



Golden Hills

Orthopedic and Sports Physical Therapy

j o u r n a l

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Our Mission...

To further the prevention, diagnosis and treatment of movement dysfunction in order to enhance the physical health and functional abilities of our patients.

To maximize the patient's potential for regaining full physical health by providing rehabilitation through the use of advancements in physical therapy techniques and state-of-the-art equipment.

To establish a self-management program for the patient through education and a personalized home exercise program for each individual to enable the patient to maintain their physical health at home and at work.

Seasonal Activity Spotlight: Baseball

It's early summer, which means that enthusiastic shouts of "Hey, batter, batter!" can be heard from playgrounds, parks and stadiums throughout the U.S. As your patients dust off their gloves and bats and head onto the diamond for fun or competition, Golden Hills is here to help them achieve their performance goals and, if an injury occurs, to help them heal and return to their pre-injury levels of performance.

Continuing our focus on seasonal sports, recreation and exercise (SRE) activities, the May-June issue of *Golden Hills Journal* delves into baseball, including strategies for injury prevention, the most common causes of injury and Golden Hills' approach to treating patients if an injury occurs. Our goal is to help you and your patients understand the risks inherent in this popular American pastime as well as the wide range of physical therapy services available to patients who play baseball competitively or simply for fun.

We welcome referrals of patients who have suffered a baseball-related injury or who are simply looking to enhance their performance through effective training and safety practices. Just contact Golden Hills at **(408) 274-0888**, or **therapy@goldenhillspt.com**. We're here to help!

Baseball: An Overview

Baseball has always held a unique place in the American imagination. It is considered our national pastime and in the last 25 years has also developed an enormous international following. In the U.S. alone, there are an estimated 5 million amateur baseball players, as well as an estimated 40 million to 50 million league softball players. About half of all players in both sports are under 12 years of age.

Aside from occasional (and often publicized) catastrophic impact injuries from contact with a ball or bat, baseball and softball are noncontact sports requiring minimal protective gear and are usually considered safe sports. In fact, the relative incidence of injury in baseball is last among common competitive sports. Because of the large number of participants, however, baseball ranks second only to football in the total number of injuries and fatalities.

Baseball-Related Injuries

Baseball-related injuries are generally defined as either cumulative (overuse) or acute (traumatic) injuries.

Overuse injuries occur over time due to stress on the muscles, joints and soft tissues without proper time for healing. They begin as a small, nagging ache or

pain, and can grow into a debilitating injury if they aren't treated early. Acute or traumatic injuries occur due to a sudden force or impact and can be quite dramatic.

The injuries most commonly associated with baseball, by body area, include the following.

Shoulder

- Torn rotator cuff
- Shoulder tendonitis, bursitis and impingement syndrome
- Frozen shoulder (adhesive capsulitis)
- Shoulder separation
- Rotator cuff tendonitis
- Shoulder instability
- Glenohumeral arthritis

Elbow

- Little league elbow (medial epicondylitis), also called golfer's elbow
- Bursitis of the elbow
- Tennis elbow (lateral epicondylitis)

Wrist and Hand

- Wrist sprains
- Finger fractures
- Wrist tendinitis
- Tenosynovitis

Back

- Muscle strains of the back
- Low back pain
- Herniated disks
- Backaches and stress

Rotator Cuff Injuries

The term rotator cuff describes the muscles and tendons that support and stabilize the shoulder bones and allow the arm to move up and down and rotate. The four muscles of the rotator cuff are the supraspinatus, infraspinatus, subscapularis and teres minor. These muscles allow the shoulder to perform powerful yet finely controlled movements, such as throwing a baseball at high speed with pinpoint accuracy.

The shoulder is the only joint in the body that is not truly held together by ligaments. The few ligaments in the shoulder serve only to keep the shoulder from moving too far in any one direction. Because of the shoulder's shallow socket and lack of ligaments, any weakness of the rotator cuff muscles makes it easy for the head of the shoulder to slide part way out of the socket, which is a partial dislocation, or subluxation. Or the head may slide all the way out, which is a full dislocation.

Sports in which the player brings his or her arm up overhead, such as baseball, tennis, volleyball and swimming, are mainly associated with overuse injuries of the shoulder. The rotator cuff muscles are not well suited to functioning under stress with the arm above a line parallel to the ground. If the shoulder joint is continually stressed with the arm in this overhead position, the rotator cuff muscles begin to stretch out. This allows the head of the joint to become loose within the shoulder socket.

If the head of the shoulder is loose, when the player extends his or her arm backward over the shoulder, the head will slide forward, catching the tendon of the short head of the biceps between the ball and the socket. The same thing happens if the patient raises the arm to the side above a line parallel to the ground. The head will drop in the socket, and the tendon of the long head of the biceps will become impinged.

A common symptom of a rotator cuff injury is aching and weakness in the shoulder when the arm is lifted overhead. A less severe injury may result in swelling, bleeding and bruising. This creates pain and inflammation as the swollen muscle pushes on the nearby bone. This can last several months before the muscle is entirely healed. Continued activity can increase the swelling and lengthen the recovery time.

A torn rotator cuff is much more severe and more serious. A tear needs to be seen and evaluated by a physician to determine if surgery is needed to repair the muscle. Many smaller tears will heal without surgery. If large tears are left alone, they often lead to arthritis due to continual rubbing and inflammation of the joint.

Recovery involves medication to reduce inflammation and physical therapy exercises to increase range of motion and strength. A potential problem with rotator cuff tears develops during the recovery period. When the shoulder is rested, as is necessary for 4 to 6 weeks following surgery, the shoulder loses its ability to move properly. This can result in a partially frozen shoulder with limited motion. Again, this necessitates a carefully constructed physical therapy rehabilitation program, with a potentially long and painful process of helping the patient restore the full range of motion.

