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# Keynote Address: Why Are There so Many Injuries to Our Young Athletes? Professionalization and Specialization in Youth Sport

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**WHY ARE THERE SO MANY INJURIES TO OUR YOUNG  
ATHLETES?  
PROFESSIONALIZATION AND SPECIALIZATION IN  
YOUTH SPORT**

**Dr. James R. Andrews, M.D.**

*Keynote address at the Amateur Sports Symposium: Death of  
Amateurism: Implications for Sport and Health, delivered at the  
University of Baltimore School of Law on Thursday,  
October 28, 2010*

**Dr. Andrews:** It is a pleasure to be here to speak to such a distinguished group. We were talking about my career in that introduction and I must say that my relationship with lawyers in the sports world has been a big part of my success. A number of the big-time sports agents that I deal with are graduates of this law school, so it's an honor to be here today. It's also an honor to be able to speak to you about a problem that's dear to my heart and really is the passion that I have had in sports medicine for the twilight of my career—the rising epidemic of youth sports injuries. Today's topic is why are there so many injuries to our young athletes. I will try to answer that and give you some guidelines.

As all of you discussed this morning, children have become more and more vulnerable in a \$5 billion youth sports industry. The two major reasons for this are early specialization and professionalism. I heard the panel in the last session talking about professionalism. But parents and athletes feel the pressure now to compete at all costs. I'll give you a little anecdote on a recent telephone call that I had—now this is true. I told you about my relationship with a number of the big-time sports agents. Well, I received a telephone call in my office in Birmingham out of the blue. So I answered my cell phone, and I didn't recognize the number. Somebody on the other side of the telephone conversation began to question me about who was a good sports agent? Like I would know! To make a long story short, I kept listening and trying to figure out what the gist of this conversation was. I finally figured out that this was a daddy calling me and there was a Nike contract involved in the conversation. They wanted to draw up a contract. I figured out that it involved a tennis institution

where they were going to go live away from home in a South Florida tennis factory. There was a contract negotiation going on with Nike. So I finally said after listening to this, "Well listen, give me some more information, how old is this athlete?" Six! Should I say more? So, I say "Well listen. You got the wrong person!" Anyway, that's the problem in a nutshell.

What about this youth sport injury phenomenon? Well there are some 30 to 45 million young athletes in the United States participating in youth sports. For example, in youth baseball alone there are some twenty-five different sports organizations. Statistics from the Center for Disease Control (CDC) show that sports are the leading cause of adolescence injuries. Young athletes are specializing in sports and positions, and a lot of times in multiple positions at an early age, with more than 3.5 million children under the age of fourteen treated annually for sports injuries. Immature bones, insufficient rest after injury, poor training, and conditioning contribute to these overuse injuries. Overuse injuries account for half of all sports injuries in middle school and high school; about 60% are all overuse. The reason that's important is if 60% of those are overuse, then most of those are preventable with common sense. Sports injuries to our youth are particularly important because minor youth sports injuries carry a significant risk factor for more severe injury during their youth and particularly during their adulthood. A lot of these injuries appear to be minor and are brushed over when they're twelve but when they're thirty, they are very significant. These injuries at an early age can contribute to long-term sequelae, such as posttraumatic arthritis. Needless to say, it's become a socioeconomic issue. The social issue is a lot of these youths drop out of school because they get injured in high school or they don't get to go to college. They wind up on the street, and from the street you know where they go. So it's an important issue in our country.

For the statistics, participation in organized sports is rising according to the National High School Athletic Association. There are over 7 million high school participants, up from 5.2 million ten years ago. It's almost equal now, in terms of the amount of boys and girls in high school athletics. This represents a tremendous rise in the sheer numbers of our youth participating in sports. That's particularly important to the young females, since Title IX. In most sports, young females are still injured four-to-one compared to males. High school athletics accounts for 2 million injuries annually, including 500,000 doctor visits, and 30,000 hospitalizations. Combined healthcare costs for the treatment of youth injuries in sports is approximately \$2.5 billion a year. That's just an estimate, late sequelae can account for

another \$3 billion a year. Therefore, year-round repetition and competition is increasing the risk of overuse and injury.

