

Training & Conditioning

Special Delivery

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At Texas Christian University, pitchers are trained to be fast, powerful, and explosive, while also taking into account rotational demands and individual imbalance issues.

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The development of baseball pitchers poses interesting questions for a strength and conditioning coach. Should they follow the same program as the rest of the team? Should they do upper body exercises with weights? Should they even be in the weightroom at all during the season?

Here at Texas Christian University, we firmly believe that pitchers aren't made of glass, as some baseball team coaches seem to think. They are athletes, and we treat them as such. The act of pitching is an explosive total-body movement, and there is nothing slow about it. Thus, our overarching goal in training pitchers is to make them fast, powerful, and explosive--so that's how we train.

However, several factors separate pitchers from the rest of the team and these should be taken into account when developing a training program. For example, due to the one-sided rotational demands of their position, pitchers can easily develop imbalances that may lead to injury.

Another challenge to creating a sound conditioning program for this population is that while they are typically lumped together because they occupy the same position, pitchers are used in different capacities on the mound. A pitching staff runs the gamut from inexperienced freshmen to seasoned veterans, from starters to relievers, from those who may pitch on back-to-back days to others who need days to recover between outings.



With these variables in mind, we can begin to solve the complex problem of how to best develop each athlete. We've found that taking an individualized approach to developing players' programs is an effective way to train our pitchers. Since each athlete's body tells a different story, we start by using a screening process as the basis for forming our pitchers' strength and conditioning plans. Then, we work them hard where they need it, while avoiding vulnerable areas, with the goal of increasing their strength, explosive power, and agility.

OUR SCREENING PROCESS

Every pitcher who walks through our doors is put through a movement screen. This is a multi-step evaluation that clues us in to a multitude of issues in each of our athlete's bodies.

A lot of schools have athletes go through a screening process, but never utilize the information effectively. In our case, each player's personal strength program is built upon his screening results. Though the bulk of the work we do will be the same for each pitcher, exercises to correct deficiencies and imbalances will vary, as well as those used when a pitcher is injured.

We screen each pitcher three different times throughout the school year (plus another two or three looking at shoulder rotation only), so we are always collecting new information. The players' programs continually change and grow from the information that we compile since new imbalances can pop up even while we're working to correct existing ones. The goal is to stay ahead of an injury by preventing it in the first place, so it's important to continue testing throughout the year.



I've utilized Gray Cook's functional movement screen (FMS) for years, but have added to it and adapted it to fit the needs of a baseball pitcher. This included changing the order of the FMS slightly to help with the flow of the process. I've also found that with pitchers, it's important to do a more thorough evaluation of the throwing shoulder, thoraco-scapular complex, and the hips since these are common areas where pitchers have imbalances.

We start each pitcher with a standard evaluation that includes range of motion (ROM) testing and looks for impingements and tightness--especially in the trunk and shoulders. What I find here determines how the rest of the evaluation proceeds. Athletes who pass the initial part of the screening with flying colors don't need to perform any more evaluation exercises, but if they have pain, ROM limitations, or movement dysfunction, we take a deeper look.

Although each athlete is different, pitchers often join our program with similar imbalances. For example, we screen for tightness in the lats and pec minor because pitchers are typically too tight in these areas. We also see a loss of internal rotation in the shoulder of the throwing arm. When too much ROM is lost, it can spell disaster for a pitcher--including chronic shoulder problems that eventually require surgery.

Perhaps the most important step in our screening process is a thorough evaluation of the throwing shoulder. This includes measuring total glenohumeral rotation and checking for proper tissue length with a goniometer, as well as asking the athlete about pains, pinches, or any problems they may be experiencing in their shoulder.

Each pitcher's shoulder is measured for total rotation four to five times throughout the year--including at least twice during the season because deficits appear quickly when an athlete is throwing a lot. We're looking to make sure a pitcher doesn't lose ROM in his throwing arm. A deficit in shoulder rotation generally means there is a deficit in glenohumeral internal rotation--a natural adaptation to throwing, but one we can't let get out of control.



When an athlete does show a deficit in rotation, we work to eliminate it immediately. Remedies range from gently stretching internal rotation every day, to soft tissue work, to thoracic spine mobility work until the issue is under control.

