

Youth Strength Training

Outdated misconceptions still exist about its effects on young bodies

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In my last contribution to *Soccer Journal*, I discussed the increasingly important issue of ACL injury prevention. In the article, a number of injury prevention techniques were described; many of which fit nicely into an overall strength and conditioning program. In the premier club I work with, we have started our own small-scale strength and conditioning program that focuses on performance enhancement as well as injury prevention. Our program focuses on providing strength and conditioning experience and education to players in a developmentally appropriate manner.

Experts define strength training as “a specialized method of physical conditioning that involves the progressive use of a wide range of resistive loads to enhance or maintain one’s ability to exert or resist force” (Faigenbaum, 2001). Research over the past 10-15 years strongly supports youth strength training, suggesting that it can be safe and effective if conducted properly. Major professional organizations such as the American College of Sport Medicine and American Academy of Pediatrics, among others, encourage participation in appropriately designed and supervised youth strength training programs. Numerous health and fitness benefits of strength training have been identified, including increased muscle strength, improved body composition and resistance to injury, to name a few. Strength training can also influence psychological well-being, self esteem and attitude toward physical activity and sports.

Studies have shown that children can have muscular strength gains of approximately 30 to 50 percent following short-term strength and conditioning programs (Faigenbaum, Westcott, et al., 1996; Faigenbaum, Zaichkowsky, Westcott, Micheli & Fehlandt, 1993; Ramsey et al., 1990). Furthermore, the evidence on the use of strength training to prevent sports injury is equally convincing. According to scholars with the American College of Sports Medicine, as many as 50 percent of youth sports injuries are preventable. By strengthening the supporting structures, improving muscle performance and increasing balance around joints,

sports injuries may be avoided.

Despite the many benefits of youth strength training, there still are myths that surround the growing trend. Some beliefs suggest that strength training is unsafe, can damage growth plates or cause other long-term harm. Researchers have not reported any data to suggest growth plate damage due to strength training, nor is there any published evidence of a decrease in stature in children who perform strength training in a controlled environment (Faigenbaum, 2001; Faigenbaum, Kraemer, et al., 1996; Lavallee, 2002). And interestingly, evidence suggests that strength training produces fewer injuries than many other sports such as football, basketball, baseball and soccer (Lavallee, 2002).

The misconceptions regarding youth strength training are now outdated. Well-planned and supervised programs can be a safe and effective supplement to any soccer training program. Ideally, strength training should be incorporated into a dynamic soccer program rather than just added to it. Guidelines for implementing strength training activities into youth soccer programs (and more advanced programs) will be outlined.

CONDITIONING GUIDELINES

Most research on youth strength training and sport-specific fitness emphasizes the importance of safety and proper technique. Program design should be grounded in safe practices and sound technical instruction. Several basic fitness principles should be followed in regard to program implementation (Faigenbaum & Micheli, 1998).

Progression, overload and specificity are important fitness principles to follow. Progression suggests the building from simple to complex over time. Any safe program should start slowly and progress to more sophisticated exercises and increased training volume. This holds true for strength training, as it does for soccer training. The principle of overload implies that an individual must train at a higher intensity than normal to elicit continued results. Essentially, an individual must exceed his/her normal training level to see improvements. And lastly, the principle of specificity

is vital for optimal training benefits. Soccer players must specifically replicate the demands of soccer in their strength and conditioning training. Often the use of specificity with a particular sport is referred to as functional training.

In addition to following these basic fitness principles, a few other general guidelines should be implemented. In order to effectively develop muscular fitness, the proper environment must be created. Strength training should be cooperative, not competitive as with normal soccer training sessions. The use of simple instructions, cue words and demonstrations is important in order to clarify proper techniques and procedures.

All strength and conditioning sessions should be supervised by a qualified, responsible adult. As a coach, if you believe you are not familiar enough with strength and conditioning practices, read on to learn more about how to get assistance with your team or program. For those who are comfortable integrating strength and conditioning into their sessions, be sure to use a dynamic warmup (aerobic movement and static stretching), as well as a similar cool down. Also, coaches may want to encourage players to track their progress in a workout log or notebook. Simple charts can be found online and modified for practical use. Specific components of strength and conditioning training can be discussed.

Well-rounded programs should include muscular strength, cardiovascular fitness (speed and agility), flexibility and dynamic sport-related movements. An effective program should utilize the FITT formula (frequency, intensity, time and type). For those familiar with typical strength training guidelines, remember to modify the expectations for children to meet their body size, experience and knowledge level.

