



Youth Strength Training

- Joe Cieszynski MS AT CSCS USAW
- Summa Health Corporate Health

2/22/19

Presentation Objectives

- Create a greater understanding of the benefits of youth resistance training and dispel many common myths and misconceptions that view youth strength training as “high risk”.
- Describe the common injuries, the respective injury rates, and the common mechanisms of injury associated in youth resistance training .
- Describe basic programming of youth resistance training and implementing, a new paradigm, the (**LTAD**) long term athletic development model.

Common misconceptions regarding youth resistance training

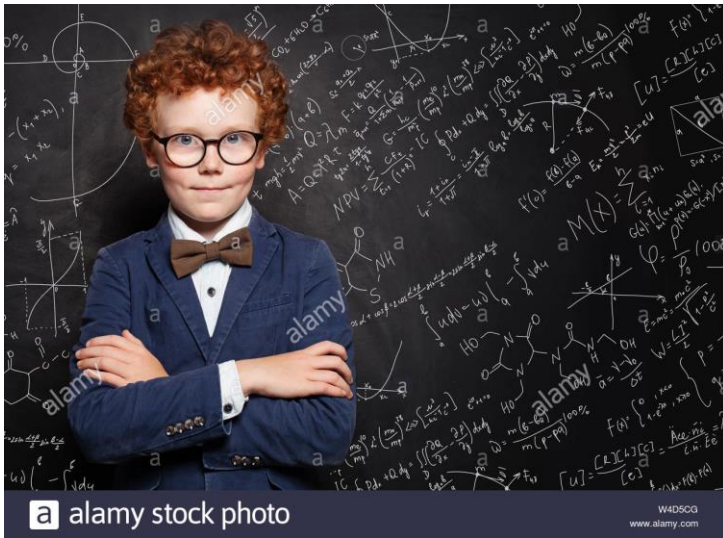
- Strength training can stunt a child's growth.
- Children cannot gain strength from resistance training due to the lack of testosterone.
- Children are more susceptible to injury due to open growth plates.

Professional Organizations Advocating Adolescent Resistance Training

- American College of Sport Medicine (ACSM)
- American Academy of Family Physicians (AAFP)
- American Academy of Orthopedic Surgeons (AAOS)
- American Academy of Pediatrics (AAP)
- American Medical Society for Sports Medicine (AMSSM)
- American Osteopathic Academy of Sports Medicine (AOASM)
- National Strength and Conditioning Association (NSCA)
- American Orthopedic Society for Sports Medicine (AOSSM)
- The President's Council on Physical Fitness and Sports. (7)

Is Strength Training appropriate for kids that are just involved in sport?

Absolutely not!!!



Health/Sport Benefits of Strength Training

1. Improve cardiovascular risk profile.
2. Facilitate weight control/Body composition.
3. Strengthen Bone.
4. Help promote and develop exercise habits during childhood and adolescence.
5. Help improve the psychosocial wellbeing of youth.
6. Enhance muscular strength and power.
7. Improve motor performance skills.
8. Decrease the incidence of sports related injuries in young athletes(1).

