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Youth sports injury prevention: keep calm and play on

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In recent years, there has been extensive media focus on youth sports injuries, especially concussions. While youth sports training and competition are more intense than ever, the focus on the 'injury risk' downside of youth sport is unfortunate because the benefits of sports participation (improvements in overall health[1] and bone density;[2] lower rates of overweight/ obesity,[3] cardiovascular disease,[3] diabetes,[3] risk-taking behaviours,[4] depression[4] and teen pregnancy;[5] and enhanced self-esteem[4] and peer socialisation[4]) far outweigh the risks for children and teens. In fact, the injury risk for youth aged 6–12 years in organised sports, even in contact/collision sports such as American football, is well below the risk of injury in typical recreational activities such as riding a bicycle or playing on a playground. Additionally, the recent focus on improving safety in organised youth sports has led to rule changes that have reduced specific acute injuries (eg, breakaway bases in baseball/softball, securing movable goalposts in soccer, limiting contact/collision drills and teaching safer tackling techniques in America football).

However, as rules have evolved to make sports safer, training patterns have evolved in the opposite direction, with practices that are longer, more frequent and more intense, raising the risk for overuse injury. There is also more emphasis on sports-specific skill acquisition and progression, leaving little or no time for basic strength and conditioning, or learning fundamental movement skills. While repetition of sports-specific skills is necessary to build expertise and confidence, it creates a risk for overuse injury, especially when preparatory strength and conditioning is inadequate.[6]

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Do Not Put The Cart Before The Horse

In the past, children engaged more in spontaneous and unstructured physical activities (self-regulated free-play), and physical education (PE) in schools focused on calisthenics (eg, sit-ups, push-ups, pull-ups, jumping jacks, stretches), both of which provided regular opportunities to enhance fundamental movement skills (running, jumping, skipping, balance, agility), increase muscle strength, make friends and have fun.[7] By the time, they entered organised sports later in childhood or early adolescence, these fundamental skills were attained and they were socially and physically ready for sports-specific training and skill acquisition. But currently, the cart often comes before the horse. Children become engaged in organised sports as early as 4 or 5 years and training programmes designed to enhance sports performance for children and teens have recently become a top 10 US fitness trend. Meanwhile, there has been a worldwide trend towards reducing time for PE in schools and the emphasis in PE classes has shifted towards playing games and learning sports-specific skills, rather than performing exercises to build the required foundations for fitness and fundamental movement skills. The result is large numbers of children and teens trying to learn and perfect sport-specific skills before they have established an adequate foundation of strength, endurance and motor skills. If a child has not mastered fundamental movement skills, these deficits may only amplify as training intensity increases and exercises become more diversified and complex over time, potentially raising their risk for sports-related injury.

Getting Back To The Basics

While we want to encourage and support a child who is genuinely eager to engage in sport at a young age, we should make sure the child is prepared. Existing data on contemporary youth clearly indicate that participation in physical activity should not begin with competitive sport, but should evolve from well-rounded preparatory fitness conditioning that is gradually progressed over time. Participation in activities purposely designed to enhance overall physical fitness during childhood and adolescence not only promotes sustained physical activity for a lifetime, but also reduces the risk of musculoskeletal injury.

One strategy for exposing children to this critical preparatory conditioning is to increase time spent in school PE classes and shift the focus ‘back to the basics’. Similar to traditional calisthenic-based PE classes of years ago, integrative neuromuscular training (INT) incorporates general (eg, fundamental movement skills) and specific (eg, exercises targeted to motor control deficits) strength and conditioning activities to enhance muscular fitness and motor skill performance. When INT was implemented in the first 15 min of second grade PE classes, it was not only feasible and well accepted by teachers and students, it also had significant positive impact on fitness, motor learning and fundamental movement skills.[8] This is likely to carry over and benefit children when they start participating in organised sports, facilitating learning of sports-specific skills, improving sports performance, reducing injury risk and promoting continuation and enjoyment of physical activity into adolescence and adulthood.

The Future Of Youth Sports Injury Prevention

Once children are engaged in organised sports, injury prevention may be further enhanced by carving out adequate time for INT and fitness training during practices, rather than focusing solely on sports-specific skills. Recent meta-analyses show neuromuscular training programmes implemented during organised sports practices can significantly reduce lower extremity injury rates. Going one step further, perhaps achievement of fundamental movement skills and a threshold level of fitness should be a prerequisite for beginning sports-specific training. This strategy—mastering fundamental movement skills followed by directed neuromuscular training programmes—deserves further study and consideration, as it may be the future direction for youth sports injury prevention.

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