



SPORTS TRAUMA & OVERUSE PREVENTION

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Keeping Kids in the Game for Life




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Sports Trauma and Overuse Prevention



The Problem

- 30 million children participate in organized sports
(Source: Safe Kids USA)
- Participation in high school athletics is increasing, with more than 7.3 million high school students participating annually
(Source: National Federation of State High School Associations)
- High school athletics account for more than 2 million injuries annually, including
 - 500,000 doctor visits
 - 30,000 hospitalizations(Source: Centers for Disease Control)


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The Problem

- 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)


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The Lasting Problem

A child's history of injury is.....

1. A risk factor for future injury during both their youth and adulthood
2. A contributor to long term degenerative diseases, such as osteoarthritis.



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The Lasting Problem – Part 2

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

- Adults
- Coaches
- Parents
- Early specialization in one sport

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


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What is **Overuse**?¹

- Excessive and repeated use that results in injury to the bones, muscles, or tendons involved in the action.
- Process begins when repetitive activity fatigues a specific structure.
- With sufficient recovery time, the tissue is able to adapt to the demand and undergo further loading without suffering injury (soft tissue corollary to Wolff's law).

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What is the result of **overuse**?¹

- Without adequate recovery, microtrauma develops and stimulates inflammatory cells and enzymes that damage local tissues.
- Cumulative microtrauma from further repetitive activity causes cumulative damage.
- The imbalance due to overly intensive training with inadequate recovery leads to a breakdown of cellular reparative mechanisms and eventual tissue failure.

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What Can We Do to Prevent **Overuse** and Trauma Injuries?

Promote injury prevention on multiple levels, including:

- Learning about the STOP Sports Injuries campaign and visiting www.STOPSportsInjuries.org for resources
- Holding ongoing discussions about the importance of rest with athletes
- Mandating pre-season physicals
- Enforcing warm-up and cool down routines
- Encouraging proper strength training routines

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Organizational Partners for STOP Sports Injuries Campaign

- **Sports Medicine Organizations**
 - American Orthopaedic Society for Sports Medicine
 - National Athletic Trainers' Association
 - American Medical Society for Sports Medicine
 - American Academy of Orthopaedic Surgeons
 - American Academy of Pediatrics -Sports Physical Therapy Section
- **Related Organizations**
 - Youth Sports Leagues
Little League
 - Professional leagues
 - Medical Institutions
Cleveland Clinic
 - Safe Kids USA

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STOP Sports Injuries Council of Champions

James R. Andrews, MD Co-Chair	Tom Brady New England Patriots Quarterback
Neal ElAttrache, MD Co-Chair	Dale Brown Dale Brown Enterprises
Hank Aaron Hall of Fame Baseball Player/Atlanta Braves	Chaplain Richard Camp, Jr. Former Nationally Ranked Track & Field Athlete
Charles Barkley Sports Broadcaster/Former NBA Player	Tom Condon Football Agent
Bonnie Blair Speed Skating Olympic Champion	Delos Cosgrove, MD CEO, Cleveland Clinic
Nicholas Bolletieri World Champion Tennis Coach	Stanley Druckenmiller Duquesne Capital Management

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STOP Sports Injuries Council of Champions (Continued)

Joe Gibbs Founder, Golf Channel	Howie Long Former NFL Player, NFL Sportscaster, Fox Network
Eric Heiden, MD Olympic Speed Skater and Orthopaedic Surgeon	Renaldo Nehemiah Director, Track & Field Worldwide
Bo Jackson Professional Multi-Sport Athlete	Jack Nicklaus Golden Bear Enterprises/Professional Golfer
Stephen Keener President & CEO, Little League International	Shaquille O'Neal NBA Basketball Player
Ian Lawson President, DePuy Mitek	Rick Peterson Milwaukee Brewers Pitching Coach
Dennis Lewin Board Chairman, Little League International	

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STOP SPORTS INJURIES STOP Sports Injuries
Council of Champions (Continued)

Christie Rampone
WNT U.S. Soccer

John Smoltz
St. Louis Cardinals Pitcher

Dan Snyder
Washington Redskins Owner

Bart Starr
Former Green Bay Packer Quarterback

Jim Wilson
Chairman, Jim Wilson & Assoc.

