



**DES MOINES  
ORTHOPAEDIC SURGEONS, P.C.**

---

**DMOS – West**  
6001 Westown Parkway  
West Des Moines, IA 50266  
**515-224-1414**  
**800-245-6129**

**DMOS – East**  
Penn Medical Plaza  
1301 Pennsylvania Ave., Suite 213  
Des Moines, IA 50316  
**515-263-9696**  
**800-688-3980**

**DMOS – Carroll**  
405 S. Clark St., Suite 250  
Carroll, IA 51404  
**712-792-2093**  
**877-284-1428**

**“IMPINGEMENT SYNDROME”  
AKA: SHOULDER TENDONITIS**

Matthew Weresh, M.D.

Shoulder impingement syndrome is one of the most common orthopaedic afflictions in today’s mid-aged active adult population. Impingement syndrome is also known as shoulder bursitis and rotator cuff tendonitis. In the majority of situations, the condition could be managed in a conservative, non-surgical fashion resulting in decreased symptoms and return to activities and athletic pursuits.

Knowing the anatomy of the shoulder is crucial in order to understand the pathomechanics of shoulder impingement syndrome. The shoulder is a ball-and-socket joint similar to our hip, however, with some differences.

The socket of the shoulder is extremely shallow. The depth of the socket resembles a golf ball’s relationship to a golf tee. In comparison, the hip socket is a much deeper socket. It much more closely resembles a hemisphere or cup in which a large percentage of the femoral head or ball is captured by its deeper socket shape. As with a golf ball’s relationship to a tee, the ball of the shoulder can rock in and out of and displace from the shallow socket with considerable ease. Because of this design, it is quite understandable that the shoulder is the most commonly dislocated joint in the body. It is also understandable, however that this lack of constraint will allow the shoulder to move with a greater arc of motion than any other joint in the body. Stability and range of motion (mobility) are inversely related.

In order to keep the ball of the shoulder from falling out of the socket on a frequent basis, four muscles/tendons help hold the ball into the socket. These four muscles/tendons make up the “rotator cuff”.

The tendons of these muscles are not shoestring tendons like in the forearm, but are more flat and broad shaped tendons like a thick ribbon. As the four tendons attach onto the periphery of the ball of the shoulder, they coalesce into one large fibrous sling or “cuff”.

Just as we can hug a beach ball to our chest with our arms and prevent the beach ball from rolling off of our chest, so do the rotator cuff tendons compress with the ball of the shoulder into the shallow socket. (See diagram #1) The 4 muscles that make up the rotator cuff are every day postural muscles that are important in all of us to maintain shoulder harmony and keep the ball of the shoulder within the center of the shallow shoulder socket. The names of the 4 muscles are the supraspinatus, the subscapularis, the infraspinatus, and the teres minor.

The other important anatomy detail is the acromion (diagram #2). It is the flat piece of bone above the shoulder. This bone sits atop the humeral ball and the rotator cuff tendons and forms a bony roof over the shoulder. The clavicle, or collarbone, comes out from our sternum and attaches to the acromion bone. The clavicle, the acromion, and the shoulder blade or scapula are the bony anchors that hold our arm and shoulder girdle to our torso.

The amount of space between the ball of the shoulder to the acromion or roof top of the shoulder is limited. In this space lies the rotator cuff tendons [See diagram #2]. As we do activities, especially activities in which our arm is elevated, if there is a tendency for the ball of the humerus to rock upward in the socket, it can pinch the rotator cuff tendons on the undersurface of the bony roof top or acromion. [See diagram #3] This rubbing or abrasion of the tendon on the undersurface of the acromion is what defines “impingement syndrome” and is the cause of rotator cuff tendonitis. Over time if enough rubbing or abrasion occurs, it can actually cause failure of the



**DES MOINES  
ORTHOPAEDIC SURGEONS, P.C.**

---

**DMOS – West**  
6001 Westown Parkway  
West Des Moines, IA 50266  
**515-224-1414**  
**800-245-6129**

**DMOS – East**  
Penn Medical Plaza  
1301 Pennsylvania Ave., Suite 213  
Des Moines, IA 50316  
**515-263-9696**  
**800-688-3980**

**DMOS – Carroll**  
405 S. Clark St., Suite 250  
Carroll, IA 51404  
**712-792-2093**  
**877-284-1428**

tendon or a hole to develop within the tendon substance. This is known as a rotator cuff tear. Impingement syndrome or rotator cuff tendonitis is a continuum that can ultimately result in rotator cuff tear.

A pioneer in the area of shoulder surgery, Dr. Charles Neer of New York, outlined the pathomechanics of impingement syndrome and the continuum of rotator cuff tear. This process begins in our late 20's and near 30's. As the tendon gradually ages and undergoes more wear from this process, it can ultimately result in rotator cuff failure or cuff tear. It is very unusual for this process to result in rotator cuff failure prior to the age of 40. Dr. Neer attributed 95% of rotator cuff tears to primary mechanical impingement. The idea that a cuff is torn from an excessive activity or injury or throwing motion is a misconception. Rather a rotator cuff tear is a time and overuse related diagnosis that is typically seen in people with greater than 40 years of age.

People who present with shoulder impingement typically have three hallmark complaints. (1) Pain with overhead activity; (2) Pain in the shoulder at night, and especially when sleeping on the involved side. (3) The location of the pain is located about 2" to 5" below the shoulder in the upper portion of the arm. (The pain is referred down the arm, but not below the elbow.)

