

# A LITIGATION PRIMER ON THE SHOULDER

**Samuel D. Hodge, Jr.**

*The human shoulder is prone to injury, but some of the damage uncovered in testing is likely to be normal wear and tear.*

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**BASEBALL, SWIMMING, PAINTING,** and aging have a common denominator—shoulder injuries. The anatomical construction of this ball-and-socket joint makes it prone to injury. Unlike the hip, which shelters and protects the deep-seated ball of the femur, the shoulder is merely held in place by soft tissues designed to provide the upper extremity with maximum flexibility.

According to the American Academy of Orthopaedic Surgeons, “about 14.4 million people went to the doctor’s office in 2001 for a shoulder problem.” These injuries are usually the result of excessive overhead motion that occurs with such things as throwing a baseball or swimming. Even people involved in routine activities like washing a wall, hanging curtains, or gardening hurt their shoulders due to over-

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head arm movement. Statistically, shoulder and wrist injuries account for the longest absences from work, and rotator cuff syndrome is the most costly injury. *The Shoulder*, American Academy of Orthopedic Surgeons Online Service Fact Sheet, March 2000. Available at [http://orthoinfo.aaos.org/fact/thr\\_report.cfm?Thread\\_ID=121&topcategory=Shoulder](http://orthoinfo.aaos.org/fact/thr_report.cfm?Thread_ID=121&topcategory=Shoulder). This article will provide an anatomical overview of the shoulder and will offer tips on litigating shoulder injury claims.

**THE ANATOMY** • The shoulder or pectoral girdle has no weight-bearing function and is designed to provide the greatest movement of any joint in the body. The shoulder is able to move in over 1,600 positions allowing a person to comb one's hair or to serve a tennis ball at over 125 miles per hour. This flexibility, however, has a downside—the joint lacks inherent stability. *Shoulder Injuries: If You're An "Overhead Athlete" You May Fall Prey to Chronic Shoulder Pain. Here is How to Prevent It*, <http://www.pponline.co.uk/encyc/0205.htm>. This ball-and-socket joint is very shallow with the ball at the upper end of the arm being about 25 percent larger than the socket or glenoid into which it sits. Muscles and tendons then cover this structure in an attempt to prevent the shoulder from sliding too far in any specific direction. See Figure 1.

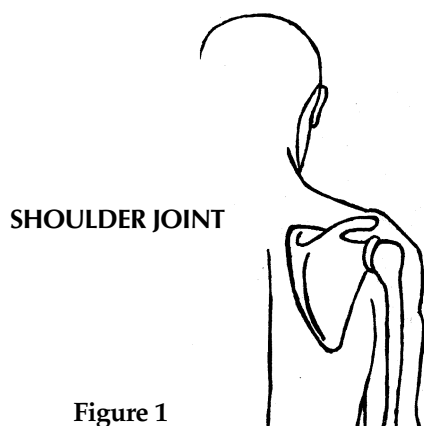


Figure 1

## The Bones Of The Shoulder

Three bones make up the shoulder: the clavicle or collar bone, the humerus or arm bone, and the scapula or shoulder blade.

### The Clavicle

The clavicle is the prominent S-shaped bone just below the front part of the neck. Its purpose is to connect the upper arm to the chest. It also acts as a rigid strut that keeps the shoulder in a functional position in relation to the skeleton and protects major neurovascular structures that pass from the neck to the axilla, or arm pit. Mark Hutchinson and Gurminder S. Ahuja, *Diagnosing and Treating Clavicle Injuries*, 24 *Physician & Sportsmed.* 26 (Mar. 1996). See Figure 2.

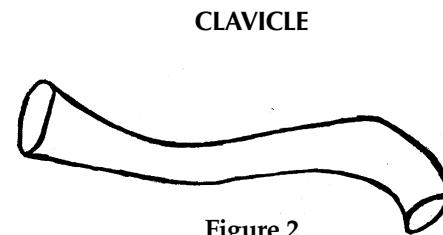


Figure 2

### The Scapula

The scapula is the triangular-shaped bone located on the outside portion of the upper back and covers the second through the seventh thoracic ribs. This bone forms the posterior portion of the shoulder girdle and provides much of the movement associated with this joint.

### The Humerus

The humerus is the longest and largest bone in the arm. The lower end of this bone forms the top part of the elbow. The upper part of the humerus or humeral head contains a ball which contacts that part of the scapula known as the glenoid to form the ball-and-socket joint. See Figure 3.

