

# The Adolescent Athlete

By Kevin D. Walter, M.D., FAAP

- Since adolescents are still growing, they have different injuries than adults.
- The physical and emotional development of adolescents occurs at a very individual rate.
- Emotional maturity in adolescents frequently does not correspond to their actual age.

## SIGNIFICANCE

Adolescence begins with the appearance of secondary sexual characteristics (pubic hair, breast development) and ends with the attainment of full physical development and adult height (skeletal maturity). Though variable, this roughly encompasses the ages from 11 to 19 years.

Adolescents' bodies are not smaller versions of adult bodies. They are quite different anatomically, developmentally and physiologically (how their bodies function). In addition, adolescence is a time of great change physically and emotionally. As teens mature, rational thought and motivation can vary greatly.

Therefore, coaches should be aware that each athlete must be assessed and treated in a unique fashion, depending upon the youngster's level of emotional and physical maturity.

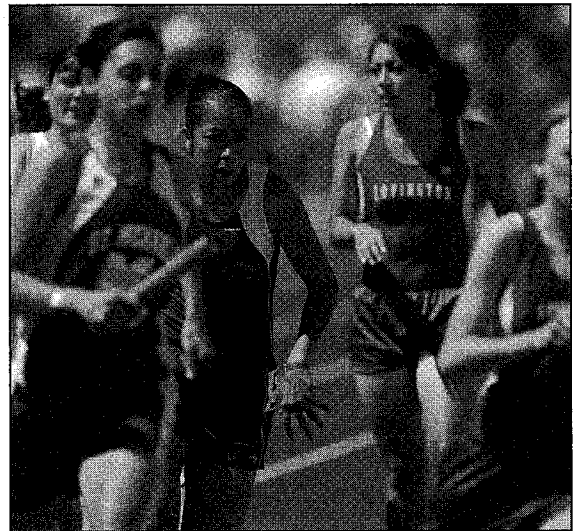
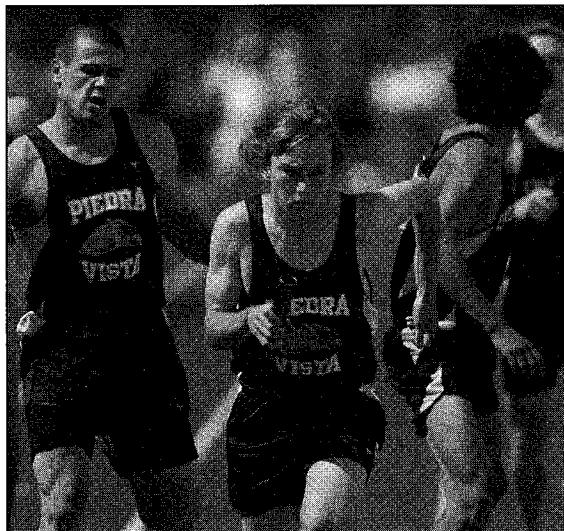
## BACKGROUND

### Physical Development

There is tremendous variability among adolescents in their rates of growth and development. The majority of physical growth occurs during puberty. Girls typically begin puberty earlier than boys. The average time for the pubertal growth spurt in girls is ages 11 to 13, while in boys it is ages 14 to 16. Pubertal development and physical growth is easier to predict and monitor in girls, as compared to boys. On average, girls will begin menstruating within two years of beginning breast development. Their "growth spurt" will occur in the interim. Most girls will see only a few inches of height gain after starting their menstrual cycle.

Rapid bone growth and maturation occurs during puberty. Bones grow from areas called physes (growth plates) which are located at the ends of each long bone. There is also a secondary growth center on many bones where large muscle-tendon units attach called apophyses. These growth centers are susceptible to both acute and overuse injury.

The growth plates at the ends of the long bones can be fractured from acute trauma. They can also be damaged from overuse with repetitive impact activities, a common cause of wrist pain in gymnasts. When growth plates are injured, there is potential for the injury to completely stop growth in the injured bone, causing permanent limb deformity.



Injuries to an apophysis can also result from acute trauma or from repetitive activity. In many cases, the area where the growth occurs is weaker than the muscle-tendon unit. Acute injuries may mimic a muscle strain, but are actually a small fracture where the muscle-tendon pulls off a small piece of bone. These injuries often occur around the pelvis. Chronic apophyseal injuries are quite common and result in knee pain (Osgood-Schlatter Disease), heel pain (Sever's Disease) and elbow pain (Little League Elbow), among other conditions.

### **Psychological Development**

It is well-known that adolescents often "rebel" against their parents as they begin to mature and move toward establishing their identity and becoming more independent. Coaches are often seen as a secondary parent, resulting in the potential for similar conflict. Adolescents experience many changes in their self-esteem and self-perception. This is often a "roller-coaster" period where an athlete may go from feeling very self-confident to feeling very badly about himself or herself in a matter of moments.

For many athletes, a positive self-image is closely related to athletic performance. It is important for coaches to help guide an adolescent athlete through any and all rough spots, such as poor performance or injury, based upon the athlete's level of maturity. More often than not, it is important to be very specific about what the athlete can and cannot do during practices and workouts while recovering from an injury.

Emotional response to injury is typically determined by the individual's developmental stage. Most young adolescents have difficulty understanding that not properly treating an injury may adversely affect them in the future. In early adolescence, children will have a greater sense of invincibility, but tend to be more concerned about letting the team down rather than an injury's long-term consequences.

Lastly, late adolescents have a greater understanding of their vulnerability and are more likely to comply with a treatment plan that involves compromise, like decreasing certain parts of practice, or missing a match against a lesser opponent, in order to play in the next big game.

### **OTHER ISSUES**

It is very important to remember that the majority of injuries in the adolescent population occur outside of athletics. As authority figures, coaches are in the position to model and reinforce the need to wear seat belts in cars and use helmets and appropriate protective equipment while biking, skateboarding, skiing or snowboarding. When appropriate, coaches can also discuss the dangers of drug and alcohol use. Adolescent athletes are also at high risk for using steroids and supplements and coaches are in an ideal position to discourage the use of such potentially harmful substances.

## **References**

Growth and maturation in adolescence. In: Landry GL, Bernhardt DT, eds. *Essentials of Primary Care Sports Medicine*. Champaign, IL: Human Kinetics, 2003:273-86.

Tanner SM. Growth and developmental concerns for prepubescent and adolescent athletes. In: Sallis RE, Massimino F, eds. *ACSM's Essential of Sports Medicine*. St. Louis, MO: Mosby-Year Book, 1997:218-25.

## **Resources**

Caring for Your Teenager: The Complete and Authoritative Guide. Edited by Donald E Greydanus, MD. Published by American Academy of Pediatrics, 2003.

National Network for Child Care. [www.nncc.org](http://www.nncc.org)

U.S. Department of Health and Human Services. [www.hhs.gov/kids](http://www.hhs.gov/kids)