Steve Wynn
Casino Resort Developer

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STOP SPORTS INJURIES Campaign focuses on 12 Sports

- Baseball
- Swimming
- Football
- Basketball
- Cheerleading
- Tennis
- Dancing
- Gymnastics
- Soccer
- Running
- Volleyball
- Softball



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STOP SPORTS INJURIES



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STOP SPORTS INJURIES The Numbers²

- Approximately 5 million children ages 6-17 participate in organized youth baseball leagues
- In last decade, Little League numbers down; explosive growth in youth elite or travel team baseball
- During this same period, there has been an increased incidence of elbow and shoulder injuries in young baseball players
- Some surgeons report a 5-6-fold increase in serious elbow and shoulder injuries in high school pitchers

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STOP SPORTS INJURIES What's the Cause? **OVERUSE**

- Related to shift towards early and high intensity focus on a single sport. Young athletes that specialize in a single sport experience more injuries (and quit sports earlier) than those playing multiple sports.¹
- Youth who pitch more than 8 months/year have **5 times** the risk of serious elbow/shoulder injuries.²⁷
- Pitchers who average throwing >80 pitches/game experience a **4-fold** increased elbow/shoulder injury rate.²⁷
- Youth pitching with arm fatigue are **36 times more likely** to have a serious elbow/shoulder injury.²⁷

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STOP SPORTS INJURIES Risk factors for UCL Reconstruction in High School Athletes²⁸

- Year-round throwing (< 2 months rest per year)
 - 69% failed to get adequate rest from throwing
 - they averaged 8 months of competitive baseball per year
- Season **overuse**
 - 62% failed to get adequate rest between outings during the season, most commonly in summer baseball
- Event **overuse**
 - 42% reported extreme **overuse** in a short time play-offs (pitching back-to-back days) tournaments showcases

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STOP SPORTS INJURIES Risk factors for UCL Reconstruction in High School Athletes ²⁸

- 85% were involved with at one **overuse** category
- 2/3 (16/24) began throwing curveballs before age 14
- 72% threw more than 80 mph
- Only one injured player had none of the risk factors

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STOP SPORTS INJURIES Risk Factors for Shoulder and Elbow Injuries in Baseball Adolescent Pitcher ²⁷

Injured	Uninjured
8 months pitching per year	5.5 months pitching per year
6 innings, 88 pitches per game	4 innings, 66 pitches per game
Fastball speed 88 mph	Fastball speed 83 mph
4 career showcases	1 career showcase
52 % regularly pitched with fatigue	11 % regularly pitched with fatigue
67 % pitched in spite of pain	42 % pitched in spite of pain
Needed 34 warm-up pitches	Needed 26 warm-up pitches
55 % regularly used NSAID's	22 % regularly used NSAID's
?? Being "in good shape" ??	
Proper biomechanics may increase risk of injury ²²	

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STOP SPORTS INJURIES What about the "Big Boys"? ¹⁰

Average age they started:	Age they'd let their sons begin:
• Pitching - 10.1 yrs	• Throwing a curve - 14.8 yrs
• Throwing a curve - 14 yrs (14.6 for major leaguers)	• Throwing a slider - 17.0 yrs
• Throwing a slider - 17.8 yrs (18.9 for major leaguers)	• Throwing a change-up - 11.9 yrs; or once they could control their fastball
• Throwing a change-up - 16.9 yrs (because no one showed them how)	

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STOP SPORTS INJURIES What about the "Big Boys"? ¹⁰

- Pitch counts, number of innings per year LOW
- Year round baseball RARE
- Most played (and excelled at) other sports
- Time lost due to injuries RARE
- Of all the pitchers who appeared on the mound in the 1991 Little League World Series, **ONLY 2** pitched through high school

