



## Why Are So Many of Our Young Athletes Getting Injured?

James R. Andrews, M.D.



Children have become more & more vulnerable in a 5 billion dollar youth sports industry



### Youth Sports Injury Phenomenon

- There are 30-45 million youth athletes in the US (Adirm & Chen, 2003)
- Statistics show that sports is the leading cause of adolescent injury (CDC 2002)



### Youth Sports Injury Phenomenon: Background

- Young athletes are specializing in sports (and positions) at an earlier age, with more than 3.5 million children under the age of 14 treated annually for sports injuries. (Source: Safe Kids USA)
- Immature bones, insufficient rest after injury, poor training and conditioning contribute to overuse injuries.
- Overuse injuries account for **half** of all sports injuries in middle school and high school. (Source: Safe Kids USA)



### Youth Sports Injury Phenomenon: Background

Sports injuries to our youth are particularly important because.....

- Minor youth sports injuries carry a significant "risk factor" for a more severe injury during both their youth and adulthood
- These injuries at an early age can contribute to long term sequelae such as post-traumatic arthritis



### Youth Sports Injuries Are Now Occurring in Epidemic Proportions

- "Too much.....too fast..too soon"
- "Previously uncommon youth sports injuries are . . . . now common"

Watkins, 1996  
Baster – Jones 1993  
Dalton, 1992



### Youth Sports Injury Phenomenon

In addition, youth are particularly at risk due to:

- Improper technique
- Ill fitting equipment
- Training errors
- Coach / parental pressure
- Failure of early injury recognition
- Shift to single sport "specialization"
- Inherent musculoskeletal imbalance

*These problems are magnified because the younger the athlete the more vulnerable they are to injury!!!*



### The Opposite Problem

70% of kids participating in sports drop out by the age of 13 because of

- Specialization
- Professionalism
  - i.e. pressure from coaches and parents

*These children lose the benefits of exercise, teamwork and healthy competition!*



### The two major reasons are:

- SPECIALIZATION
- PROFESSIONALISM

Parents and athletes feel the pressure to compete at all costs!



### Further Statistics

- Participation in organized sports is rising according to the National High School Athletic Assoc.
  - 7.34 million high school participants – up from 5.2 million 10 years ago
    - 4.32 million boys
    - 3.02 million girls
- This represents a tremendous rise in the sheer numbers of our youth participating in sports/particularly young females (Title 9)
- High school athletics account for more than 2 million injuries annually, including
  - 500,000 doctor visits
  - 30,000 hospitalizations

(Source: Centers for Disease Control)



### Statistics Cont'd

- Combined health care costs for treatment of youth injuries in sports is approx. 2.5 billion dollars a year. Late sequelae can account for another 3 billion dollars a year
- In addition public and parent education is lacking – I.E. parents markedly underestimate their child's risk!
- This becomes a major **health reform issue!!!!**



### CHANGING THE CULTURE OF YOUTH SPORTS

AUGUST 2014

This National Initiative is Proposed and Coordinated by:



Founding Sponsor



### A Nation wide questionnaire by Safe Kids: Entitled

Exploring the Culture of Youth Sports

1.24 million kids were seen in emergency rooms for sports injuries in 2013.

That's 3,397 every day  
 141 every hour  
 1 every 25 seconds.

Among children ages 19 and under, 13 to 15-year-olds accounted for the largest number of injuries.

37%

90% of athletes said they have been injured while playing a sport.

Sometimes seriously:

- Concussions/head injuries 12%
- Dehydration 24%
- Broken/fractured bones 13%
- Sprains/strains 37%

54% of athletes said they have played injured.

WE ASKED WHY

- "I was excited and couldn't let the team down."
- "I didn't want to be benched."
- "It was an important game."

Fewer than half of coaches say they have received certification on how to prevent and recognize sport injuries.

80% of parents said they would want their child's coach to be certified in injury prevention.

< 50%      80%

More than half of coaches (53%) say they have felt pressure from a parent or player to put an athlete back into a game if a child has been injured.

### Strategies for Smart Play

- Set the ground rules at the beginning of the season. Coaches bring together parents and athletes before the season begins to agree on the team's approach to prevent injuries.
- Teach athletes ways to prevent injuries. Proper technique, strength training, warm-up exercises and stretching can go a long way to prevent injuries.
- Prevent overuse injuries. Encourage athletes to take time off from playing only one sport to prevent overuse injuries and give them an opportunity to get stronger and develop skills learned in another sport.
- Encourage athletes to speak up when they're injured. Remove injured athletes from play.
- Put an end to dirty play and rule breaking. Call fouls that could cause injuries.
- Get certified. Learn first aid, CPR, AED use and injury prevention skills.

