

The Throwing Conditioning Program

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A major emphasis of any sports training program is to prepare the body for the overall demands of performance. A baseball pitcher for example, may throw an average of 15-20 pitches per inning over the course five or more innings. The act of throwing the baseball involves the transfer of energy from the feet through the legs, pelvis, and trunk, out the shoulder through the elbow and hand (1). Physiological adaptations to training, such as proper throwing mechanics and the development of adequate resistance to fatigue are incredibly specific. This means that in order for the baseball pitcher to be prepared for the physical demands of throwing, he needs to throw.

However, the dynamic nature of the throwing activity places the joints of the throwing arm in extreme positions and subjects them to significant torques and forces. The baseball athlete not only has to generate the forces needed to propel the ball, but he must also be able to re-absorb those forces and decelerate the following the throw. Performing this repetitive motion at unaccustomed volumes and intensities greatly increases the athlete's risk of injury.

The "Throwing Conditioning Program" is designed to bring about the gradual range of motion, strength, and mental (confidence, as well as, the sense of preparedness) adaptations that are required for throwing using a progression of graduated throwing distances. Focusing on a systematic transition from general to specific and low to high load throwing activities, will channel and structure the athlete's attention and energy in order to attenuate the chance of injury and maximize the training response. While not the main focus of the article, it should be noted that a comprehensive program should also include strength, power, and flexibility development for the lower extremities, scapulo-thoracic region, as well the posterior rotator cuff musculature. Proper warm-up and throwing mechanics should be emphasized in order to activate the normal muscle recruitment patterns utilized and to limit the joint stresses during the throwing motion (2, 5).

Phase I – Base Development Phase

The most appropriate time for the initiation and development of the thrower's baseline level of conditioning is the latter period of the Off -Season, approximately 2 months prior to the season. The use of flat ground throwing activities allows for safe and adequate progression of volume and distance (3). Throwing intensity is decided by the distance to be thrown. Volume should be increased before progressing to the next throwing distance. Individual considerations such as the athletes' age and level of competition, training history, and injury history should be considered when determining proper throwing intensities and volume. With the use of the Crow-Hop method, the athlete begins warm-up throws and gradually progresses to the training session's designated throwing distance. The program begins at 45 feet with 2 sets of 25 throws. If proper throwing mechanics cannot be maintained or the

with at least 1-2 days between throwing sessions. The second session should repeat the 45 feet throwing distance and increase the volume to 3 sets of 25 throws. This progression continues to 2 sets of 25 throws at 60 feet and so on, increasing by 10-15 feet until the athlete reaches his maximum base distance (Table 1). Emphasis should be placed using just enough effort to achieve the designated distance while keeping the ball on a line or with a slight arc as the distances increase past 90 feet.

| Level of Competition | Maximum Distance |
|-----------------------------|-------------------------|
| Little League | 75 – 90 feet |
| Babe Ruth League | 90 – 115 feet |
| High School Varsity | 115 – 120 feet |
| Collegiate | 120 – 150 feet |
| Professional | 120 – 200 feet |

Table 1

Phase II – Position Specific Phase

Once the throwing baseline is achieved, the program progresses to the Position Specific Phase. The Phase I throwing program may be used as daily preparation for the higher intensity position-specific sessions. However, it will be performed at a lower throwing volume. For example, perform 10-15 throws at 45-60 feet and continue with 5-7 throws at 60, 75, 90, 105, 120, 150, and 180 feet intervals or until the maximum throwing distance per Table 1 has been achieved. This is a total throwing volume of approximately 55 throws as compared to the 75-throw volume in Phase I. The athlete does not have to continue to the maximum distance each day. There may be some days in which he may require additional rest, or his position specific volume may be high for that days activities, and he may choose to limit his daily throwing to only 90 feet. This is perfectly acceptable. Consider the total volume of each day's throwing session and "listen to your body" to determine the necessary loads.

