

Overuse Injuries in Young Athletes

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Participation in youth athletics has dramatically increased over the last two decades. Approximately 45 million children ages 6-18 participate in some form of organized athletics. The total number of high school students participating in sports has increased by 75% since 1970, due in large part to the passage of Title IX and subsequent access that girls had to participation.

With the growing number of young athletes, increased attention is being given to overuse injuries in this population. Approximately half of all injuries evaluated in pediatric sports medicine clinics are associated with overuse. Overuse injuries are chronic injuries that occur with repetitive stress on the musculoskeletal system over the course of time without allowing time for adequate recovery. Pediatric athletes are prone to overuse injuries due to stresses placed on the growing bones. External factors that contribute include inappropriate increases in training, hard training surfaces or improper equipment. Internal factors include decreased muscle flexibility and strength or extremity malalignment, such as excessively flat feet.

Overuse injuries manifest in the young athlete in a multitude of ways. The most common overuse injuries in the young athlete include an irritation of the growth plate (apophysitis), problems with tendons, stress fractures, and patellofemoral (knee) pain. Pain, decreased performance, limping and swelling are signs of overuse injuries that should be evaluated.

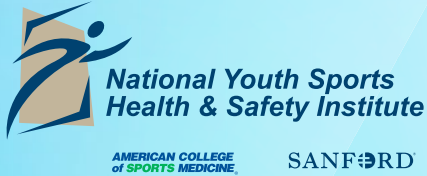
You may have heard the adage that children are not just small adults. The injuries that young athletes sustain are very different than those of adults. The main reason for this difference is the growing skeleton and its open growth plates. The growth plate (physis) is made up of cartilage that is becoming bone and as such does not yet have the strength properties of adult bone. For this reason the growth plate tends to be injured before the surrounding bone or ligaments. The difficulty in recognizing injury to the growth plate is that they are not always palpable, they can be difficult to detect on X-ray and there is wide variability in the location and closing (fusing) of growth plates.

Growth plates occur where ossification (bone-making) centers are located on the skeleton, at the end of long bones (epiphysis) and at the attachment sites for tendons. These ossification centers appear (ossify) and disappear (fuse) in a relatively ordered fashion depending on age, gender, genetics and location on the skeleton. Ossification centers at the knee appear in the first year of life where as some in the elbow don't appear until the tenth year of life. Most centers disappear after the adolescent growth spurt but some, like in the pelvis or clavicle, can stay open as late as 20+ years of age.

Another trend seen in youth sports is the early specialization of sport. With more athletes and earlier specialization, we are seeing more overuse injuries. Because of early sport specialization and increased availability of indoor training facilities, young athletes are increasingly playing one sport year-round. With year-round training in a single sport, children don't give their bodies adequate time off for rest and recovery. The best athletes tend to get more injuries because they log more minutes on a club or travel team in addition to their school team. No one knows exactly how much is too much, but one month off from a year-round sport every six months is a good rule. This does not mean complete rest, but rest from the primary sport. Cross-training with other sports is encouraged. One day off per week, one sport per season, one team per sport and increase training intensity gradually over a period of weeks are all good rules of thumb. Additional resources for overuse injury prevention are available at the website of the American Academy of Pediatrics Council on Sports Medicine and Fitness.

Overuse injuries are common in young athletes. We must be aware that there are different types of overuse injuries and the diagnosis affects the treatment. Any athlete who exhibits pain, decreased performance, limping or swelling deserves evaluation by a sports medicine provider familiar with injuries in young athletes. The common thread among these overuse injuries is overtraining, so education of athletes, parents and coaches is essential for prevention. We must let them know that adequate rest and recovery is an integral part of training.

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