

Youth Sports: A Pediatrician's Perspective on Coaching and Injury Prevention

Michael C. Koester, MD, ATC

Good Shepherd Community Hospital, Hermiston, OR

Objective: My objective is to review the factors that influence youth participation in sports, to discuss the role coaches may play in youth sports injuries, and to call on athletic trainers and other health professionals to become involved in youth sports in an effort to limit injury risk.

Background: Millions of American youths participate in team sports. Their primary motivation to participate is to have fun. Unfortunately, large numbers of participants have sustained correspondingly large numbers of injuries. Many injuries can be attributed to improper technique and conditioning methods taught by volunteer coaches. Although not the only contributors to injuries, these may be the most amenable to preventive measures, such as formal instruction for coaches in the areas of proper biomechanics and player-coach communication.

Description: I provide an overview of the reasons why children participate in sports, discuss participation motivation, and review the literature on coaches' communication methods that have been proved effective in maximizing learning and enjoyment for young athletes.

Clinical Advantages: This article provides certified athletic trainers with the background knowledge needed to take an active role in youth sports injury prevention at the community level.

Key Words: young athletes, sports psychology, participation motivation, injury prevention, coaching

Nearly 20 million youths between the ages of 6 and 16 years old participate in a vast array of nonscholastic organized sports, with an additional 6 to 7 million high school students involved in school-sponsored athletic activity yearly.¹ Not surprisingly, such large numbers of participants and a myriad of other factors have led to rather startling injury statistics. Young girls playing organized sports have an estimated injury rate of 20 to 22 per 100 participants per season, while boys have an almost doubled risk of 39 per 100 participants per season.² Recent data show that sports and recreational activities account for 32.3% of all serious injuries in children ages 5 to 17 years.³

Numerous studies and review articles have reviewed the potential causes for injury in youth sports participants, often stressing the unique physiologic and biomechanical aspects of the growing body.⁴⁻⁷ In addition, the literature regarding the effects of life stress on injury occurrence is expanding.^{8,9} Although this area has not yet been scientifically investigated, anecdotal evidence implies that improper training methods and lack of proper sport-specific techniques also contribute to injury. Some sports medicine professionals point directly to poor coaching as a factor in injury.¹⁰

Injury has always been recognized as a natural risk of participation in organized sport. However, many injuries may be preventable, particularly those resulting from a lack of proper, well-supervised training and participation. My purpose is to review the factors that influence youth participation in sports, to discuss the role coaches may play in youth sports injuries, and to call on athletic trainers and other health

professionals to become involved with youth sports in their communities in an effort to limit injury risk. Also, I hope to stimulate athletic trainers to increase their knowledge in pediatric sports medicine.

Athletic trainers are viewed as sports injury experts by parents, coaches, and, increasingly, the medical profession. In this role, they can help to educate parents and coaches in injury prevention. Granted, other factors lead to injury, but they are not the focus of this discussion. Here, I present a primer for sports injury prevention by first making sure that coaches are emphasizing fun and fundamentals in working with their young athletes.

HISTORY OF YOUTH SPORTS IN THE UNITED STATES

The industrialization and urbanization of the 19th century led to the creation of organized youth sports in America. Early youth sports organizations had their origins within local schools and churches, as physical activity was thought to be character building. In the 1890s, the YMCA first began offering the opportunity for young men to compete against each other. The founding of New York City's Public School Athletic League in 1903 ushered in the explosion of organized sports participation in the first half of the 20th century.¹¹ By the 1930s, professional team sports such as football and baseball became a significant part of America's popular culture, and involvement in youth sports paralleled this rapid rise in popularity.

