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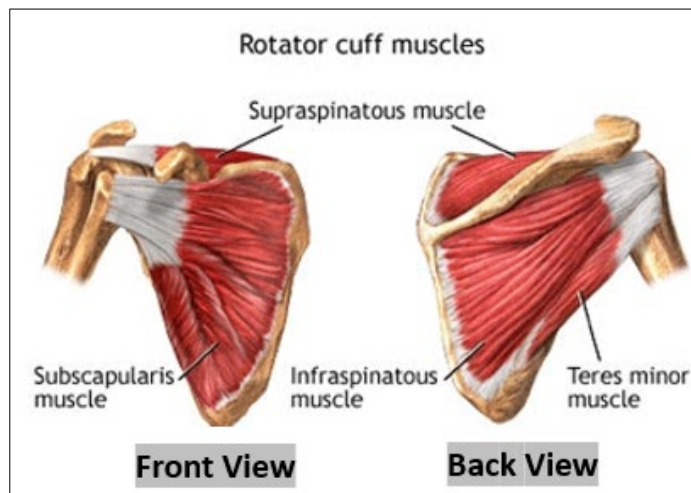
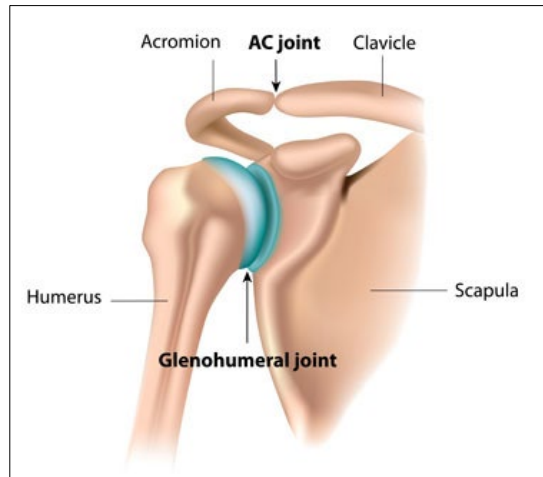
## **Rotator Cuff Tears: definition, diagnosis & treatment options**

### **ABOUT ROTATOR CUFF TEARS**

- A rotator cuff tear is a common cause of pain and disability among adults. Each year, almost 3 million people in the United States visit their doctors because of a rotator cuff problem.
- A torn rotator cuff will weaken your shoulder. This means that many daily activities, like combing your hair or getting dressed, may become painful and difficult to do.
- Most people with rotator cuff injuries can recover with rest and physical therapy. However, more serious injuries, such as complete rotator cuff tears, may require surgical repair.