At this point, position players begin situational throwing to the bases and cut-offs similar to their actions while fielding balls during the game. These situational throwing activities can be performed during infield / outfield practice or while performing position- specific practice activities such as fielding ground balls, practicing double play feeds, throw-downs from the catcher, etc. Care should be used to continue to monitor the athlete for proper throwing technique and signs or symptoms of pain and discomfort. Ideally, the player should limit his throwing volume so as not to initiate fatigue. As fatigue sets in, the athlete will begin to alter his throwing dynamics. Continuing to practice in a fatigued state only results in practicing the wrong movement patterns and increases the risk of injury.

During this phase, the pitcher increases his specificity by initiating mound (bullpen) sessions. The early sessions should be limited to fastballs only and begin with 1 set of 15 pitches. Again, care should be taken to ensure proper throwing mechanics and monitor for pain and discomfort. Allow 1-2 days between pitching sessions and increase the volume by 10-15 pitches in each subsequent outing. The total volume of the bullpen sessions during this phase should not exceed 60-65 pitches. Once the pitcher has advanced to a volume of 30-35 pitches, he can include an off-speed pitch such as the change-up. As the 35-40 pitch volume is achieved, breaking pitches may be added. However, the fastball should dominate the session and no more than 40-50% of the throws be a combination of the change-up and breaking ball.

Phase III – In-Season Maintenance Phase

Performance and competition are the spotlights of the In-Season. Athletes need to realize that as intensity and effort increase, there is a greater need for planned recovery (Table 2). Monitoring pitching workloads by keeping track of pitch counts and paying attention to how the body feels, can be helpful in assessing recovery and the need to modify the training program (Table 3). Throwing activities should be tailored to promote recovery. During the season, the player should strive to maintain the strength and athleticism that has been developed up to the competitive phase. By incorporating an undulating plan of mini-cycles ranging from the low to moderate to higher intensity daily activities, the player can minimize the effects of competition and detraining.

The In-Season Maintenance Phase is an opportune time to incorporate long toss training. The practice of throwing to maximum or near maximum distances is based on the premise that athletes that are able to throw at higher velocities consequently are able to throw the ball farther distances. Therefore, the theory is that by attempting to throw the ball farther, the athlete will in turn develop “arm strength”. The long toss throwing distance may be different based on the individual abilities of each athlete. The maximum distance an athlete can achieve should be performed using proper throwing mechanics and the Crow-Hop method to generate adequate lower extremity power while placing a slight arc on the trajectory of the ball. Due to the high intensity nature, the volume and the frequency should be on the low end of the spectrum. For example, once the athlete reaches his maximum distance only 3-6 throws should be performed in 1 training session per week for a “Starting” pitcher and a maximum of 2 sessions per week with a “Relief” pitcher. Attempting to throw too great a volume at too great a distance can exceed body’s adaptations and result in potential injury.

| | GOALS: | ACTIVITIES: |
|--------------------------------|---|---|
| Immediately after Start | Recovery Core | Active Shoulder “Flush” Core Stabilization Cardio x 5-10min |
| Day 1 after Start | Strength Mobility Recovery | Play Catch Cardio x 20min Kinetic Chain Mobility Scapular Stabilization Ex’s |
| Day 2 after Start | Strength Core | Long Toss Double Pole Sprints Core Strength Lower Body Workout |
| Day 3 after Start | Strength Balance/Stabilization Recovery | Short Bullpen/Hat Drill Pole Sprints Kinetic Chain Stability Scapular Stabilization Ex’s |
| Day 4 after Start | Strength Recovery | Long Bullpen Agility Running UB Workout Core Stabilization Active Shoulder Flush |
| Day 5 after Start | Strength Mobility | Play Catch Short Sprints (40yds) Kinetic Chain Mobility Core Strength Scapular Stabilization Ex’s |
| Day 6 after Start | Recovery | Play Catch Short Sprints (20yds) |

Table 1 Sample 7-Day Pitcher Recovery Plan

A systematic and approach with attention to slow and gradual progressions of throwing volume and intensity, as well as, proper technique and a comprehensive training program will help to prepare the body for the overall demands of baseball performance. Proper preparation can decrease the chance of injury and maximize on-field outcomes.

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