

Impingement Syndrome

Shoulder Anatomy

To understand impingement syndrome, it is important to know about the anatomy of the shoulder. Anatomically, the shoulder is like a cup and saucer. The cup is the head of the humerus (arm bone) and the saucer is the glenoid socket of the scapula or shoulder blade. The tendons of four muscles form the rotator cuff, blending together to help stabilize the shoulder. The fibers of the rotator cuff bend as the shoulder changes position.

Tendons attach muscles to bone and are the mechanism enabling muscles to move bones. It is because of the rotator cuff tendons, which connect the long bone of the arm (the humerus) to the scapula (the shoulder blade) that we can raise and rotate our arms. The rotator cuff also keeps the humerus tightly in the socket (glenoid) when the arm is raised. For normal function, each muscle must be healthy, securely attached, coordinated and conditioned.

Another important structure within the shoulder joint is the bursa, or lubricated sac of synovial fluid, that protects the muscles and tendons as they move against each other. There is a bursa between the part of the scapula that makes up the roof of the shoulder (known as the acromion) and the rotator cuff tendons. The bursa simply allows the moving parts to slide against one another without too much friction.

The normal shoulder joint is a very elegant, complex machine - it has the most mobility of any joint in the body. The ball and socket design of the shoulder allows the arm to rotate, enabling us to reach and swing our arms, hit or pitch a baseball, use a tennis racket, wash your hair or lift and carry a child. It is because of this flexible design that we are able to use our hands and arms in so many different positions.

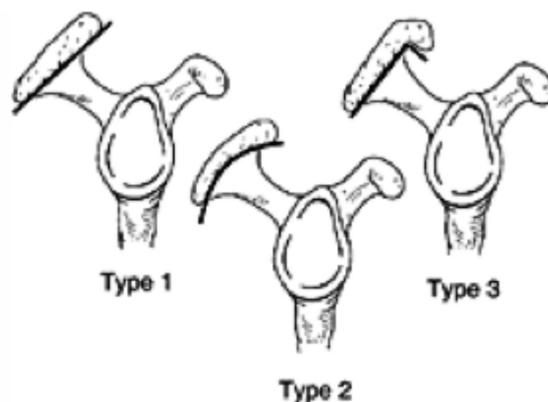
What is Impingement Syndrome?

If you experience impingement syndrome in your shoulder, the bones and tissue in your shoulder are improperly aligned - narrowing the space between the acromion and the rotator cuff. It is often a precondition for many common shoulder ailments, including bursitis, tendonitis, arthritis, as well as injuries to the rotator cuff tendons. One of the common signs of impingement syndrome is discomfort when you raise your arm above your head.

The design of the shoulder joint gives it great range of motion but limited stability. It is prone to injury as we age. As long as the parts of this joint are in good working order, the shoulder can move painlessly and easily. When injury or conditions such as impingement syndrome, tendonitis or bursitis affect the shoulder joint, pain and the loss of mobility result. Because we depend on flexible arm movement for so many of the activities that are important and pleasurable to us, injuries to the shoulder joint can be very disruptive.

When the space between the humerus and the acromion above it is narrowed, the four rotator cuff tendons, the cartilage on the ends of the bone and the bursa are all impinged upon or squeezed. This results in one or more forms of inflammation of the joint. Bursitis, tendonitis and arthritis are all inflammatory conditions closely related to impingement syndrome, often occurring in combination with it. Impingement syndrome also contributes to the tearing of rotator cuff tendons, as it weakens the rotator cuff and makes it more susceptible to injury. To some degree, impingement occurs in everyone's shoulder as the result of daily activities that involve using the arm above shoulder level.

Three types of acromion process
 Magee D. *Orthopedic Physical Assessment*.
 3rd ed. Philadelphia: W.B. Saunders; 1997.



Causes of Impingement Syndrome

People who continuously work with arms raised overhead, or who engage in repetitious throwing activities, are especially vulnerable to this condition. They may become aware of a generalized aching sensation in the shoulder or pain when raising the arm out from the side or in front of the body. Activities requiring overhead reaching put particular pressure on the rotator cuff tendons, and any form of repetitive movement, chronic misuse or recurring stress may result in impingement.

Another problem that may contribute to impingement is the development of bone spurs. Bone spurs can further reduce the space available for the rotator cuff and cause wear and tear of the acromioclavicular (AC) joint between the collarbone and the shoulder blade. This joint sits directly above the bursa and any bone spurs developing beneath it irritate the bursa, making impingement worse.

