



OPPORTUNITIES TO USE NATIONAL AND MOVEMENT GAMES IN PHYSICAL EDUCATION AND ATHLETICS

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Annotation

Strengthening muscles and connective tissues with strength training offers a means to increase the forces they are capable of sustaining and helps to make the young player more resistant to soft-tissue injury. In adolescents particularly, it is important to strengthen these connective tissues to accommodate the rapid gains in strength and body mass that occur during puberty (1).

Keywords: youth sports; strength training; metabolic conditioning; neuromuscular training; injury prevention

Strengthening muscles around upperlimb and lower-limb joints through appropriate training similarly offers a means to increase the active stability provided to these joints, which can serve a protective function (43). Strength training has been shown to improve neuromuscular control indices during jumping and landing in female adolescent athletes (29). Such development of motor control and coordination improves balance and active joint stability, both of which are important to help reduce the incidence of lower-limb injury. In young female players, lower-limb strength development, in general, and hamstring strengthening, in particular, should be major areas of emphasis (3). Measures of hamstring strength are reported to plateau early in female athlete's physical development, with older age groups (i.e., 13–17 years) showing no significant gains on this measure compared to 11-year-old girls (3). The hamstrings compress the knee joint and oppose anterior shear forces during weight-bearing closed-chain movements; as a result of these functions, the hamstrings are described as an anterior cruciate ligament agonist (22). The relative weakness of the hamstrings of female players is of clinical relevance given the 2 to 10 times greater rates of noncontact knee ligament injury in adolescent female athletes compared with male athletes (17). Prepubescent athletes are shown to have a greater tendency than older athletes to show asymmetric lower-limb performance, based on scores with single-





leg hopping functional tests (2). In the absence of intervention, such imbalances may persist after puberty in boys and girls (3). Appropriate strength training offers a means to help correct such right–left imbalances in lowerlimb function, particularly in combination with plyometric or dynamic balance training (37). This role of strength training in correcting side-to-side strength imbalances is crucial for young players at all stages of development. Strength and flexibility imbalances are identified as major risk factors for injury (26). Strength imbalances can have negative consequences for both limbs. Overreliance may place excessive strain on the stronger limb, whereas the weaker limb is less able to actively counter injurious forces (14). Studies show that young players who have strength training experience tend to sustain fewer injuries (12). Incidence of injury in strength-trained youngsters is approximately one-third that of young athletes without any strength training experience (5). In addition to reducing overall incidence of injury, strength training can also help to reduce the severity of injuries. After an injury, strength-trained young players also respond better to rehabilitation, resulting in a more rapid return to training and competition (12,27). For these reasons, strength training is recommended in a preconditioning role for young people before they start to compete in organized youth sports (5). Young players who are better conditioned and less prone to injury because of appropriate physical preparation, including strength training, are more likely to continue to participate in youth sports. In this way, strength training can help reduce dropout rates and help to keep youngsters healthy later in life (12). Aside from the benefits of general strength training, targeted strength training involving particular exercises may also be used to guard against certain injuries that commonly occur in sports. This targeted injury prevention role for strength training is often overlooked, particularly in young athletes. Too often exercises to strengthen areas that are prone to injury are prescribed only once an injury has already occurred. Unfortunately, there are currently an insufficient number of prospective studies in the literature involving youth sports players to provide evidence-based training guidelines regarding effective training for injury prevention (32).

TRAINING TO DEVELOP BONE HEALTH AND CONNECTIVE TISSUE

In much the same way as for adults, positive links are established between physical activity and bone mineral density and connective tissue integrity in young people (18,43). Although genetics is a determining factor, the major stimulus for accumulation of bone mass and mineral content is mechanical loading (18). The cross-sectional area and architecture of connective tissues are also trainable; appropriate strength training can develop the strength and size of tendons and ligaments (9). Mechanical loads must exceed a





threshold to trigger adaptive responses (9). As a result, high-force weight-bearing and strength-type activities appear most suitable for use to elicit bone and connective tissue adaptations. Dynamic skeletal loading (i.e., loading during movement) appears to be relatively more osteogenic than the same loads applied under static conditions (18). It follows that relatively high mechanical loading occurring during dynamic training activities should result in the greatest bone adaptation. Recommended exercises generally involve weight bearing so that the young athletes own body weight provides additional loading (9). Sporting activities that involve high ground reaction forces are associated with increased bone mineral content and density (18). For this reason, sprinting, jumping, and other lower-body plyometric exercises are good training activities for developing bone strength because they offer high ground reaction forces and impact loading