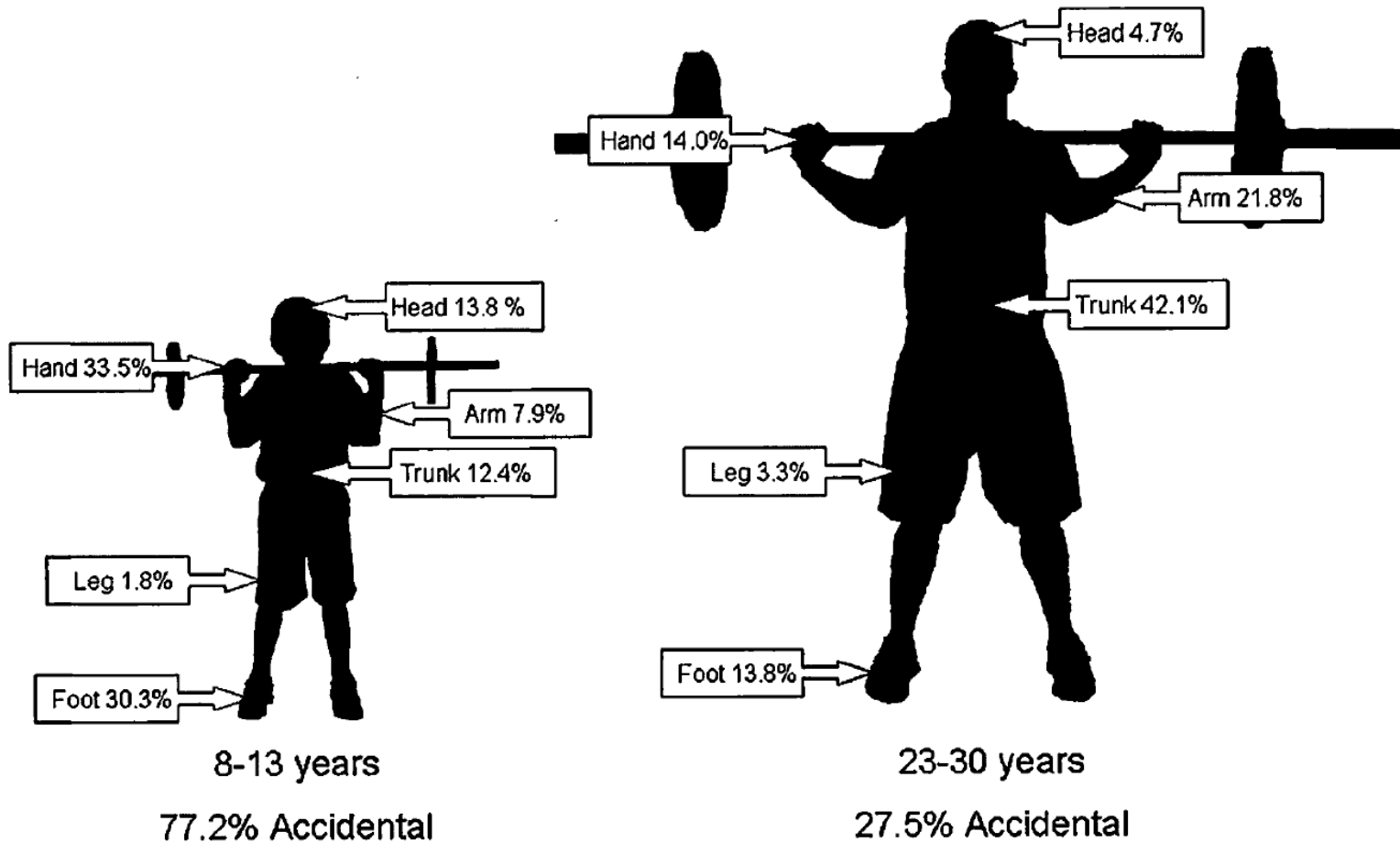


Risk of injury

- The risk of injury in resistance training is the same or lower for kids participation in traditional sports. (1), (3), (4).
- Epiphyseal plate injuries can occur. (Salter–Harris 1) Usually the result of overuse or dropping the weight on an extremity or overuse. The risk may be less in a child < 13 than an Adolescent 13-19 years. (Micheli).
- 46% all injuries are strains. Low back and upper trunk most common soft tissue injury/pain. Thought to be due to improper program design. (3),(4)
- Two thirds of the injuries sustained were to the hand and foot and were most often related to dropping wt. on feet or pinching fingers. (7) Related to maturity level.

| Sport | Injuries (Per 100 Hours) |
|---------------------------|-----------------------------|
| Schoolchild Soccer | 6.20 |
| Rugby (UK) | 1.92 |
| Athletics (USA) | 0.57 |
| Football | 0.10 |
| Squash | 0.10 |
| Basketball | 0.03 |
| Gymnastics | 0.044 |
| Powerlifting | 0.0027 |
| Tennis | 0.001 |
| Volleyball | 0.0013 |
| Weight Training | 0.0035 (85,733 hrs) |
| Weight Lifting | 0.0017 (168,551 hrs) |

Injury Distribution in kids vs young adults



Youth Physical Culture

1. Obesity and Diabetes rates are at all time highs.
2. Diminishing "Free Play".
3. Physical Education and Recess is being watered down or eliminated. Organized athletics are even replacing Physical education in some states.
4. 16 year olds are as active as 60 year olds.
5. Sports are becoming more "Elite" and kids are "Specializing" in particular sports at an earlier age. Emphasis on competition over skill development.
6. Kids spend an average of 3 years in competitive sports and 70% are done by age 11.