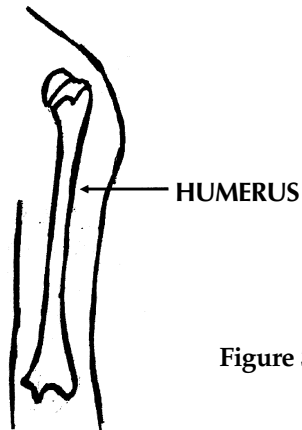


Figure 3

### The Rotator Cuff

The rotator cuff does exactly what its name implies. Four short muscles and tendons form a cuff that wraps around the shoulder allowing the arm to rotate through its ranges of motion. More specifically, the rotator cuff secures the humerus to the scapula to firmly hold the joint together while the arm moves in a variety of directions. These soft tissues are known as the:

- Supraspinatus;
- Infraspinatus;
- Terres minor; and
- Subscapularus.

With a healthy rotator cuff, a person is able raise the arm above the head, and to move the extremity back and forth. With the exception of the supraspinatus, these muscles act as rotators for upper arm movement. The supraspinatus, on the other hand, assists the deltoid muscle during the first steps of outward movement of the arm. Keith L. Moore & Arthur F. Dalley, *Clinically Oriented Anatomy* 697-98 (Lippincott Williams & Wilkins, 4th ed. 1999). See Figure 4.

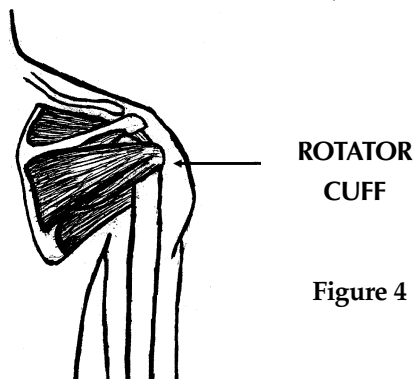


Figure 4

### The Joints Of The Shoulder

The shoulder consists of a number of joints but only two participate in movement. The acromioclavicular ("AC") joint is considered a gliding joint and is situated at the meeting point of two bones: the acromion and the clavicle. As previously noted, the clavicle is the S-shaped bone known as the collar bone. The acromion is the portion of the scapula that forms the high part of the shoulder and is easy to locate. The acromion is the lump that may be palpated at the top of the shoulder. The glenohumeral joint is the actual ball-and-socket that allows the arm to move in so many directions. It too describes the meeting point of a pair of bones: the glenoid and the humerus. The glenoid is the socket-shaped part of the scapula and the humerus is the upper arm bone that contains the ball part of the joint. *Questions and Answers About Shoulder Problems*, National Institute of Arthritis and Musculoskeletal and Skin Diseases May 2001. [www.niams.nih.gov/hi/topics/shoulder-probs/shoulderqa.htm](http://www.niams.nih.gov/hi/topics/shoulder-probs/shoulderqa.htm). See Figure 5.

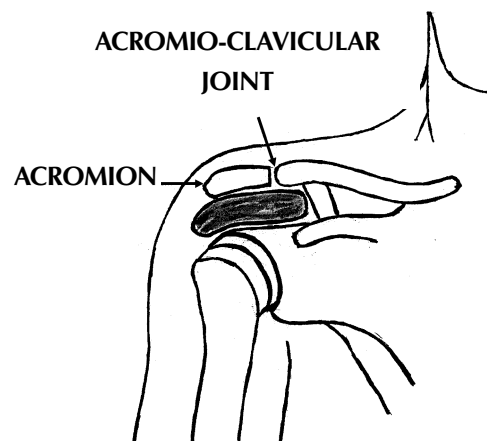


Figure 5

### The Bursa

A bursa is a lubrication-filled sac that reduces the friction between moving parts. In the case of the shoulder, the bursa is sandwiched between the acromion and the rotator cuff pre-

venting the acromion from rubbing against the rotator cuff during movement. See Figure 6.

