

Orthopedic Injection therapy

- What types are available?
- How effective are they?
- When do they work the best?

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Financial Disclosures

I have no financial disclosures.

I will not be talking about off label uses of medications.

Objectives

- Identify the types of medications used in common orthopedic injections.
- Identify the common problems in which injections are discussed.
- Discuss the benefits and potential risks of these injections.
- Discuss the AAOS recommendations for injection therapy (when available).

Who are the players?



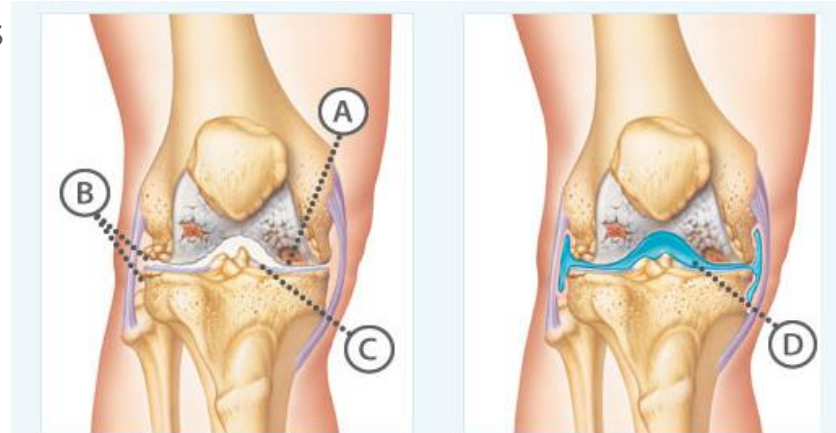
Common medications-Steroids

- Corticosteroids (steroids, cortisone) are potent anti-inflammatory. They are injected into the joint typically with a local anesthetic to reduce inflammation.
- Cost: \$50-200 per injection

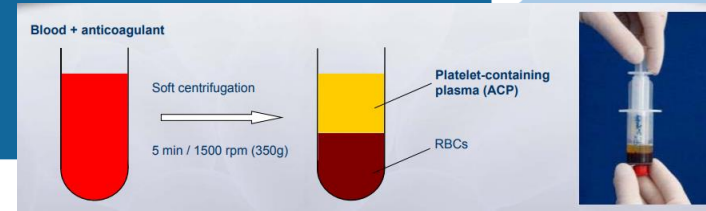


Common medications-Viscosupplementation

- Hyaluonic Acid (HA) is a component in normal cartilage. It works as a lubricant and shock absorber to help reduce the pain in patients with osteoarthritis.
- It comes in multiple forms:
 - A 1 time injection that involves 3 times the medication
 - A series of 3 injections given one week apart from one another.
 - One medication is recommended as a series of 5 injections given one week apart
- Cost: \$1200-1500 for the series

