

PHYSIOTHERAPY TIPS FOR COMMON MUSCULOSKELETAL (MSK) COMPLAINTS

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Disclosure of Affiliations, Financial Support, and Mitigating Bias

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Affiliations:

- **No External Support**

Financial Support:

- **Not Applicable**

Mitigating Potential Bias:

- **Not Applicable**

Acknowledge Thanks Merci Gratitude

I would like to begin my session by acknowledging that we are in Robinson-Huron Treaty territory and the land on which we gather is the traditional territory of the Atikameksheng Anishnawbek.

Learning Objectives

- **Identifying Common Musculoskeletal Conditions/ Complaints**
- **How to Diagnose Common Musculoskeletal Conditions**
- **Physiotherapy interventions patients can use to help with common MSK problems**

Overview

- **Rotator Cuff and Shoulder Impingement**
- **Lateral Epicondylitis**
- **DeQuervain's Tenosynovitis**
- **Carpal Tunnel Syndrome**
- **Meniscal Tears**
- **Ankle sprains**
- **Plantar Fasciitis**
- **Deep Venous Thrombosis**

Rotator Cuff Tears/Sprain

- The rotator cuff includes supraspinatus, infraspinatus, teres minor, and subscapularis.
- The long head of the biceps pathology is often involved/examined during rotator cuff injury.
- Rotator cuff tears often present with shoulder pain, weakness, and loss of range of motion.

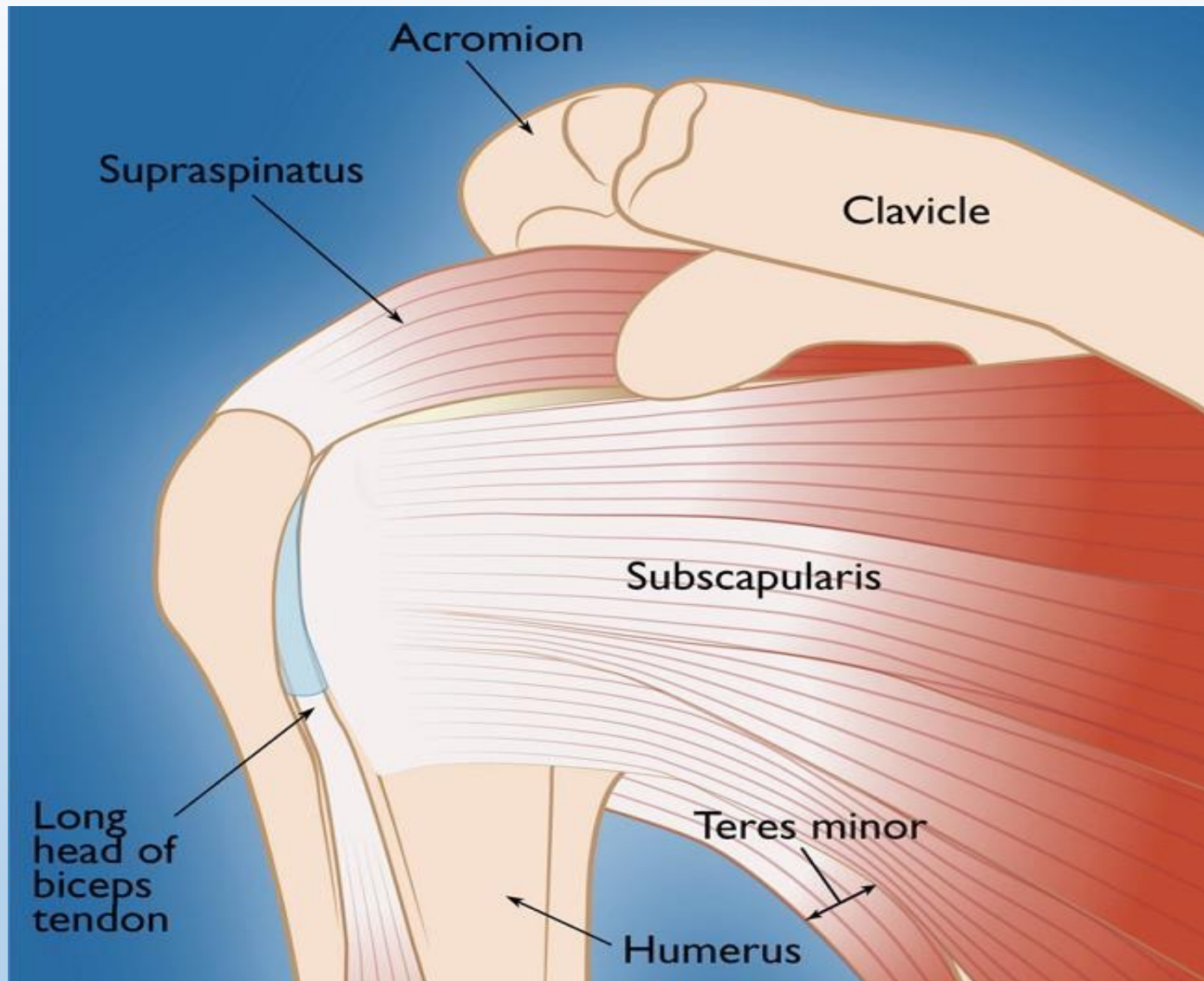


Figure 1: Shoulder Anatomy showing rotator cuff muscles (Pic taken from online)

Assessment

- Inspection of the rotator cuff assesses supraspinatus and infraspinatus atrophy in the suprascapular and infrascapular fossa.
- In cases of massive rotator cuff tears the humeral head can be appreciated to be superiorly displaced.
- The long head of the biceps tendon in the bicipital groove is palpated for tenderness between the greater and lesser tuberosities of the humeral head.
- Active and passive range of motion is assessed. Rotator cuff tears lead to loss of active range of motion and passive range of motion is often preserved.

