

LITTLE LEAGUE SHOULDER & LITTLE LEAGUE ELBOW

As the months of February and March begin to ramp up for the beginning of spring baseball, it is usually quite common to also see an increase in adolescent shoulder and elbow injuries. Although the creation and implementation of pitch-count and pitch-type monitoring has considerably decreased the overall prevalence of injuries such as Little League Shoulder and Little League Elbow, these injuries are continuing to show up. Most of the time this is primarily due to inadequate monitoring of pitch counts and pitch types in adolescent pitchers.

When evaluating the anatomy of a long bone such as the humerus or the ulna, the two bones which literally fracture in the Little League Shoulder and Little League Elbow conditions respectively; these bones have growth plates at each end so the entire bone can progressively lengthen over time.



Normal Growth Plate

The problem is the fact that the growth plate is a cartilage model that is not nearly as durable as the bone that surrounds it. When these growth plates are subjected to the forceful external rotation, internal rotation, and distraction forces that come with the over-handed throwing motion, it is easy to see how repetition and overuse cause a shearing effect at the growth plate which eventually leads to a fracture.



Fractured Growth Plate

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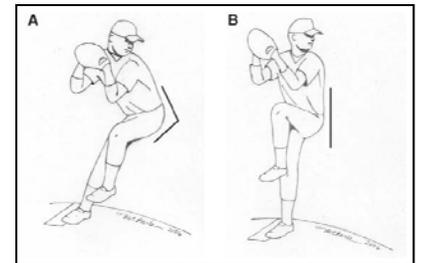
Pitching Fallacies and Injury Rates

In 2009, the results of a study of 169 baseball pitchers between the ages of 9-18 were released regarding the relationships between certain pitching techniques and their respective injury rates to the shoulder and/or the elbow. Here's what they found.

"The Effect of Pitching Biomechanics on the Upper Extremity in Youth and Adolescent Baseball Pitchers."
Davis, Limpisvasti, Fluhme, Mohr, Yocum, ElAtratche, and Jobe.
American Journal of Sports Medicine, 2009.

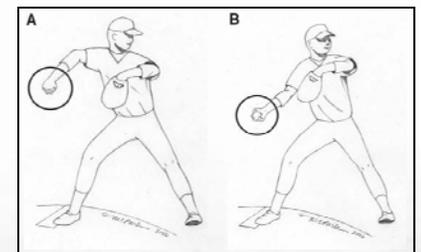
#1. Leading with the Hips

Leading with the hips (A) causes the overall momentum of the body to move ahead of the arm. In doing so, velocity is lost and the arm undergoes 2.5x greater force in the shoulder & elbow to make-up for the difference.



#2. Hand-on-top-Position

The palm up position at separation (B) requires the shoulder and the elbow to elevate and rotate into position prior to acceleration. This literally doubles the overall force placed on the shoulder and elbow.



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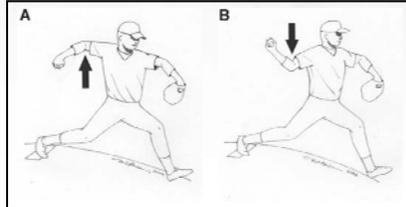
Editor: Darren H. Lunow, M.Ed, ATC, LAT, Athletic Trainer

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Pitching Fallacies cont...

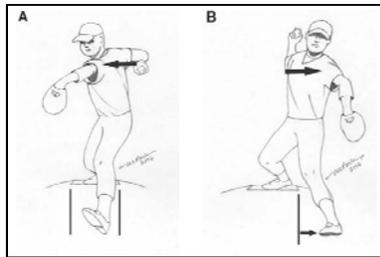
#3. Elbow Height at Stride Foot Contact

The elbow that is not at maximum height at stride foot (B) contact loses velocity and undergoes significantly more force than the arm that accelerates at max height.



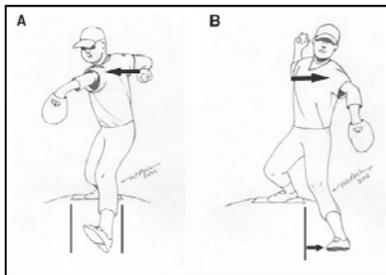
#4. Closed-Shoulder Position

When the lead shoulder points directly towards the plate (A), the body's momentum is carried straight ahead. This dramatically reduces the force placed on the shoulder and elbow. The pitcher who opens up increases the force placed on his shoulder and elbow and loses ball control and velocity.



#5. Stride Foot Towards Home Plate

Whichever way the stride foot points upon ground contact is also the direction where the pitcher's momentum is going. The athlete who turns his foot in or out (B) redirects and loses his body's momentum prior to ball release, has to now throw harder to make up for the loss, and is subsequently at a greater risk for shoulder and elbow injury.



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Shoulder and Elbow Injury Prevention

By the scheduling of most youth baseball programs, athletes have approximately 1 month prior to their competitive season's opening day. Therefore, consider using this time frame as a good time to "pre-habilitate" your thrower's shoulder and elbow prior to the beginning of the season if you haven't been doing so already. Furthermore, when the season cranks up, periodic utilization of the same exercises during the year can help you maintain good strength and stability throughout the season.

Likewise, consider the recommendations from the experts in the baseball and sports medicine communities on pitch counts and pitch types for the youth baseball pitcher. These general guidelines provide great insight and reflect what is seen in the most current research and clinical data.

The Thrower's Ten Exercise Sheet

Pitch Counts and Pitch Types

Both of these documents are archived on The Home Exercise Program Section of our website at no charge.
www.csosortho.com

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