### **WHAT IS THE ROTATOR CUFF?**

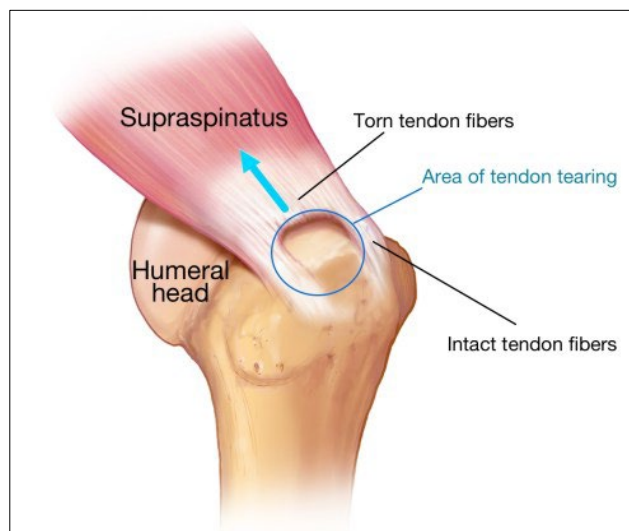
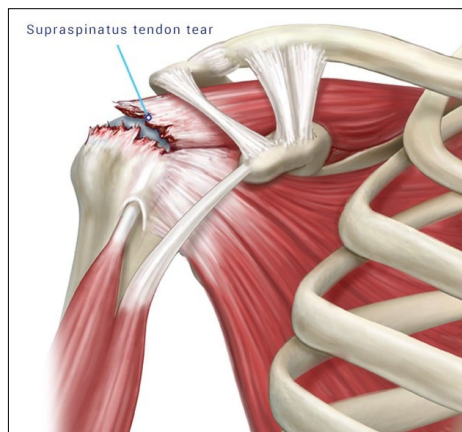
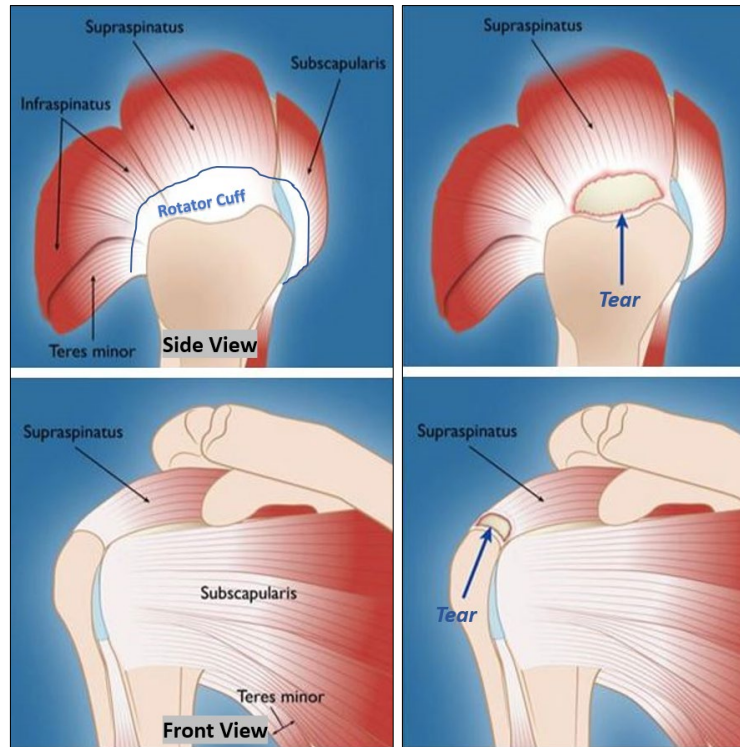
- The shoulder is made up of three main bones: the humerus, the scapula (shoulder blade), and the clavicle (collar bone)
- The shoulder joint is a ball and socket joint with the ball coming from the upper portion of the humerus and the socket coming from the scapula, more specifically called the glenoid
- The rotator cuff is a group of four *muscles* that come together as *tendons* to form a covering around the head of the humerus.
  - The muscle bellies transition to tendons as they reach the humerus bone, and the tendons join together to insert on the humerus, creating a “cuff” of tissue.
  - *Remember: tendons attach muscles to bones*
- The rotator cuff attaches the humerus to the shoulder blade and helps to lift and rotate your arm.
  - The rotator cuff helps control motion at the joint, allowing you to rotate your shoulder in a full circle, and also helps to stabilize the shoulder joint.



*Image caption: The muscle bellies of the rotator cuff muscles are depicted in red. There are four muscles of these muscles that make up the rotator cuff. The tendons of the rotator cuff are depicted in white, and attach to the humerus bone.*

## WHAT IS A ROTATOR CUFF TEAR?

- The tendons of the rotator cuff can tear near their attachment on the humerus
- Tears can involve one or several of the four rotator cuff tendons
- Tears can also be “full-thickness” or “partial-thickness”
- Tears can occur suddenly, often during heavy lifting with the feeling of a pop in the shoulder. Or, they can occur slowly over time and are associated with worsening pain and weakness.
- The size, thickness, and timing of the rotator cuff tear is important in planning the non-surgical vs surgical treatment options.



*Image caption: This demonstrates a “full-thickness” tear of the central portion of the rotator cuff (more specifically the supraspinatus) tendon. Due to the tear, the intact fibers now see more stress which can lead to further tearing of the tendon. However, the intact tendon fibers can be strengthened through physical therapy.*

## DIAGNOSIS

- **Physical Exam:**
  - Patient's will often demonstrate pain or loss of range of motion of their shoulder, particularly when elevating their arm over-head. Patient's will often have aching pain throughout their shoulder that is worse with activities and worse at night, often waking them from sleep.
- **X-ray:**
  - X-rays help to visualize the bony structures like the humerus (arm bone), clavicle (collar-bone) and scapula (shoulder blade), but they do not directly show the rotator cuff. X-rays of patients with rotator cuff tears can sometimes demonstrate bone spurs or narrowing of the space where the rotator cuff sits, but can also be without any abnormal findings.
- **MRI:**
  - This is the best way to visualize the rotator cuff as well as other soft tissue structures around the shoulder. The MRI will not only demonstrate the presence of a tear, but can also help visualize the size of the tear as well as the tissue quality of the rotator cuff. This is important when considering whether or not surgery will be recommended.