By following the FITT formula, coaches can create well-rounded strength training programs for their players. With the 8-12 exercises, consider performing at least one exercise for each major muscle group. Focus on lower body strength, upper body strength, and core strength. Various modes of exercise can be utilized. Players can use their own body resistance

in exercises such as push-ups, sit-ups, lunges and Pilates. Free weights are ideal in that they are inexpensive and highly functional, but many teams do not have access to them. If your team is able to invest in some equipment (more to come about how our club made it work), items such as steps, ladders, hoops, medicine balls, resistance bands and resistance balls are very useful. Many of these items come with lists and diagrams of suggested exercises.

While the focus of strength and conditioning programs isn't usually on cardiovascular fitness, it is obviously important for soccer players. It is necessary to have a solid aerobic base before moving onto speed and agility training. When running, avoid running one pace for an extended period of time. Instead, run in intervals, at different speeds and distances. Intervals are more indicative of the demands of a soccer game. Speed and agility can be developed using a number of exercises to allow change in speed, direction and distance. Using ladders, hoops, small hurdles and jump ropes, a variety of exercises can provide improved speed and agility. Sprints that include a focus on acceleration and deceleration can be especially helpful with injury prevention. To increase the challenge level, try sprinting while holding a medicine ball (or just a soccer ball) out in front of the body or overhead. Cardiovascular exercise can be performed 3-5 times a week, while speed and agility training should be done less frequently due to the intensity.

Unfortunately, flexibility often is overlooked or emphasized at the inappropriate time. Most of us have seen soccer teams circle up and stretch prior to games and practices after little more than a jog around the field. While this is a well-intentioned practice, there is very little scientific evidence to suggest that static stretching prior to competition improves flexibility or prevents injury. The greatest gains in flexibility are made after the body is fully warmed up, which often occurs during or at the end of practices and games. Incorporating flexibility is very important for reducing injuries and optimizing performance, however it makes more sense to emphasize static stretching throughout a workout or as a part of a full cool-down. Exercises for flexibility can be done from three to seven days a week. Stretches should be held for 20 seconds and performed one to three times.

For the creative coach, there are numerous ways to incorporate soccer movements into strength and conditioning activities. Any chance you can safely use a soccer ball to create another challenge should be taken. For instance, have players jump up on a step, then jump off and land, then volley a soccer ball, jump back up and repeat. This can be done with trapping or

Strength Training Guidelines – The FITT Formula

F requency	Two to three nonconsecutive days a week
I ntensity	Moderate to high repetitions with low to moderate resistance (increase gradually, 5-10 percent)
T ime	One to three sets of 8-15 repetitions of 8-12 exercises (start with one set of 10-15 reps)
T ype	Body resistance exercises, free weights, other inexpensive equipment such as: steps, medicine balls, ladders, resistance bands, hoops, hurdles, jump ropes, etc.

heading as well. Implementing sport-related movements also can help improve the balance and coordination of players. Sport specific movements will make direct connections from training to competition, which players will enjoy.

IMPLEMENTING A PROGRAM

With the scientific background and practical guidelines described, coaches should have enough information to consider implementing a strength and conditioning component into their soccer programs. While the information presented here is not exhaustive, there should be enough to spark an interest. Hopefully, one or more of the coaches in a given organization have some experience or expertise in the field of exercise science. If not, encourage your organization to develop a relationship with a local college or university program. Graduate students are ideal people to work with teams and players. They usually are very enthusiastic about what they are learning academically and anxious for more practical experience. And most graduate students appreciate an opportunity to make some extra money. With our club, we have initiated a relationship with a local college with a specialized graduate program in strength and conditioning. We were able to coordinate this with a graduate student who was an ODP and college soccer player – really a perfect fit!

Prior to initiating the relationship with the local college, we started off with a small-scale in-house program. Several coaches volunteered to work with players from any of our teams (U-13 and up) during an eight-week period during the spring season and then a six-week summer session. We charged the players a reasonable fee and put all of the income toward purchasing equipment for our club. We were able to buy steps, ladders, hoops, medicine balls, resistance bands and jump ropes. We had players pay for their own resistance balls because they are large and difficult to store. Since the resistance balls are inexpensive and very functional, we wanted to include them in our program.

In our first year we were able to involve

a number of players from our club and most of my own team. Although our program is still small, the opportunity to expand is large. We're already brainstorming about what to offer next to better our club, improve soccer performance and reduce the likelihood of injuries. With the right people and a positive direction, similar programs are possible in any number of soccer settings. Plenty of informational resources are available with a few phone calls and some online homework. Best wishes for stronger and healthier soccer teams. ⚽

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