Special Tests-Subscapularis

- **Lift-off Test** - The examiner assists the patient to get in a position where he/ she touches their lower back with the arm fully extended and internally rotated. A test is judged positive if the patient is unable to lift the dorsum of his hand off his/her back reflecting weakness of the subscapularis.
- **Belly Press Test**- The examiner instructs the patient to press the abdomen with the hand flat and attempts to keep the arm in maximum internal rotation. The test result is normal when the elbow does not drop backward, meaning that it remains in front of the trunk. A positive test, sign of subscapularis weakness, is when the elbow drops back behind the trunk.

Special Tests-Supraspinatus

- **Jobe's Test (Empty Can Test)** - This test is performed by first assessing the deltoid with the arm at 90° of abduction and neutral rotation. The shoulder is then internally rotated and angled forward 30°; the thumbs should be pointing toward the floor. Manual muscle testing against resistance is performed with the examiner pushing down at the distal forearm. This test is regarded as positive when there is weakness to resistance with arm in 90° of abduction as compared with when it is angled forward 30°, and is indicative of supraspinatus pathology.
- **Drop Arm Test**- This test assesses the supraspinatus and is performed by passively abducting the patient's shoulder to 180 degrees and then observing as the patient slowly lowers the arm to the waist. This test is positive when the arm drops to the side.

Special Tests-Infraspinatus

- **External Rotation Lag Sign at 90 Degrees (Drop Sign)-** The patient is seated with his or her back to the clinician, who holds the affected arm at 90° of elevation (in the scapular plane) and at almost full external rotation, with the elbow flexed at 90°. In this position the maintenance of the position of external rotation of the shoulder is a function mainly of the infraspinatus. The patient is asked to actively maintain this position as the clinician releases the wrist while supporting the elbow. The sign is positive if a lag or 'drop' occurs.

Special Tests-Teres Minor

- **Hornblower's Sign-** The examiner supports the patient's arm at 90 degrees of abduction in the scapular plane with elbow flexed at 90 degrees. The patient then attempts external rotation of the forearm against resistance of the examiner's hand. If the patient cannot externally rotate, they assume a position characteristic of a positive hornblower's sign

Special Tests-Biceps Tendon/Bicipital Tendonitis

- **Speed's Test-** The patient is asked to flex his shoulder (elevate it anteriorly) against resistance (from the examiner) while the elbow is extended and the forearm supinated. The test is positive when pain is localized to the bicipital groove for biceps tendon pathology.

Special Tests-Shoulder Impingement

- **Neer's Test:** The examiner stabilizes patient's scapula with one hand, while passively flexing the arm while it is internally rotated. If the patient reports pain in this position, then the result of the test is considered to be positive.
- **Hawkins/Kennedy Test:** The examiner places the patient's shoulder in 90 degrees of shoulder flexion with the elbow flexed to 90 degrees and then internally rotates the arm. The test is considered to be positive if the patient experiences pain with internal rotation.

PHYSIOTHERAPY TIPS

- **PEACE and LOVE**
- **Avoid Overhead and provocative postures initially.**
- **Pendular exercises.**
- **Active assisted ROM exercises using stick/Pulley**

P		PROTECTION Avoid activities and movements that increase pain during the first few days after injury.
E		ELEVATION Elevate the injured limb higher than the heart as often as possible.
A		AVOID ANTI-INFLAMMATORIES Avoid taking anti-inflammatory medications as they reduce tissue healing. Avoid icing.
C		COMPRESSION Use elastic bandage or taping to reduce swelling.
E		EDUCATION Your body knows best. Avoid unnecessary passive treatments and medical investigations and let nature play its role.
&		
L		LOAD Let pain guide your gradual return to normal activities. Your body will tell you when it's safe to increase load.
O		OPTIMISM Condition your brain for optimal recovery by being confident and positive.
V		VASCULARISATION Choose pain-free cardiovascular activities to increase blood flow to repairing tissues.
E		EXERCISE Restore mobility, strength and proprioception by adopting an active approach to recovery.

Tennis Elbow/Lateral Epicondylitis

- Lateral epicondylitis, or tennis elbow is defined as a pathology at or near the lateral epicondyle of the humerus resulting in pain, tenderness, and functional limitations. The mechanism of injury is variable but typically results from overloading of the common wrist extensors.
- Examination:
 - Pain and point tenderness over lateral epicondyle
 - Pain and weakness on resisted wrist extension
 - Weakness on grip strength testing