## TREATMENT OPTIONS

- **Overview:**
  - No healing of the tendon itself occurs without surgical repair. Thus, the goal of the non-surgical treatment is to maintain a symptom-free or tolerable state, not to 'heal' the tear.
    - There is concern that tear size can increase over time and the quality of the tendon may deteriorate, potentially leading to worse outcomes if surgery is needed in the future
    - Large tears can alter the mechanics of the shoulder which may lead to the early development of arthritis requiring shoulder replacement.
  - Age, level of function, occupation, tobacco use and medical problems should all be taken into consideration when determining the appropriate treatment course
  - Tear size, location, timing and patient function play a large role in determining the need for surgical repair
    - Treatment is primarily dependent on the extent of the tear and the person's pain after a certain period of non-surgical care.
- **Physical Therapy:**
  - The goal of physical therapy is to regain or maintain strength and flexibility to return to all daily and recreational activities
  - **Strength:** Strengthening the muscles that support your shoulder will help keep your shoulder joint stable. Keeping these muscles strong can relieve shoulder pain and prevent further injury
    - Exercises can help strengthen the muscles around the torn tendon, to make up for the weakness there.

- Flexibility: Stretching the muscles that you strengthen is important for restoring range of motion and preventing injury. Gently stretching after strengthening exercises can help reduce muscle soreness and keep your muscles long and flexible.
- A focused physical therapy program should be continued for at least 6 weeks, unless otherwise specified by Dr. Flikkema or your physical therapist.
  - When not working directly with your physical therapist, additional home exercises should be performed. These will be prescribed by your therapist or can be found **HERE**.  
([https://orthoinfo.aaos.org/globalassets/pdfs/2017-rehab\\_shoulder.pdf](https://orthoinfo.aaos.org/globalassets/pdfs/2017-rehab_shoulder.pdf))
- Anti-inflammatory medications (i.e. NSAIDs, Tylenol etc.)
- Anti-inflammatory topical treatments
  - Diclofenac (Voltaren) gel
  - Aspercreme, IcyHot, DeepBlue by DoTerra
  - CBD
- Anti-inflammatory diet
  - Green leafy vegetables (spinach, kale, collards)
  - Fish (salmon, tuna, sardines, mackerel)
  - Nuts (almonds, cashews, walnuts)
  - Healthy fats (olive oil, avocado oil, coconut oil, ghee)
  - Fruits rich in antioxidants (raspberries, strawberries, blueberries, blackberries)
  - Supplements (fish-oil, Vitamin C/D/B<sub>6</sub>/B<sub>12</sub>, Turmeric, Ginger, Boswellia, Fisetin)
- Steroid (i.e. cortisone) injections
  - Can help to decrease the pain and inflammation but do not work to heal the repair
  - In fact, they can actually lead to progression of the size and severity of the tear
  - Steroid injections should be avoided in any patient that may require surgery
    - Steroid injections performed prior to a surgical rotator cuff repair significantly increases the chance of failure and need for repeat surgery<sup>1</sup>
    - Steroid injections performed prior to surgery also increase the risk for infection following surgery<sup>2</sup>
- **Surgery:**
  - Rotator cuff repair
    - The general goal of surgery is to re-attach the torn tendon to the humerus bone where it has torn or detached from.
    - This is generally done with bone 'anchors' that are inserted into the humerus bone and have sutures attached to them. These sutures are then used to sew the tendon and tie it down to the bone. This allows the tendon to heal back to the bone over a course of 3-6 months.