Youth exposure to strength training/athletics

- Parents/Family Members/Friends.
- Social Media/Internet.
- Physical Education Class.
- School Sponsored Athletics.
- Club Sponsored Athletics.
- Commercial Gyms
 - YMCA, Performance Gyms, Crossfit, ect...

Are we educating and inspiring youth to achieve their full athletic potential, develop physical literacy, build athletic skills—and utilize sport as a path toward an active and healthy lifestyle, from cradle to grave?

(LTAD) Long Term Athletic Development

- **LTAD** is basically the ability to develop athletic skills over time in a developmentally appropriate manner.
- Earliest origins were in ancient Sparta.
- The dominance of the USSR, Germany and the Eastern Block countries in the Olympics from the 1950's through the 80's is often attributed to this system of development.
- 1960's President Kennedy responded by promoting physical education that emphasized building physical literacy and fitness to prepare people for the military.
- In the last several years (2014) many NGB's in the US have been adopting this model. US Soccer, Lacrosse, Basketball, Football, Hockey, and Baseball.

LTAD

Focused on developing “**Physical Literacy**” and “**Athletic Movement Skills**”.

Focused on “**Skills Development**” and “**Athlete Retention**”.

“**Cradle to Grave Approach**”. Developing age appropriate skills from childhood through adolescence into adulthood.

LTAD Model – Level 1, 6-9 years of age “Fundamental's”

- Programs designed for young children aged 6-9 years old or older kids who are just starting out strength training.
- Programs involve modified body wt. weight type exercises and light resistance work performed for relatively high reps (15)
- Getting kids accustomed to regular training, develop basic fitness abilities, strength, endurance, co-ordination, and flexibility in a **FUN** environment. Play Games!
- Must be Adult supervised!
- Plank for 60 sec.
- Perform 10 well controlled back extensions
- Perform 10 well controlled full range double leg squats with hands behind head and feet flat on the floor.
- Perform 10 well controlled push ups.
- Perform 5 well controlled lunges with each leg with back knee touching the ground with good balance.
- Wall squat at 90 degrees for 60 seconds.
- Touch their toes in sit and reach test.

LTAD Model – Level 2, 9-12 years of age “Learning to Train”

- Begin to incorporate some free weights and machine weight exercises as well as body wt. exercises.
- Must be adult supervised, ideally someone with an appropriate strength and conditioning certification. CSCS, CPT, Coaching Certification.
- Make It **Fun!!!!**
- Satisfy Level 1 requirements.
- Plank for 90 seconds
- 10 reps barbell bench press @40% of body wt.
- 10 reps dumbbell rowing in each hand @15% of body wt.
- 10 well controlled horizontal pull ups, underhand grip.
- 10 well controlled lunges each leg with back knee touching the ground and good balance holding a load of 10% in each hand.
- Reach 2 inches beyond toes in sit and reach test.

LTAD Model – Level 3, 12-15 years of age “Training to Train”

- Begin to progressively use more free weight exercises, but avoid complex lifts such as cleans, snatches, deadlifts, barbell squatting ect. Unless coaching is available from a competent coach CSCS, USAW, CCSA. Training must be supervised.
- Be sure to use appropriate sized equipment for the individuals. Womens Bar 15kg (33lbs) 25mm diameter vs Mens Bar 28-32 mm and 20kg. Kids 5-15 lbs bar. Appropriate size bumper plates.
- **FUN!!!**
- Satisfy requirements for levels 2 and 3.
- Plank 120sec.
- Perform 5 well controlled, full ROM, single leg squats.
- Perform 10 well controlled parallel dips for boys and bench dips for girls.
- Perform 10 well controlled chin ups for boys and a 90 degree bar hang for 30 sec. for girls.
- Perform 10 reps barbell bench press @ 70% bw for boys and @50% bw for girls.

LTAD Model – Level 4, 15-18 years of age “Training to Compete”

- Progressively moving towards an advanced adult program involving split routines and complex multi-joint movements demonstrating sound technique.
- The repetition range is between 6-15 RM with a max loading of the 1 RM.
- Still emphasize **Fun!**

General considerations

- Age – Chronological vs. Biological. Focus on the individual. Start at **6-8 years old**.
- Prior Training Experience.
- Medical History.
- Sport(s) Played.
- Qualified Instruction.
- Emphasize Technique/Safety.



