

Baseball Specific Speed

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What do you think of when you think of speed? Do you think of a sports car, the Olympic sprinter, the wide receiver on your favorite football team? How about when it comes to the game of baseball? Is it the flame throwing closer or the player with 40 stolen bases? Speed is an essential part of the game. But, how do we define speed in baseball and is it really the same speed as defined in most sports? For decades baseball has been testing the 60 yard sprint to determine a player's speed. In recent years many pro and college programs have been putting more weight on shorter sprints like the 30 yard dash. With this trend are we seeing a new standard for players and will that change the way we train players?

Baseball specific speed should not be considered the same as speed for the track athlete, or wide receiver, or countless other sports. Baseball has demands like no other sport. The majority of the athlete's speed is based on reaction to some other activity or outcome. For example, a player can't run till he hits the ball. He can't steal until the pitcher pitches. He can't field until the ball is hit. This makes training a baseball player's speed not only based on physical factors like strength, power, and form but also on mental factors like reaction time, and anticipation. As we open the topic of baseball specific speed, it is important for coaches, players, strength specialists, and athletic trainers to understand the importance of this quality in player development and how it can be enhanced specifically for the game of baseball.

When training speed for baseball we must start with a basic understanding of the energy systems used for baseball. In most activities in the game the player is only performing a task for a few seconds. I am going to go as far as saying that no task in the game takes more then 30 seconds. This makes training for speed in baseball very specific, working only in the Fast Glycolysis and Phosphagen systems during the game. In the Phosphagen system the player works in 90 to 100% of maximum power during tasks only lasting up to 10 seconds (1). In the Fast glycolysis system the player works within 75 to 90% of maximum power during tasks only lasting from 15 to 30 seconds (1). So when



training for specific speed, short maximal and near maximal bouts of work should be used for the baseball player.

The breakdown of energy systems allows the coach, player, or trainer to pick activities in this specific work capacity. Sprints in the 10 to 200 yard distance allow the athlete to train in these specific zones. But other activities used for speed development must also fall into these time frames. These activities will include speed specific plyometric work, explosive work, and form running drills. One component we don't want to leave out when training speed is the rest to work ratio. While working at these high power outputs the athlete will need breaks to recover for the next bout. The ratios at these work capacities range from 12:1 to 3:1, depending on the activity and the intensity level. Table 1 has a break down of both the energy systems but also the rest to work ratios (1).

Max Power %	System	Exercise Time	Exercise Rest Ratio
<i>100-90%</i>	<i>Phosphagen</i>	<i>5-10 sec</i>	<i>1:12 to 1:20</i>
<i>90-75%</i>	<i>Fast Glycolysis</i>	<i>15-30 sec</i>	<i>1:3 to 1:5</i>
<i>75-30%</i>	<i>Fast Glycolysis/Oxidative</i>	<i>1-3 min</i>	<i>1:3 to 1:4</i>
<i>35-20%</i>	<i>Oxidative</i>	<i>Over 3 min</i>	<i>1:1 to 1:3</i>

Table 1 Conley M. Bioenergetics of Exercise and Training. (2000)

When we train speed in baseball there are 3 basic phases we can train: reaction time, acceleration, and maximal velocity. For the baseball player, reaction time and acceleration are the two most important phases. The reason being reaction time is what actually sets the player in motion. The faster they can react, the faster they can get moving. The acceleration phase is the second most important phase because acceleration typically lasts for about 15 meters (2), or 50 feet. The faster we get up to speed the more success the player will have not only out of the box, but also on that fast grounder up the middle. Maximal velocity is important. But in the game of baseball, teaching the player to get to maximum velocity would be more important. Typically an athlete's maximal velocity is not reached till 30-90 meters (2), or 100 to 300 feet. In baseball, we don't have this much time.

For baseball specific speed, understanding the components that make up speed is important in designing a program. Speed is made of 4 basic components: stride frequency, stride length, sprinting form and speed endurance (3). Stride frequency in baseball is how many steps are taken in a specific distance or time. Generally we would



measure specific distances on the ball field, like home to first. Training for increased stride frequency would include exercises that are considered assisted sprinting. Examples would include towing with elastic cords, treadmill sprinting, or sprinting down hill (4).

The distance that the player covers with each step is the stride length. This usually is increased with specific sprinting strength and power exercises. These exercises are called resisted sprinting drills and typically include: towing sleds or tires, pulling chutes, and uphill running or stairs (4).

Sprinting form has also been included as an essential part of speed development. But, we are going to put a greater importance on the start for the baseball player. The start becomes so important because of the short distance we need to run. If a player takes a 10 foot lead the distance to steel is reduced to only 80 feet and if it takes 50 feet typically to reach top speed that only leaves 30 feet to stride it out. In general terms, many sprint form programs work on technique that is maintained at top speed. This



Standing Broad Jump

becomes less important in baseball because of the decreased time in the maximum velocity phase. Starting form and acceleration technique become the most important components. Explosion type movements like jumping, hopping, lateral hopping, footwork drills, ladders, and hurdles work on quick reaction and explosive starts.

When working on speed endurance for baseball, we should work on maintaining low reaction times and being able to sprint those short distances for repeated efforts. Short interval type training is usually used. We sprint at 90 to 100% while using short bouts of active recovery. For most baseball players, sprinting 60 yards for speed development is enough, and at 60 yards the recovery time would range from 50 to 70 seconds as long as the player can maintain the sprinting time goal for the drill to be repeated.

Reaction time as a speed component for baseball is many times over looked and can be a deciding factor in the race with the ball. Typically in baseball, the player is using multiple senses in reaction, the most common is vision. But they can use audible cues as well, such as instructions from a coach or even



the ball striking the bat. Training reaction time is very simple and can use simple tools like multiple colored balls, hand signals, lights, and audible cues like the crack of the bat, clapping, or certain words.

Baseball is a game of speed and quickness. Developing the quality of speed in the player can aid their game in all aspects from hitting to fielding. Developing a program specific to the game of baseball can help the player progress with greater efficiency and outcome. Baseball demands specific speed qualities like reaction time and acceleration. For the player to excel at the game they must train with these specific qualities and training styles in mind.

Drive Step Bound Drill: (a) Start Position (b) Flight Phase (c) Landing Position



(a)



(b)



(c)



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Nv ml mc Chdbsn neOk xd Cdudknol dms s In Ron srS hmf hmBnk cn: dg rgr
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e nl sgd Tntud rlx neMn sgd mBnk cn: dg r addmbd stc r Rs dnfsg nr Bnnc lshnnnf
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