- Open vs Arthroscopic
  - Open techniques typically involve an incision located along the front or side of the shoulder and range from 3-6cm long. The deltoid shoulder muscle is split and dissected to access the rotator cuff. Arthroscopic techniques involve three to four, small 1cm incisions for insertion of a camera (i.e. scope) and small instruments to perform minimally invasive surgery and without disruption of the deltoid
  - Healing rates of the repaired rotator cuff are similar using arthroscopic or open surgical techniques with arthroscopic surgery having the advantage of significantly smaller incisions and generally less pain and stiffness after surgery
- Recovery
  - Most patients will need to wear a sling for 4-6 weeks after surgery
  - Generally, patients can return to light duty or sedentary work 1-2 weeks after surgery
  - More strenuous or physically demanding jobs may require a longer recovery time to return to work, with the specific time to return depending on the specific duties of the job. Jobs with heavy lifting or that require prolonged use of the arm overhead may take 4-6 months or more to return.
  - Most patients return to full sports activities around 6 months after surgery depending on the sport and the patient's progress with physical therapy
  - Surgery is not a substitute for physical therapy. You will need to complete a physical therapy program to have a successful recovery after surgery
- Risks
  - Risks of arthroscopic rotator cuff repair include but are not limited to: infection, damage to blood vessels or nerves (causing numbness, tingling, burning or weakness), blood clots, shoulder stiffness, scarring, continue pain or discomfort
  - There is also the possibility that the repaired rotator cuff can re-tear. This risk varies dependent on several factors including but not limited to the size of the tear, the quality of the rotator cuff tissues, chronic tears, the patient's age, tobacco use and compliance with physical therapy. It is possible that additional surgery may be needed if the rotator cuff does not heal correctly or re-tears.
  - Complications are generally uncommon and often can't be predicted in advance
  - Surgery may relieve some pain and weakness, but may not fully restore your strength. This is of concern when the tendon tear is large and more severe
- **General Considerations:**
  - "Partial-thickness" tears respond well to non-surgical treatment with minimal risk of delaying surgery. However, they should be closely monitored for worsening of the tear size and tendon health.

- “Full-thickness” tears may still respond to non-surgical treatment options but risk further deterioration of the tendon that may result in worse surgical outcomes. Those undergoing non-surgical treatment should have close follow up to monitor symptoms and deterioration of the rotator cuff.

### COMPARING THE OPTIONS:

	Non-surgical Options	Surgery
What does it mean?	<ul style="list-style-type: none"> <li>• Physical therapy, NSAIDs, injections</li> </ul>	<ul style="list-style-type: none"> <li>• Repair of the rotator cuff tendon back to the bone</li> </ul>
Results	<ul style="list-style-type: none"> <li>• Improvement within 6 weeks               <ul style="list-style-type: none"> <li>○ Those that don't improve may require surgery</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Improved outcome scores and reduced pain compared to non-surgical treatment<sup>3</sup></li> <li>• Majority of patients reach significant improvement 6 months after surgery and typically reach full improvement within one year</li> </ul>
What is the advantage?	<ul style="list-style-type: none"> <li>• No surgery</li> </ul>	<ul style="list-style-type: none"> <li>• Improved strength and pain</li> <li>• Surgery may decrease the risk of developing arthritis (full-thickness tears)</li> </ul>
What is the disadvantage?	<ul style="list-style-type: none"> <li>• Delayed surgery and prolonged recovery if no improvement without surgery</li> </ul>	<ul style="list-style-type: none"> <li>• Recovery time including up to 6 weeks in a sling</li> <li>• Increased financial cost of surgery</li> </ul>
What are the risks?	<ul style="list-style-type: none"> <li>• Increased size and severity of the tear, leading to more difficult surgical recovery</li> <li>• Injections increase the risk for infection, progression of the tear, and failure of surgical repair</li> <li>• Large tears may lead to early development of arthritis</li> </ul>	<ul style="list-style-type: none"> <li>• The risks, discomforts, and inconveniences of surgery</li> <li>• Re-tear of the tendon               <ul style="list-style-type: none"> <li>○ This risk increases with: tear size, previous injection, age and tobacco use</li> </ul> </li> </ul>

For more helpful information on rotator cuff tears and other rotator cuff disorders, please visit:

<https://www.healthwise.net/ohridecisionaid/Content/StdDocument.aspx?DOCHWID=aa54545>

### CITED SOURCES:

1. Puzitello et al. Adverse Impact of Corticosteroid Injection on Rotator Cuff Tendon Health and Repair: A Systematic Review. *Arthroscopy* 2020.
2. Forsythe et al. The Timing of Injections Prior to Arthroscopic Rotator Cuff Repair Impacts the Risk of Surgical Site Infection. *JBJS* 2019
3. Ramme et al. Surgical Versus Nonsurgical Management of Rotator Cuff Tears: A Matched-Pair Analysis. *JBJS* 2019.