Professionalism and its monetary rewards now rule many of our youth sports systems. Which means, to change the system to prevent injuries, you must do something with the system from the top down, as well as from the bottom up. In addition, public and parent education is lacking. You'd be surprised how parents markedly underestimate their child's risks for playing a specific sport. They have no idea that there could be a possibility of a catastrophic injury. This becomes a major health reform issue. I'll talk more about that in a minute, including the role the federal government must play in this.

Youth are particularly at risk due to the following things: Improper technique continues to be the number one factor. We do all of these other things to talk about pitch counts, but improper technique is still the number one factor across the twenty-five youth sports. Ill-fitting equipment, training errors, and coach/parental pressure are the other factors. Remember: a minor injury leads to a major injury. These kids are developing, and they have to play a sport to develop. So we're not against playing, but remember the word *playing*. These problems are magnified because the younger the athlete, the more vulnerable they are to injury. Real professional athletes, those beyond college, are much better taken care of from the sports medicine, training, and coaching stand point than our young kids are—and it should be just the opposite. That's your challenge!

Youth sports injuries are now occurring in epidemic proportions: Too much, too fast, too soon. And, previously uncommon youth sports injuries are now common. That's the thing that I recognized in the year 2000. Thirty to fifty percent of all youth sports injuries are secondary to overuse. This epidemic is particularly prevalent in youth baseball, and that's where I first recognized it. There's an epidemic increase in injury to the throwing arm since 2000. The number-one risk factor in youth baseball is, very simply put, year-round baseball.

We have an opposite problem, too. Seventy percent of kids participating in sports now drop out by the age of thirteen because of specialization, professionalism, and pressure from coaches and parents. These children lose the benefit of exercise, team work, and healthy competition. Prevention of youth sports injuries is the common denominator.

The time is right. We all agree the time is right to make a major impact in prevention. The American Orthopedic Society for Sports Medicine, as the world leader in research and education, has a unique opportunity to lead the way. It is our responsibility to get involved. For so many years, as doctors, I must admit, we were negligent in

prevention. All we were worried about was figuring out new techniques, how do we fix this, how do we heal them quicker, how do we get them back on the paying field quicker; but finally it came back around to the point where we say, hey, we have got to put something back into medicine, back into our society, and we got to get involved in prevention. So that's where we are today.

Now that's not an easy task, so how do we move forward? Well, the American Orthopedic Society for Sports Medicine started a national initiative when I was president-elect two years ago and that's called the STOP Sports Injuries Program. The acronym STOP stands for Sports Trauma and Overuse Prevention, and particularly in youth sports. Under the leadership of the Sports Medicine Society, this program has been developed this past year as a comprehensive public outreach program focusing on the importance of sports safety. Specifically, as it relates to overuse trauma injuries. We will focus on injury reduction. Highlighting how playing safe without overuse can increase a young athlete's career, improve team work, increase fitness, reduce obesity, and create a lifelong love of exercise and health activity. Our goal is to keep our young athletes out of the operating room and keep them on the playing field. The STOP program is a national five-year education initiative that includes public service announcements, posters, DVDs, brochures, fact sheets, electronic newsletters, and an interactive website, [www.stopsportsinjuries.com](http://www.stopsportsinjuries.com).

This program will have a national impact through various media outlets and partnerships. Partnerships are the key. However, a grassroots outreach is essential to the success of this national initiative.

We will focus on the youth baseball, gymnastics, and cheerleading, both on the trauma side as well as the overuse side. I keep adding to this list. Every time I give a talk, I have someone come up to me and say, "What about my sport?" I had Lyn St. James, the only woman to win the Indy 500, ask me, "Why don't you have race car driving on that list?" Maybe she's right. We're all the way down to rowing, martial arts, skiing, and wrestling. So we're trying to cover all of our youth sports.

For the implementation of this program, we will lean heavily on our Sports Medicine Society orthopedic doctors who are the professionals and specialists across the country taking care of high schools, junior high schools, colleges, and pros, as well as our Olympic doctors. However, this initiative will not be successful as an *I* situation but as a *we* program to include the cooperation of all major organizations involved in youth sports.