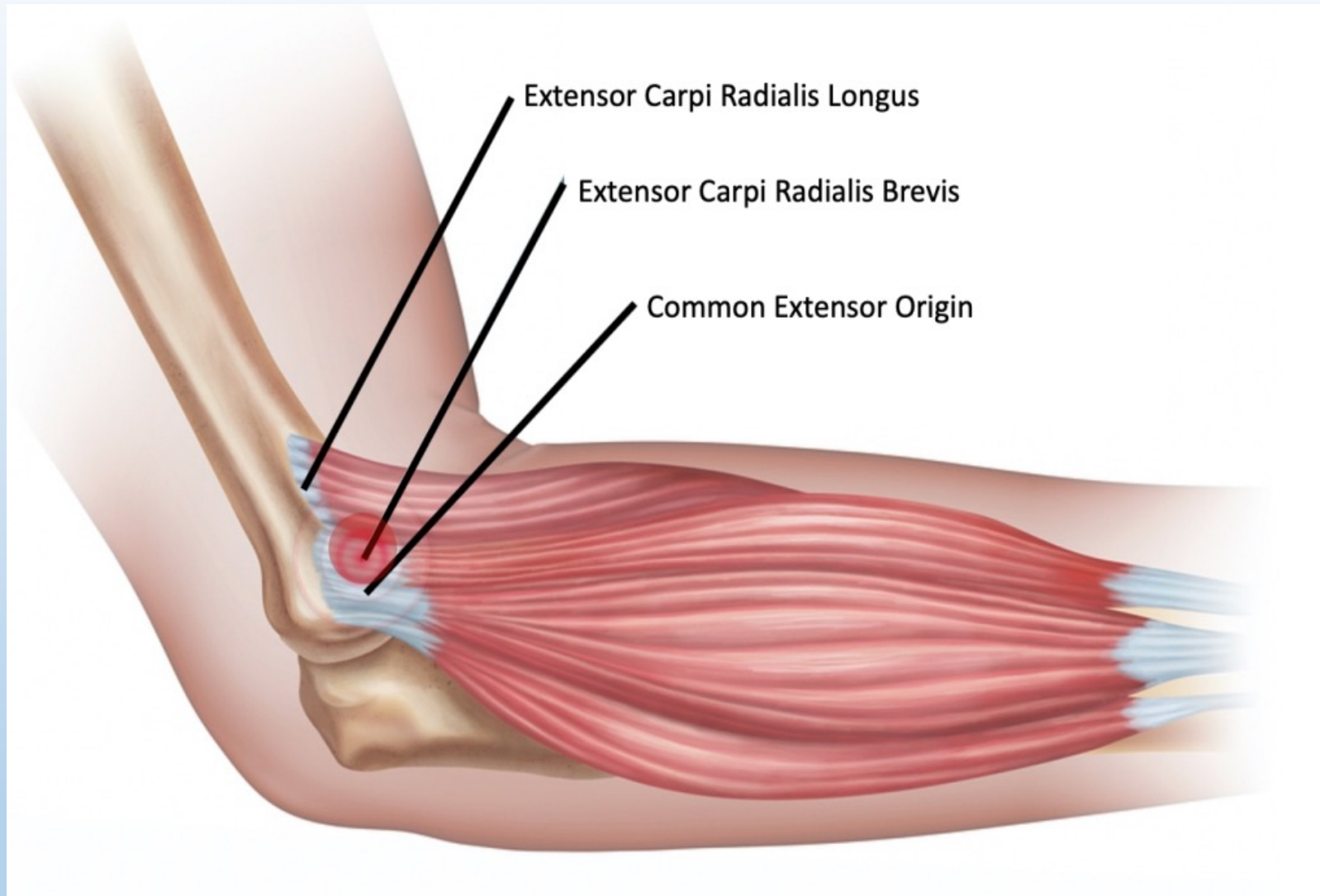


Figure 2: Lateral elbow showing common wrist extensor muscles origin (Pic taken from online)

Special Tests

- **Mill's Test:** The patient is seated with the upper extremity relaxed at the side and the elbow extended. The examiner passively stretches the wrist in flexion and pronation. Pain at the lateral epicondyle or proximal musculotendinous junction of the wrist extensors is a positive sign for LET.
- **Maudsley's Test:** The examiner resists extension of the third digit of the hand, while palpating the lateral epicondyle. A positive test is indicated by pain over the lateral epicondyle.

PHYSIOTHERAPY TIPS

- Extensor stretch
- Eccentric strengthening of extensors
- Deep tissue massage of the extensor
- Use of Tennis elbow brace
- Activity modification- avoiding repetitive heavy lifting/gripping/hammering/racket sports.

DeQuervain's Tenosynovitis

- De Quervain's tenosynovitis predominantly impacts the abductor pollicis longus (APL) and the extensor pollicis brevis (EPB) tendons. The etiology of this disease is due to repetitive and continued strain of the APL and EPB tendons as they pass under a thickened and swollen extensor retinaculum.
- Patients present with complaints of pain and inflammation in the region of the radial styloid. This pain is exacerbated by motion and activity requiring ulnar deviation with a clenched fist and thumb metacarpophalangeal (MP) joint flexion.