**SAFE KIDS WORLDWIDE**  
safekids.org



*" A few examples of what's happening to our youth"*

The adolescent throwing arm & cheerleading/gymnastics are good examples to discuss!

### The Adolescent Throwing Elbow

*In youth baseball, our stats at ASMI indicate that there is a 5-7 fold increase in throwing arm injuries since 2000*

For example:  
Year 'round baseball is producing an epidemic of injuries to the elbow in young baseball players.

This 15 year old pictured with his parents is a typical example.



- 15 yo pitcher / catcher "year round baseball"
- Hx of 2 yrs of chronic elbow pain
- Now unable to play




X-Ray of elbow with chronic spurs      MRI of elbow with chronic UCL injury

### The Adolescent Throwing Shoulder

*Some young throwers also have unbelievable extensive damage to the shoulder associated with year-round and seasonal overuse*

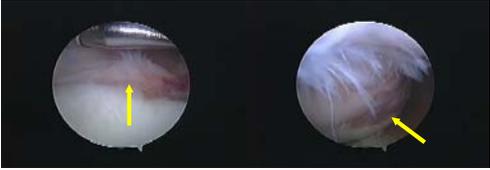


### Case Example

"Internal Impingement" with Anterior Instability

- 19 yo scholarship college baseball pitcher
- Posterior shoulder pain with cocking
- Progressive for 2 years
- Now unable to pitch secondary to pain
- 10 mph velocity loss

**Arthroscopic Pathology**  
Right Pitching Shoulder



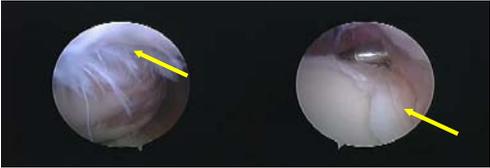
Ant. Capsulolabral Disruption      Hill-Sachs Lesion  
In a Thrower

**Arthroscopic Pathology**  
Right Pitching Shoulder



Type III SLAP Lesion

**Arthroscopic Pathology**



Partial Undersurface  
Infraspinatus Tear      Posterior Labral Detachment  
With "Peel-Off"

**Prevention Studies in Baseball**

*Both at ASMI in Birmingham and at the Andrews Research & Education Foundation in Pensacola we have worked closely with USA Baseball and the Int. Little League Assoc. to help prevent injuries in youth baseball*

From these studies we have identified the following "risk factors" associated with overuse in youth baseball

- Year round baseball
- Seasonal & event overuse
- Playing in more than one league at one time
- Showcases
- The radar gun
- Early breaking pitches ( the curveball)
- Poor mechanics

**Epidemiological Studies**

- Over the last ten years at ASMI, because of this epidemic of throwing arm injuries, we have done the following epidemiological studies with the hope that we could "prevent some of these injuries"
- We have also been instrumental in changing some of the rules in youth baseball to prevent injuries!!

**A Few of These ASMI Studies Include:**

- Effect of pitch type, pitch count, and pitching mechanics on risk of elbow and shoulder pain in youth baseball pitchers  
*Lyman et al, Am J Sports Med 2002*
- Risk factors for shoulder and elbow injuries in adolescent baseball pitchers  
*Olsen et al, Am J Sports Med 2006*

The Take Home Message in These ASMI Studies Showed That if a Young Pitcher Throws with Fatigue He Has a 36 to 1 Times Risk of Injury

From these ASMI epidemiology studies, the USA Baseball Medical & Safety Advisory Committee has made the following recommendations and position statements on Youth Baseball Pitching Injuries

**Injury Prevention**

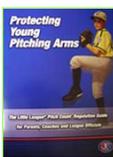
USA Baseball Guidelines (2004)

- Pitch count chart
  - Pitches per game, season, year
  - Ages 9-14 yrs
- Discourage
  - Breaking pitches
  - Multiple leagues
  - Showcases
  - Year-round baseball
- Encourage
  - Good mechanics
  - Good conditioning



**From These Studies and Recommendations, the Little league Got Involved in Injury Prevention**

- Little League Pitch Count Rule (2007)
  - Pitches allowed per game
    - 17-18 yrs 105 pitches
    - 13-16 yrs 95 pitches
    - 11-12 yrs 85 pitches
    - 10 and under 75 pitches
    - 7-8 50 pitches (2008)
  - Days rest after pitching
    - 61 or more pitches 3 days
    - 41-60 pitches 2 days
    - 21-40 pitches 1 day



*What about Cheerleading / Gymnastics?*

Dr. Fred Mueller  
 “Cheerleading for a long time has been out of control”

