**Strength Training Safety for Younger Children**

Cordelia W. Carter, MD; and Lyle J. Micheli, MD

---

**Q: IS STRENGTH TRAINING SAFE FOR YOUNGER CHILDREN?**

**A:** Yes. Resistance training was traditionally discouraged for children and adolescents as a result of unfounded concerns that it was unsafe for the skeletally immature population. However, there is now an abundance of scientific literature demonstrating that resistance training is not only safe for the young athlete, but is routinely associated with increased muscle strength, and in fact may play a role in the prevention of sports-related injuries.

A recent meta-analysis of the available literature on resistance training in children and adolescents reviewed 27 studies that employed a resistance training intervention in youth aged 6 to 18 years. Only three instances of injury were reported in this group: 1) shoulder pain that resolved with one week of rest; 2) a shoulder strain that resulted in one missed training session; and 3) thigh pain that resolved with 5 minutes of rest. The estimated injury rates for these studies were 0.176, 0.053 and 0.055 per 100 participant hours, respectively (compared with rugby, for example, which has been reported to have an injury rate of 0.800 per 100 participant hours).

While there have been several case reports of physeal (growth plate) injury related to resistance training, it has been noted that these injuries were almost exclusively the result of improper technique, inappropriate training load or lack of qualified supervision.

In addition to its proven safety, there is good evidence demonstrating the efficacy of resistance training in child and adolescent athletes for improving muscle strength, with strength gains of up to 74% reported in one study after 8 weeks of progressive resistance training.

As summarized by Faigenbaum and Myer, two meta-analyses evaluating the effectiveness of resistance training in youth demonstrated a significant positive association between resistance training and strength gains, with effect sizes of 0.57 and 0.75, respectively.

It is now almost universally accepted that resistance training, when performed under the close supervision of a qualified instructor, using appropriate training equipment, and a stepwise progression of loads and skills can be both safe and effective for the young athlete.

---

**REFERENCES**