In the 1930s, opposition to youth competitive leagues arose, and these organizations began to fall under the auspices of community groups, rather than churches and schools. Many educational leaders were opposed to children's involvement in

Address correspondence to Michael C. Koester, MD, ATC, 105 SE Crestline Drive, Hermiston, OR 97838. E-mail address: mkoester@eoni.com

competition for a variety of reasons, including premature specialization and the potentially harmful psychological effects of competition.¹¹ At that time, several schools did disband competitive leagues for elementary school-aged children. This shift in philosophy in the school systems had repercussions that are still felt today. As physical educators and other teachers played less of a role in coaching school-sponsored sports, thousands of parents and others with no formal training in coaching or child development took their place.¹²

Despite opposition, youth sports continued to grow in popularity. Between the founding of Little League Baseball in 1939 and the mid 1960s, numerous youth sports organizations were formed on the national level. The 1970s and 1980s saw an ever-increasing number of young women and girls playing individual and team sports, as previous barriers to participation were overcome both legally and socially, although calls to ban competitive youth sports continued.¹³

FACTORS IN PARTICIPATION

Why do children choose to participate in organized sports? Study in the arena of participation motivation has burgeoned in the past 2 decades. The research centers on the reasons individuals adopt for initiating, continuing, and sustaining involvement in physical activity, as well as the reasons for discontinuing involvement.¹⁴ Not surprisingly, many studies have concluded that “having fun” is the primary reason children choose sports participation.^{15,16} Skill development, making friends through team involvement, the challenge of sports, and improving physical fitness were also commonly found factors leading to participation. Interestingly, in what is likely a symptom of changing family structures in the United States, Stern et al¹⁶ found that preadolescents in an urban boys club basketball league also ranked “having a coach to look up to” rather highly.

Research in recent years has demonstrated that perceived confidence and perceived ability also play major roles in participation motivation.^{14,17,18} Harter termed this competence “motivation theory” and postulated that individuals are motivated to demonstrate competence in an achievement area and do so by engaging in mastery attempts.¹⁴ Although a more detailed discussion of competence motivation is beyond the scope of this article, a few significant findings put the theory into perspective. Children who tested highly in perceived physical competence were motivated by the prospect of further skill development, while gymnasts high in perceived social competence were motivated by the affiliation aspects of their sport.¹⁷ In what could be the paradigm of Harter’s theory, Orlick¹⁸ interviewed children who had never participated in organized youth sports programs and discovered that 75% wanted to participate but did not try out for a sport because they felt they were not good enough.

Many youngsters eventually choose to discontinue sports participation, as many as 50% according to 1 study.¹⁹ The reasons for this high rate of attrition are varied but include interest in other sports, outside interests other than sports, lack of playing time, overemphasis on competition, and dislike of the coach. DuRant et al¹ found injury to be the most common factor in the discontinuation of school sport involvement among 674 high school students. Sadly, attrition among elementary school-aged participants results from little success, a lack of playing time, and “absence of fun.”²⁰

THE ROLE OF THE COACH IN YOUTH SPORTS

Although they are often the subject of a great deal of criticism,^{10,15} no one plays a more vital role in the lives of young athletes than their coaches. According to Engh,²¹ 85% of coaches are either parents or other interested persons who have no formal training in coaching. The need for coaches has quadrupled over the last 20 years, which has led to a shortage of qualified applicants.¹⁵ Perhaps not coincidentally, health care professionals feel that injuries resulting from organized sports activity have been on the rise in recent years.^{7,10}

Athletic injuries that occur in children can be divided into macrotrauma (fractures, sprains) and microtrauma (enthesitis, tendinitis). Microtrauma is often said to be secondary to overuse. In fact, these injuries generally result from a combination of overuse and misuse. Many young athletes are never taught the proper conditioning methods or technique for their sports.⁷ Youngsters and coaches alike often fall prey to the “more is better” philosophy of sports training, attempting to do “too much, too soon” while also using improper biomechanics.

Many coaches simply do not have the proper knowledge base for instructing in correct sport techniques.¹⁵ Volunteers without formal training often base their coaching style and techniques on their own personal experiences. Even trained coaches will likely have learned many of the technical aspects of their job by observing and listening to other coaches.²² Both of these styles of acquiring coaching knowledge are prone to misinformation and improper theory being perpetuated for years, setting the stage for injury.

PLAYER-COACH COMMUNICATION

A vital but often overlooked component of the player-coach relationship is communication. Sports psychologists have found that the manner in which a coach communicates with his or her athletes not only affects how players perceive their own abilities but can also affect the athletes’ ability to assimilate technical instruction.²³ Much of this research again centers on competence motivation theory. Horn²⁴ found that skill improvement accounted for the greatest variance in self-perception among junior high school female softball players. Surprisingly, players who received more frequent positive reinforcement actually scored lower in perceived physical competence than those who received more frequent criticism. This appears contradictory at first glance; however, Horn²⁴ also observed that positive reinforcement was often given unconditionally to players with less ability (eg, “good job” and “nice try”) without regard for their effort. Players with more ability received skill-relevant information as part of the criticism (eg, “use 2 hands,” “keep your glove down”).