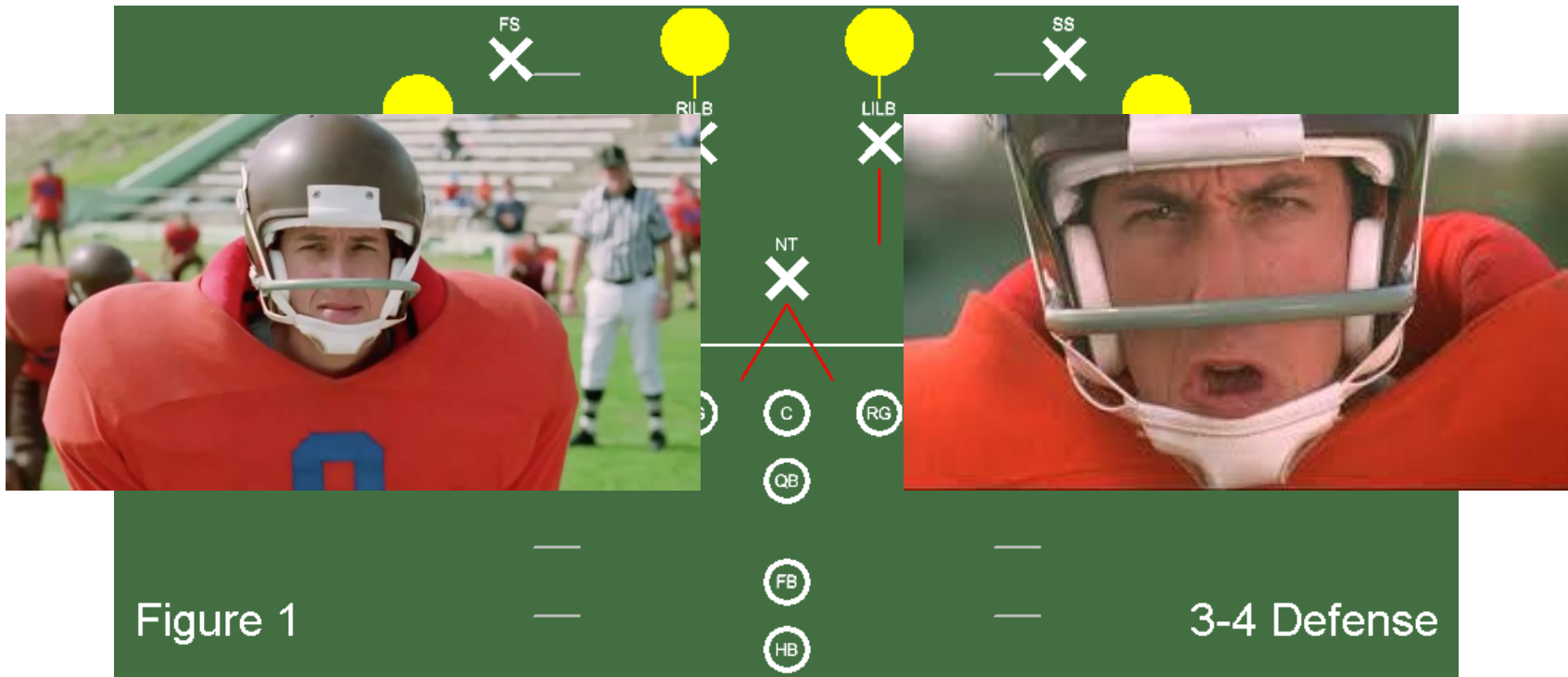


Common medications-PRP



- Isolation of the platelet rich plasma from an autologous blood sample and injecting it into the site of injury/damage.
- Platelets help mediate the balance of anabolic and catabolic forces at the area of damage.
 - **Catabolic:** pro-inflammatory factors that are inhibited by PRP
 - **Anabolic:** growth factors that are thought to promote cartilage growth and regenerate tendon tissue through collagen synthesis, vascularization, and tendon cell proliferation.
- There is some discussion as to the importance of selecting LR-PRP versus LP-PRP with specific injections.
- Cost: Variable

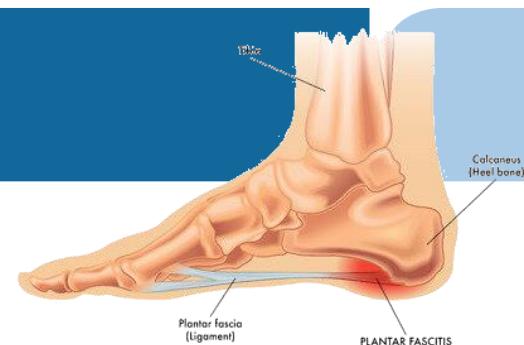
Who are they up against?



When are injections being performed?

- Plantar Fasciitis
- Knee arthritis
- Meniscus tear
- Spinal stenosis
- Lateral epicondylitis
- Shoulder Impingement
- Rotator cuff tear
- Adhesive capsulitis
- AC joint osteoarthritis
- Glenoid labral tear
- Carpal Tunnel Syndrome
- Trigger finger
- De Quervain tenosynovitis
- Hip arthritis
- Acetabular labral tear
- Hip impingement
- Greater trochanteric bursitis
- Trigger point injections

Plantar Fasciitis



- The most common cause of heel pain.
- Likely due to degeneration of the plantar fascia, which is a fibrous tissue that connects the heel to the proximal toes.
- Non-traumatic onset of focal heel pain.
 - Pain is worse in the morning and after long periods of resting.
 - Pain resolves with sitting .
- A heel spur may be seen on x-ray, but is not the source of the pain.
- Treatment requires at least 6-12 months of conservative therapies, but has 95% success.

Plantar Fasciitis

What stretches can relieve heel pain?

A session with a physical therapist can help you learn specific exercises.