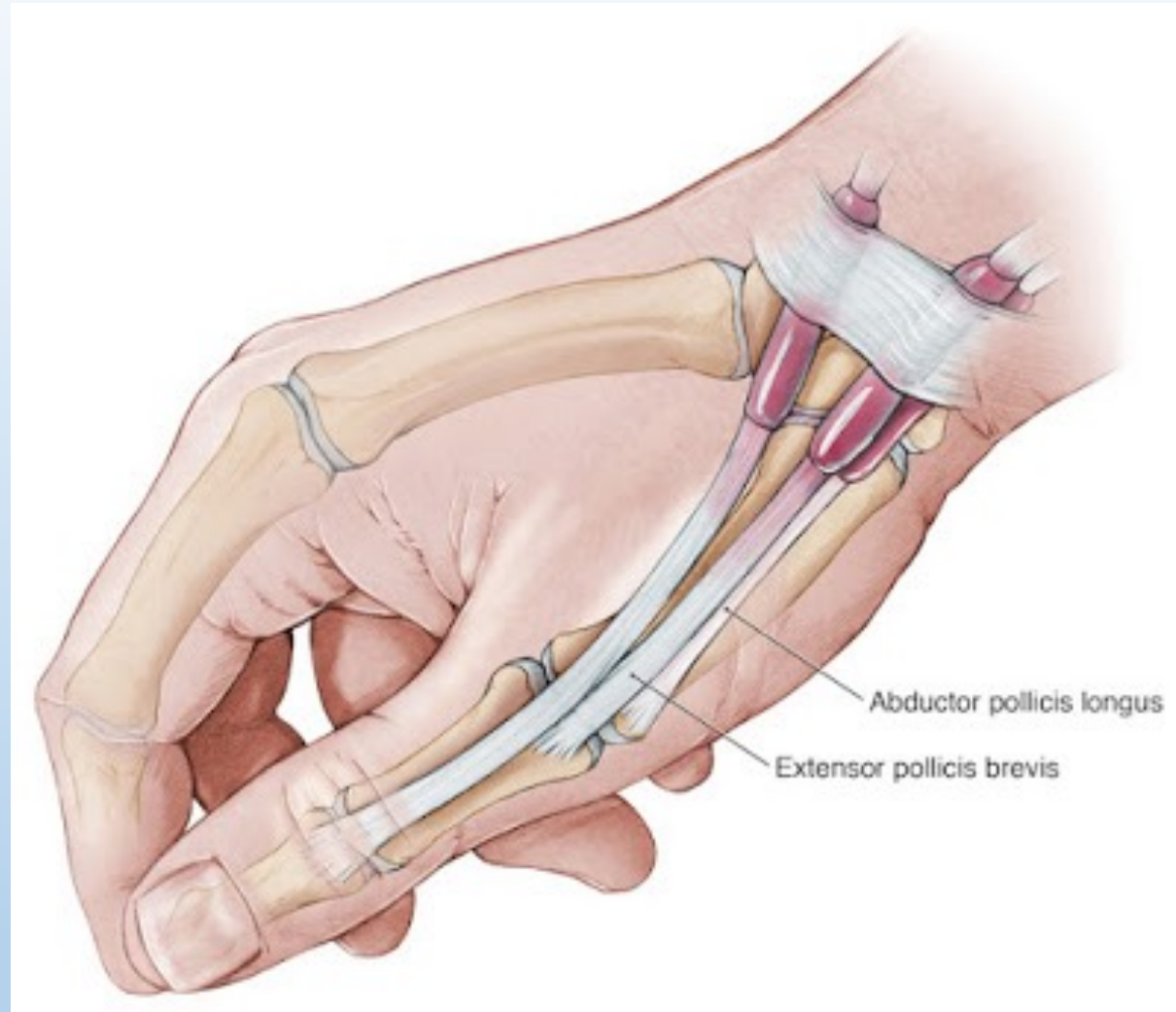


Figure 3: Snuff box Anatomy showing APL and EPB Tendons (Pic taken from online)

Special Test for DeQuervains

- **Finkelstein's test - Clinician asks the patient to make a fist around a thumb and to perform a ulnar deviation. Can also be done passively to add more stress.**

PHYSIOTHERAPY TIPS

- Activity modification- avoiding ulnar deviation and thumb opposition initially.
- Splinting is helpful initially depending on severity of pain.
- Finkelstein's Stretch and eccentric strengthening in pain free zone is recommended.
- MWM- Mobilization with movement is helpful.

Carpal tunnel Syndrome

- Carpal tunnel syndrome (CTS) is a common medical condition that remains one of the most frequently reported forms of median nerve compression. CTS occurs when the median nerve is squeezed or compressed as it travels through the wrist. The syndrome is characterized by pain in the hand, numbness, and tingling in the distribution of the median nerve. Risk factors for CTS include obesity, monotonous wrist activity, pregnancy, genetic heredity, and rheumatoid inflammation.

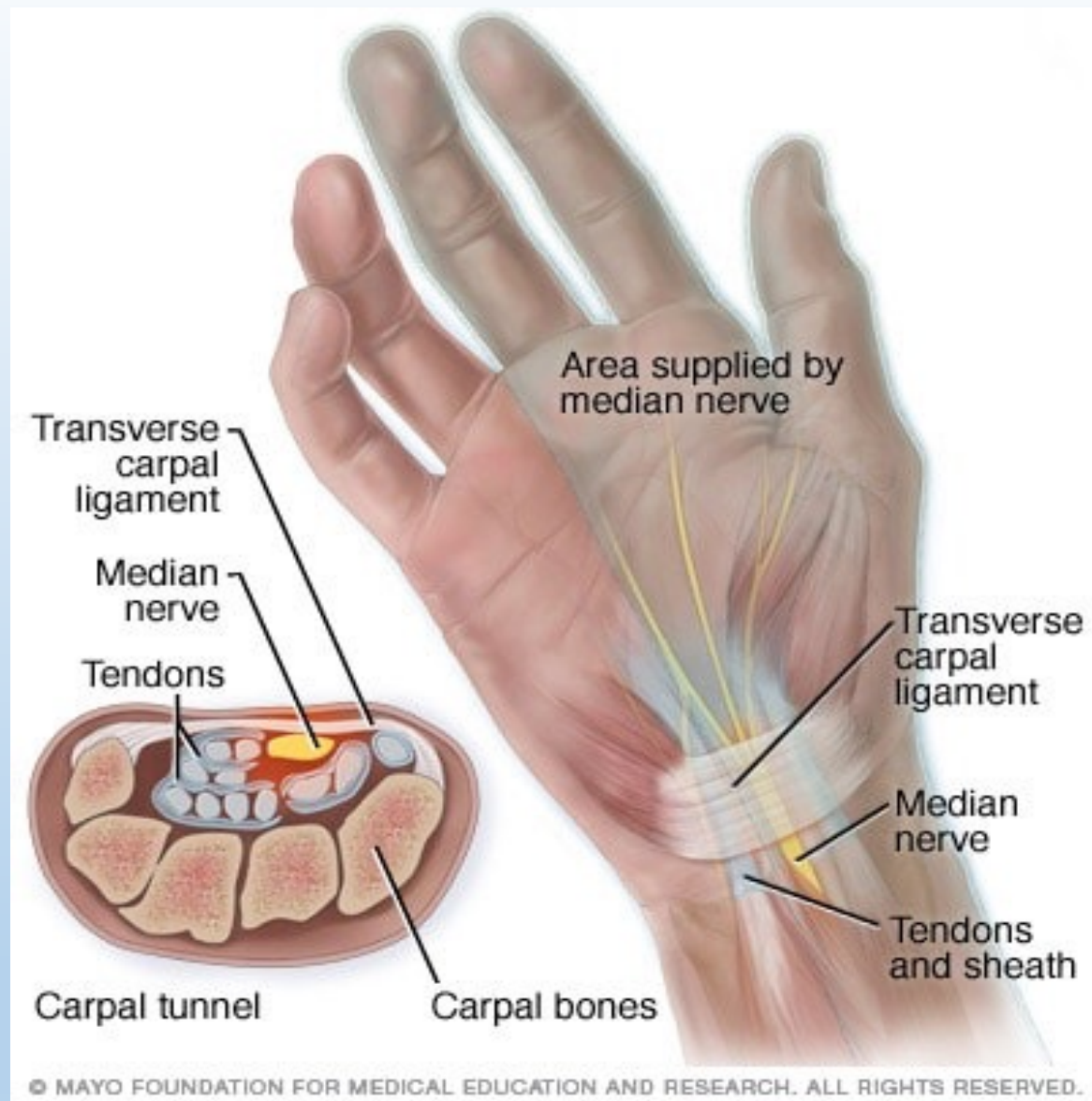


Figure 4: Wrist Anatomy (Pic credit Mayo Foundation)