Components of youth strength training

1. **F**requency. Majority of the research has shown that **2, non-consecutive days** a week produce better results than 1 day a week. Faigenbaum showed 74.3% strength increase in a group of kids 7-12 yrs. old that performed 3 sets of 5 different exercises **twice a week** vs only 13% increase in the control group. Rhea found in a meta-analysis that frequency changes with experience of the individual. The study concluded that those with >1 year experience had the greatest strength gains with 2 x week while those with < 1 year experience had better results with 3 weekly sessions.
2. **I**ntensity. at an intensity ranging from **50-85% 1RM** for strength exercises and **1-3** sets of **6-8** repetitions for power exercises. **6-8** exercises per session. Overload by stressing the body beyond what it is accustomed to.
3. **T**ime. (Volume). The current literature recommends **1-3** sets for **6-15** repetitions for strength exercises, per muscle group. 60-90 minutes max.
4. **R**est periods. **2-3** minutes, between sets for strength exercises and **1** minute for hypertrophy. (NSCA).
5. **E**njoyment. Youth need to be engaged by balancing skill and challenge. Fun!
6. **S**ocialization. Engage youth by creating social interactions with their peer group to motivate and challenge themselves. Fun!
7. **S**upervision . Provide a safe exercise environment along with meaningful feedback. Fun!

Planning the Exercise Session

1. Start with 10-15 minute dynamic warm up. Include movement and mobility drills.
2. Include exercises that address all major muscle groups. Emphasize symmetrical development around the joint.
3. Perform Multi-joint exercises before single joint exercises.
4. Train large muscle groups before small muscle groups.
5. Include exercises for balance, proprioception, and coordination.
6. End session with a cool down, and static stretching.
7. Combine with aerobic exercise/agility/speed drills on other days or same day if time allows.

Sample 2 days/week program for 15-18 year olds

1. Dynamic Warm Up 10-15 minutes. Could include running drills, balance drills, and/or mobility drills.
 1. Deadlift 3 x 8-10 x 65-75% 1RM
 1. Bench Press 3 x 8-10 x 65-75%
 1. Squat 3 x 8-10 x 65-75%
 1. Pull Ups 3 x 8-10 x 65-75%
 1. Planks 3 x 60 sec x BW
 1. Stretch/Conditioning/Stick work – work on weaknesses.
1. Dynamic Warm Up 10-15 minutes. Could include running drills, balance drills, and/or mobility drills.
 1. Lunges 3 x 8-10 x 65-75%
 1. Lat Row 3 x 8-10 x 65-75%
 1. Dips 3 x 8-10 x 65-75%
 1. Back Extension 3 x 8-10 x BW
 1. Med Ball Rotations 3 x 8-10
 1. Stretch/Conditioning/Stick work – work on weaknesses.

Conclusion

- Its ok to start kids early in resistance training. If they are ready for the field they are ready for the gym.
- Use an individual approach with each kid. One size does not fit all.
- Plan for the long term. Create a lifetime commitment to physical activity.
- Engage your athlete. Make it Fun!!!

**“It is easier to build strong children than to repair broken men.”
— Frederick Douglass**

References

1. Strength Training for the Young Athlete. Journal of Australian Strength and conditioning Volume 21, Issue 1, March 2014.
2. Resistance Training for Children and Adolescents. Translational Pediatrics 2017; 6(3)137-143.
3. Strength Training by Children and Adolescents. Position Statement. PEDIATRICS Volume 121 # 4, April 2008.
4. Youth resistance Training: Updated Position Statement Paper From The NSCA. Journal of Strength and Conditioning Research. Vol. 23 August 2009.
5. USA Hockey ADM. US Hockey Website. 2019.
6. Resistance training in youth – Benefits and Characteristics. Journal of Biomedicine 2018, Vol.3, 32-39.
7. Youth vs Adult “weightlifting Injuries Presenting to US Emergency Rooms: Nonaccidental injury mechanisms. Journal of strength and conditioning research 2009 Oct. 23(7): 2054-2060.

References

8. LTAD Part 1: Volt Athletics Website. Joe Eisenmann. 2019