Stretches like the ones shown here should be done 3 times a day – in the morning, at midday, and before you go to bed. Be sure to stretch both sides, even if only one heel is involved.



Lean forward against a wall with one leg in front of the other. Straighten your back leg and press your heel into the floor. Your front knee is bent. Hold for 15 to 30 seconds.

Do: Keep both heels flat on the floor. Point the toes of your back foot toward the heel of your front foot.



Stand on a bottom step and place the ball of your foot on the edge of the step. Slowly drop your weight into the heel of your foot, pushing your heel lower than edge of the step. Hold for 15 to 30 seconds.

Do: Hold onto the banister for balance.



Sit on the floor with both legs out in front of you. Wrap a towel around the ball of one foot and pull the towel toward your body. Hold for 15 to 30 seconds.

Do: Sit up tall and keep your legs straight.

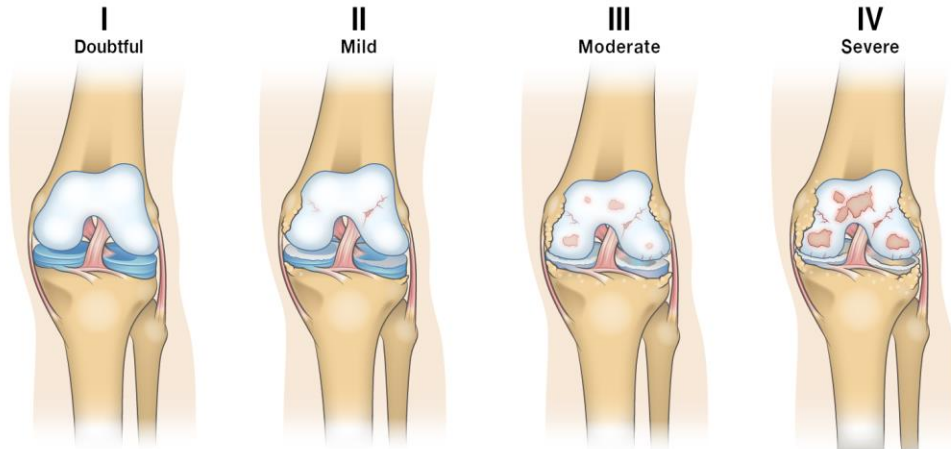
These exercises
and more available
on:
Orthoinfo.aaos.org

Plantar Fasciitis

- If conservative treatment of stretching program has failed to improve symptoms, a corticosteroid injection may be performed.
- X-rays are required prior to plantar fascia injection.
- The needle is directed into the calcaneus and advances distally until it falls into the plantar fascia.
 - Can be a very painful injection.
 - Typically very successful.
- If injected too superficially, it could cause atrophy of the superficial fat pad and loss of cushion of the heel.

Knee Arthritis

- One of the most common chronic degenerative diseases
- Gradual or post-traumatic degeneration of the articular (hyaline) cartilage
- Pain and loss of function (range of motion and strength)
- Treatment options range from activity modification to knee replacement

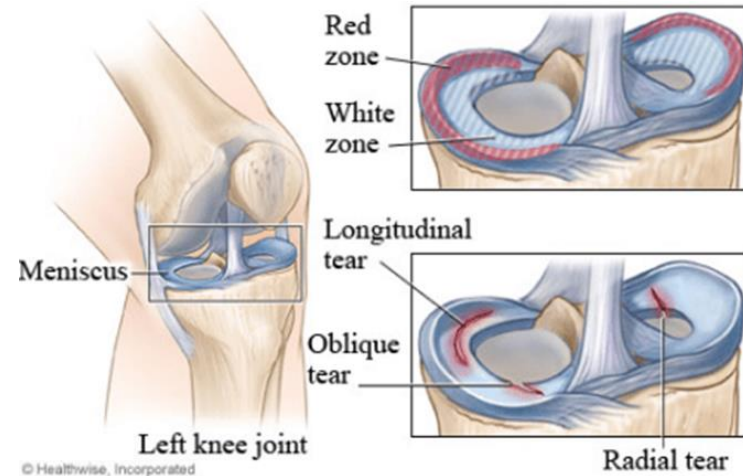


Knee Arthritis

- Corticosteroid injections
 - Moderate benefit of symptoms for 2-8 weeks (short term improvement).
- Viscosupplementation injections
 - Wide variability amongst resources about effectiveness
 - Could be useful as a treatment for moderate term improvement after other treatment options have failed.
- PRP injections
 - Multiple meta-analysis showed PRP is at least as good as HA at 6 months, and better than HA at 12 months post-injection for both **pain** and **function**.
 - Still more studies are needed to confirm.