The other area that is directly tied to all shoulder issues is the scapula. The scapula is the most important area for proper functioning of the shoulder, and quite often, pitchers arrive on campus with some form of scapular dysfunction. We make sure to train the scapula for proper movement, such as upward rotation, as well as depression and retraction. Within these movements, we want the scapula to be stable and provide a proper platform for glenohumeral movement.

Studies have shown that pitchers' shoulders (as well as their elbows) lose ROM following an outing. This is especially prevalent in starting pitchers. The greatest loss shows up 12 to 24 hours after they've thrown, so the day after each mound appearance, we gently restore each pitcher's shoulder and elbow ROM through light stretching and soft tissue work with foam rollers, tennis balls, and a self-roller massager called The Stick.

The upper body isn't the only area where imbalances occur, however. We commonly find the hips to be an area of concern. The front-side hip often loses internal rotation, and an inability to fully rotate over the hip can mean problems in the shoulder and arm.

We have our pitchers stretch for internal rotation by trying to touch their knees together while their feet are spread apart. We'll then work to integrate that specific flexibility into movements like hurdle duck-unders or a diagonal lunge pattern.



IN THE WEIGHTROOM

Depending on the time of year, our pitchers perform anywhere from four to seven total body movements during their weight lifting sessions. Including warmup and our speed and movement work, total training time for high-intensity sessions is generally 70 to 90 minutes, three days a week.

Though each lifting session is a total-body workout, we alternate between an upper-body and lower-body emphasis. The foundation of our lower-body movements includes the back squat, front squat, and Romanian deadlift. However, we often individualize programs, especially for our pitchers who are unable to back squat due to shoulder injuries. These athletes will usually use the safety squat bar instead.

Our main upper-body movements include the reverse pull-up (also known as the inverted row) and pushups. I believe reverse pull-ups are one of the best posterior upper-body exercises a pitcher can perform. Not only does it teach proper scapula movement, but the move also requires stability throughout the entire trunk along with glute activation.

And I believe pushups--provided they are done correctly--are one of the best overall exercises any throwing athlete can perform because of the benefits for core stability. I especially like using pushups with a DB row and rotation. While they are great for the serratus anterior, when pushups aren't fully completed at the top, the serratus isn't activated. I also always make sure athletes aren't letting their hips and core sag at any point during the movement.



Our pitchers' shoulder health is key, so we take major precautions in the weightroom. For example, our pitchers don't do any overhead moves in the "high five" position. Most of our exercises utilize a neutral grip including all of our pull-ups, pushups, and any dumbbell pressing variations we may do.

For back work, we always perform at least a 2:1 ratio of posterior upper-body movements to anterior. Depending on the time of year, we will sometimes work at a 3:1 ratio. Also, some athletes' imbalances will dictate that they do nothing on the front side and focus all of their work on strengthening the posterior muscles.

Nearly every pulling movement we do is taught with retraction and depression of the scapula. We put an emphasis on stabilizing the scapula in these movements so that the shoulder complex doesn't become compromised. When training the scapula, we make sure to emphasize the lower and middle trap and serratus anterior. These muscles are very important in stabilization and safe upward rotation, which is hugely important for an overhead-throwing athlete.

The thoracic spine receives a lot of attention as well. Training mobility throughout the thoracic spine should be a high priority in any throwing athlete. Being able to rotate and fully extend eliminates compensations that can cause low back issues, as well as problems related to the shoulder and elbow.

Recovery sessions include soft tissue massage work using foam rollers, sticks, tennis balls, or lacrosse balls. Each athlete will then perform their specific movement training, which is based on their screening results. One athlete may perform specific thoracic spine mobility work with an exercise like a reverse lunge with a rotation, while another athlete works on increasing torso stability through a bird dog pattern or modified pushup.

Next is a rotator cuff, scapula, hip, and core activation circuit. This is low-intensity work that includes exercises such as hip raises and clamshells for the glutes, some type of stabilization work such as Iso Abs or planks for the torso, and some form of scapular or rotator cuff work like Y's, or any number of external rotation variants. The entire circuit lasts about 10 to 15 minutes.



Finally, the athletes finish with any specific corrective mobility and flexibility work that we have assigned based on their screening results. This is an example of where each athlete's training program differs slightly. In total, our recovery training sessions are only about 30 to 40 minutes long, depending on each pitcher's needs.