Although the above-mentioned research only looked at the effects of communication on athletes’ self-perceptions and feelings about aspects of competition, there are further implications of these findings. If improper technique does indeed lead to a number of injuries, as is believed to be the case, simply using new methods of communication and instruction may result in a decline in injuries. Such communication may be even more important for younger children, because it is believed that children who are beginning to attain skills depend even more on adult evaluation.

OFFERING A SAFE ENVIRONMENT TO YOUTH SPORTS PARTICIPANTS

It has been estimated that a young athlete spends an average of 326 hours of practice time under supervision of a coach during 1 athletic season, dwarfing the time spent with teachers, health educators, and physicians.²⁵ This has led to a recent call for coaches to take a more active role in health education and to use the athlete-coach relationship to modify high-risk behaviors and to focus on social-skills training and character formation.²⁵ Ideally, the above call would be an outstanding plan. However, to heap more responsibility onto well-meaning but undertrained individuals is unproductive and detrimental. At this point, we must ask of coaches only that they foster an environment in which children can participate in athletics with a minimal chance of injury and enjoy themselves while doing so.

How can this goal be accomplished? Injury prevention in the growing athlete centers on the principles of effective coaching, proper training habits, maintenance of flexibility, and the consistent use of correct biomechanics. First, coaches must be knowledgeable in the technical aspects of the sport they coach. Specifically, they must be aware of the proper biomechanics and training techniques required by that sport. Fundamentals are essential to all athletes but they are even more important to young, skeletally immature participants, who are at high risk for tendon and muscle injuries imparted by the more stressful forces caused by poor biomechanics.

Second, coaches must be aware of the emotional and psychological developmental stages of children and adolescents and not treat them like "little adults."²⁶ We cannot ask our coaches to be formally trained in child psychology, but we must expect them to always have the youngsters' best interests at heart and to keep instructions, expectations, and goals developmentally appropriate (Table 1). We are all aware (personally or professionally) of the emotional trauma and stress that can be inflicted on young athletes. However, despite our perceptions and societal stereotypes, athletics may not be as stressful as other activities for school-aged children. Simon and Martens²⁷ found that children performing band solos experienced more anxiety than athletes, and among the sports compared, only wrestling was significantly more anxiety arousing than test taking.

Finally, coaches can be trained through formal instruction in methods of communicating with young athletes to avoid emotional conflict, foster positive attitudes, and improve skills. Over the past decade and a half, Smith and Smoll²³ and Smith et al^{28,29} have carried out a series of studies with Little League baseball players in which they proved the effectiveness of certain communication techniques used by coaches. Players

enjoy competition more and find their coaches to be more effective than coaches not trained in such techniques.²⁹ The players also scored higher in self-esteem than controls. The coaches' behavior that the athletes found most beneficial was error-contingent, corrective instruction (eg, "you dropped the ball because you didn't use 2 hands"). Such training could result in a decrease in injuries because properly informed coaches may more effectively instruct their players in the correct technique.

As I have detailed, children participate in sports to have fun. That participation is usually discontinued either because of injury or because the young athlete is no longer having fun. Therefore, our efforts must be directed toward the twin goals of preventing injury and maximizing enjoyment of the sport. As discussed, training programs are an effective way of increasing coaches' knowledge bases and communication abilities, both of which will lead to fewer injuries (Table 2). It is unlikely, however, that most volunteer coaches will have the opportunity to take advantage of these courses. However, we must make our local coaches aware of such programs and strongly encourage attendance. Many courses are short (half day) and relatively inexpensive. Travel costs could be defrayed by applying a portion of the league sign-up fees.