Meniscus tear

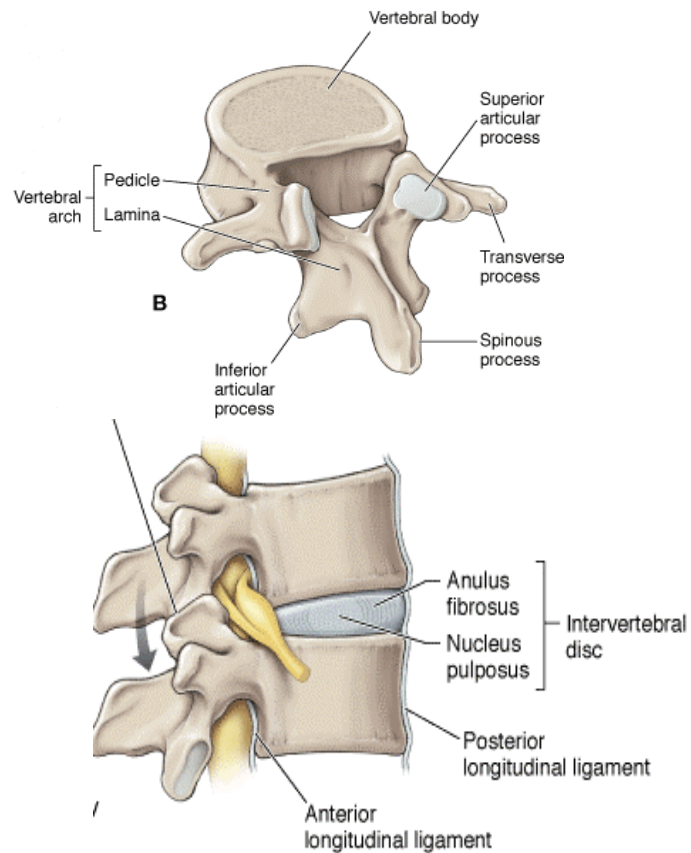
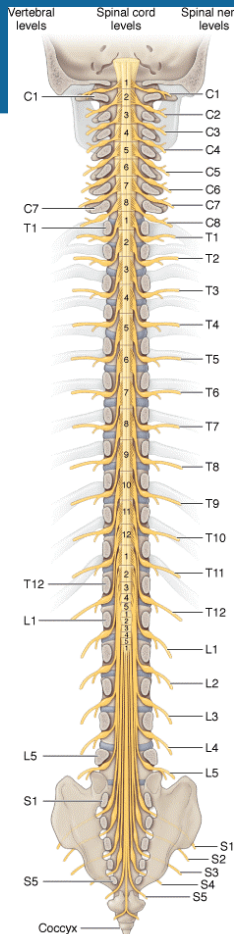
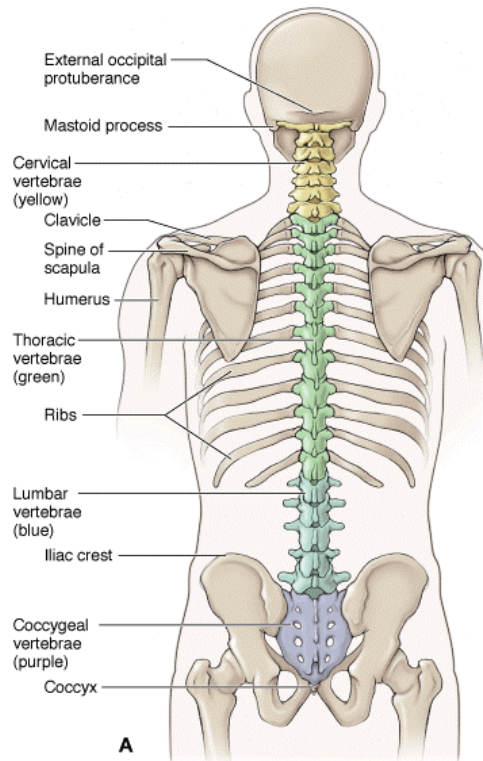
- Acute or degenerative tearing of the fibrocartilage structure that sits between the femur and tibia and acts as a shock absorber.
- Acute tears usually form after twisting or pivoting motions
- Degenerative tears usually form after low-mechanism injuries such as getting up from a chair or squatting
- Location of the tear is very important.
 - If in the red zone, it is likely repairable
 - If in the white zone, it is likely not repairable.
- It is associated with pain and swelling
 - May also notice catching, locking, or instability



