

Sports Medicine Monthly

Editor: Darren H. Lunow, M.Ed, ATC, LAT • Certified Athletic Trainer

Volume 2, Issue 5, December 2010

INJURY PREVENTION FOR THE BASEBALL AND SOCCER ATHLETE



Pre-season strength and conditioning in athletics is nothing new. Research and experience has consistently demonstrated that a strong commitment to focused strengthening and conditioning in the pre-season has a direct correlation to improved performance. Pre-season strength and conditioning increases muscle strength and endurance, improves joint stability, increases overall cardiorespiratory health and fitness, and improves overall reaction time. In short, the better the preparation, the better the outcome.

In addition to improving overall athletic ability, a pre-season strength and conditioning program is one of the single greatest tools available in reducing the overall likelihood of injury. Focused strength and conditioning ensures for accurate technique, proper joint position, and overall joint strength and stability. Likewise, by generating and dispersing force throughout an entire body segment and even the body as a whole, the strain placed on individualized structures is reduced, and the likelihood of injury is lessened.



In developing a pre-season training program, a few general guidelines exist:

***For Gains in Muscle Strength:**

-3 sets of 5 at 80-90% of 1RM with 1.5—3 minutes of rest in between

***For Gains in Muscle Strength and Endurance:**

-3 sets of 15 at 65-75% of 1RM with 30 seconds of rest in between

***For Gains in Cardiorespiratory Fitness:**

-20 to 30 minutes at 60-75% of one's max heart rate

***For all of the above:**

-3 to 5 times per week is required for sufficient demand & sufficient rest

Pre-Season Injury Prevention Program for the Baseball Athlete



For a sport that is so upper extremity dominant, pre-season injury prevention programs should focus on three major components: Proper Throwing Mechanics, Core Strength, and Joint Stability and Upper Extremity Muscular Strength and Endurance.

Proper Throwing Mechanics:

In baseball, defining proper throwing mechanics is like asking a group of people what is the best flavor of ice cream; you will get a variety of answers. However, for the over-handed throwing athlete, there are a few common techniques that will greatly decrease the force placed on the elbow and the shoulder while greatly increasing the overall force placed on the ball.

Shoulder Positioning through the Windup and Cocking Phase:

Anytime a shoulder is maximally externally rotated, a tremendous amount of force is placed on the entire joint complex. Therefore, when the hands separate at the beginning of the windup and the arm proceeds into the cocking phase, make the effort to reach back rather than rotate back.



Elbow Positioning at the end of the Cocking Phase:

When the elbow is positioned at a 90 degree angle as forward arm acceleration begins, force dramatically increases on the inside aspect of the elbow. Simply opening up the angle at the elbow greatly reduces the strain on the elbow and places much more of the terminal force through the hand into the ball.

continued on page 2



R. Clio Robertson, MD
Don L. Hawkins, MD
David R. Hicks, MD
Michael W. Tanner, MD
Brian C. Howard, MD
James D. Cash, MD

David E. Nonweiler, MD
Randall L. Hendricks, MD
David K. Wong, MD
Bryan J. Hawkins, MD
Perry D. Inhofe, MD
Thomas G. Craven, MD

Jeffrey R. Morris, DO
Ronald S. LaButti, DO
Jeff A. Fox, MD
Kathleen M. Sisler, MD
Troy A. Glaser, DO

Tulsa: 918.481.CSOS (2767) • Statewide: 888.269.CSOS (2767) • www.csosortho.com

Tulsa • Owasso • Vinita • Grove • Bixby • Jenks

**Pre-Season Injury Prevention Program
for the Soccer Athlete**



Injury prevention for the soccer athlete should focus on two major components: Strength and Conditioning and Balance and Proprioception.

Strength and Conditioning:

As soccer is primarily a lower extremity sport, preseason workouts usually focus on cardiorespiratory fitness, and strengthening the calf, hamstrings, quadriceps, and core. When addressing pre-season strengthening, ensuring a 75% hamstring to quadriceps strength ratio and at least 40lbs of resisted strength in the hip abductors is vital. These muscle groups aid in maintaining proper knee stability and position and greatly reduce the likelihood of injury. The following exercises are very effective for isolating and increasing the overall strength and conditioning of these areas.

Hamstrings:

- Hamstring Curl Machine
- Good Mornings
- Lying Plate Drags
- Russian Hamstring
- Back Pedal, Backward Lunges, and Backward Running



Abductors:

- Side-lying Straight Leg Raise
- Multi-Hip Machine -Carioca
- Lateral (Defensive) Shuffle
- High-Knee Crossovers
- Lateral Cone Hops

Balance and Proprioception:

Proper knee and ankle position is always vital for any sport that involves running, cutting, and jumping. Training the knees to always remain right over the toes through repetitive agility and foot work activity greatly reduces the likelihood of lower extremity injuries.

- Jump Rope: Double and Single Leg
- Foot Ladder -Plyo Jumps
- Dot Drills -Broad Jumps

**Pre-Season Injury Prevention Program
for the Baseball Athlete Continued:**

Core Strength:

The baseball throw is a full body motion. Force is to be generated in the lower extremity, increased in the core, and then transmitted throughout the entire upper extremity into the ball. Proper mechanics therefore removes the shoulder from the responsibility of force generator and transitions the joint to the role of force transmitter, thereby greatly reducing the overall stress placed on the joint. For the over-handed thrower, greater abdominal core strength is vital to increasing overall velocity and distance on the ball without increasing the stress on the shoulder.



Abdominals:

- Crunches
- Bicycle Crunches -Rotational Crunch
- Hip Ups -Reverse Crunch
- Medicine Ball:
Wood Choppers, Rotations, and
Crunch Press

Joint Stability and Upper Extremity

Muscular Strength and Endurance:

The shoulder joint, much like any other joint, has an optimal position of function. This optimal position is largely created and maintained by the rotator cuff and the scapular stabilizing muscles. In the absence of sufficient strength, the presence of increased force, or both, the labrum, rotator cuff, and restraining ligaments are greatly stressed. However, the reverse situation is also true. Proper strengthening of the rotator cuff and the scapular stabilizers provide for optimal joint position, tremendous joint stability, and great reductions in stress on the shoulder joint. For more information on rotator cuff, scapular strengthening exercises, and upper extremity exercises in general for the over handed athlete, visit www.csosortho.com, select Sports Medicine and Wellness and click on **Thrower's Ten**.



- | | | |
|-----------------------|--------------------------|------------------------|
| R. Clio Robertson, MD | David E. Nonweiler, MD | Jeffrey R. Morris, DO |
| Don L. Hawkins, MD | Randall L. Hendricks, MD | Ronald S. LaButti, DO |
| David R. Hicks, MD | David K. Wong, MD | Jeff A. Fox, MD |
| Michael W. Tanner, MD | Bryan J. Hawkins, MD | Kathleen M. Sisler, MD |
| Brian C. Howard, MD | Perry D. Inhofe, MD | Troy A. Glaser, DO |
| James D. Cash, MD | Thomas G. Craven, MD | |

Tulsa: 918.481.CSOS (2767) • Statewide: 888.269.CSOS (2767) • www.csosortho.com

Tulsa • Owasso • Vinita • Grove • Bixby • Jenks