Pediatric Sports Injuries: Who's Getting Hurt, Why, and What to Watch For

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Pediatric sports-related injuries are on the rise. More kids are playing and starting at younger ages, before musculoskeletal maturity. Here, a pediatric ED physician details the types of injuries you're likely to see and how to help kids avoid them.

Participation in youth sports in the United States has increased over the past 2 decades: currently, 30 million children and teens are involved in some form of athletic competition. The number of sport-related injuries is keeping pace, of course, with the uptick in engagement—for a total of approximately 3 million injuries annually among young athletes. Some facts:

- Among children younger than age 18 years, 1 in 5 injuries seen in the emergency department (ED) is sports-related;
- There are more than 800,000 sports-related ED visits each year among children younger than age 14 years;
- Almost half of all sports-related injuries involve children ages 5 to 14 years;
- Sports-related incidents account for 19% of all injury-related outpatient pediatric visits; and,
- Sports injuries account for almost a third of all childhood mishaps.

Let the games begin!

The potential for injury is inherent in sport whether from falls or trauma related to collision with an opponent or an object, or from misuse or overuse of the human body. The highest rate of injury occurs in sports with contact and collisions—football, hockey, lacrosse, and basketball. For boys, football has the highest injury rate; for girls, soccer is the most common source of injury. Seldom are injuries fatal unless there is injury to the brain. In the US, 21% of all traumatic brain injuries in children and adolescents are related to sports and other recreational activities—most notably, biking, skateboarding, and water sports.

Risk Factors

The rise in pediatric sports-related injuries is related not only to increased participation in competitive youth athletics but also to changes in who participates and when participation begins. Children are beginning to play sports at ever-younger ages, when the musculoskeletal system is immature and more susceptible to injury. (The most severe injuries, however, tend to occur in older children.) Also, experience counts. Beginners are more vulnerable to injury than “veterans.” Other risk factors include:
• Differences in sizes of children who are the same age
• Inappropriate or ill-fitting equipment and safety gear
• Improper technique
• Poor body mechanics
• Rapid growth spurts
• Coach/parent/child unwilling to allow rest after injury
• Year-round participation in a single sport, rather than cross training

Before puberty, boys and girls are equally likely to become hurt during sports. Boys after puberty tend to get bigger, stronger, and more aggressive than girls of the same age and to play in a wider variety of contact sports. They are also more likely while playing a sport to take risks that put them in harm’s way. And so, after puberty the incidence of injury is greater in boys than in girls and boys tend to get hurt more severely. One interesting difference, however, is that young female athletes are more susceptible to anterior cruciate ligament (ACL) injury than their male counterparts (more below) and especially female adolescent soccer and basketball players.

Types of Injuries
Sprains and strains are the most common sports-related injuries; fractures and lacerations occur less frequently. Children who participate in sports involving throwing or bracing from a fall, such as baseball and gymnastics, are prone to upper extremity (shoulder, elbow, wrist) injury. Most injuries, however, involve a lower extremity—especially a knee or an ankle.

ACL injury. Girls injure the ACL 4 to 8 times more often than boys playing similar sports. Although it is rare in children younger than age 11 years, ACL injury is becoming more common and now affects 1 out of every 100 high school athletes. Of these episodes, 70% do not involve contact.

Twisting is the usual mechanism of injury. The knee swells almost immediately, and the child will say that the knee feels wobbly or like the leg cannot bear weight. Physical findings may include hemarthrosis.

Overuse injuries. These are most common in adolescents because their bones are still maturing and injury is often masked, so activity continues. Overuse directly contributes to apophysitis, an issue analogous to tendonitis that involves chronic irritation or microfracture at the musculo-tendon insertion or origin. Microtraumatic damage to bone, muscle, or tendon is the consequence of constant, repetitive stress with inadequate time to heal. Apophysitis leads to inflammation, pain, and loss of function.

There are 4 stages of overuse injury:
1. Pain after physical activity
2. Pain during activity that does not limit performance
3. Pain during activity that limits performance
4. Chronic pain, even at rest

There are many types of overuse injury, including:
• Little league shoulder, or proximal humeral epiphysitis, primarily affects children 11 to 16 years old.
• Little league elbow, or medial epicondylar apophysitis, occurs in children who are 9 to 12 years old.
• Gymnast’s wrist involves stress injury to distal radial physis.
• Osgood-Schlatter disease, or apophysitis of the anterior tibial tubercle, is the most common overuse injury in the pediatric athlete. It typically affects adolescents 11 to 15 years old who are experiencing a growth spurt. Symptoms include pain and prominence at the tibial tubercle that worsen with jumping, running, or squatting.
• Sever disease, apophysitis of the calcaneal ossification center, usually affects runners between the ages of 10 and 12 years old. Heel pain, especially after a growth spurt or an increase in training/activity, is typical.
• Spondylolysis is stress fracture of the spine, usually involving L5.

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Management

Overuse injuries are generally managed conservatively with rest, NSAIDs, and supportive bracing as needed. If symptoms persist or do not respond as expected, refer the child to a specialist.

Proper training that emphasizes flexibility and correct technique is crucial to management. Cross-training minimizes the risk of overuse injury. Encourage the athlete to take 2 to 3 months off from his specific sport during the year, and to participate on only 1 team during the season. Emphasize to coaches, parents, and the child that a premature return to play will worsen the injury and probably lead to new injuries. I encourage my patients and their parents to embrace the mantra: “If it hurts-rest it!” In my opinion, child athletes are best served by focusing on having fun, developing sportsmanship and skills, and staying safe.1

A note about Little League injuries. Little League elbow and shoulder are managed nonsurgically but require complete rest for 2 to 3 months. Counting pitches, following appropriate mechanics, and avoiding curve balls may help prevent elbow and shoulder injuries. Here are some general guidelines to follow and to share with parents:

- Avoid breaking pitches until the child is 14 years old
- Avoid split-finger change-up
- Avoid side-arm throwing
- Allow 3 days of rest between outings
- Observe the Little League guidelines for pitch counts and days of rest

Prevention

More than half of all organized sports-related injuries can be prevented if the parents and coaches make sure that the child:

- Has a pre-participation physical examination
- Wears proper protective equipment (helmets, face/mouth guards, body protection/pads) that meets safety and quality standards
- Plays in a safe environment
- Prepares properly, with adequate conditioning starting 6 to 8 weeks before the start of the season
- Takes time to warm-up and cool down thoroughly
- Trains properly, with good form, to avoid overuse injury
- Is treated early in the event of injury, to avoid more serious damage to musculoskeletal structures

With an adequate pre-conditioning program, proper equipment, cross-training, and sufficient rest periods, most children will be able to look forward to a healthy competitive career. Participation in sports builds the foundation for a healthy lifestyle that can last throughout adulthood.

References:

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