Meniscus tear

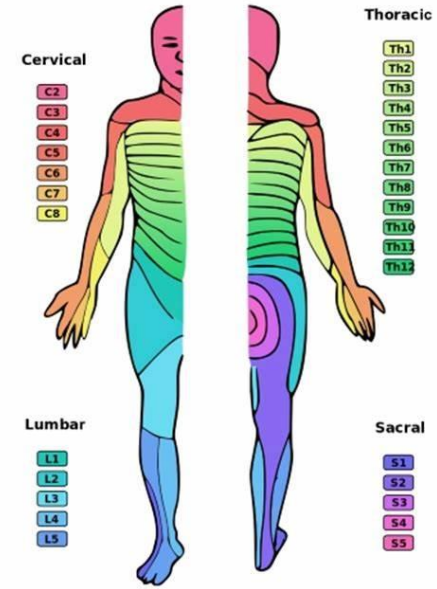
- Conservative treatment is recommended for irreparable and non-locking meniscus tears.
 - This treatment typically involves physical therapy, anti-inflammatories, and RICE.
 - Corticosteroid injections +/- aspiration can be beneficial in patients with significant pain and limitations that would impede physical therapy progress.
 - Likely similar relief as with osteoarthritis
 - But if an acute exacerbation of chronic degenerative tear, may provide longer relief until a future exacerbation occurs.

Spinal Stenosis



Spinal Stenosis

- Narrowing of the spinal canal causing the nerve roots.
- Could be caused by facet joint degeneration, disc herniation, spondylolisthesis, & spondylosis.
- About 1/3 are asymptomatic
- Neurologic symptoms typically follow dermatomal patterns.
- Neurogenic claudication
- Symptoms typically improve with sitting or lying down (shopping cart sign)
- Neurological symptoms should be evaluated for surgical management and Cauda Equina Syndrome requires urgent surgery.

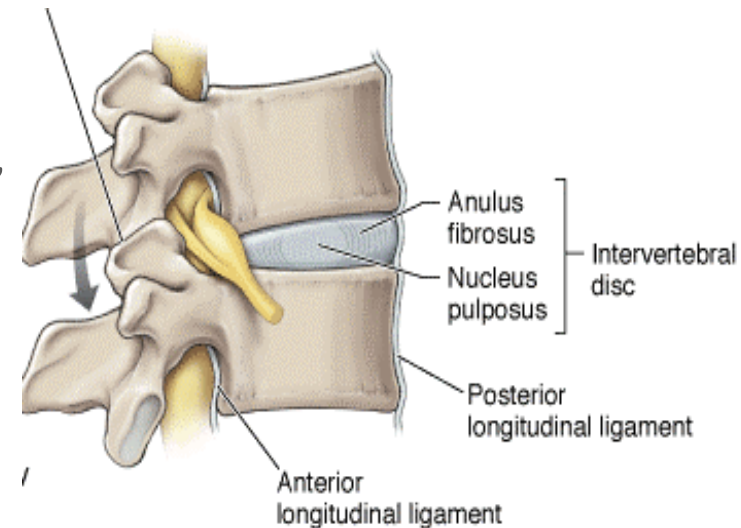


Spinal Stenosis



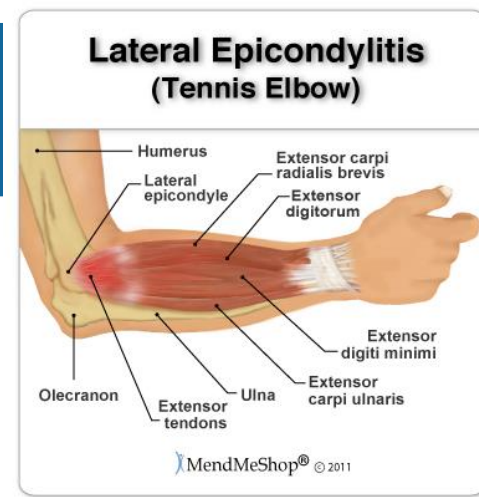
Spinal Stenosis

- Treatment is typically conservative with focus on physical therapy
- Epidural injections of local anesthetic +/- corticosteroids
 - Improvement in pain relief
 - Improved function
 - Decreased opioid intake
- Injections can be performed through caudal, intralaminar, or transforaminal approach.
- Complications include headaches, increased back pain, vasovagal reaction, and leg pain.
- Cost: \$2000-\$3000



