In 2008, Malcolm Gladwell authored a book popularizing the “10,000 hour rule.” He suggests mastering a particular skill requires an investment of 10,000 hours of deliberate practice. This conclusion was reached after studying the most successful business professionals and musicians throughout history and their paths to success. Many believe this rule can also be applied to sports and can justify the intensive training to which many of our youth are subjected.

More than 25 million children aged 6 to 18 years participate in organized team sports, while 60 million participate in some form of organized sports in the United States. Although it can be argued that youth athletic participation and competition are advantageous to building a strong foundation for a healthy lifestyle, the methods employed currently may, in fact, be failing our youth. Our culture emphasizes, and very often obsesses over, athletic performance. Success is often measured not on an athlete’s overall fitness, but on attaining elite status in a particular sport or skill set. Parents, who hope for future athletic scholarships, along with many self-interested coaches can pressure children toward high-intensity single-sport training at a young age. Logically, specialized young athletes will fulfill the proposed 10,000 hours of practice required to master their sport and increase their chances of future success and possible financial reward. The sporting goods industry, having a vested interest in increasing the demand for specialized products, perpetuates this by targeting children with its advertising. The success stories of Tiger Woods and Andre Agassi, who began strict training regimens at very early ages, are well publicized and heralded by the media. All of these factors have resulted in increasing numbers of children specializing in one sport at an earlier age.

Early sports specialization can be defined as year-round training in a single sport at the exclusion of other sports. Specialization in one sport is becoming a trend in the United States, as statistics show growth in the number of year-round travel leagues and growing numbers of young Olympic athletes. Young athletes increasingly are involved in high-level travel or club teams, are part of multiple teams simultaneously in the same sport, or seek extra training from sport-specific specialists. Theoretically, this high-intensity training will foster the development of one sport’s particular skill set. However, this structured environment may actually be detrimental to achieving elite status. It exposes young athletes to increasing demands on their developing musculoskeletal system and may have damaging effects on their psychosocial development.

Continuous single-sport specialization and the repetitive nature of developing specific skills (eg, pitching, tumbling, racquet swinging) subjects the body to recurring microtrauma and overuse. This is particularly applicable to young athletes, in whom physiological and skeletal development is ongoing. It is accepted that growth cartilage present at the physes, apophyses, and articular surfaces is less resistant to injury than mature bone, which makes overuse injuries of these structures a common concern. Up to 54% of injuries in patients between the ages of 5 and 18 years seen in a typical sports medicine clinic are over-
use injuries, and these injuries show a linear relationship with increased weekly hours of sports participation.\(^5\) Notably, young athletes who are highly specialized are 36% more likely to suffer a serious overuse injury than those who are not.\(^4\) The highly susceptible young athlete will experience injury of overuse without adequate recovery time or rest to allow for the body’s natural physiological response to stress to occur. Year-round single-sport participation has theoretical and measurable risk for the physical development of children and adolescents.

The psychosocial development of a child is also at risk with intense training and sports specialization. The focus on one sport may lead to isolation of the athlete from peers. The time commitment to travel teams and weekend tournaments can disen-gage children or adolescents from attending other recreational or educational activities with their age-matched groups. This may slow the critical social development of athletes and promote overdependence of athletes on their sport. Burnout, defined as a response to chronic stress when a previously enjoyable activity is no longer so,\(^6\) is of real concern for the single-sport athlete. The physical and psychological demands of the sport and the pressure to succeed lead to anxiety, decreased performance, and, in many cases, withdrawal from the sport. The consequences of early sports specialization and overtraining in young athletes can stunt their psychosocial growth and leave effects lasting well into adulthood.

Participation in multiple sports into adolescence may enhance a young athlete’s chance of attaining elite status in one particular sport. Nearly 70% of Division 1 athletes at one US university delayed sports specialization until the age of 12 or older.\(^7\) This is also commonly found around the globe, as world-class athletes are more likely to play multiple sports until a later age than athletes competing on a national level.\(^4\) The theory behind the protective effect of sports diversification is that the greater number of activities experienced during early development may increase an athlete’s ability to transfer skills across differing sports.\(^8\) The multi-sport athlete will develop a foundation of balance, coordination, flexibility, and strength while decreasing the chances of overuse injuries and burnout commonly encountered by the specialized athlete.

Pediatricians and nonsurgical sports medicine specialists are well versed in the evaluation and care of the young athlete. Their literature emphasizes screening methods to identify children and adolescents at risk for overuse injuries and burnout and methods of prevention. The American Academy of Pediatrics and the American Medical Society for Sports Medicine recommend against early sports specialization, warning that it may not lead to long-term success in sports but instead increase the risk of overuse injury and burnout.\(^2,10\) Orthopedic sports medicine must recognize the injuries and consequences associated with single-sport specialization among young athletes and direct efforts toward their prevention. We must promote 10,000 hours of diverse athletic activity to ensure our young athletes develop into healthy adults.

**REFERENCES**