Some of our collaborative partners have signed an agreement with us to follow the rules and regulations governing this national initiative. The Sports Medicine Society has welcomed the collaboration and support of all organizations and has established common perimeters and expectations to insure consistency in the recognition and contribution of its partners. The collaborative partners who have committed to our program include The American Academy of Orthopedic Surgeons—that's our big organization, 30,000 strong—The American Academy of Pediatrics, the NATA, the American Physical Therapy Association and its sports-medicine section, The American Medical Society for Sports Medicine, and the Safe Kids USA program. We anticipate having many more organizations sign up and we're hopeful that the federal government and its leadership will initiate a mandated federal restructuring for youth sports safety as well as financial support. We're working on legislation in various states to mandate that all public high schools, not just the big ones and the more financially able ones, have on-site and full-time athletic trainers.

Prevention begins at the high-school and junior high-school level. You probably can guess the sport that has the highest risk of injury, but does not necessarily have the most complicated injuries: cross country. Those are stress reactions. The next category where it's most serious is football and co-ed tennis and co-ed golf are at the bottom of the list. The thing that's interesting about this is if we look at female soccer versus male soccer, you will see there's a much higher instance of injury in the female sports compared to the male sports. That's adjusting yourself to some degree, but I must say that we have a long ways to go, further to go with our young female athletes compared to our males. I hate to admit that it is a problem, but sometimes our males get more medical attention, too. That has to be equalized and we're still moving in that direction.

Let me show you a few examples of what's happening to our youth. Now these are just two or three different examples. The adolescent throwing arm, cheerleading and gymnastics are good examples to discuss. For example, here's a young fifteen-year-old baseball player. Year-round baseball is producing an epidemic of injury to the elbow of young baseball players and this kid right here is a pitcher and catcher.

By the way, we finally passed a rule just last year in little league baseball so they couldn't switch them back and forth. This kid is so happy because he finally found somebody who could try to fix his elbow. There's an epidemic of pitching injuries and it's all over the newspaper about young kids throwing baseballs. The thing we want

to do is keep this out of the courts, but it may be headed in that direction if they don't pay attention. Kids should be playing on the field and not coming in for surgery.

Here's what this kid's elbow looks like. On your left shows an ossification where he's pulled his ulnar collateral Tommy John ligament off; he's fifteen years old. If you look at the side view, you'll see that he's got a great big spur that's broken off on the tip of his elbow in the back. If you look at the MRI looking straight at the elbow, you'll see a big white spot: that's a complete chronic tear of his Tommy John ligament, the main stabilizing ligament of the elbow. There's no ligament there; it's all been destroyed at age fifteen. We operated and reconstructed his elbow, but where is he going to be ten years from now? (Audience member: Medical school.) Probably; hopefully.

Let me show you an adolescent shoulder. Some young throwers also have unbelievable extensive damage to the shoulder associated with year-round and seasonal overuse. This is a nineteen-year-old scholarship kid at a junior college in Alabama. Looking with a scope in the shoulder, what you see on your left is that the ligaments have pulled off the front of the shoulder; this is from the shoulder coming in and out of place. If you look on your right, you'll see an erosion where that arrow points and that's where the back of the shoulder bone has been rubbing against the front when it comes out indicating a subluxation, a partial dislocation of his shoulder, from playing baseball. If you look at the top of his shoulder, there is a labral tear. This is a Type 3 SLAP tear, which usually doesn't occur until you're thirty-five or forty years of age. That arrow pointing to the whole thing torn off flipping back and forth in his shoulder joint; you see all of that fuzzy stuff hanging down? That's a tear in his rotator cuff. If you look to the back of his shoulder, you'll see that his labrum in the back of his shoulder is all torn up. What do you think the chances of this kid being fixed by me or anybody to be able to play college baseball? What do you think his chances might be? Well, we went outside and played with him and his parents and his preacher when we got through.

We've done a bunch of prevention studies in baseball in Birmingham at our research institute the American Sports Medicine Institute (ASMI) and also at The Andrews Institute for Orthopedics & Sport Medicine in Pensacola. We work closely with USA baseball and The International Little League to help prevent injuries in youth baseball. We've identified the following risk factors for overuse in youth baseball: Number one is year-round baseball.

Number two is seasonal and event overuse, which is playing in more than one league at the same time. That's something we ought to

legislate and prevent. Showcases are uncontrolled; there are some good showcases, and there are some bad ones. I could tell you some stories about showcases you wouldn't believe. The radar gun should be outlawed in high-school baseball and young kids leagues because kids don't need to match a radar gun. Their ligaments are developing and it's not developed when they are fifteen years of age to throw ninety mph. There is still a lot of debate about early breaking pitches, the curveball. Poor mechanics continue to be a big problem.