Lateral epicondylitis (Tennis Elbow)

- One of the most common soft tissue injuries.
 - Affects 1-3% of adults each year
- Mechanical overload of the common extensor tendon abnormal microvascular changes.
- Dominant elbow is most commonly affected.
- Lateral elbow pain, pain with wrist extension and pronation, decreased grip strength.
- Treatment involves activity modification, NSIADs-including topical anti-inflammatories, elbow strap, and PT starting with gentle stretching exercises.
 - When these options fail, local injections may be performed.

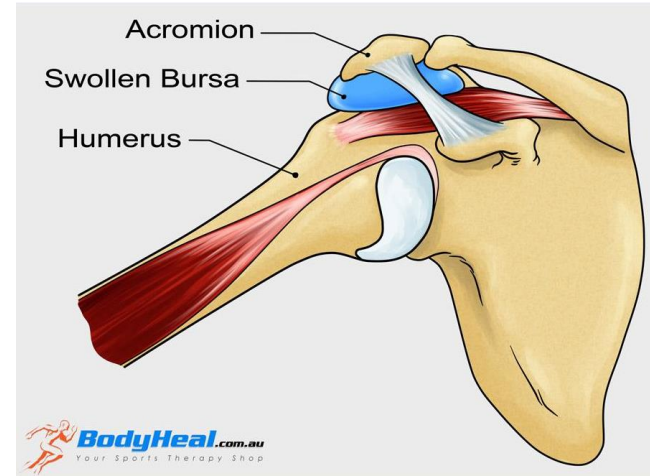


Lateral epicondylitis (Tennis Elbow)

- Corticosteroid injections are the historical “gold standard”.
 - Short term relief of symptoms in severe cases.
 - May lead to higher recurrence rates.
 - May cause permanent damage and atrophy within the tendon.
 - May actually slow down the healing of the tendon.
- PRP injections are becoming more prominent in the treatment of LE
 - At least as effective, and may be more effective than CSI particularly in the intermediate term treatment (12-26 weeks).
 - More studies find benefit with LR-PRP than LP-PRP in this case.
 - Not covered by typically insurance companies, which means out of pocket cost for patients.