Knee Ligament

- Anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) injuries
- Medial collateral ligament (MCL) and lateral collateral ligament (LCL) injuries

Miscellaneous Pain and Injuries

- Blisters
- Delayed-onset muscle soreness “DOMS”
- Other knee pain
- Sprains and strains
- Stress fractures

Injuries by Body Part and Mechanism

In a recent study conducted by the National Collegiate Athletic Association Injury Surveillance System¹, researchers analyzed data on baseball-related injuries in collegiate men’s baseball from 1988-89 through 2003-04.

Approximately 45% of all game and practice injuries were to the upper extremity. The second most common body area injured in both activities was the lower extremity, accounting for about one third of injuries.

The frequency of injury to 5 general body parts (head/neck, upper extremity, trunk/back, lower extremity, and other/system) is shown in figure 1 to the right.

In games, the most frequent injuries were upper leg muscle-tendon

strain (11.0%), ankle ligament sprain (7.4%) and shoulder muscle-tendon strain (6.5%). In practice, the most frequent injuries were shoulder muscle-tendon strain (10.0%), ankle ligament sprain (8.5%) and upper leg muscle-tendon strain (8.3%).

A participant was twice as likely to sustain a shoulder strain in a game

as in a practice, almost 3 times as likely to sustain an ankle-ligament sprain or acute elbow injury in a game or practice, and more than 4 times likely to sustain an upper-leg muscle-tendon injury.

The most common injury mechanisms are shown in figure 2 below.

Figure 1

Body Part	Percentage of Injury in Games	Percentage of Injury in Games
Head/neck	9.0	6.6
Upper extremity	44.6	46.4
Trunk/back	8.3	11.5
Lower extremity	35.2	31.7
Other/system	2.9	3.8

Percentage of game and practice injuries by major body part, men’s baseball, 1988–1989 through 2003–2004.

Figure 2

Mechanism of Injury	Percentage of total injuries
Being hit by a pitch	9.5
Contact with thrown ball (nonpitch)	2.4
Contact with boundary walls, railing, dugout	2.6
Contact with opposing player	9.0
Contact with teammate	2.0
Contact with ground	10.9
Contact with fixed based	7.6
Contact with breakaway base	0.6
Throwing (pitching)	15.3
Throwing (nonpitching)	5.3
No apparent contact (nonthrowing)	19.0
Hit by batted ball	9.9
Other	6.1

Sport-specific game injury mechanisms, men’s baseball, 1992–1993 through 2003–2004.

¹Descriptive Epidemiology of Collegiate Men’s Baseball Injuries: National Collegiate Athletic Association Injury Surveillance System, 1988–1989 Through 2003–2004. Available at: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1941283>. Accessed: May 12, 2008.

Physical Therapy Treatment

When a baseball-related injury occurs, Golden Hills’ physical therapists are prepared to help your patients heal from the injury and recover their pre-injury levels of performance, including strength, flexibility, balance and endurance. We are skilled at treating a wide range of conditions, including all conditions listed under “Baseball-Related Injuries.”

In past issues of *Golden Hills Journal*, we have discussed in depth our treatment approach for injuries to specific joints or biomechanical systems. The following table shows which areas are discussed in which issues. Please contact us if you would like another copy of any of the issues!

Biomechanical System	Discussed in Issue
Shoulder	Aug-Sep 2006
Elbow	Oct-Nov 2006
Hand/Wrist	Jan-Feb 2007
Knee	Jun-Jul 2006
Foot/Ankle	Mar-Apr 2007

Injury Recover Phases

During the acute recovery phase, the patient should:

- Seek physical therapy evaluation and care
- Follow the R.I.C.E. principles (rest, ice, compression and elevation)
- Limit his or her activity, allowing time to heal

Depending on the type and severity of the injury, treatment may also include medical care, surgery, and

various taping and bracing treatments.

Regaining range of motion and strength should be started as soon as possible as directed by the physical therapist. Once muscle strength and flexibility return the therapist will work with the patient to slowly get back into his or her sport, working at about 50% to 70% max capacity for a few weeks. During this reentry phase, functional drills for balance, agility and speed can be added as tolerated by the patient.

In order to ensure a safe return to the sport, the patient should:

- Be pain free
- Have no swelling
- Regain full range of motion
- Have full or close to full (90%) strength
- Be able to perform full weight bearing on injured hips, knees, and ankles without limping
- Be able to perform throwing movements with proper form and no pain
- Take extra care with the injured part for several months

By following the above guidelines, your patients can significantly increase their enjoyment of their sport and avoid many of the injury conditions discussed earlier in the article. For more information on how Golden Hills can help your patients achieve their baseball-related training or injury recovery goals, contact us at **(408) 274-0888**, or **therapy@goldenhillspt.com**.

Baseball Child Safety Recommendations

The American Academy of Pediatrics recommends the following:

1. Baseball and softball for children 5 through 14 years of age should be acknowledged by pediatricians as relatively safe sports. Catastrophic and chronically disabling injuries are rare; the frequency of injuries does not seem to have increased during the past 2 decades.
2. Preventive measures should be used to protect young baseball pitchers from throwing injuries, including a restriction on the number of pitches thrown in organized and informal settings and instruction in proper training, conditioning and throwing mechanics.
3. Serious and potentially catastrophic baseball injuries can be minimized by the proper use of available safety equipment.
4. Baseball and softball players should be encouraged to wear polycarbonate eye protectors on their batting helmets to reduce the risk of eye injury.
5. Consideration should be given to using low-impact NOCSAE-approved baseballs and softballs for children 5 to 14 years of age.
6. Developmentally appropriate rule modifications, such as the avoidance of head-first sliding, should be implemented for children younger than 10 years.