We did a lot of epidemiology studies through the last ten years at the ASMI, and hopefully some of these studies can help prevent injuries. We've also been instrumental in changing some of the rules in youth baseball to prevent injuries. A few of these studies include the effect of pitch type, pitch count, pitching mechanics, and the risk of elbow and shoulder pain in youth baseball players. Another study we did and published was risk factors for shoulder and elbow injuries in adolescent baseball players. We've just recently published a ten year follow-up longitudinal study on kids that got hurt when they were thirteen, fourteen, and fifteen. We followed them for ten years to see how minor injuries produce major injuries and how many of them continued to play baseball.

The take-home message in our studies, and this is very important, is when they play with fatigue. Fatigue means three different types of fatigue. One is event fatigue where they pitch too much. We had a kid the other day that pitched 180 pitches in one twelve-year-old youth baseball game, and his parents had him in our office with shoulder pain the next week—they wanted to know why he was hurt. So that's event fatigue.

The second thing is seasonal fatigue, where they have too many outings in a season or are playing in two leagues at the same time. The last thing is year-round fatigue, where they play almost twelve months out of the year competitively. If they pitch with fatigue in this age group, there's a thirty-six-to-one risk of injury to the shoulder or elbow. If that doesn't get parents' attention, then nothing will.

From these studies we've made the following recommendations to youth baseball. The injury prevention that USA baseball, which is the governing body for amateur baseball in the United States, came out with a pitch count chart. We discourage breaking pitches, multiple league showcases, and year-round baseball. We encourage good mechanics and good conditioning. The little-league associations, which have always made their number one priority the health of their kids, came out with pitches-per-game counts for different ages and rest requirements after pitching. By the way, someone asked me,

“Well what are the results of these pitch count rules that we initiated seven years ago in little league baseball?” We’re still studying the overall results, but we have done yearly research back to the managers. They filled out questionnaires and the pitch count rules had been accepted very favorably in all the parameters that we questioned. We’re still studying that to make sure we’re doing the right thing.

What about cheerleading and gymnastics? Dr. Fred Mueller, director of the National Center for Catastrophic Sports Injury Research in the University of North Carolina, published work saying that cheerleading is out of control. I raised four cheerleader daughters, I’ve got two granddaughters now in cheerleading, and I’m asking myself, “Why are they doing this?”

Cheerleading injuries resulting in emergency room visits have increased six fold since 1980 to nearly 30,000 in the 2008. The exact number of serious injuries is not known because there is no formal reporting system. We need a national registrar of youth sports injury so we’ll know what’s really happening.

We don’t have that, but for catastrophic injuries, cheerleaders lead the stats. Over the last twenty-six years from 1982 to the year 2008, disabilities caused by head or spine trauma are almost doubled for high-school cheerleaders than for all other female sports combined. There were seventy-three catastrophic injuries, including two deaths during this period of time. Gymnastics were second with nine catastrophic injuries—and the federal government and the federal courts want to say that cheerleading is not a sport. Did y’all hear about that? Hope you weren’t on that panel! I would have loved to argue that position.

Cheerleading is out of control. There are approximately 3 million cheerleaders nationwide, with 400,000 at the high-school level. During 2005, 25% of the NCAA insurance medical expenses were spent on cheerleading injuries. In comparison, football with ten times the participants accounted for 57% of the money spent. So cheerleading is out of control.

What about football? Reportedly one in every three high-school football players will be sidelined subject to injury. In 2007, more than 920,000 athletes under the age of eighteen were treated in the emergency rooms, doctor’s offices, and clinics for football related injuries. And you know about all the problems we’re having with concussions now.

So how can football injuries be prevented? Have a preseason health and wellness evaluation, perform proper warm-up and cool-down routines, consistently incorporate strength training and stretching, hydrate adequately to maintain health and minimize

cramps, stay active during summer break, prepare to return to sports in the fall, and wear properly fitted protected equipment—don't let your helmet come off three or four times during a football game. I'm just waiting for an NFL player's helmet to come off and he's not touched and he falls down and his helmet comes off and he's got to get up and run again. It's going to happen. Watch the T.V., you'll see it.

