

Pitching Velocity and Strength Training for Pitchers

Can baseball pitchers improve their throwing velocity by increasing their arm strength or overall strength?

Or is much strength required for pitchers to maximize their pitching velocity? If so how much?

When high school or college pitchers are trying to improve their pitching velocity, coaches will normally advise them to do more long toss or go into the weight room and get bigger and stronger. But is either activity proven to increase pitching velocity? The sports science research says no. That's right...the actual research regarding the ability to throw a light object such as a 5 oz. baseball does not require much strength at all...thus why some 10 year old pitchers are able to throw 70 mph which requires hitters to have about the same reaction time as facing a 90 mph pitch from 60'6".

Throwing Does Not Improve Arm Strength.

The idea of doing long toss is that it is supposed to strengthen the pitching arm or more specifically the throwing shoulder. However, the research says that the non-throwing shoulder is just about as strong as the throwing shoulder. This being true, then long toss does not improve shoulder strength otherwise the throwing shoulder would be much stronger.(Sirota, Malanga, Eischen & Laskowski, 1997, The Science And Art Of Baseball Pitching, Topic 7.1, Mills, Rushall, 2006)

Here is what most coaches fail to consider or even understand. In an activity such as pitching when a movement is fast...strength cannot be used. So in pitching speed of movement of the body going from the back leg to the front leg is far more important than full body strength or arm strength.

Athletes such as football linemen need strength to move other 300 lb. linemen. But what are pitchers trying to move? A 5 oz. baseball. So we might have a 6'175 lb. pitcher who is trying to move a 5 oz. baseball faster. Do you really think that more strength is required? Why...when a Little League pitcher can throw a high velocity pitch without having done any strength training.

This idea that more strength is required to throw higher velocity pitches may be the most misunderstood belief about how to improve baseball pitching. Thus a great deal of time is wasted on strength activities that do not provide improvement but can increase the risk of injury.

If all this weight training and long toss were valuable, why are so many pitchers still looking desperately for more velocity and why are so many pitchers getting injured at such an alarming rate at all levels of baseball?

What then should pitchers consider if they want to improve throwing velocity?
Develop more speed of movement of the body...not more general strength and certainly not more arm strength.

What Type Of Conditioning Is Best For Pitchers?

What pitchers need as a conditioning routine is more overall general fitness. They need full body explosive exercises to energize as many muscles of the body as possible since pitching is a full body activity. So full body explosive exercises such as upper and lower body plyometrics is a perfect way for pitchers to get into shape for pitching not so they improve velocity but so their body is conditioned to prevent injury since pitching is an explosive movement.

Doing exercises in the weight room, where individual muscle groups are strengthened, actually teaches the body to be slow in an activity such as pitching where being explosive is the most important factor. Timing of the pitching delivery is also equally important.

If Strength Training Doesn't Work...What Does Improve Velocity?

However, the research says that no amount of additional strength training is going to help a pitcher improve his throwing velocity.

Again, for a pitcher who is performing a maximum effort pitch, the speed of his body is what creates more elastic energy, which cannot be improved upon with added strength. So the speed factor is far more important for pitching than the strength factor.

So there are several things coaches should consider when thinking of improving pitching velocity from a conditioning standpoint. The major consideration is that pitching velocity requires speed training not strength training thus why exercises such as upper body medicine ball and lower body explosive jumping are so important. We want the body to learn how to move fast and while doing so put as many muscles of the body on stretch as fast as possible...since that is what happens during a high velocity pitch.

Just watch Nolan Ryan or Tim Lincecum and see how fast they are able to move their bodies down the mound. That speed of movement into a long stride is what produces maximum elastic energy as their bodies stretch out like a huge rubber band. Upon landing, that stored elastic energy is released which provides the whipping action to pull the arm through at high speed.

Tim Lincecum, the 23 year old pitcher for the Giants is 5'10" 170 lbs. He throws 95-100 mph. He would be considered small and weak by most high school or college coaches. And yet, do you actually believe it would make sense to get him bigger and stronger so he could throw over 100 mph? More than likely what would actually happen is that any added mass or weight would actually slow down his speed of movement and reduce his velocity.

When Pedro Martinez was throwing 96-98 mph 6 years ago, he was listed at 5'10" 170 lbs. Right now he is listed at 193 lbs. And over this six year period we have seen his velocity drop from the upper 80's to the low 90's. Most commentators comment that he

is now older thus why he throws slower. I say he is 23-25 lbs heavier thus he moves slower.

Two other things coaches should consider for training pitchers:

1. The speed with which a muscle is put on stretch (like doing medicine ball exercises) is directly proportional to the velocity of the release. This is why we must train pitchers using high velocity or explosive movements in order to reduce their risk of injury. We must get their bodies trained or energized so all the muscles and connective tissue can be put into a lengthened and stretch position without tearing. However, this type of training by itself will not improve throwing velocity.
2. Pitching velocity is a highly skilled movement pattern that requires proper timing of all the parts. For example, the lower body and upper body actions must be timed properly so that energy is not transferred too early or too late which would reduce velocity and add stress to the throwing arm.

Therefore, pitching velocity is more dependent on precise timing of the overall delivery rather than any singular muscular strength of a particular body part.

What does this mean for a pitching coach who is trying to help all his pitchers improve their velocity? To achieve the highest velocity in pitching, training has to involve large amounts of high velocity pitching from the mound. And let me add this pitching practice from the mound must be videotaped so that the coach and the player are able to use the feedback from the video to help improve the timing of the overall delivery so that maximum energy is getting transferred properly from one part to the next so that the throwing arm is whipped through at high speed almost effortlessly.

Keep this in mind...it is very important to understand. Once the pitcher has landed there is not much he can do to produce any more velocity except to powerfully flex his trunk forward into a flat back position. What this actually means is that velocity is mostly produced even before the pitching arm moves since upon landing the pitcher is simply transferring the energy produced from his forward momentum into stored elastic energy which does not get transferred until after foot plant.

This is why working on developing more momentum into a long stride while using mechanics with good timing are the two key factors for improving throwing velocity. Pitchers simply need to work on improving their overall speed of movement and their mechanics while pitching off the mound more often in order to maximize their throwing velocity. Strength training has not proven to be the answer.