PERFECT POSITIONING

Our pitchers spend the first three weeks of every off-season developing what we call the athletic position. This is just what it sounds like--teaching the athlete to be in a proper position for movement. Hips should be pushed back with the knees bent, and the chest out over knees, almost like a middle linebacker set for a play.

While it may not be a common position for pitchers on the mound, we teach it to every athlete in every sport as it is fundamental to most athletic movements. Nearly every movement that is taught in the weightroom and on the field stems from the athletic position. We put a high priority on this training and review the athletic position over and over again throughout the year.

Once the athletes understand the position, we move into deceleration training where we teach our pitchers body control and the ability to slow down and stop in a controlled manner. Most baseball fans can recall a pitcher blowing an easy bunt play because he slipped or couldn't gather himself in time to make an accurate throw. This happens all too often because pitchers are not taught to accelerate, get their body under control, and decelerate while fielding a ball.

We teach them using cone and line drills. Our main drill is a five-yard out and back and 10-yard out and back shuttle. In addition to the typical sprints and backpedals, we also use a lot of lateral movements such as shuffles. Each line can be used to teach deceleration or quickness. Our main goal is for the players to know how to stop and control their bodies using the athletic position.

After spending some time perfecting the athletic position and the movements involved in deceleration training, the final six weeks of the fall are spent on sport specific movements. Our specific movement training involves non-programmed, reactive agility work. Essentially, we are trying to duplicate the movement patterns that a pitcher will face in fielding.



For example, a pitcher will go through his throwing motion while facing a wall located about 20 feet away. As he completes this motion, a player standing behind the pitcher will throw a tennis ball to a random spot against the wall. The pitcher must immediately react and field the ball. We start with our pitchers fielding the ball and going through the motion of a throw to first base, then progress to calling out a base as the pitcher fields the ball, which forces them to adjust and throw to the correct base.

Rotational training is another major aspect of our off-season. It's a part of every training session the athletes complete through all 15 weeks. We spend the first three weeks teaching general rotational movement patterns utilizing hip and thoracic spine rotation. From there, we move to strength development in the transverse plane. And the final six weeks of the fall we begin to implement power development in our rotational movements in the form of medicine ball work like throws and slams. We start off doing these in a speed-strength complex, super-setting throws with a strength movement, and eventually progress to nothing but med ball throws.

SPEED & EXPLOSIVENESS

During the fall, our pitchers train five days a week and have weekends off. Monday, Wednesday, and Friday are total-body high-intensity work days, and then we build recovery into our Tuesday and Thursday workouts.

Each high-intensity training session begins with our dynamic warmup and speed and movement training program. This includes linear and lateral movements, as well as jump training, and usually lasts 30 to 40 minutes.

I believe strongly in the benefits of speed training for all athletes, even for a pitcher who isn't too worried about how fast he is. Just to name a few benefits, proper speed training helps improve a pitcher's stretch reflex, enhances coordination, aids in increasing all around hip motion, and complements strength and power development. It falls directly in line with my overall philosophy of training pitchers to be fast, powerful, and explosive. "Train fast to be fast" is how I approach speed work for all of our players, so we utilize short sprints and long recoveries.

The majority of our speed work consists of training 10- to 30-yard accelerations. We do this from a number of different starting positions, including blind starts from the players' stomachs to athletic position starts facing various directions. A typical training session averages 200 to 300 yards of total volume of 10-, 20-, and 30-yard sprints.

It's not until the final six weeks of the fall semester that we begin any type of energy system training with our pitchers. This work starts late in the semester because we want the majority of our year spent developing a foundation of speed and power.

I look at what a pitcher does on the mound and structure our training to match it. In an actual game, a pitcher might throw six pitches then have to field a bunt. He may throw two more and have to back up third base on a triple to the gap. Then he may throw three more pitches and have to back up home or cover first base.

In essence, we duplicate our pitchers' energy system demands by using a four- to six-pound medicine ball for a series of throws and movements including sprints, shuffles, and backpedals. We may start with three series of eight to 10 throws per set and work our way up to four to five series of 12 to 15 throws with anywhere between two and 10 movements per set. This specific conditioning continues through the fall and leads up to the first week of the season.

There is no "one size fits all" way to train your pitchers, but regardless of their exact needs, you must train them as athletes and not keep them out of the weightroom. Here at TCU, individualizing programs, putting an emphasis on total-body explosive movements, and moving safely and effectively have proven successful for our pitching staff, and these principles can do the same for yours, too.