You must tackle with the head up. We've got a video that we sent to every high school in the United States on how to tackle with your head up to prevent head and neck trauma. It's supposed to be mandated that the coaches show that to the kids and their parents. That was done through our foundation in Pensacola. Other ways to prevent injuries include speaking with sports medicine professionals or athletic trainers if you have any concerns about injuries or prevention strategies. We're there to help them.

On the other side of the coin, there is another problem that we have to deal with and it's the young-athletes paradox. This is really a problem, and it's a problem for two reasons. The younger they are, the more symptoms and pain they have. And the less you find on physical exams, the more parents want you to operate on their children, the less pathology you find if you take them to surgery. And the less talented they are regardless of what their parents say.

Now there are two categories that fit into this. We've got kids coming in to see sports-medicine doctors that want to see the doctor because they don't want to play. They have too much pressure and they won't tell their parents and they won't tell their coach. The parents are sitting there doing all the talking, and you can't figure out, why is this kid here seeing me. There's another problem in this category. Kids coming in wanting their elbow examined because they say their elbow is sore and they can't throw. And they're fourteen years old and you do all of these tests and you can't find much. You know what they want? They want a Tommy John operation so they can be a major league pitcher. It really makes life difficult in the office with young kids.

Our sports-injury structure for the STOP program is under the direction of Irv Bomberger, who's our CEO at the Sports Medicine Society office. We've got the public relations office in Washington, D.C. that's working with us on brochures and directing media outlets. We've got a full-time professional fundraising group. If we don't have the right funds, this thing will move to the wayside.

The sports-injury structure will include a national prevention of injuries in youth sports day annually and our first one will be targeted for youth baseball and softball. We're hoping to kick that off next

spring. Each consecutive year a new individual youth sports day will be targeted.

We've developed a council of champions, and Dr. Neal S. ElAttrache of the Kerlan-Jobe Clinic and I are cochairmen of that council. The purpose of this council is to help promote, influence, fund, and stimulate the goals of the STOP program, primarily funding. The council so far has members who are celebrity athletes in all categories and sports as well as influential business leaders. One of those influential leaders is Tom Condon. Other's include Joe Gibbs from the Golf Channel and Dan Snyder, owner of the Washington Redskins; if I can get in his pocketbook we'll have it made! Steve Wynn is behind us 100% out in Las Vegas. Bill Johnson, who started the Waffle House's and the Ritz Carlton Hotels is behind us, he's been our biggest private donor so far. We've got Howie Long and Terry Bradshaw from Fox NFL helping us, Hank Aaron, Steve Keener, John Smoltz, and on and on. Nick Bollettieri, the big guru of tennis coaching, Charles Barkley, the Mouth of the South, Dale Brown, and Shaquille O'Neal have been a big help to us. Tom Brady, Brett Favre, Bo Jackson, Renaldo Nehemiah, Bart Starr, Sam Bradford, Jack Nicklaus, Jerry Pate, Bonnie Blair, and Eric Heiden, who is an orthopedic surgeon.

We are also getting involved in research with this thing and research will be a big part of our prevention program. We've got \$250,000 out there. An all out media blitz was done and a hard launch of this program was done in April during National Prevention of Injuries in Youth Sports week. That was a big deal for us. We went up to New York and we had John Smoltz, who's a future baseball hall of famer and ESPN analyst, and we had Sam Bradford who was the number one draft pick in the NFL Draft this year, help me launch this.

The STOP campaign is a nonprofit 501(c)(3) organization. Sponsorship and financial commitment for the STOP campaign against youth injuries is crucial for the overall success. Believe it or not, our goal is \$50,000,000. I met with the federal government, I met with our senators, and we've got a lot going on. If you think \$50,000,000 is a lot of money, it's not. That's only one million dollars per state. So, y'all help us if you can.

The summary of the STOP campaign is that there's a tremendous need for prevention of injuries in youth sports. Our country's socioeconomic structure in some ways is dependent on keeping these young athletes healthy. I really, really have been trying to get to President Obama because if anybody should understand the importance of this, it should be him. Education and research in prevention is the key to these goals. And again our motto is we're not

trying to keep the kids out of sports; Our goal is to keep the kids out of the operating room and on the playing field. So please help, thank you all very much!