Special Tests-CTS

- **Tinel's sign-** It is performed by lightly tapping (percussing) over the nerve to elicit a sensation of tingling or "pins and needles" in the distribution of the nerve.
- **Phalen's maneuver-** The patient places flexed elbows on a table, allowing wrists to fall into maximum flexion. The patient is asked to push the dorsal surface of hands together and hold this position for 30-60 seconds. This position will increase the pressure in the carpal tunnel, in effect compressing the median nerve between the transverse carpal ligament and the anterior border of the distal end of the radius.

PHYSIOTHERAPY TIPS

- **Activity Modification and ergonomic modifications**
- **Night Splinting**
- **Medial Nerve Mobilization**
- **Tendon gliding exercises**

Knee Meniscal Injury

- Isolated meniscal tears occur due to rotational or shearing forces placed across the tibiofemoral joint, especially when an increased axial load is placed through the menisci.
- Medial meniscal tears are more common than lateral meniscal tears, possibly due to the relatively decreased mobility of the medial meniscus secondary to its connection to the MCL.
- Effusion that develops more gradually over the course of 24 hours is more indicative of an isolated meniscal tear.

Knee Meniscal Injury

- Pain is typically reported over the anteromedial or anterolateral joint line.
- Depending on the type and extent of the meniscal lesion, there may also be symptoms of locking, clicking, catching, intermittent inability to fully extend the knee, or feeling of the knee giving way

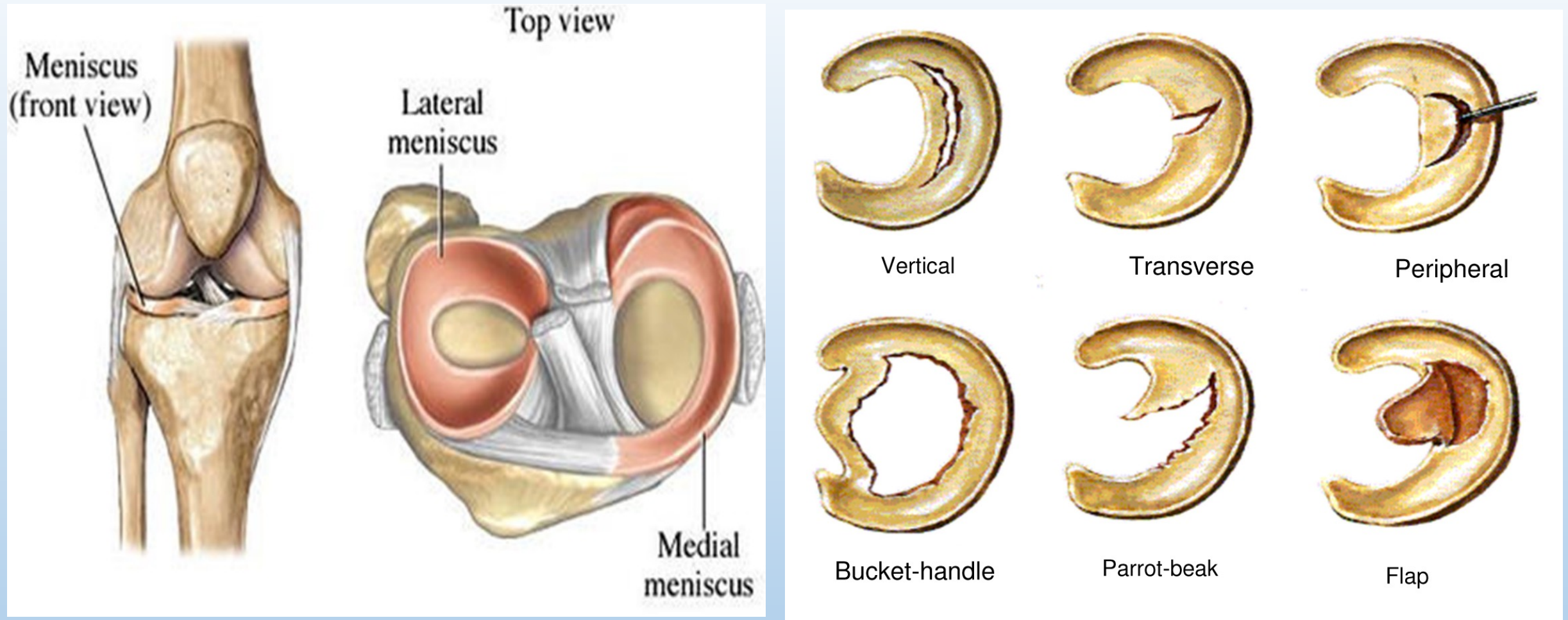


Figure 5: Knee Anatomy and different types of meniscal tears (Pic credit- Brisbane Knee and Shoulder Clinic Online Article)

Examination

- Anteromedial and anterolateral joint line tenderness performed with the patient's knee at the edge of the table at 90 degrees of flexion is 83% sensitive and 83% specific for a meniscal tear.
- Thessaly test is 75% sensitive and 87% specific.
- McMurray's test has a sensitivity of 61% and specificity of 84%.