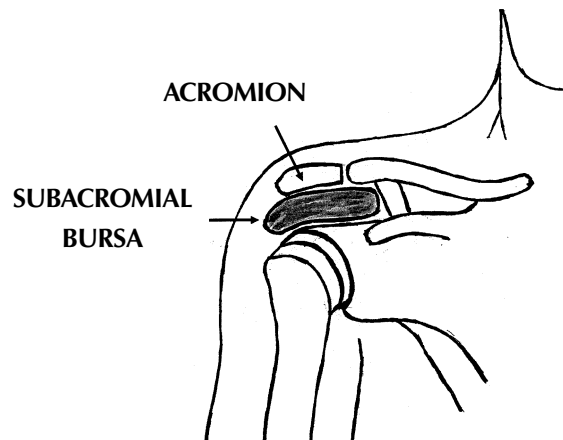


Figure 6

**SHOULDER INJURIES** • The National Occupational Research Agenda has determined that over two billion dollars a year is paid in worker's compensation benefits for musculoskeletal disorders involving the upper extremities. Ninety million dollars is also paid annually in indirect costs such as hiring, training, overtime and administrative costs attendant to these injuries. The surprising fact about these statistics is that they underestimate the actual magnitude of the problem. Shoulder injuries usually involve the soft tissues and not the bony structures, and problems range from inflammation of a tendon or muscle to a complete tear of the rotator cuff. *Musculoskeletal Disorders of the Upper Extremities*, National Occupational Research Agenda, <http://www.cdc.gov/niosh/nrmusc.html> (last updated Aug. 27, 1999).

### The Rotator Cuff Injury

Rotator cuff injuries are common and are known by such labels as "tennis shoulder" or "pitcher's shoulder." An injury to the rotator cuff may result from trauma such as that which might occur from a direct impact to the shoulder or from repetitive overhead arm move-

ment. Sports requiring throwing or overhead lifting are primary culprits in rotator cuff problems as are jobs involving overhead reaching such as painting, stocking of shelves, or window washing. The supraspinatus muscle and tendon have the highest rate of injury even though any one of the four structures of the rotator cuff can sustain trauma. The supraspinatus is so easily injured because it is the one structure that passes directly beneath the acromion subjecting it to abuse from rubbing, friction, spurs, and impingement.

### Mechanism Of Injury

The amount of force needed to tear the rotator cuff depends on a person's age, type of injury, and degenerative changes. Rotator cuff tears tend to happen in people over 40, but overuse can cause a tear regardless of age. A tear can also occur as the result of a dislocation of the upper arm from the glenoid, or it can occur spontaneously from certain movements of the arm against resistance. Lesli Alene Cossey, *Tearing the Rotator Cuff Muscles—Causes, Diagnosis, and Treatment*, [www.muhealth.org/~shrp/radsci/student/rotatrc/rotatarc.html](http://www.muhealth.org/~shrp/radsci/student/rotatrc/rotatarc.html). Warning signs of a problem include shoulder pain and arm weakness. This discomfort is centered in the top front portion of the shoulder or at the outside part of the upper humerus. Overhead elevation of the arm exacerbates the pain, and sufferers frequently complain about the inability to sleep. Arm weakness varies depending upon the severity of the problem. For instance, a person who has sustained a complete tear of the rotator cuff is unable to lift the arm. An individual with a partial tear, however, can elevate the arm but has pain in performing this maneuver. *Rotator Cuff Tear Injury*, [http://www/ecureme.com/emylealth/data/Rotator\\_Cuff\\_Tear\\_Injury.asp](http://www/ecureme.com/emylealth/data/Rotator_Cuff_Tear_Injury.asp).

## Shoulder Impingement

Any narrowing of the space between the acromion and rotator cuff can cause pinching and damage to the soft tissues of the rotator cuff. A number of factors can predispose a person in developing impingement. The most common culprit is the size and shape of the acromion. The acromion may also contain a spur on its undersurface. With overhead activity, the cuff or bursa may contact the spur and become chronically irritated. Michael G. Ciccotti, *Rotator Cuff Injury and Surgery*, Rothman Institute of Orthopaedics. <http://rothmaninstitute.com/patienteducation/shoulder/rotator.htm>.

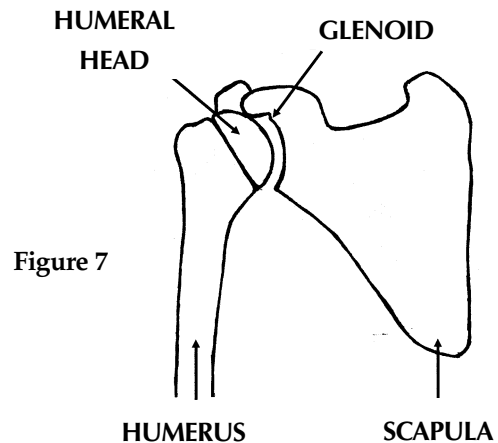
## Tendonitis

A tendon anchors muscle to bone. Tendonitis of the shoulder, therefore, refers to an inflammation or swelling of the rotator cuff tendons caused by excessive pressure on the acromion. When a tendon becomes inflamed, it may become trapped under the acromion thereby causing shoulder impingement. Repeated arm motion, or shoulder motion over many years, may wear down the tendon or muscle causing tendonitis. Inflammation may also be caused by diseases such as rheumatoid arthritis. *Questions and Answers about Shoulder Problems*, supra.

