

Training Considerations for Pitchers

John Pallof, PT, OCS, COMT, CSCS

Consider for a moment the amount of money that is invested in pitchers every year at the professional level - from signing bonuses for new draftees, to the mammoth contracts signed by pitchers like CC Sabathia (twenty three million a year - buys alot at McDonalds, by the appearance of his ahem, frame), AJ Burnett, and countless others. Also consider the number of young pitchers, from little league through college, who routinely experience elbow or shoulder pain - the age at which pitchers are being introduced to the surgeon is getting younger and younger. I've seen several high schoolers undergo ulnar nerve transpositions; I have a 15 year old patient who had to have Tommy John (elbow ligament reconstruction) surgery - fifteen years old!!!! Despite the large amounts of money invested in pitchers, and despite the growing epidemic of arm injuries in an ever-younger population there is an alarming dearth of sound practices being implemented to try to stem the tide of injury. The following article attempts to lay a basic foundation to build upon when training a throwing athlete - from professionals to little leaguers.

1. The core principles of training pitchers are the same as athletes of other sports. The goals of training programs are the same for pitchers as they are for athletes of other sports - improving lean mass, fitness levels, maximal strength, and explosiveness. There are a number of people out there who are under the misconception that: pitchers shouldn't lift weights, because they will lose their flexibility; overhead movements (pushing and pulling) should be avoided at all costs as they are "unhealthy" for shoulders; training for pitchers should be done with "functional" movements - movements that "replicate" the pitching motion; pitchers don't need to lift heavy weights; and many many more. Bottom line: pitchers need to become more athletic!! This means they need to get bigger, stronger, and more explosive.

2. Fatigue Resistance. A well-developed fitness/work capacity base is essential to the health of a pitcher. This should be high on the priority list early in the off-season - this will allow the athlete to better withstand the rigors of the off-season program, and build fatigue resistance. Fatigue is an enemy - fatigue leads to increased risk of injury. Fatigue can be further classified into two types: accumulated and acute. Accumulated fatigue being the effects of a long season full of late nights, travel, generally poor diet, and of course competing. Acute fatigue being the more traditional sense of the term - experienced while pitching, which leads to increased injury risk and impaired performance. The cardiovascular demands of the position are often overlooked - but remember that the pitching delivery is a maximal effort - so consider a starting pitcher throwing 100 pitches - compare that to 100 hang cleans - pretty tiring!!

To combat this: be sure to emphasize conditioning early on - work capacity circuits, intervals, etc. To counteract accumulated fatigue - educate!! Teach the pitcher the importance of proper sleep, nutrition, and in season programming.

3. Rest!! The baseball season is extraordinarily long - stretching from mid February training camp possibly all the way to October. An initial period of rest is important both physically and mentally. A few weeks of rest early on is extremely important - it allows the athlete to recover physically, and allows the pitcher to relax mentally - and get ready for a productive off-season. However - some light exercise, and tightening the screws up on proper nutrition can make this time productive. Make sure the athlete doesn't enjoy himself too much though - excessive alcohol intake or poor eating will lead to digging himself a body composition hole - don't get fat.

Also very important - the athlete **MUST** give themselves a prolonged period of time of **NO THROWING** - don't even pick up a ball. This is essential to allow the tissues of the arm/shoulder/and neck to recover from the stresses of thousands of throws from the beginning of the off-season throwing program until the last pitch of the season - this includes long tossing, bullpens, and actual pitching. Generally, roughly eight weeks is a good place to start. This will vary depending on how much volume the pitcher accumulated in season, if they were injured, rehabbing, or perhaps playing winter ball - but the bottom line = rest is

absolutely necessary after a long season and prior to initiating a graded off-season throwing program (which will be discussed later).

4. Proper Nutrition. Generally, as with most athletes, baseball players' nutrition is less than optimal, at best. Part of the blame falls at the feet of their teams' staff, and with various personnel they come into contact with along their path. Example, from an MLB team's off-season manual: bagels are good for you; pizza is OK as long as it is vegetable. Minor leagues are horrifying - chick-fil-a sandwiches for lunch in camp (along with bags of potato chips) and soft drinks; huge bowls of Doritos and cheese poofs in the club house pre game. Plus, the amount of traveling with baseball requires a lot of eating on the fly - so the athletes' nutritional options will frequently be limited, and will often be heavier on convenience and lighter on nutrition.

