fun way

Who should participate in strength training?

To begin a strength training program, a child should have the maturity and the understanding to participate within a group and follow directions. Children as young as 8 years of age can participate safely in a strength-training program, and have been shown to display improvements in strength and coordination.

Is strength training in young athletes safe?

Yes. Strength training does not damage growth plates or stunt growth in children, as was previously thought. If nutritional guidelines, including adequate calcium intake, are met, and if training guidelines are followed, strength training in young athletes actually can enhance growth. The greatest amount of bone formation occurs during childhood, and strength training can create stronger bones if done correctly and in the proper setting.

What are the benefits associated with strength training in young athletes?

- **Increased sports performance.** In addition to increasing overall strength, strength training has been shown to increase speed in young athletes. Strength training also gives children and adolescents more self-confidence, which can translate into success in sports.
- **Improved body composition.** Strength training can lead to a loss of body fat, which has been helpful in decreasing childhood obesity.
- **Prevention of injury.** Strength training prepares young athletes for the rigors of organized sports. It gives children a basic level of fitness by using a wide range of exercises to promote flexibility and coordination, which decreases the number of injuries. Children and adolescents can begin organized sports with preconditioning and practice, which leads to fewer debilitating field injuries.
- **Psychosocial benefit.** Strength training increases self-confidence, self-image, social skills, and mental discipline.

What are the risks associated with strength training in young athletes?

- **Improper supervision.** It is important for strength training programs to be run by qualified individuals who are trained specifically in working with children and adolescents. Programs should have no more than 10 participants per instructor (and fewer in beginner classes).
- **Improper technique.** Serious injury can result if individuals use poor technique, including lifting weights that are too heavy for them, or using equipment suited for adults, not children.

- **Soft-tissue injury.** There is a considerable risk of soft-tissue injury from overuse caused by excessive strength training. Training should begin at an appropriate level, with adequate rest between exercises to minimize injury and maximize fun. Proper form will decrease the risk of a soft-tissue injury.

What are the guidelines for designing an effective strength-training program for young athletes?

- Children must have appropriate supervision at all times, with a maximum of 10 participants per adult.
- Children should wear loose clothing and sneakers to train.
- Safety in the training room is important.
- Set reasonable goals for each child, based on his or her desires and ability.
- Stretch or perform light exercise for 10 minutes before training.
- Use different modes of training, including free weights, size-appropriate weight machines, body-weight exercises, and medicine balls.
- Start with 6 to 8 exercises, 10 to 15 repetitions per set, at a low weight level. Choose weights with which a child can succeed. Adults can spot children to help them finish a set.
- Stress proper technique, rather than increased weight.
- Children should rest between sets, and complete 1 to 3 sets, based on their needs.
- Encourage use of workout cards and review progress at each session.
- Children should attend 1 to 2 sessions per week.