## Shoulder Dislocation

The shoulder can dislocate in a number of directions producing a great deal of pain in the process. For instance, a strong force or extreme rotation of the joint may pop the ball of the humerus out of its socket. By forcing the bone back into proper anatomical position, symptoms can be abated. This maneuver is known as reduction. Following a dislocation, the shoulder may become susceptible to reinjury. Ligaments may have been torn or stretched during the initial trauma, and the shoulder may dislocate again. Frequent dislocations cause problems

with surrounding tissue or nerves requiring surgical intervention to reattach the torn ligaments or to tighten stretched ones. *Questions and Answers about Shoulder Problems*, supra, at 2. See Figure 7.



## Shoulder Separation

The purpose of a ligament is to hold bones together. A shoulder separation involves the stretching or tearing of the ligaments of the acromioclavicular ("AC") joint or the soft tissues that hold the clavicle and scapula together. Medically known as an acromioclavicular separation, this injury is common in sports and usually occurs as the result of a direct blow to the shoulder or it may happen by falling on an outstretched hand. For instance, a hockey player checked into the protective glass may suffer a shoulder separation. There are six degrees of shoulder separation based upon the severity of symptoms. *Shoulder Separations*, [www.emedx.com/emedx/diagnosis\\_information/shoulder\\_disorders/shoulder\\_separation\\_outline.htm](http://www.emedx.com/emedx/diagnosis_information/shoulder_disorders/shoulder_separation_outline.htm).

## Frozen Shoulder

Adhesive capsulitis, also known as a "frozen shoulder," describes the loss of motion in an upper limb because of pain. The cause of this soft tissue condition is generally unknown, but it is usually linked to an underlying inflamma-

tory process. People stop using their affected arm because of pain, thereby prompting adhesions to form which restrict movement. Only one shoulder is usually involved, and the condition affects more women than men. The condition is also rare in people under 40, and diabetics are at particular risk for developing this problem. Other predisposing factors include hyperthyroidism, trauma, depression, Parkinson's disease, and cardiovascular problems. *Frozen Shoulder*, American Academy of Orthopaedic Surgeons, Nov. 2004; [http://orthoinfo.aaos.org/fact/thr\\_report.cfm?Thread\\_ID&162&topcategory=shoulder](http://orthoinfo.aaos.org/fact/thr_report.cfm?Thread_ID&162&topcategory=shoulder)

#### **LITIGATING A ROTATOR CUFF INJURY •**

Tears of the rotator cuff account for about half of all significant shoulder injuries. *Three Clinical Tests Reliably Diagnosis Rotator Cuff Tears*, American Family Physician, October 1, 2001, <http://www.aafp.org/afp/20011001/tips/9.html>. In a litigation setting, there are over 1,600 reported cases involving rotator cuff problems with several verdicts in excess of \$1 million. *Troy v. National Railroad Passenger Corp.*, 1995 WL 450276 (E.D. Pa. July 27, 1995), *aff'd without op.*, 92 F.3d 1173 (3d Cir. 1996); *Bernstein v. Red Apple Supermarkets*, 642 N.Y.S.2d 303 (N.Y. App. Div. 1996), *appeal dismissed*, 678 N.E.2d 493 (N.Y. 1997), *reh'g denied*, 680 N.E.2d 619 (N.Y. 1997). On the other hand, some courts have found that a rotator cuff tear may be caused by degenerative disease and not by a work-related fall on the shoulder. *See, e.g., Turner v. Central Foundry Div., General Motors Corp.*, 1991 WL 82893 (Ohio App. Ct. May 10, 1991). An analysis of these cases, however, reveals that there are certain facts that a lawyer should know in advancing or defending a rotator cuff claim.

