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**Off-Season Training: *Building a Strong Pitching Elbow***

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Now that the fall months are here, many summer sport athletes get to enjoy a period of rest and recovery, reflect on their successes of a season past, and look to next year. For the competitive and striving youth athlete, the off-season is where next season begins.

The off-season is a period where an athlete should work to improve their physiological and skill capabilities. For the Pitcher, this is especially important. Briefly, the biomechanics of the pitching motion is highly complex, and results in the lengthening and shortening of the elbow joint, which contributes to the acceleration and deceleration of the ball. The strength and endurance of the muscles in the shoulder, and upper and lower arm are essential for maintaining and protecting the health of the pitcher, and their in-game effectiveness.

Fatigue or weakness in these muscles is considered to be a primary contributor to injury. In addition to the concentric and eccentric roles of these muscles, their role in stabilization is important as a protective mechanism to the underlying joint structures. Every pitcher's off-season must include a full arm strength training program.

***Target Exercise Requirements for the Elbow Joint***

The elbow joint flexors (the 3 bicep muscles) must be able to provide stability to the joint, particularly the ulnar collateral ligament (UCL). *It's the UCL that is replaced in Tommy John surgery.* Therefore the elbow must be exercised in all pronated, supinated and neutral positions. The contraction requirements include 1:1 concentric and eccentric, as well as rapid concentric/ eccentric contractions. The elbow flexors also decelerate the pitching arm, and must be trained with an eccentric emphasis. Due to the biarticulating attachment of the long-head of the biceps acting to flex both the shoulder and elbow, the position of the shoulder during these exercises should also include neutral and flexed positions.

The elbow extensors should be trained for rapid acceleration and strength with varied forearm positions. Exercises should isolate the lateral head of the triceps as it is highly involved in the external rotation of the shoulder. Due to the biarticular design of the triceps, the long head stabilizing the posterior, and externally rotating the shoulder, shoulder position relative to flexion and extension is important. Full range of motion exercises should be included for the elbow extensors.

For exercise photos and more info on baseball training refer to Performance Training Systems Baseball page at [http://www.performancetrainingsystems.net/PTS\\_Baseball.php](http://www.performancetrainingsystems.net/PTS_Baseball.php)

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