- There are approx. 3 million cheerleaders nationwide
- With 400,000 at the high school level
- In college, during 2005, 25% of the NCAA insurance medical expenses was spent on cheerleading injuries
- In comparison, FB with 10X the participants accounted for 57% of the money spent



Dr. Fred Mueller Director of the National Center for Catastrophic Sports Injury Research at the Univ. of North Carolina

- Cheerleading injuries resulting from ER visits have increased almost 6 fold since 1980 to nearly 30,000 in 2008 according to the US Consumer Product Safety Commission
- The exact number of serious injuries is not known because there is no formal reporting system
- But for catastrophic injuries cheerleaders lead the stats
  - Over the 26 yrs from 1982 to 2008 they show disabilities caused by head or spine trauma are almost double for high school cheerleaders than for all other female sports combined. There were 73 catastrophic injuries including 2 deaths during this period
- Gymnastic was 2<sup>nd</sup> with 9 catastrophic injuries

The good news is that USA CHEER who is the governing body for sport cheerleading recognized the need for safety precautions and injury prevention. Over the last 3-4 years they have made cheerleading a much safer sport




Steps Taken to Improve Safety

Recent efforts on behalf of cheerleading safety have included:

- Elimination of Double Downs, a twisting dismount, in 2012 at the high school level
- Creation of the USA Cheer Safety Council, in partnership with the American Sports Medicine Institute, lead by Dr. Jeff Dugas, which is comprised of orthopedic surgeons, coaches and athletes



- More than 5,000 cheerleading coaches per year taking the NFHS Spirit Rules course, the highest number of any other high school sport
- Cheersafe.org, a community wide resource for cheerleading safety, was launched in 2013 as a way to share current cheerleading research and data

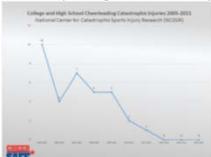
Facts on Cheerleading Safety

- The average concussion rate for all high school sports is 3.8 per 10,000 athlete exposures; the concussion rates for cheerleading is 43% less at a rate of 2.2 per 10,000 athlete exposures.
- Now, cheerleading has fifth lowest overall injury rate out of 22 sports. Only boys cross country, track, and boys and girls swimming/diving rank lower.



### Facts on Cheerleading Safety

Cheerleading has seen a dramatic reduction in catastrophic injuries since new regulations were instituted ten years ago. Those regulations included surface restrictions, prohibiting certain skills like double downs, and requiring additional spotters.



College and High School Cheerleading Catastrophic Injuries 2005-2015  
National Center for Catastrophic Sports Injury Research (NCCSIR)



### Facts on Cheerleading Safety

- Emergency room visits for cheerleading are lower than girls' basketball, soccer and softball. Of these visits, 98% are treated and released.
- More spirit coaches than any other coaches have taken safety certification courses on NFHS.org. Nearly 5000 coaches took the AACCA course in 2015, a higher amount than other sports.



### What about Football?



Reportedly one in every three high school football players will be sidelined 2<sup>o</sup> to injury

In 2007, more than 920,000 athletes under the age of 18 were treated in emergency rooms, doctors offices and clinic for football related injuries according to the Consumer Product Safety Commission




### How Can Football Injuries be Prevented?

- Have a pre-season 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 to prepare for return to sports in the fall
- Wear properly fitted protective equipment, such as helmet, pads, and mouthguard
- Tackle with the head up and do not lead with the helmet
- Speak with a sports medicine professional or athletic trainer if you have any concerns about injuries or prevention strategies



### In regards to Prevention of Concussions in Football

Concussions are **3X** higher in High School than College

The #1 prevention solution is to limit contact in practice to 1-2 days per week or perhaps no contact



### On The Other Side of The "Coin"

There are two other Youth Sports Problems We Have To "Deal With!"



The first problem has an incredible impact

Poor kids are being priced out of expensive youth sports

These kids cannot afford to keep up with the **socioeconomic aspects of youth sports**

As you know,

- Participation in youth sports improves:
  - Physical and mental health
  - Lowers crime and teen pregnancy rates
  - Increases college enrollment
  - Social benefit
  - Increase emotional well-being

Why the decrease in participation for youth sports?

- Expensive youth sport leagues
  - According to Project Play, nearly 70% of children from families making more than \$100,000 played team sports, and that figure is nearly cut in half for families making less than \$25,000.