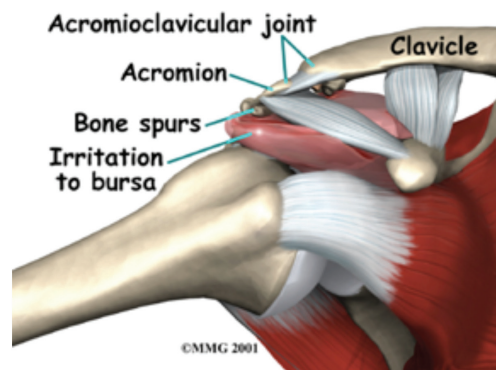
Symptoms of Impingement Syndrome

Most people with impingement syndrome complain of difficulty sleeping when they roll over onto the affected arm. A sharp pain when trying to reach into a back pocket is also a very reliable indication of impingement. As time goes on, discomfort increases and the joint may become stiffer. There may be a "catching sensation" when the arm is lowered. In some cases, if the arm is so weak that you are unable to lift it on your own, the rotator cuff tendons may have been torn.

Impingement syndrome usually results in the slow onset of pain and discomfort in the upper shoulder, especially when the arm is raised. If tendonitis or bursitis develop, there may also be pain when the arm is lifted away from the body. Sometimes tendonitis develops in the biceps tendon, the tendon located in the front of the shoulder that helps bend the elbow and turn the forearm. If so, pain may travel to the front of the arm and down the forearm.

Diagnosis of Impingement Syndrome

In diagnosing impingement syndrome, Dr. Gudeman will ask about your medical history and any other previous or persistent conditions of the arm and shoulder. He will inquire about your activities and occupation, as they usually play a major role in the onset of impingement. A complete and competent exam involves considering the possibility of associated injuries or conditions such as tendonitis, bursitis, arthritis and rotator cuff tears.



X-rays may be taken to examine the site for bony abnormalities including unusual anatomy of the acromion, the presence of bone spurs or evidence of arthritis. Some people have an unusual anatomy of the acromion, in which the bone tilts too far down and reduces the space between it and the rotator cuff. X-rays will indicate this and will also reveal any bone spurs in the acromioclavicular (AC) joint.

An MRI scan is a special test involving the use of magnetic waves to create pictures that look like slices of the shoulder. The MRI scan can also show whether there has been a tear in the tendons.

Another common test for impingement involves the injection of a small amount of local anesthetic (such as Novocain or Lidocaine hydrochloride) into the space under the acromion. This test helps eliminate the possibility that the pain results from a problem in the neck. If pain subsides immediately after injection, impingement syndrome is likely to be the cause of discomfort.

Non-surgical Treatment for Impingement Syndrome

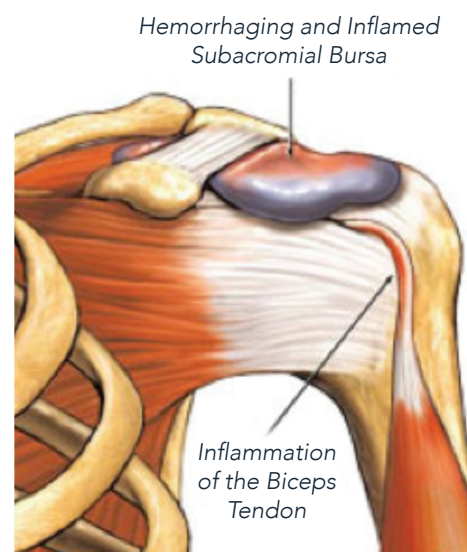
Conservative treatment may be considered as the best course of action to help resolve your shoulder symptoms in order to prevent surgery. Conservative treatment is determined by various factors including your goals, activities of daily living, job requirements and available time commitment as well as the exam completed by Dr. Gudeman. The two more common interventions considered with conservative treatment are physical therapy and a cortisone injection. A quality course of rehabilitation with a physical therapist or athletic trainer helps ensure pain and swelling is managed and that the appropriate muscles are strengthened. A physical therapist or athletic trainer can also help condition you for your work or athletic activities as your rehabilitation progresses. An injection is used to decrease inflammation in the location of the impinged tendons and can help rule out another pathology if one is suspected. In addition to physical therapy and/or cortisone injection, Dr. Gudeman will most likely suggest, rest, cryotherapy and reduction in certain activities to allow time for the inflammation to resolve and pain to decrease.

Surgical Treatment for Impingement Syndrome

Surgical intervention is usually recommended if there is still no significant improvement after undergoing conservative treatment. Contemporary surgical methods include either arthroscopy, open surgery or sometimes a combination of the two. Either form of surgery can repair damage and relieve impingement pressure on the tendons and bursa.