ROLE OF THE ATHLETIC TRAINER IN YOUTH SPORTS

Only at the elite levels of competition are youth sports participants assured access to athletic trainers and sports medicine physicians. Millions of other active youngsters are often without timely or proper injury-prevention techniques, acute injury evaluation, and rehabilitation assistance. Many, but certainly not all, high school student-athletes have an athletic trainer or team physician available, at least on a part-time basis. Younger athletes, however, have only their coach available for acute injury care and rehabilitation guidance. Compounding matters, the family physician or pediatrician evaluating the young athlete usually has little understanding of the causes of pediatric sports injuries or the principles of rehabilitation.

Given the current inequities of youth sports injury prevention and care in the United States, the athletic training profession could benefit young athletes nationwide by making a concerted effort at the local, state, and national levels to become involved with youth sports programs. Ideally, athletic trainers can begin by organizing coaching clinics to highlight the uniqueness of young athletes and their susceptibility to injury. Strength and conditioning principles, the bedrock of injury prevention, can also be taught. Youth sports coaches can

Table 1. Developmentally Appropriate Coaching Methods and Principles for Young Athletes

Developmental Level	Task	Method/Principle
Elementary school	Practice of learned skills	Recognize heavy dependence on adult input for sense of competence Provide repetitive instruction and emotional support Reinforce effort and progress, not results: strive to achieve, not to win Motivate based on positive accomplishments, not fear of failure Define mistakes as "learning opportunities"
Adolescence	Achievement of autonomy	Provide advanced instruction to improve skills and knowledge base Support autonomy by fostering internalized performance standards Provide feedback contingent on performance: praise only when appropriate Recognize that critical comments are often perceived as a threat to autonomy; provide corrective instruction

Adapted with permission from Libman.¹²

Table 2. Organizations Offering Instructive Programs for Coaches

National Youth Sports Coaches Association
2050 Vista Parkway
West Palm Beach, FL 33411
561-684-1141

American Coaches Effectiveness Program
1607 North Market Street
Champaign, IL 61820
800-747-4457
www.humankinetics.com

Youth Sports Institute
Michigan State University
213 IM Circle
East Lansing, MI 48824
517-353-6689
E-mail: ythsprts@msu.edu

Coach Effectiveness Training Program
Frank Smoll
Department of Psychology
Guthrie Hall, N1-25
University of Washington
Seattle, WA 98195
206-543-4612

be further instructed in the basics of acute injury recognition, emphasizing symptoms that indicate the need to discontinue participation immediately and seek medical care. Such knowledge would limit further, more serious injuries. The focus of all involvement should be on injury prevention, not evaluation and treatment.

Another role may include mediation in times of dispute over an injury or other malady affecting a child's ability to participate. The athletic trainer who is interested only in the child's health and safety rather than the outcome of the event can offer parents and coaches an impartial third party. Athletic trainers may also serve a valuable role in actively policing the local coaching ranks (with the cooperation of others) to remove individuals abusing their authority and those who have "winning out of perspective"³⁰ (Table 3). Athletic trainers can also gather information about, and encourage attendance to, coaching programs and seminars such as those discussed above.

I outline the above program fully recognizing the time constraints of all involved. Many athletic trainers already work long hours for relatively minimal compensation compared with other health care professionals. However, the proposed interventions do not command huge time commitments and offer the added incentive of boosting public awareness of the profession. As athletic trainers come into contact with a wider variety of athletes and parents outside the high school and

Table 3. Criteria to Determine that Winning is Out of Perspective³⁰

1. A display of comradeship with an opponent is considered a sign of weakness.
2. Laughter is judged to be a lack of competitiveness.
3. Strategies to take unfair advantage of opponents are developed.
4. Youngsters are cajoled to cheat or intimidated to excel.
5. Winning the game is more important than winning friends, respect, self-confidence, skill, and self-worth.

college settings, the public will become more aware of athletic trainers and their role in sports injury care.

Obviously these goals cannot be accomplished overnight, nor without great effort or organization. I am not asking athletic trainers to act alone, but I am calling for involvement by many in each community, including physicians, nurses, physical therapists, psychologists, teachers, and coaches. All must be vocal advocates for child safety issues, becoming involved not just as professionals, but as parents, grandparents, aunts, uncles, and friends. Programs such as the National Athletic Trainers' Association-endorsed National Safe Kids Campaign³¹ should also be vigorously supported. While we must keep in mind that risks are always inherent risks in physical activity, our goal should be to create as safe and enjoyable an environment as possible in which our children can participate.

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