#### **General Facts About Rotator Cuff Injuries**

Partial- or full-thickness tears can be caused by a number of risks other than trauma, includ-

ing vascular or degenerative factors. Statistically, partial tears usually occur in people older than 40 while full-thickness tears may happen in younger people. It is known occupationally that sudden trauma to the shoulder or chronic overuse with repetitive overhead motion and rotation of the arm can cause a tear. *Shoulder Injury*, Colorado Department of Labor and Employment, [www.coworkforce.com/DWC/Rule\\_XVII\\_Exhibit\\_B4.asp](http://www.coworkforce.com/DWC/Rule_XVII_Exhibit_B4.asp).

#### **Government Studies**

The federal government has analyzed the relationship between shoulder disorders and work and has concluded that there is a positive association between highly repetitive work and shoulder injuries, but the evidence has important limitations. For instance, there is insufficient evidence for a positive association between force and shoulder disorders based upon current epidemiologic studies. The evidence for specific shoulder positions and injury is strongest when there is combined exposure to several physical factors such as holding a tool while working overhead. There is also insufficient evidence to find a link between vibration and shoulder problems. *Shoulder Musculoskeletal Disorders: Evidence for Work-Relatedness, Musculoskeletal Disorders and Workplace Factors*, The National Institute for Occupational Safety and Health, <http://www.cdc.gov/NIOSH/ergtxt3.html> (last updated July 22, 1997).

#### **Rotator Cuff Injuries And Sports**

The handling of a claim involving a rotator cuff injury should always include an investigation of the person's recreational activities. Multiple studies have established a direct link between sports involving overhead movement and shoulder lesions. Baseball, tennis, volleyball, weightlifting, and swimming are activities involving overuse of the shoulder. For instance, tennis has gained popularity among many peo-

ple as a way of staying physically fit. Tennis players, however, are particularly susceptible to rotator cuff tears because they frequently play the sport past their fifth decade, and shoulder injuries increase with age. This has been confirmed in one study which ascertained that 24 percent of teenage tennis players reported shoulder problems while 50 percent of middle-aged players complain of shoulder discomfort. Bertrand Sonnery-Cottet et al., *Rotator Cuff Tears in Middle-Aged Tennis Players: Results of Surgical Treatment*, 30 Am. J. Sports Med. 558 (July-Aug. 2002).

### Rotator Cuff Tears and Surgery

A rotator cuff tear, by itself, is not an indication for surgery. Most older patients with rotator cuff tears and impingement do well without surgical intervention. Allen E. Fongemie et al., *Management of Shoulder Impingement Syndrome and Rotator Cuff Tears*, available at [www.aafp.org/afp/980215ap/fongemie.html](http://www.aafp.org/afp/980215ap/fongemie.html) and 57 Am. Fam. Physician 667 (Feb. 15, 1998). Statistically, 70 percent of all people will improve with conservative treatment. Initial care includes anti-inflammatory medication, ice, and restrictions on reaching and lifting activities. *Rotator Cuff*, <http://www.IASM.com/rc.html>.

### High Asymptomatic Incidence

Counsel must also be careful when presented with diagnostic proof of a rotator cuff problem since the evidence may not be clinically significant. Numerous studies have demonstrated that asymptomatic people have abnormal shoulder findings on diagnostic imaging. One research team found that 24 percent of healthy individuals had rotator cuff tears on ultrasound imaging. An astonishingly high number of these rotator cuff tears were found in the asymptomatic population as their age increased. As a result, the investigators concluded that rotator cuff tears must to a certain extent be

considered normal degenerative attrition, not necessarily causing functional impairment and pain. Siegbert Tempelhof et al., *Age-Related Prevalence of Rotator Cuff Tears in Asymptomatic Shoulders*, 8 J. Shoulder & Elbow Surg. 296 (July-Aug. 1999). See also Schibany et al., *Rotator Cuff Tears in Asymptomatic Individuals: A Clinical and Ultrasonographic Screening Study*, 51 Eur. J. Radiol. 263 (Sept. 2004).

### What Can Imaging Really Tell You?

Magnetic Resonance Imaging ("MRI") has become the gold standard in many aspects of diagnostic testing because of the test's ability to image any part of the body in exquisite detail. Abnormalities in asymptomatic people, however, are routinely detected on MRI testing, so one must question whether these findings are clinically significant. For instance, the prevalence of rotator cuff tears was found to be 34 percent in the asymptomatic population. Once again, these abnormalities increased with age and were compatible with normal, functional, and painless activity. J. S. Sher et al., *Abnormal Findings on Magnetic Resonance Images of Asymptomatic Shoulders*, 77 J. Bone & Joint Surg. 10 (Jan. 1995).

