

Sports Shorts

GUIDELINES FOR PHYSICIANS

Strength training

Strength training (or resistance training) uses resistance to increase an individual's ability to exert force. Resistance may be provided with weight machines, free weights, bands, tubing, or the individual's own body weight.

Common myths associated with strength training

- **Strength training will result in a loss of flexibility:** With a proper warm-up and cool down, strength training doesn't result in a loss of flexibility.
- **Strength training will not result in an increase in strength until puberty:** A well-designed strength training program, 2-3 times a week for a minimum of 8 weeks has demonstrated strength gains of 30-50% beyond normal growth and development. These strength changes are achieved through improved neuromuscular firing rather than changes in muscle size.
- **Strength training will result in stunted growth:** Current research doesn't support this claim. Early concerns regarding growth delay occurred in developing countries where young children were malnourished and also participated in heavy manual labor.

Benefits of strength training include:

- Improved muscle strength, stamina, and coordination.
- Regular participation in strength training improves cardiac health, body composition, bone mineral density, and decreases cholesterol levels.
- Pre-season conditioning prevents common shoulder injuries in swimmers and tennis players.
- Hamstring strengthening and core strengthening in combination with plyometric exercise has demonstrated a reduction in non-contact ACL injuries in the knee.

Unusual injuries for physicians to consider with heavy weightlifting:

- Stress fractures of the distal clavicle (osteolysis)
- Stress fracture of the spine (spondylolysis)
- Disc herniation
- Tendon ruptures (pectoralis tendon)*

Research has shown that strength training is safer than many organized sports including soccer, football, and basketball.

* Consider an anabolic steroid screen if this injury is identified.

Where can I refer patients to find proper instructors?

The National Strength and Conditioning Association (www.nscs-lift.org), The American Council on Exercise (www.ace-fitness.org), and The American College of Sports Medicine (www.acsm.org).

Further evaluation of patients with the following conditions is required:

- Temporary restriction of athletes with Stage 2 hypertension until normal blood pressure is achieved.
- Individuals with history of childhood cancer treated with doxorubicin, daunorubicin, idarubicin, and possibly mitoxantrone.
- History of cardiomyopathy or severe pulmonary hypertension.
- Marfan's syndrome.
- Uncontrolled seizure disorder.

What are the important components in a strength-training program?

- Combine with aerobic training and a 5-10 minute warm-up/cool down performed 2-3x per week for 20-30 minutes.
- Lifts should be learned without weight for proper form and technique.
- All major muscle groups and core should be included in the program.
- Joints should be moved through a full range of motion.
- Each lift should be performed 8-15 times with 2-3 sets of all lifts completed.
- Minimum duration is 8 weeks. (Strength gains will be lost after discontinuing this program for 6 weeks.)
- Weight should be increased in increments of 10%

When is it safe to start strength training?

At 7-8 years of age, most individuals will have the discipline to perform resistance exercises several times a week and the capacity to listen and follow directions. At this age the proper balance and postural control is achieved.

Injuries can be prevented by:

- Using proper techniques and form.
- Properly fitting the machines for the athlete's height.
- Wearing proper clothing and shoes with good traction.
- Proper supervision and spotting at all times.
- Avoiding rapid breathing (hyperventilation), bearing down, or breath holding.
- No Maximum 1 repetition maximum weights or ballistic maneuvers prior to Tanner Stage 5.
- Lifting should be stopped immediately if pain is felt.
- Supervisor to learner ratio of 1:10.

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GUIDELINES FOR PARENTS

Strength training

Definitions:

Strength training (or resistance training) uses resistance to increase an individual's ability to exert force. Resistance may be provided with weight machines, free weights, bands, tubing, or the individual's own body.

Common myths associated with strength training

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- *Strength training will not result in an increase in strength until puberty:* A well-designed strength training program 2-3 times a week for a minimum of 8 weeks has demonstrated strength gains of 30-50% beyond normal growth and development. These strength changes are achieved through improved neuromuscular firing rather than changes in muscle size.
- *Strength training will result in stunted growth:* Current research doesn't support this claim. Early concerns regarding growth delay occurred in developing countries where young children were malnourished and also participated in heavy manual labor.

Benefits of strength training include:

- Improved muscle strength, stamina, and coordination.
- Regular participation in strength training improves cardiac health, body composition, bone mineral density, and decreases cholesterol levels.
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- Hamstring strengthening and core strengthening in combination with plyometric exercise has demonstrated a reduction in non-contact ACL injuries in the knee.

Are there risks associated with strength training?

Injuries reported in an unsupervised strength training program have included growth plate injuries (commonly in the wrist and spine), disc herniation, and occasionally death from weights landing on the chest wall or neck. A well-supervised program is considered a coach to student ratio of 1:10 or less, and proper certification of the instructor. In well-supervised programs significant injuries are rare, but can include stress fractures of the distal clavicle (collar bone) or spine (spondylolysis), muscle strains, disc herniation, and tendonitis. Research has shown that strength training is safer than many organized sports including soccer, football, and basketball.

When is it safe to start strength training?

The proper age is based on maturity level and attainment

of appropriate developmental milestones. Your child should demonstrate a desire to participate, the discipline needed to perform resistance training several times a week, and the capacity to listen and follow directions. In addition, the child should have proper balance and postural control. Most children are developmentally ready to strength train around age 7 or 8 years.

Your child should see their doctor before starting if they have the following conditions:

- High blood pressure
- Childhood cancers
- Seizures
- Complex congenital cardiac disease

What are the important components in a strength training program?

- Combine with aerobic training and 5-10 minute warm-up/cool down performed 2-3x per week for 20-30 minutes.
- Lifts should be learned without weight for proper form and technique.
- All major muscle groups and core included in lifts.
- Joints should be moved through a full range of motion.
- Each lift should be performed 8-15 times with 2-3 sets of all lifts completed.
- Minimum duration is 8 weeks.
- Weight should be increased in increments of 10%.

Injuries can be prevented by:

- Using proper techniques throughout the lift.
- Properly fitting the machines for height.
- Wearing proper clothing and shoes with good traction.
- Proper supervision and spotting should be available at all times.
- Avoid rapid breathing (hyperventilation), bearing down, or breath holding.
- No Maximum 1 repetition weights or ballistic maneuvers prior to reaching skeletal maturity.
- Lifting should be stopped immediately if pain is felt.

Where can I learn about qualified strength trainers near my home?

The National Strength and Conditioning Association (www.nscs-lift.org), The American Council on Exercise (www.acefitness.org), and The American College of Sports Medicine (www.acsm.org).