5. Off Season Throwing Program. Perhaps the most important component of any off-season program. There is no substitute for throwing. This is how the pitcher develops arm strength, and "calluses up the tissues" in the limb. I had the opportunity to listen to Rick Knapp, former minor league director of pitcher development for the Twins (good track record there), present pitching coach for the Detroit Tigers (has done well there so far this year). His presentation made a real impact - because he keeps things beautifully simple. He made a comment that seems simplistic, but is remarkably accurate, and just about impossible to argue with:

"If a guy can throw the ball far, I'm pretty sure he'll be able to throw it hard..."

How does one argue with that? So, the necessity for a highly structured, well thought out off-season throwing program becomes apparent - the goal is to be able to throw the ball hard over a long distance. Programming should consist of long tossing first and foremost, and bullpens. And the process is very similar to training: volume, frequency, and intensity are the variables that are manipulated to attain the desired results - sound familiar?

There are many many philosophies out there regarding how to go about this - and many of them work equally well, even with pretty divergent approaches. A few of my own observations:

1. Volume: Remember, the baseball season is extremely long, and throwing is not a natural activity for the arm. So - the trick is doing enough early on, but not too much. And definitely not too little. A pretty basic principle - gradually build volume to gradually strengthen connective tissues. Wolff's Law (don't quote me, but this is the gist): tissues will respond accordingly to the stresses that are placed upon them. Most long tossing programs I have seen build volume by increasing frequency, not by just building volume within sessions. So, going from 3x/week to 5x/week for instance. The biggest problem I see is a lack of a structured approach - going out and just throwing and throwing some more (too much too soon - remember you need to save bullets), or throwing too little - just throwing when the athlete feels like it, or when it is convenient.

2. Frequency: A good way to add volume without overstressing the arm too early. And it is necessary to get to the point where the athlete is throwing 5-6x/week, as this is what will be happening come spring training. A good starting point is 3x/week, building upwards.

3. Intensity: Two factors at play here: distance (the farther out you are, the more effort it takes to get the ball there), and the trajectory of your throws - "on a line" vs. with some arc. So common sense dictates that this should be gradually increased as well - perhaps progressing in distance if you have the space, or gradually throwing more hard from a limited distance. How much distance? Some teams advocate going all the way out 300 feet. If space is limited, 150 feet is plenty - throwing on a line. This is important, because it can be a fairly accurate indicator of arm strength - a borderline hall of fame pitcher known for his meticulous approach (and large appetite) won't get on the mound to throw a single pitch until he can get out to 240 feet on a line - then he feels as though he is at an adequate point with regards to arm strength.

4. Bullpens: A bullpen is a throwing session that closely mimics the intensity of actually pitching. It is done on the mound, and is limited and intense. Pitching off of the mound is more stressful on the shoulder due to the downhill nature of the mound - this increases the external rotation type stresses on the shoulder due to the downhill trajectory of the pitcher's delivery/stride. Generally not until at least 4 weeks of long tossing. And again, gradually building in intensity/volume. Start with straight fastball/change ups for first 3-4 sessions, then adding in breaking pitches gradually. Generally two bullpens a week, starting with say 25 pitches, perhaps building to 40-50 - no more.

One last important point: make sure EVERY THROW has a purpose!!! The arm can withstand only so much of such a stressful activity, so every throw in a program must have a purpose - save the bullets for when you need them!!

6. **Pitchers need to be good "pullers"**. As a rule, pitchers should be strong in pulling movements, and be able to do lots of it. Why? These are very important muscles in both acceleration and deceleration of the arm complex - and play an enormous role in scapular, thoracic, and cervical stabilization during the very violent action of pitching. So, a few rules of thumb:

-Pitchers should be able to do an appropriate volume/load for chin ups. Great lift for pitchers. I like chins vs. pull ups because I believe the closed grip lessens the potential for excessive stresses to the anterior shoulder/anterior capsule. Injure this, and you have big problems. Also - when coaching them, I prefer the athlete stop just short of the absolute bottom - that way the supporting musculature is always engaged, and should lessen the stresses on non-contractile (e.g. ligaments, labrum, etc.) tissues in the glenohumeral joint. So - if a pitcher is large, bodyweight should be a good measure of strength; otherwise, add external load.