Special Tests

- **McMurray's Test:** Patient is in supine laying position. From a position of maximal flexion, extend the knee with internal rotation of the tibia and a varus stress (lateral meniscus), then return to maximal flexion and extend the knee with external rotation of the tibia and a valgus stress (medial meniscus).
- **Thessaly test:** The patient stands flat footed on one leg while the examiner supports the patient by holding their outstretched hands. The patient then flexes the knee to 5° and rotates the femur on the tibia medially and laterally three times, while maintaining the 5° flexion. The uninjured leg is tested first so that the patient may be trained with regard to how to keep the knee in the flexed position. The test is then repeated at 20° flexion. The test is considered positive for a meniscus tear if the patient experiences medial or lateral joint line discomfort or a sense of locking/ catching in the knee.

PHYSIOTHERAPY TIPS

- **PEACE & LOVE**
- **Gentle ROM Exercises- towel slides on floor, heel slides in bed, stationary biking- within pain limits.**
- **Quads Sets/ straight leg raise**
- **Mini squats as tolerated.**

Ankle Sprain ATFL/CFL Tears

The three ligaments that compose the lateral complex are the anterior talofibular (ATFL), the calcaneofibular (CFL), and posterior talofibular (PTFL) and they tend to be injured in this order with the anterior talofibular ligament being injured most commonly. The ATFL is the weakest ligament of the lateral ligament complex, and approximately 70% of lateral ankle sprains involve only this ligament and a mechanism of plantar flexion and inversion. The CFL is injured more commonly in dorsiflexion and inversion mechanisms. The posterior talofibular ligament is the least commonly injured of the lateral ligament complex.

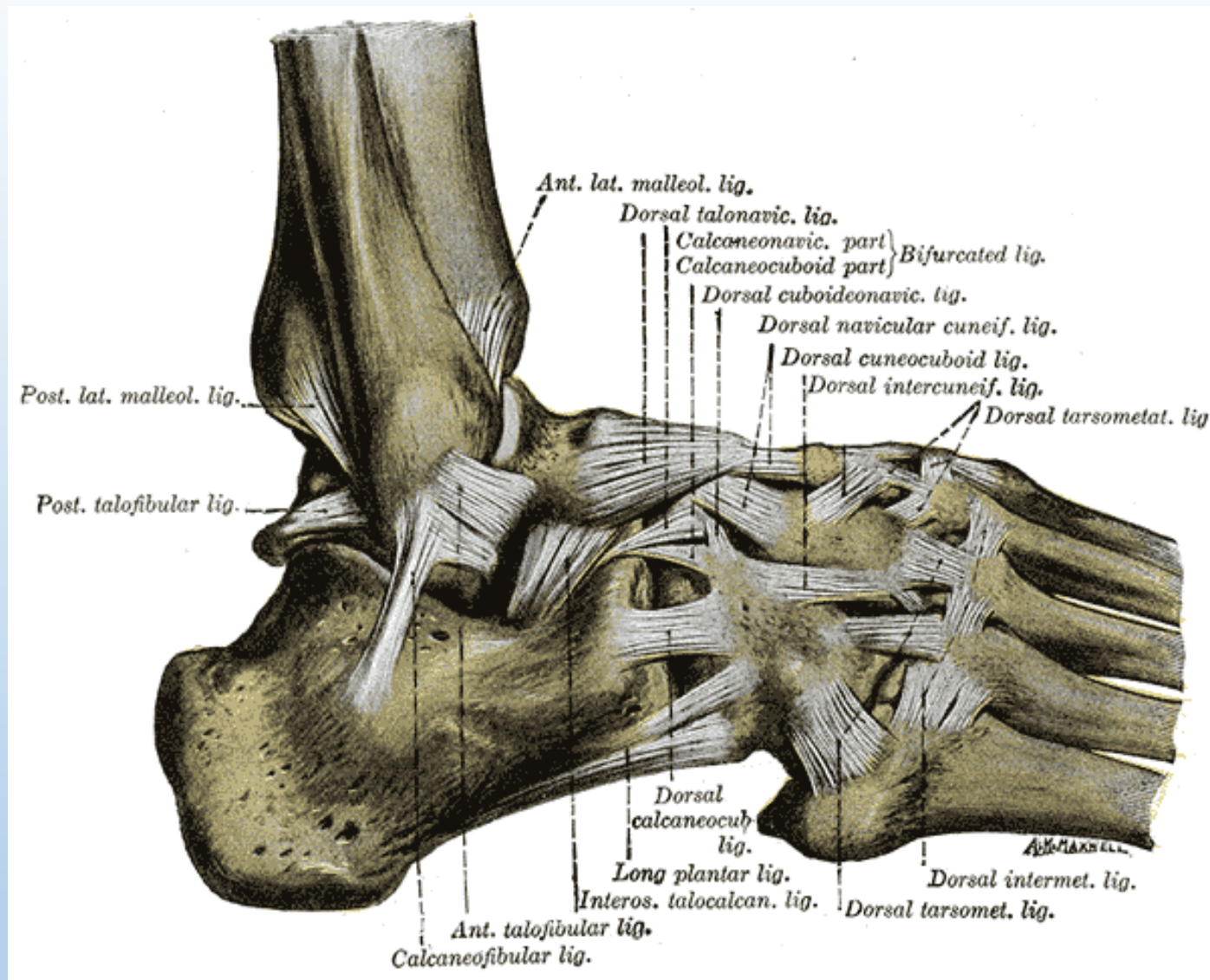


Figure 6: Lateral ankle Anatomy (Pic taken from online source)

Ankle Sprain- Examination

➤The Ottawa Ankle rules

- Tenderness over the posterior edge of the distal 6 cm or tip of the lateral malleolus
- Tenderness over the posterior edge of the distal 6 cm or tip of the medial malleolus
- Inability to bear weight immediately after the injury and for four steps at the time of evaluation.