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STOP SPORTS INJURIES What Do We Tell the "Little Boys"? ⁴

- Take 2-3 months off from throwing (Andrews prefers 4)
- Avoid pitching with arm fatigue/pain
- Avoid pitching too much (see next slide)
- Avoid going from pitcher to catcher
- Get rid of the radar gun
- Don't throw a curveball until you shave

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STOP SPORTS INJURIES What Do We Tell the "Little Boys"? ⁴

Monitor pitchers with the following characteristics closely:

- regularly using anti-inflammatory drugs
- pitchers who throw > 85 mph
- pitchers who warm-up excessively
- pitchers who are taller and heavier ²¹
- pitchers with GIRD > 20 degrees
- pitchers having gone through recent growth spurt ¹⁶



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STOP SPORTS INJURIES Recommended Pitching Restrictions³

Little League Baseball		USA Baseball
Age 7-8 yrs	50 pitches/game	Age 8-10 yrs 50 pitches/game; 75/wk
Age 9-10 yrs	75 pitches/game	Age 11-12 yrs 75 pitches /game; 100/wk
Age 11-12 yrs	85 pitches/game	Age 13-14 yrs 75 pitches/game; 125/wk
Age 13-16 yrs	95 pitches/game	Age 15-16 yrs 90 pitches/game; 2 games
Age 17-18 yrs	105 pitches/game	Age 17-18 yrs 105 pitches/game; 2 games

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STOP SPORTS INJURIES Rest after Pitching³²

USA Baseball

Age, y	1 Day	2 Days	3 Days	4Days
8-10	21 ± 18	34 ± 16	43 ± 16	51 ± 19
11-12	27 ± 20	35 ± 20	55 ± 23	58 ± 18
13-14	30 ± 22	36 ± 21	56 ± 20	70 ± 20
15-16	25 ± 20	38 ± 23	62 ± 23	77 ± 20
17-18	27 ± 22	45 ± 25	62 ± 21	89 ± 22

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STOP SPORTS INJURIES Rest after Pitching³

Little League

No. Pitches per day	Days of Rest
Pitchers age 16 yrs or less	
>61	3
41-60	2
21-40	1
1-20	0
Pitchers 17-18 yrs old	
>76	3
51-75	2
26-50	1
1-25	0

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STOP SPORTS INJURIES Recommend age to Learn Various Pitches³²

USA Baseball

Pitch	Age (yr)
Fastball	8 +/- 2
Change-up	10 +/- 3
Curve ball	14 +/- 2
Knuckle ball	15 +/- 3
Slider	16 +/- 2
Fork ball	16 +/- 2
Screw ball	17 +/- 2

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STOP SPORTS INJURIES Emphasize **CORE** conditioning

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STOP SPORTS INJURIES The Kinetic Chain

courtesy of www.winlow-holzer.com

STOP SPORTS INJURIES What Does the Future Hold?

- Better prevention of injury
- New surgical techniques are being evaluated to treat injuries – less invasive
- Ongoing research to understand the injury risk and how to prevent
- Continued rise in injury rates unless education is increased

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STOP SPORTS INJURIES Other Resources

- www.orthoinfo.org
- www.nata.org
- www.sportsmed.org
- www.SAFEKids.org

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STOP SPORTS INJURIES Educational Content



- Sports tips
 - Sport specific information
- Video podcasts
- Specific educational tool kits focused on various audiences
 - Parents
 - Athletes
 - Coaches
 - Healthcare providers

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STOP SPORTS INJURIES Web Site and Technology

Comprehensive Web site Features

- Educational resources
- Media center
- Downloadable applications
- Online survey
- Quizzes
- Blogging
- RSS feeds
- Social media interaction through Facebook and Twitter



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STOP SPORTS INJURIES

Let's Work Together to **STOP Sports Injuries**
And Keep Kids in the Game for Life!

www.STOPSportsInjuries.org

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