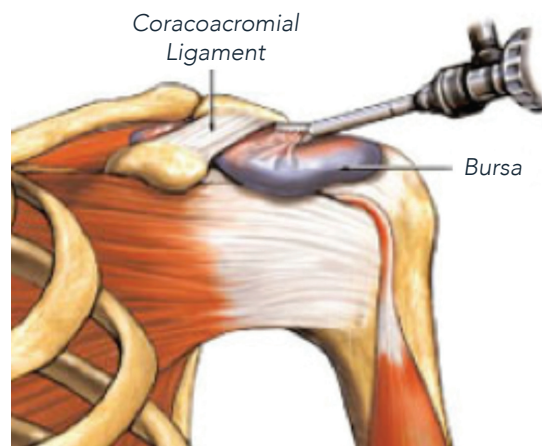
When surgery becomes necessary, the major goal is to increase the space between the acromion and the rotator cuff tendons. The first thing Dr. Gudeman will do is remove any bone spurs under the acromion that chaff the rotator cuff tendons and the bursa. In most cases, a small part of the acromion will be removed as well, to give the tendons more space and enable them to move without rubbing on the underside of the acromion. People who have an abnormal tilt to the acromion will probably need to have more of the bone removed.

Surgery for impingement syndrome offers an opportunity to correct other related conditions as well. If there is degenerative (wear and tear) arthritis in the AC joint in addition to impingement, the end of the clavicle may be removed. This procedure is called a resection arthroplasty. After about one inch of the clavicle has been cut away, scar tissue fills the space left between the clavicle and the acromion to form a false joint. This usually puts an end to arthritic pain in the AC joint,



as the scar tissue forms a stable, flexible connection between the clavicle and the scapula.

Today, arthroscopy is frequently used for the surgical procedure. Two or three small incisions are made on the shoulder, but repair in the joint itself is done with an arthroscope, a fiberoptic telescope. Pencil-sized instruments containing a small lens and lighting system magnify and illuminate the structures inside the joint. The arthroscope is inserted into the joint and attached to a miniature television camera, allowing a magnified view of spaces in the joint that would otherwise be inaccessible. This technology makes possible very precise treatment of specific parts of an injury, using instruments to cut away damaged tissue. One advantage of arthroscopy is that you can often go home the same day. Very rarely is an open procedure performed.



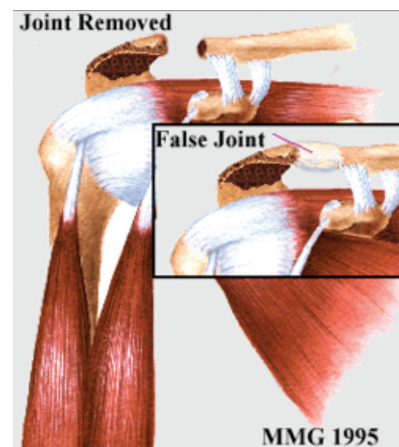
After surgery, your arm will be protected with a sling or an immobilizer. In most cases, your physical therapist or athletic trainer will begin working with you the morning after your surgery, showing you how to do simple exercises to help prevent stiffness and swelling. Even if the shoulder itself is not exercised right away, it is important to gently move your fingers, hands and elbow. This movement, combined with icing regularly, controls swelling pain and helps prevent stiffness.

Your physical therapist or certified athletic trainer will work with you on a program to develop strength, stabilize the shoulder and help you with use of a sling.

Possible Complications of Surgery for Impingement Syndrome

Although surgery for impingement syndrome is usually without any significant problems, there may occasionally be unforeseen complications associated with anesthesia, including respiratory or cardiac malfunction. The surgery itself may be complicated by infection, injury to nerves and blood vessels, fracture, weakness, stiffness or instability of the joint, pain, inability to return to full duties or the need for additional surgeries.

Improvement to the shoulder is determined not only by surgery but also by your general condition and rehabilitative effort. In many cases, the tendons and muscles of the shoulder have been weakened from prolonged misuse or degeneration, and strengthening them will require a gentle, steady process of changing habitual ways of moving your arm.



Keeping in mind that it is likely to be several months before you achieve maximal results, you can almost always look forward to a more mobile, pain-free joint. Taking care of impingement syndrome also means you are less likely to be subject to chronic bouts of impairment from related conditions such as bursitis, arthritis or tendonitis.

Informative Websites:

www.orthoinfo.org
www.sportsmed.org
www.aana.org

Helping you achieve the
optimal activity level for your
lifestyle is my first priority.

- Scott Gudeman, MD



Scan here to visit
ScottGudemanMD.com.

The information provided herein is not intended to be a substitute for professional medical advice. You should not use this information to diagnose or treat a health problem or disease without consulting a licensed physician.
(c)2000 DynoMed.com, LLC, Indianapolis, IN