Rotator cuff tendinopathy/ Shoulder impingement

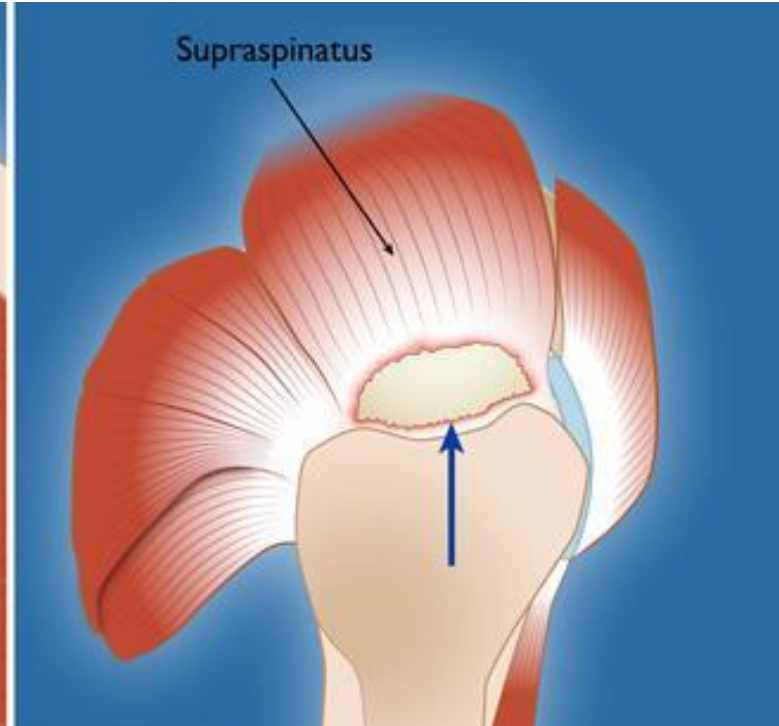
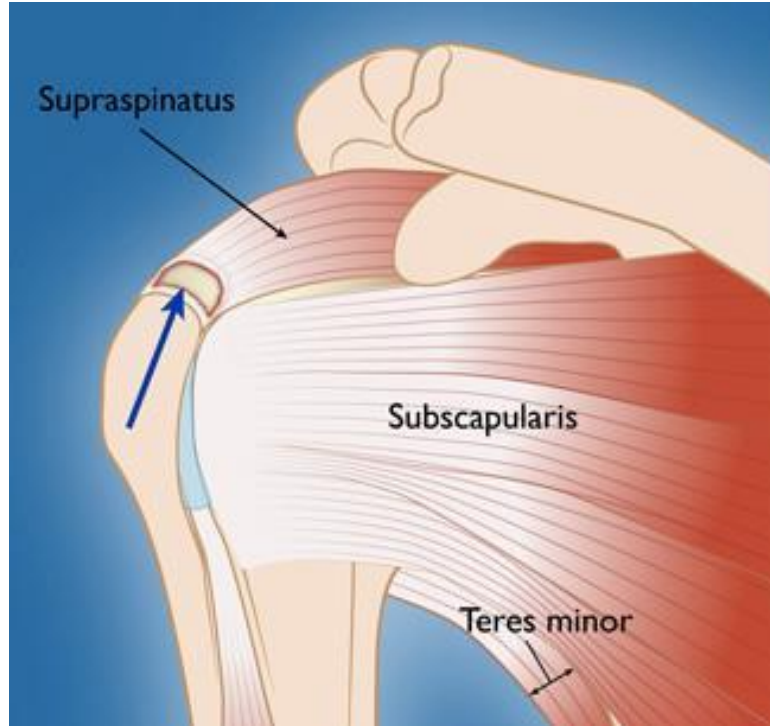
- Inflammation of the bursa and underlying rotator cuff tendons.
- Likely due to a combination of mechanical insult of the tendon by the coracoacromial arch and decreased vascularity of the RC tendon.
- Pain with abduction (especially between 90-120 degrees).
- No muscular weakness or atrophy.
- Treatment typically consists of PT and anti-inflammatories.



Rotator cuff tendinopathy/ Shoulder Impingement

- Corticosteroid injection
 - After 6 weeks of PT, if patient has not had any symptomatic improvement.
 - Rare case reports of septic bursitis.
 - Not superior to PT in the long term, but may allow for more effective PT.
- PRP
 - Comparable improvements in both pain and function when compared to CSI.
 - A safe alternative to CSI for rotator cuff tendinopathy.
 - Not first line therapy due to the cost comparison.

Rotator cuff tear

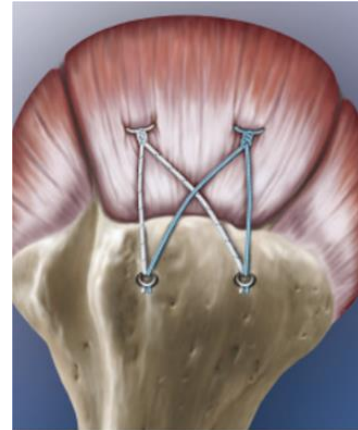


Rotator cuff tear

- A tear in the group of muscles that connect the scapula to the humeral head.
 - Function is to rotate the shoulder and stabilize humeral head against the glenoid.
- Most tears occur in the supraspinatus, but can progress both posteriorly and anteriorly.
- Most are the result of age-related degeneration.
 - In individuals aged 40-50 more likely to be acute.
 - Many older individuals have asymptomatic tears.
- Chronic or acute onset of shoulder pain often associated with some injury, weakness, grinding, and difficulty raising the arm above shoulder height.
 - Often leads to difficulty sleeping

Rotator cuff tear

- Corticosteroid injections
 - May be a good option for chronic rotator cuff tears with acute onset of pain.
 - Possible association of repair failure after >3 subacromial CSI.
- PRP
 - Similar pain relief as rotator cuff tendinopathy in non-surgical patients.
 - May be effective in decreasing re-rupture rate in small to medium tears if injected intra-operatively after a double row repair.
 - Some thought that it may also decrease post-operative pain.
 - For right now, it is not standard of care for RCR augmentation.



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Questions?