Another study found a wide array of abnormal magnetic resonance signals in the shoulders of young asymptomatic people. Therefore, nonenhanced magnetic imaging may be of limited value in establishing rotator cuff injuries in patients with shoulder pain unless a full-thickness tear is clinically suspected. Anthony Miniaci, *Magnetic Resonance Imaging Evaluation of the Rotator Cuff Tendons in the Asymptomatic Shoulder*, 23 Am. J. Sports Med. 142 (Mar.-Apr. 1995). In fact, small amounts of fluid which can be indicative of an injury and the lack of preservation of the subdeltoid fat plane are routinely found in the shoulders of asymptomatic subjects. C. H. Neumann et al., *MR Imaging of the Shoulder: Appearance of the Supraspinatus Tendon*

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The shoulder is an amazing anatomical structure that allows individuals to move an arm in many directions. This ability, however, has a price. The shoulder is easily injured by overhead movement or by a direct impact to the area.

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*in Asymptomatic Volunteers*, 158 Am. J. Roentgenology 1281 (1992).

#### ***Look For Evidence Of Earlier Examinations***

As a practice tip, counsel handling a shoulder injury claim should always ascertain if a prior shoulder MRI was performed and learn the results of that study. Research has been conducted on the asymptomatic individuals who tested positively for rotator cuff tears over a five-year period to see if their cuff abnormalities progressed into a symptomatic condition. Repeat evaluations demonstrated that 51 per-

cent of the previously asymptomatic individuals become symptomatic over a mean of 2.8 years without any interceding trauma. This development of symptoms was correlated with an appreciable increase in pain and a decrease in the ability to perform activities of daily living. K. Yamaguchi et al., *Natural History of Asymptomatic Rotator Cuff Tears: A Longitudinal Analysis of Asymptomatic Tears Detected Sonographically*, 10 J. Shoulder & Elbow Surg. 199 (May-June 2001).

**CONCLUSION** • The shoulder is an amazing anatomical structure that allows individuals to move an arm in many directions. This ability, however, has a price. The shoulder is easily injured by overhead movement or by a direct impact to the area. Age also plays a significant role in the development of shoulder problems. The aging process is not kind to the rotator cuff, which sustains a number of tears by merely wearing out with time. Diagnostic tests such as ultrasound and MRI are useful in identifying shoulder abnormalities but these modalities have their limitations. An appreciable number of asymptomatic people have shoulder abnormalities on diagnostic imaging. Therefore, counsel must be careful in using diagnostic test results to make sure that they correlate to the patient's complaints and clinical picture.

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## PRACTICE CHECKLIST FOR A Litigation Primer On The Shoulder

Tears of the rotator cuff account for about half of all significant shoulder injuries. Some result in significant awards of damages; some do not. In any event, there are certain facts you need to know in advancing or defending a rotator cuff claim.

- Partial- or full-thickness tears can be caused by a number of risks other than trauma, including vascular or degenerative factors:

Partial tears usually occur in people older than 40 while full-thickness tears may happen in younger people;

Sudden trauma to the shoulder or chronic overuse with repetitive overhead motion and rotation of the arm can cause a tear.

- There is a correlation between highly repetitive work and shoulder injuries, but the evidence has important limitations:

There is insufficient evidence for a positive association between force and shoulder disorders based upon current epidemiologic studies;

The evidence for specific shoulder positions and injury is strongest when there is combined exposure to several physical factors such as holding a tool while working overhead; and

There is also insufficient evidence to find a link between vibration and shoulder problems.

- The handling of a claim involving a rotator cuff injury should always include an investigation of the person's recreational activities. Multiple studies have established a direct link between sports involving overhead movement and shoulder lesions. Activities involving overuse of the shoulder include:

Baseball;

Tennis;

Volleyball;

Weightlifting; and

Swimming.

- A rotator cuff tear, by itself, is not an indication for surgery:

A rotator cuff problem may not be clinically significant. Many asymptomatic people have abnormal shoulder findings on diagnostic imaging;

Abnormalities in asymptomatic people are routinely detected on MRI testing, so one must question whether these findings are clinically significant. These abnormalities increased with age and were compatible with normal, functional, and painless activity. Nonenhanced magnetic imaging may be of limited value in establishing rotator cuff injuries in patients with shoulder pain unless a full-thickness tear is clinically suspected. As a practice tip, counsel handling a shoulder injury claim should always ascertain if a prior shoulder MRI was performed and learn the results of that study.