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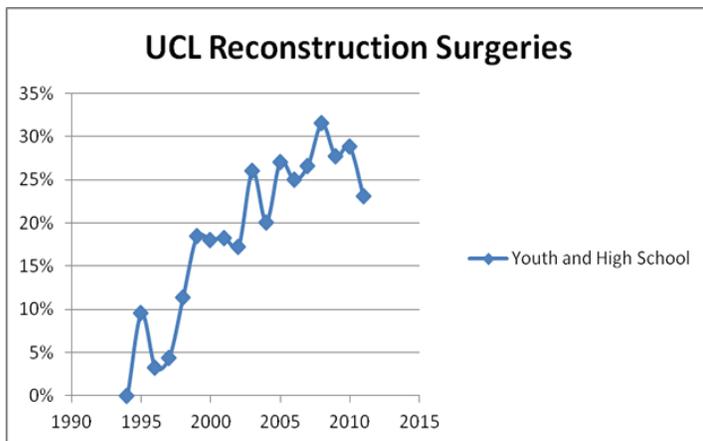
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ULNAR COLLATERAL LIGAMENT INJURIES IN THROWING ATHLETES

Over the last several decades, baseball pitching injuries in youth athletes, specifically to the Ulnar Collateral Ligament (UCL) in the elbow, have become increasingly more and more prevalent. According to the American Sports Medicine Institute, UCL reconstruction surgeries in youth and high school patients has consistently risen over the course of the last 20 years.



Unlike most rapid-onset injuries in sport, the cause of injury to the ulnar collateral ligament is frequently attributed to repetitive microtrauma. In other words, this injury happens a little at a time, and the subsequent rupture of the UCL occurs as a result of cumulative wear and tear on the ligament over time. As the UCL is basically undergoing stress and distraction forces with each and every throw, the correlation between injury rates and pitch counts is simple. Simply put, the more pitches thrown, the greater the likelihood for injury. Additionally, types of pitches thrown (i.e. curveball), overall pitching mechanics, and general physical condition of the athlete can also increase one's likelihood for injury.

Year-Round Baseball and Elbow Valgus Load

The Ulnar Collateral Ligament stabilizes the inside of the elbow joint against the forces of the typical overhand throwing motion. This force is known as Elbow Valgus Load (EVL). In a nutshell, EVL from overhand throwing basically pulls a rotational and lengthwise tensile force on the UCL. And much like other tissues in the body, repetitive stress from athletic activity can cause tissue degradation, microtraumatic injury, and subsequent inflammation in the UCL with use. However, these are not only very common consequences of activity, but are also necessary in order to gain tissue stability and integrity over time.

In fact, according to one research study published in the American Journal of Sports Medicine in 2011, MRI imaging of the uninjured high school-aged baseball pitcher demonstrated that the bony structure on the inside of the elbow actually increase in density and durability, and the UCL actually thickens in response to the demands of pitching in this particular population. As in any form of strength and conditioning or sport-specific activity, the reason for this change over time is simply a function of appropriately managing tissue loading with corresponding rest and recovery.

However, as the youth and high school-aged pitcher has now trended towards throwing more frequently with less breaks, and likewise throwing for multiple back-to-back seasons year around, subsequent injury rates have also increased. In summary, as EVL continues to increase on the UCL when appropriate rest and recovery times are not put in place, the microtraumatic damage to the UCL will weaken it over time and eventually cause it to fail.

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Risk-Prone Pitching Activities

In 2014, a research study published the results of a national survey asking 754 youth baseball pitchers and their parents how often they performed the following pitching practices which have been documented to increased the risk for injury. Below are some of the key results.

Risk-Prone Pitching Activities and Injuries in Youth Baseball: Findings from a National Sample.

- *45% pitched in a league without pitch counts or limits
- *43.5% pitched at least once on consecutive days
 - = 4x greater risk of arm fatigue
 - = 2.5x greater risk of arm pain
- *19% pitched more than 1 game in the same day
 - = 89% greater risk of arm pain
- *30.4% pitched on multiple teams in overlapping seasons
 - = 3x greater risk of arm fatigue
 - = 1.85x greater risk of arm pain
- *13.2% reported pitching for more than 8 months per year.
- *1 out of 10 pitchers also play the catcher position
- *Reported pitching with arm tiredness
 - 6.6% Often**
 - 59% Sometimes*
 - 29.4% Never
 - **7.88 increased risk for injury
 - *3.71 increased risk for injury
- *Reported pitching with arm pain
 - 4.2% Often**
 - 32% Sometimes*
 - 59.6% Never
 - **7.5% increased risk for injury
 - *5.4% increased risk for injury

Other Recommendations to Reduce Injury Risk

1. Appropriate Preseason Strength & Conditioning -Thrower's Ten Exercises

2. Maximum Pitch Counts per game by age:

8-10 yrs:	52
11-12 yrs:	68
13-14 yrs:	76
15-16 yrs:	91
17-18 yrs:	106

3. Appropriate Rest after Throwing

8-10 Years of Age

<i>21 Pitches</i>	<i>34 Pitches</i>	<i>43 Pitches</i>	<i>51 Pitches</i>
1 Day	2 Days	3 Days	4 Days

11-12 Years of Age

<i>27 Pitches</i>	<i>35 Pitches</i>	<i>55 Pitches</i>	<i>58 Pitches</i>
1 Day	2 Days	3 Days	4 Days

13-14 Years of Age

<i>30 Pitches</i>	<i>36 Pitches</i>	<i>56 Pitches</i>	<i>70 Pitches</i>
1 Day	2 Days	3 Days	4 Days

15-18 Years of Age

<i>30 Pitches</i>	<i>36 Pitches</i>	<i>56 Pitches</i>	<i>70 Pitches</i>
1 Day	2 Days	3 Days	4 Days

For this information, as well as addition information regarding Pitch Counts, Pitch Types, and Injury Prevention for the Throwing Athlete, visit our website at

www.csosortho.com

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