

Will weight training stunt an adolescent's growth? How old is old enough to begin weight training? What type of program should adolescents follow? These are all questions commonly asked when dealing with weight training and adolescents. More often than not, the answer received is an opinion. This article will answer these questions and more by examining what science says.

Note: The term strength training is synonymous with weight training and resistance training.

"Does Weight Training Stunt Growth?"

The biggest concern amongst parents as well as children is whether strength training will stunt the child's growth. This is a common public belief. Is this belief true or just a myth? Science proves it is a myth. So where did this myth originate?

This myth that strength training damages the growth plates of children, which would cause decreased stature growth, is believed to have stemmed from an old report which examined children in remote areas of Japan (Kato & Ishiko, 1964). This report stated that these children, who performed heavy labor, were short in stature. It should also be noted that these children "performed heavy labor in mountainous villages for several hours a day" in addition working and living on a poor diet (Faigenbaum, 2001). From this, it was speculated that strength training could damage the composition of the epiphyseal junctures, or "growth plates", from which bone continues to emanate until complete skeletal growth is achieved. This belief was not based on scientific findings, but an anecdote.

On the contrary to this belief, strength training improves the bone mass density of children and adolescents (Morris et al., 1997). Osteoporosis, a progressive disease which causes bones to lose their mineral mass and become brittle and spongy, is an ever growing disease that affects more than 20 million Americans. Due to an insufficient intake of calcium, the body begins to use bone calcium for its needs. This is a problem in itself, but is further aggravated by the sub-optimal levels of bone mass on adults due to inactivity. Bone mass also decreases as one ages (Katch & McArdle, 1993). Without going into too much detail, exercise, more specifically weight bearing exercise, leads to the buildup of calcium in bones, assuming calcium intake is adequate. By exercising at an early age, children can give their bones a head start in the fight against osteoporosis.

Science does not support the myth that strength training has a negative effect on the growth of children, but rather it has positive effects on their bone health and growth. These facts have led to The American College of Sports Medicine, American Orthopaedic Society for Sports Medicine, and the National Strength and Conditioning Association supporting child and adolescent participation in strength training programs.

"Will Strength Training Lead To Other Injuries?"

Another common concern is that children are easily injured from participation in strength training programs. Research shows that "young athletes participating in resistance training... do not appear to be at any greater risk of injury than young athletes who have not undergone such training" (Guy et al., 2001). In fact, strength training will prepare children who plan on participating in sports for the magnitude of forces they will experience in practice and games, which will decrease their risk for sport-related injuries (Smith et al., 1993).

"What Benefits Will They Get From Strength Training?"

One of the main benefits children and adolescents experience from strength training is increased strength. While some muscle hypertrophy is possible, increase in muscle size is not the main factor influencing these strength gains. Because children have not reached puberty, their androgen levels (i.e. testosterone) are low. Therefore, these strength gains are attributed to neuromuscular learning. Muscles are controlled by activating motor units; these motor units each control a certain number of muscle fibers. Movements such as blinking or writing with your hand require the activation of a small number of motor units. On the other hand, performing squats requires a large number of motor units to be activated. Strength training "teaches" the nervous system how to activate the number of motor units that will fire during a given muscle contraction. The ability to activate more motor units leads to greater strength.

Other benefits include: (Quoted from Washington, 2001)

- Increased muscle strength
- Increased bone-mineral density
- Increased cardiorespiratory fitness
- Improved blood-lipid profile
- Improved body composition (muscle vs. fat)
- Lowered blood pressure (if hypertension)

- Increased resistance to injury
- Increased psychosocial well-being
- Improved attitude towards lifetime physical activity

The benefit that stands out the most is improved body composition. Childhood obesity is a growing disease. Because strength training is not as taxing on the respiratory system as aerobic exercise, overweight children are more easily able to participate due to the decreased fatigue during exercise.

"When Can A Child Begin Weight Training?"

It has been found that children as young as six years old can safely participate in strength training programs (Washington, 2001). It should also be noted that the trainee should be emotionally mature enough to accept and follow directions. They should also understand the benefits and risks associated with strength training. Just like any other type of activity (jogging, baseball, basketball, or any other sport or form of exercise), injury can occur. That is why it is vital that children participating in a strength training program be supervised at all times. The supervisor should be a competent, responsible adult willing to work with the child. It is also important that before a child begins strength training they are screened by their doctor. The child may have medical complications or other conditions that would make strength training contradictory to its purpose.

"What Type Of Strength Training Program Should My Child Follow?"

I'm sure you've heard the saying "No pain, no gain". This does NOT apply to children. Children should follow a sensible program. The children should not be expected to perform at the same intensity or volume as an adult (Washington, 2001). Children should not attempt a maximal lift (one repetition max). Proper form and execution of all exercises is far more important than the amount of weight lifted. It is recommended that during the initial stage of learning, children should perform the exercises with no resistance (Faigenbaum, 2001).

Two to three days of training will provide benefits. Each session should begin with a warm up, preferably cardiovascular. Next have the child perform one exercise for each main muscle group using the 12-15 rep range. The weight session should be followed by a cool-down and stretching (Faigenbaum, 2001).

Conclusion

Strength training is safe and can be very beneficial if done correctly. Before beginning a program, the child should have a medical evaluation and clearance from a physician. Make sure that the physician is knowledgeable about exercise for children. Special attention should be paid to the form and execution of each exercise. It is not vital that each exercise session be more intense than the last, as long as the child is progressing. The most important thing of all is that the child is having fun. This should be enjoyable, not a forced task.

Works Cited

Faigenbaum, Avery D. Strength Training and Children's Health. Journal of Physical Education, Recreation & Dance, Reston. March 2001. Vol. 72, Iss. 3; pg. 24-31.
 Guy JA. Micheli LJ. Strength training for children and adolescents. Journal of the American Academy of Orthopaedic Surgeons. 9(1):29-36, 2001 Jan-Feb.
 Katch. F.L. & McArdle, W.D. (1988). Nutrition, Weight Control, and Exercise (3rd ed.) Philadelphia: Lea & Febiger.
 Mannie, Ken. On the Subject of Adolescent Strength Training. Coach and Athletic Director. Jefferson City. Sep 2002.
 Washington, R. Strength Training By Children and Adolescents. Pediatrics, Evanston. Jun 2001. Vol. 107, Iss. 6; pg. 1470-3.

Dave Draper, Arnold Schwarzenegger, Lou Ferrigno, Shaquille O'Neal, David Robinson, Karl Malone, Michael Vick, ... All started lifting weights in their early teens and are over 6' 1"