Rates of development of a number of physiological and physical performance parameters measured in young team-sports athletes are shown to peak at approximately the same time as they attain peak height velocity (41). The age at which this occurs is highly individual; typical ages are approximately 11.5 years for girls (3) and 13.8 to 14.2 years for boys (41). However, this age varies considerably; levels of biologic and physiological maturation can be markedly different between young athletes of the same chronologic age (5,27). What constitutes appropriate strength training and metabolic conditioning for a young player is therefore determined by, and is specific to, the individual players stage of physical development. The stage of physical maturity also influences the mechanism of training effects, such as whether improvements are predominantly mediated by neural factors or whether morphologic and physiological adaptation plays the greater role (43). The emotional and psychological maturity of the individual is another important factor to be considered when designing and implementing strength training for a youth sports player (27,43). Another area of training for young athletes that has received less attention is neuromuscular training, including specific instruction and practice of fundamental movement mechanics. Neuromuscular and postural control and movement biomechanics for jumping, landing, running, and changing direction all can be developed in the young team-sports player as a means to improve athleticism. Such development of fundamental movement skills may also help reduce injury risk by equipping the young player to be better at reacting to challenges in the game environment.

NEED FOR PHYSICAL PREPARATION WITH YOUNG TEAM-SPORTS PLAYERS

A major public health concern is the sedentary behaviors and decreasing levels of physical inactivity of youth worldwide (23). Regular physical activity and proper





nutrition exert a major influence on growth and development in children and adolescents. From this perspective, appropriate physical preparation assumes increased importance to a young players athletic development given the apparent lack of habitual physical activity elsewhere in his or her lifestyle. The absence of such a program of physical preparation to help achieve a threshold level of physical activity may otherwise hinder young players. development during critical periods in their growth and maturation to the extent that they may not fulfill their genetic potential (23). As a result of modern sedentary lifestyles, young people are also often not physically prepared for the rigors of youth sports (12,27). Accordingly, the increase in participation in organized youth sports in North America has been accompanied by a dramatic increase in sports-related injuries (17,27). It has not been documented whether the increase in the number of injuries has been proportional to the increased numbers of participants or whether there has been a relative increase in the rate of injury among these young players. Whatever the case, approximately onethird of young athletes participating in organized sports in the United States sustain injuries requiring medical attention (2). Incidence of medical treatment for sports injuries peaks between the ages of 5 and 14 years and progressively decreases thereafter (1). The ankle and knee are the most common sites of injury reported in these young athletes (1,2). Youth sports players also appear to be at greater risk of low back pain and acute lumbar spine injury, particularly during adolescence (28). Inadequate physical preparation is believed to play a role in most sportsrelated injuries in young athletes (27). Conditions of muscle fatigue place athletes at greater risk of injury; tired players in the latter stages of a game are more likely to sustain injury than when they are fresh. Likewise, players are more likely to be injured early in the season when their fitness levels are not up to standard (45). Physical preparation, which includes strength training and training to develop cardiorespiratory fitness, is therefore an established part of strategy for prevention of sports injuries, including those in children and youth sports (32). Inadequate motor skills are another factor identified as increasing the risk of youth sports injury (1). Again, these abilities may be developed through appropriate athletic preparation. Injuries incurred during youth sports are a frequently cited reason for ceasing to participate in sports as an adult (32). This cessation has negative health implications given the established links among physical inactivity, obesity, and chronic disease in adulthood. From this perspective, prevention of injury in youth sports assumes increased importance, beyond enhancing youth sports performance





REFERENCES

1. Adirim, TA and Cheng, TL. Overview of injuries in the young athlete. *Sports Med* 33: 75–81, 2003.
2. Barber-Westin, SD, Galloway, M, Noyes, FR, Corbett, G, and Walsh, C. Assessment of lower limb neuromuscular control in prepubescent athletes. *Am J Sports Med* 33: 1853–1860, 2005.
3. Barber-Westin, SD, Noyes, FR, and Galloway, M. Jump-land characteristics and muscle strength development in young athletes. *Am J Sports Med* 34: 375–384, 2006.
4. Baxter-Jones, ADG and Sherar, LB. Growth and maturation. In: *Paediatric Exercise Physiology*. Armstrong N, ed. Edinburgh: Elsevier Health Sciences, 2006. pp. 1–26.
5. Bompa, T. *Total Training for Young Champions*. Champaign, IL: Human Kinetics, 2000. pp. 1–20