Without medical attention or assistance, the propagation of the shoulder pain is inevitable. In the typical scenario, a person initially starts having symptoms as listed above. The self-doctoring theory of letting the shoulder rest and avoiding use to the arm is then applied. With the lack of use and lack of activity to the shoulder, the muscles weaken or atrophy to a mild extent. With this the rotator cuff muscles are less conditioned and allow the ball to have more excursion, side to side and up and down, within the shallow concavity of the socket. This mild increase in rocking motion of the ball in and out of the shoulder allows for the rotator cuff tendons to rub against the undersurface of the acromion in a more dramatic fashion. Therefore, ironically, as you protect the shoulder and the muscles weaken, the shoulder pain or impingement syndrome worsens. [See diagram #4]

The typical intervention from a medical standpoint is to strengthen the rotator cuff tendons to mechanically reverse the impingement process. By participating in a graduated strengthening program to the rotator cuff tendons, we can then gradually decrease the amount of excursion of the ball in and out of the socket and decrease also the amount of the impingement on the rotator cuff tendons by the acromion. The basic understanding of these principles is what allows the majority of patients with impingement syndrome to be treated in a non-surgical fashion to decrease their symptoms of tendonitis.

*Dr. Weresh is an Orthopaedic Surgeon that specializes in Fracture and Reconstructive Surgery at Des Moines Orthopaedic Surgeons. To reach Dr. Weresh's office at Des Moines Orthopaedic Surgeons please call (515) 224-5216.*



**DES MOINES  
ORTHOPAEDIC SURGEONS, P.C.**

**DMOS – West**  
6001 Westown Parkway  
West Des Moines, IA 50266  
**515-224-1414**  
**800-245-6129**

**DMOS – East**  
Penn Medical Plaza  
1301 Pennsylvania Ave., Suite 213  
Des Moines, IA 50316  
**515-263-9696**  
**800-688-3980**

**DMOS – Carroll**  
405 S. Clark St., Suite 250  
Carroll, IA 51404  
**712-792-2093**  
**877-284-1428**

DIAGRAM # 1

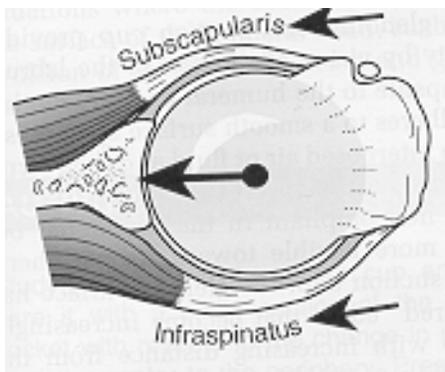
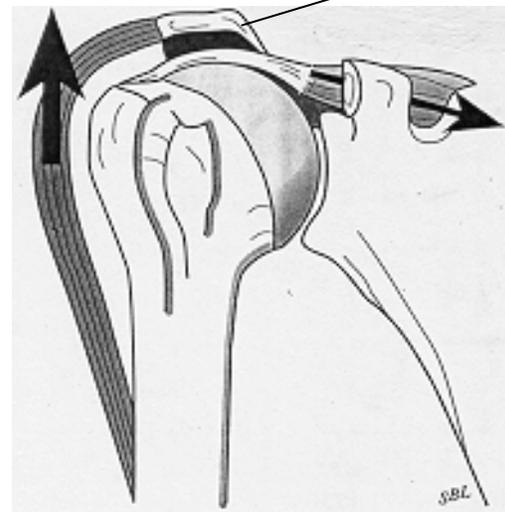


DIAGRAM # 2





**DES MOINES  
ORTHOPAEDIC SURGEONS, P.C.**

**DMOS – West**  
6001 Westown Parkway  
West Des Moines, IA 50266  
**515-224-1414**  
**800-245-6129**

**DMOS – East**  
Penn Medical Plaza  
1301 Pennsylvania Ave., Suite 213  
Des Moines, IA 50316  
**515-263-9696**  
**800-688-3980**

**DMOS – Carroll**  
405 S. Clark St., Suite 250  
Carroll, IA 51404  
**712-792-2093**  
**877-284-1428**

DIAGRAM # 3

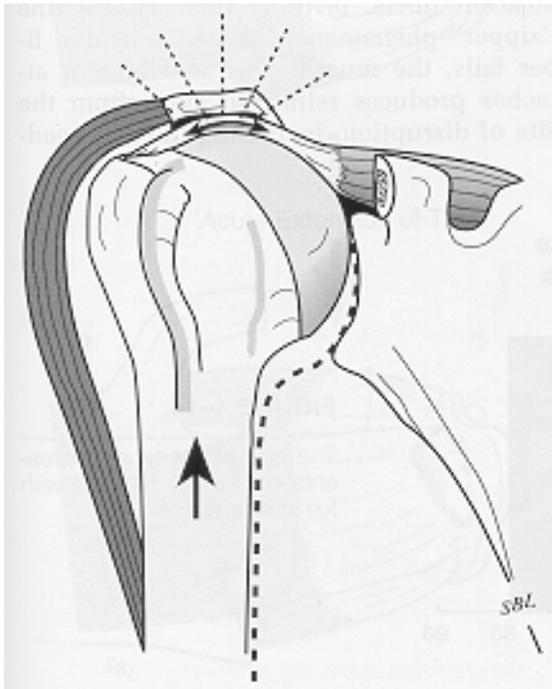


DIAGRAM # 4

