



BUILDING A CANON ARM

(From Bulldogs Materials)

There is nothing more impressive in baseball than an outfielder gunning a baserunner down, a catcher throwing out the runner stealing second, or a third baseman making that great throw to beat the runner at first. Developing the ability to throw a baseball with great accuracy, speed, and distance takes technique and strength. This article will give the reader more specific weight-training guidelines for strengthening the throwing arm.

There is a lot more to the throwing motion than most people would suspect. A brief review of the pitching/throwing motion and the muscles involved will help the reader better understand this complex motion. It is the intent of this article to give a basic level of understanding of the pitching motion. However, all other throwing is very similar to the pitching technique, and the muscles being used are generally the same. There are five phases of the throwing/pitching motion: wind-up, cocking, acceleration, deceleration, and follow-through (see photos - red highlighted areas designate primary muscle groups being used).

During the wind-up, the shoulder muscles play a very small part. The major group of muscles that are being used are in the legs. This explains why strengthening the legs is very important to the throwing motion.

The cocking phase is when the arm is brought back and up, to prepare for the forward throw. The lead leg steps forward, while the back leg is beginning to push off the mound. The muscles in the shoulder that are being used in this phase are the external rotators (muscles that rotate the arm out) and the deltoid muscles (help to lift the arm up and back). Other muscles that contribute to the cocking phase are the trapezius muscle (elevates shoulder - shrug) and the rhomboids, (bring the shoulder blades back). While

the arm is cocking back, both the legs and trunk (back and stomach) are being used to propel the body forward.

The acceleration phase is when the arm is coming forward getting ready to release the ball. The lead leg has planted and the trunk must transfer the energy from the legs up into the arm. This explains why back and stomach exercises are very important to the throwing athlete. The shoulder muscles that contribute to the forward throwing motion of the arm are the internal rotators (rotate the arm inward). Other muscles contributing to this forward movement are the chest muscles, the latissimus dorsi (large back muscle) and the tricep muscle (back of the arm). At the end of this phase, the arm begins the initial act of slowing itself down. Because the arm is moving so fast, something has to slow the arm down to prevent injuries to the shoulder. The term 'deceleration' is used to describe this action. The muscles that decelerate the arm (slow it down) are the muscles in the back of the shoulder (external rotators). The triceps muscle extends the elbow, and the biceps muscle helps to slow the elbow down to prevent any injuries to the elbow joint.

The deceleration phase is when the arm has released the ball and has started to slow itself down. During the beginning of this phase, the arm and trunk are finishing the forward motion. The same muscles are slowing the arm down that were described in the acceleration phase. Other muscles that help contribute to this deceleration are the trapezius (traps), located on top of the shoulder, the middle back muscles (rhomboids), and the serratus anterior that helps keep the shoulder in place. The legs and trunk are still involved in this motion as well.

The final phase is the follow-through. This is when the arm comes across the body and the trail leg ends facing home plate. The trunk needs to continue bending forward toward the plate in order to help protect the shoulder from injury. The legs help keep the body balanced and allow for a smooth transition. The muscles in the shoulder are still trying to slow the arm down. In addition to the pitching motion, the young athlete must now understand when to initiate a sport-specific strengthening program.

It is important to realize that most sports have three separate components: off-season, pre-season and in-season. A weight-training program should be specific to each individual part of the season. Off-season should be focused on total body conditioning. Pre-season should continue the program from the off-season and focus primarily on sport-specific muscle groups. In-season should be spent on maintaining the conditioning developed in the off-season and pre-season.

The off-season is a good time to become involved in other sports and activities to maintain fitness (unless you're fortunate enough to live in a climate where baseball is played year 'round - Ed.). It is important during the weight-training program at this time to allow for plenty of rest to recover between sets. In addition, work on technique and build endurance (high repetitions and low weight).

Pre-season is the time of year when changes in weight training are made to develop the muscles used in baseball. The most specific group of muscles would be in the shoulder. The shoulder plays an important role in the game of baseball and injuries to the shoulder are very common. Exercises should be performed not only to develop a better throw, but to prevent injuries.

In-season workouts should be specifically designed to maintain strength. Increasing strength during this time of year is not advisable. Most experts would agree that 2 sets at 10-12 repetitions of each exercise is sufficient to maintain conditioning.

It cannot be emphasized enough that too much specialization too early in a young athlete's career is unwise. Resistance training for young athletes should include exercises for all the major muscle groups of the body. Once a young athlete is able to handle generalized weight training program, and has developed adequate strength, he or she can slowly begin a more sport-specific program. Although basic guidelines can be provided, one program cannot fit the needs of all growing children.

After the off-season weight-training has been completed, the young athlete can now advance into the pre-season program. The pre-season program is a starting point from

where appropriate changes can be made to meet each athlete's individual needs. It is important to recognize whether an athlete can physically or mentally handle the workload being put on their bodies. Every child matures and develops at a different rate. Designing workouts to meet each athlete's needs is highly recommended. This is done by changing the workout by either increasing or decreasing resistance, repetitions, or sets. The illustrations provided are specifically designed to strengthen the shoulder complex. These exercises, combined with a lower body and upper body weight training program, will not only help in the prevention of shoulder and elbow injuries, but it will also allow the young athlete to achieve his or her goals of developing a 'cannon' arm!