Special Tests ATFL/CFL

- **Anterior Drawer test:** The patient is supine, the ankle joint is in 20° of flexion, the heel is resting on the palm of the examiner's hand that is resting on the table. thereby stabilizing the calcaneus. The examiner then stabilises the tibia and fibula whilst drawing the calcaneus anteriorly observing the amount of anterior translation at the lateral aspect of the ankle and the change in end feel. The amount of anterior translation and the eventual weakening of the end feel, changing from hard ligamentous to weak elastic, is observed. An anterior translation greater than 1 cm compared to the healthy contralateral ankle and an evident weakening of the end feel are most indicative of a partial rupture or complete rupture of the anterior talofibular ligament.

Special Tests Ankle cont...

- **Talar Tilt Test:** Patient is seated with foot and ankle unsupported. The foot is positioned in 10-20 degrees of plantarflexion. The distal lower leg is stabilized with one hand just proximal to the malleoli and the hindfoot is inverted with the other hand. The lateral aspect of the talus is palpated to determine if tilting occurs. The laxity is compared to the contralateral side.

PHYSIOTHERAPY TIPS

- **Peace & Love**
- **Bracing if ++ Instability**
- **Gentle ROM exercises in pain free ranges using towel/belt, towel slides on floor.**
- **Isometrics**
- **Aerobic exercise like low intensity stationary biking**

Plantar Fasciitis

- PF results from chronic overload of the plantar fascia. It can be due to overuse, as seen in runners and military personnel, or due to excessive loading, as seen in obese (body mass index >30) sedentary individuals and those who stand for prolonged periods of time. Plantar fasciitis (PF) occurs more frequently in individuals with structural foot deformities, including pes planus, pes cavus, and leg length discrepancies, each of which are associated with tightness of the intrinsic foot muscles or heel cord.
- Typically, patients report a dull aching or throbbing pain, which is localized to the area around the origin of the plantar fascia on the calcaneus. This pain is usually worst with the first step in the morning and when getting up from sitting. It often gets better with activity, but then worsens as the activity becomes prolonged.

Examination

The physical examination begins with an evaluation of standing alignment and gait. Particular attention should be paid to the alignment of the hindfoot and the midfoot as individuals with pes planus or pes cavus are predisposed to the development of PF. The plantar fascia and its origin at the calcaneus should be palpated, to elicit tenderness.

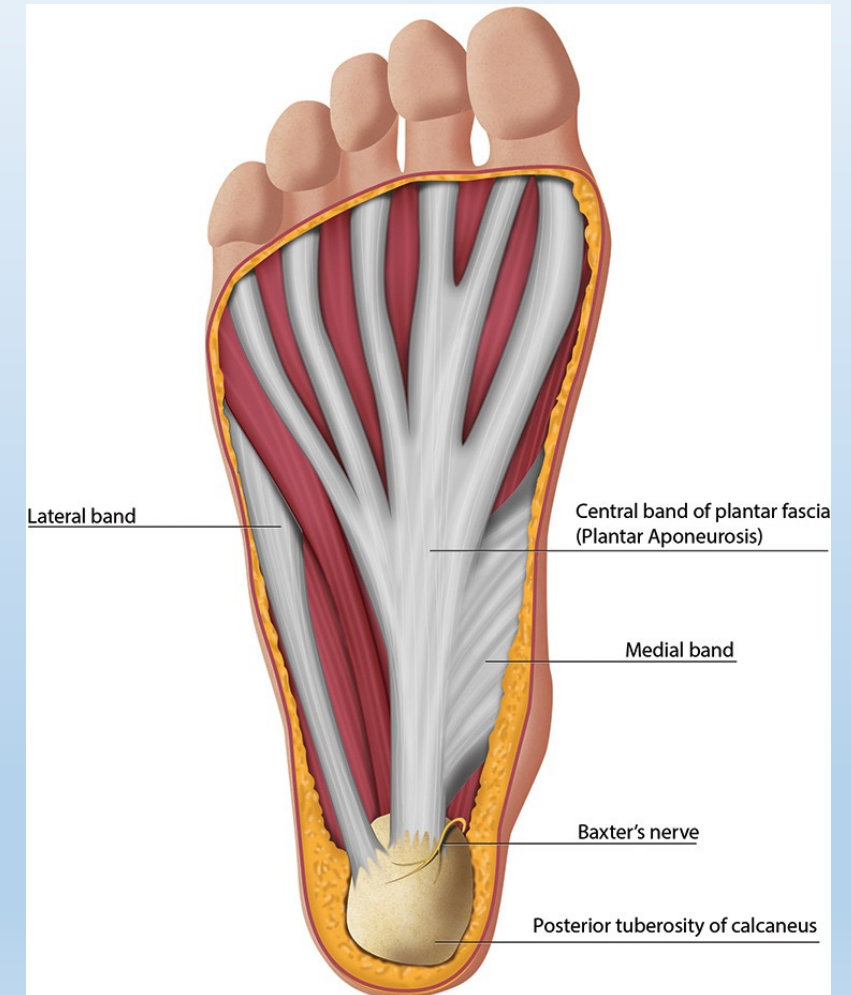


Figure 7: Plantar Fascia Anatomy (Pic taken from online source)

Special Tests-Windlass Test

- **Weight Bearing:** The patient stands on a step stool and positions the metatarsal of heads of the foot to be tested just over the edge of the step. Patient is instructed to place equal weight on both feet. The examiner then passively extends the first metatarsophalangeal joint while allowing the interphalangeal joint to flex.
- **Non-weight bearing:** The patient's knee is flexed to 90° while in a non-bearing position. Examiner stabilized the ankle (with one hand placed just behind the first metatarsal head) and extends the MTP joint while allowing the IP to flex (preventing motion limitations due to short hallucis longus). Positive test if pain was provoked at the end range of the MTP extension.

