

## Training Differences of Baseball Players vs. Other Athletes

George Carlin did a classic bit of comedy on the differences between the sports of baseball vs. football, giving the impression that the two sports couldn't be more opposite in terms of pace, terminology and other factors. We agree and would add that the training for each sport has to be different as well. Both sports are power oriented sports, but there are differences in how that power is expressed and trained.

### Sport & Athlete Needs Assessment

The trainer has to assess the unique needs of the sport and allocate time to improving each quality within the athlete. Athletic abilities assessment should be made for each athlete to match the athlete's needs to the sport based on the level of competition. Then the athlete has a clear roadmap of where they are and where they wish to go based on their motivation and goals.

All sports differ in terms of the relative importance various physical skills contribute to the game and to individual athlete's performance. The movements in baseball are ballistic in nature and involve full-body activity. The ability to repeatedly perform near maximal level with limited rest bouts is necessary for baseball players.

Baseball players should not be trained to build excess bulk or muscle mass. They should focus on improving quick, reactive movements, increasing explosiveness and injury prevention, as well as improving speed and trunk rotation. This will lead to improved bat speed and ball velocity.

### Energy Systems

Because of the anaerobic nature of the game, baseball players use the phosphagen system as the primary source of energy. About 80% of the body's metabolic energy will come from the phosphagen system. Training programs involving sprinting and plyometric exercises under 10 seconds in duration that provide complete recovery are indicated. This type of training will improve speed and power development.

### Rotational Movements

One of the key differences in baseball is that the main activities of hitting and throwing occur in a *rotational plane of movement and are very ballistic or explosive in nature*. Therefore, baseball players need to train rotationally with light weights and high speed. Exercise that emphasizes rotating the hips and torso using resistance from cables/pulleys, dumbbells and medicine balls are effective.

Players often lack abdominal or core strength. Abdominal crunches and various rotational twists with a medicine ball should be used to develop a strong muscular base in this area. This will focus on improving strength and power in the rotational muscles of the core area that are vital for swinging a bat or throwing a ball.

### Shoulder Stability & Rotator Cuff Work

Another key difference is the *unusually high stress placed on the shoulder joint generally and the rotator cuff muscles*. The act of pitching occurs at an angular velocity at the shoulder joint approaching 7,000 degrees per second (almost 20 full circles) and is one of the fastest human movements. This places the shoulder joint and surrounding muscles at significant risk of injury from repetitive stress.

Exercises that strengthen the anterior and posterior shoulder muscles in a balanced manner are vital. The shoulder should be flexible to allow for adequate external rotation necessary to throw at high speeds. Deceleration is the phase of pitching most associated with injury. Specific exercises to develop the muscles responsible for deceleration (mainly the rotator cuff and scapula muscles) are crucial.

Plyometric exercises for the shoulder and upper body are useful due to the explosive nature of the pitching motion. Exercises for the rhomboids, lats, pectorals and shoulder area are necessary to throw at high speeds.

### Bat Speed Training

*Swinging the bat is a skill that is unique to baseball*. Players need good lower body and core strength to develop power in the swing. These muscles need to be trained rotationally in a high-velocity, explosive manner.

Strong hip and leg muscles will initiate the swing, the core area then sequentially transfers the rotational speed to the torso and the arms to complete the swing. The efficient transfer of force from the lower body to the upper body, known as the kinetic chain principle, requires that there be muscular balance for optimal sequential transfer of forces.

Strong lats, triceps and forearms will help to continue bat acceleration through ball contact. Squats, bench presses, pull ups, forearm and triceps exercises will develop the potential for power. Bat Speed Training with heavy and light bats within a prescribed range will transfer that potential to the actual sports skill in a specific manner.

### Ball Velocity Training

*Throwing a baseball with high velocity is an explosive, full-body movement that requires total body development*. Strong leg, hip and core muscles are crucial to transfer power from the ground, through the lower body to the torso and eventually to the arm and hand to provide a fast, whip-like release of the ball. The efficient transfer of force through the proper sequencing of body parts through the legs, hips, trunk, and upper limb to the ball is crucial.

In addition to strength training, a weighted ball program or medicine ball throwing progression can be utilized to improve velocity. This will improve the ability to generate power in the throwing muscles. The combination of a heavy load to build power and a light load to build arm speed, thrown in a prescribed manner, has been shown to improve throwing velocity safely.

The athlete should train for proper trunk rotation during arm cocking as well as strength and flexibility in order to generate angular velocity within the trunk for maximum ball velocity. Training should involve trunk rotational exercises to develop the obliques so that maximum arm speed can be generated.

#### Biomechanical Analysis

We use video analysis of the pitching and hitting mechanics of each player for technique analysis, fault correction and feedback, as well as for assessing progress at a later stage of the program

#### Visual Skills Training

We also incorporate visual skills training for batters since the ability to accurately track the baseball and predict where it's going to be is crucial to a hitter. Without this unique skill, all your other training can be rendered useless. Many of the exercises are easy to perform and do not require expensive equipment.

#### Mental and Emotional Skills Training

We introduce mental and emotional skills training to help players deal with both success and failure, as well as to deal with game pressure. Baseball is unique in that being successful three times out of ten gets you to the Hall of Fame. Players have to deal with consistent failure and still remain confident.

The following are the basics for a Baseball / Softball Conditioning Workout:

Cardiovascular Training: Sprints and interval training, not long distance running

Stretching: Important for increased flexibility and injury prevention.

Strength Training: Important for increased maximum strength. Begin with bodyweight exercises and progress to weights.

Medicine Ball Exercises: Important for rapid powerful upper body movements to develop increased explosiveness and rotational forces.

Plyometrics: Used in conjunction with strength development in an integrated program to improve the link between the strength developed in the weight room and the ability to develop explosive power, speed and agility.

Speed, Agility and Quickness Training: When it comes to baseball, speed and agility are important on both sides of the field. Speed is important in the field where hit balls must be defended. On offense, speed puts pressure on the other team and distracts the pitcher and catcher; this help the hitter get better pitches to hit. The development of speed and agility is as vital as the development of batting power and throwing arm stability.

When you translate the strength developed in the weight room with the speed developed during the plyometric training and then add proper batting and pitching mechanics, you will have a stronger, more powerful, more productive player.

All training needs to be integrated with sports skill training. You cannot do either area in isolation without leaving the player's development lacking. Trainers need to work closely with the team coach and medical staff to ensure a balanced, effective training program. Nutrition and diet and various recovery methods should be discussed with appropriate professionals in those fields.

***Charles Slavik***