- Most lower-income families unfortunately are unable to sign their kids up for youth sport leagues
  - Not able to afford league costs
  - Not able to afford equipment
  - Some cant afford transportation

A novel solution

- The answer for the problem is to eliminate the financial barrier for participation in youth sports: **for example**,
  - Develop a waiver, which adds a checkbox to the sign-up forms. "I am a resident of the City, and I am requesting a waiver of all fees."
- In a pilot project in a metropolitan city where this was developed:
  - Participation for children who attend high poverty schools, shot up almost 80 percent

The other problem is *The Young Athlete's Paradox*

- The younger they are:
  - The more **symptoms** and **pain** they have
  - The less you find on P.E.
  - The more they want you to operate
  - The less **pathology** you find at surgery!
  - *The less talented they probably are regardless of what their parents say!*

### Prevention of Youth Sports Injuries

- We all agree “the time is right” to make a major impact in prevention
- The AOSSM as a world leader in research and education has a unique opportunity to lead the way

*It is our responsibility to get involved  
- All of us!*

*Not an easy task!!!*

*How do we move forward?*

### AOSSM National Initiative

S.T.O.P. Program



### The S.T.O.P Program

- The acronym S.T.O.P. stands for Sports Trauma and Overuse Prevention in youth sports
- Under the leadership of the AOSSM, this program has been developed as a comprehensive public outreach program focusing on the importance of sports safety – specifically as it relates to overuse and trauma injuries
- It focuses on:
  - Injury reduction
  - Highlighting how playing safe and without overuse can increase a young athlete’s career, improve teamwork, increase fitness and 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 on the playing field**

We focus on the following youth sports both on the trauma side as well as the overuse side!

• Baseball & Softball	• Volleyball	• Field Hockey
• Swimming	• Gymnastics	• Figure Skating
• Football	• Lacrosse	• Inline Skating
• Basketball	• Golf	• Hockey
• Cheerleading	• Rowing	• Rugby
• Tennis	• Martial Arts	• Water Polo
• Dancing	• Skiing & Snowboarding	
• Soccer	• Wrestling	
• Track & Field and Cross Country	• Cycling	



### For the Implementation of this program:

- We lean heavily on AOSSM’s both **adult** and **pediatric** orthopaedic sports medicine specialists.
- However this initiative will not be successful as an “I” situation but as a “we” program to include the cooperation of all of the major organizations involved in youth sports

### Collaborative Partners

- The AOSSM has welcomed the collaboration & support by other organizations and has established a common set of parameters and expectations to ensure consistency in the recognition and contributions of its partners

### Those Collaborative Partners Who Have Already Committed to the AOSSM's STOP Program

- The AAOS
- The American Academy of Pediatrics
- The NATA
- The APTA and its Sports Section (Pending)
- The American Medical Society for Sports Medicine
- The Safe Kids USA Program
- The Cleveland Clinic  
"among others"

### Collaborative Partners

- We anticipate having many more organizations sign up under a formal collaborations agreement now numbering over 1000
- We are hopeful that the federal government and its leadership will take a responsible role to include a mandated federal restructuring for youth sports safety as well as financial support!

### STOP Youth Sports Injuries Structure: Includes

- Annually, the month of April is designated as **YOUTH SPORTS SAFETY MONTH**
  - Our first one was targeted for youth baseball and softball
- Each consecutive year a new individual youth sport will be targeted

### Youth Sports Injury Prevention Research

- Research is a big part of our prevention program
- The Andrews Mentoring Program has raised approximately \$500,000 through OREF
- A yearly grant of \$150,000 is available for prevention of injuries in youth sports through OREF

### Summary of the STOP Campaign

- Yes there is a tremendous need for prevention of injuries in youth sports
- Our country's socioeconomic structure in some ways is dependant on keeping these young athletes healthy!
- Education and research in prevention is the key to these GOALS!!
- Please help –

**In Addition,**

Major League Baseball has also developed a comprehensive **PREVENTIVE** youth baseball program entitled



Go to MLB link for further information:  
<http://m.mlb.com/pitchsmart/>

**The Andrews Institute at Children's Health**

It's primary mission here in Texas is prevention of injuries in youth sports.

**One of our Initiatives**

We are the official medical partner for **Texas Association of Private and Parochial Schools (TAPPS)**

We have established a sports medicine standard of care for all health and safety of their athletes.

Including:

- EAP's
- Concussion Management
- Return to Play Protocols
- Pitch Count Regulations
- Cardiac and Medical Screenings



**This initiative includes...**

- Statewide Tour (5 cities) with USA Football for all TAPPS Football coaches and Athletic Trainers in health and safety concerns
- Medical coverage for all TAPPS championship events
- Advocate for Athletic Trainers and Physicians statewide



**In Conclusion:**

Remember our **YOUTH SPORTS** motto is:

**Keep our kids out of the operating room and on the playing field**

*Thanks...Jim Andrews*



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