PHYSIOTHERAPY TIPS

- Plantar fascia stretches using ball/foam roller
- Calf stretches
- Alphabets/writing name with toes; handkerchief picking
- Night Splints, gel heel cushions
- Eccentric calf strengthening
- Extracorporeal shock wave in extreme cases

Homan's Sign/DVT

- Homan's sign test is used to test for Deep Vein Thrombosis (DVT). A positive Homan's sign in the presence of other clinical signs may be a quick indicator of for DVT.
 - Procedure: In performing this test the patient will need to actively extend his knee. Once the knee is extended the examiner raises the patient's straight leg to 10 degrees, then passively and abruptly dorsiflexes the foot and squeezes the calf with the other hand. Deep calf pain and tenderness may indicate presence of DVT. Next steps to rule out DVT can be initiated i.e. ultrasound.

PHYSIOTHERAPY TIPS

- **Prevention through early mobilization post-operatively.**
- **Ankle pumps**
- **Heel raises**
- **Low intensity walking/stationary biking**
- **Medical Emergency- If DVT is Positive**

QUESTIONS/ THANK YOU

References

- Bobowik A-F PZ; 2019; Effectiveness of physiotherapy in carpal tunnel syndrome (CTS), *Advances in Rehabilitation/Postępy Rehabilitacji* (2), 47–58
- Boob M A, Phansopkar P, Somaiya K J (July 31, 2023) Physiotherapeutic Interventions for Individuals Suffering From Plantar Fasciitis: A Systematic Review. *Cureus* 15(7): e42740. DOI 10.7759/cureus.42740
- Caratun R, Rutkowski N.A, Finestone H.M; January 2018; Stubborn heel pain Treatment of plantar fasciitis using high-load strength training; *Canadian Family Physician | Le Médecin de famille canadien* } Vol 64: January 2018
- Carpal Tunnel Syndrome: A Summary of Clinical Practice Guideline Recommendations, Using the Evidence to Guide Physical Therapist Practice; *J Orthop Sports Phys Ther* 2019;49(5):359-360. doi:10.2519/jospt.2019.0501
- Daniel Latt L, Jaffe D.E, Tang Y, Taljanovic M.S; 2020; Evaluation and Treatment of Chronic Plantar Fasciitis; *Foot & Ankle Orthopaedics* 2020, Vol. 5(1) 1-11
- Day J.M, Lucado A.M, Uhl T.L; October 2019; A Comprehensive Rehabilitation Program For Treating Lateral Elbow Tendinopathy; *The International Journal of Sports Physical Therapy* | Volume 14, Number 5 | October 2019 | Page 818
- Dubois B, Esculier J-F; January 2020; Soft tissue Injuries simply need PEACE and LOVE; *Br J Sports Med* Vol 54 No 2
- Genova A, Dix O, Saefan A, et al. (March 19, 2020) Carpal Tunnel Syndrome: A Review of Literature. *Cureus* 12(3): e7333. DOI 10.7759/cureus.7333
- Goel R, Abzug J.M; 2015; de Quervain's tenosynovitis: a review of the rehabilitative options; *American Association of Hand Surgery, Hand* (2015) 10:1–5
- Goff J.D, Do, Crawford R; September 15, 2011; Diagnosis and Treatment of Plantar Fasciitis; *American Family Physician*, Volume 84, Number 6, September 15, 2011
- Ijaz M.J, Karimi H, Ahmad A, Gillani S.A, Anwar N and Chaudhary M.A; 2022; Comparative Efficacy of Routine Physical Therapy with and without Neuromobilization in the Treatment of Patients with Mild to Moderate Carpal Tunnel Syndrome; *Hindawi BioMed Research International* Volume 2022, Article ID 2155765, 8 pages <https://doi.org/10.1155/2022/2155765>
- Jain N.B., Wilcox R, Katz J.N., Higgins L.D.; 2013 January; Clinical Examination of the Rotator Cuff; *PM R*. 5(1): . doi:10.1016/j.pmrj.2012.08.019

References Contd.

- Mattacola C.G, Dwyer M.K.; 2002; Rehabilitation of the Ankle After Acute Sprain or Chronic Instability Journal of Athletic Training;37(4):413–429 q by the National Athletic Trainers' Association, Inc www.journalofathletictraining.org
- McBain B, Rio E, Cook J, Sanderson J and Docking S; 2023; Isometric thumb extension exercise as part of a multimodal intervention for de Quervain's syndrome: A randomised feasibility trial, Hand Therapy Vol. 28(2) 72–84
- MOON Shoulder Nonoperative Rehabilitation for Full Thickness Rotator Cuff Tears – Patient Home Therapy Booklet
- Mordecai S.C, Al-Hadithy N, Ware H.E, Gupte C.M, July 2014; Treatment of meniscal tears: An evidence based approach; World J Orthop 2014 July 18; 5(3): 233-241
- Plantar Fasciitis Will Physical Therapy Help My Foot Pain?; J Orthop Sports Phys Ther 2017;47(2):56. doi:10.2519/jospt.2017.0501
- Poenaru D, Badoiu S.C, Ionescu A.M; 2021; Therapeutic considerations for patients with chronic plantar fasciitis (Review); Medicine International 1: 9, 2021
- Polzer H, Kanz K.G, Prall W.C, Haasters F, Ockert B, Mutschler W; Diagnosis and treatment of acute ankle injuries: development of an evidence-based algorithm; 2012; Stefan Grote Munich University Hospital, Dept. Trauma Surgery - Innenstadt Campus, Ludwig-Maximilians-University, Munich, Germany; Orthopedic Reviews; volume 4:e5
- Raj MA, Bubnis MA. Knee Meniscal Tears. [Updated 2023 Jul 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK431067/>
- Safran-Norton et al; 2019; A consensus-based process identifying physical therapy and exercise treatments for patients with degenerative meniscal tears and knee OA: the TeMPO physical therapy interventions and home exercise program; BMC Musculoskeletal Disorders (2019) 20:514
- Zaworski K; Functional Diagnostics and Physiotherapeutic Treatment in De Quervain Syndrome; April 30, 2020; Health Problems of Civilization; ISSN 2353-6942, <https://doi.org/10.5114/hpc.2020.95502>