

Sports Injuries

- Sports injuries → injuries that occur in athletic activities or exercising
- Site
 - Soft tissue
 - Hard tissue
- Onset
 - Acutely → direct “contact”
 - Overuse → indirect “non-contact”
- Soft tissue injury → When soft tissue experiences trauma, the dead and damaged cells release chemicals, which initiate an inflammatory response. Inflammation is characterized by pain, localized swelling, heat, redness and a loss of function. Small blood vessels are damaged and opened up, producing bleeding within the tissue. The inflammatory stage is therefore the first phase of healing. However, too much of an inflammatory response in the early stage can mean that the healing process takes longer and a return to activity is delayed. Sports injury treatments are intended to minimize the inflammatory phase of an injury, so that the overall healing process is accelerated.
- Traumatic injuries can include:
 - Contusion or bruise – damage to small blood vessels which causes bleeding within the tissues.
 - Strain – trauma to a muscle due to overstretching and tearing of muscle fibers
 - Sprain – an injury in a joint, caused by the ligament being stretched beyond its own capacity
 - Wound – abrasion or puncture of the skin
 - Bone fracture – break(s) in the bone
 - Head injury – concussions or serious brain damage
 - Spinal cord injury – damage to the central nervous system or spine
 - Cramp – a strong muscle contraction that can be very painful lasting in few minutes but massaging the muscles can relieve the pain
- In sports medicine, a catastrophic injury is defined as severe trauma to the human head, spine, or brain.
- Risk Factors
 - Intrinsic (Personal) Factors:
 - Gender
 - Age, weight/body fat, height
 - Congenital Irregularities: flat feet, high arch, knocked knees, bow leggedness ” Genu varum”
 - Lack of muscular flexibility, coordination, balance, speed, strength, and endurance
 - Malnutrition and lack of sleep
 - Extrinsic Factors:
 - Sports specific and protective equipment: helmet, mouth guard, goggles, shin guards
 - Condition of sports setting: maintenance of floor/field and weather environment
 - Insufficient pre-game warm up, overtraining and fatigue

- Common sports injuries:
 - Concussion – severe head injury where the brain moves violently within the skull so that brain cells all fire at once, much like a seizure
 - Muscle cramps – a sudden tight, intense pain caused by a muscle locked in spasm. involuntary and forcibly contracted muscle that does not relax
 - ACL sprains – The anterior cruciate ligament (ACL) is a ligament involved in knee stabilization. An ACL rupture can occur when the foot is planted and the knee twists to change direction.
 - ACL tears – The anterior cruciate ligament; one of four major knee ligaments necessary for comfortable knee movement, tears, causing major pain and causes the knee to "give way".
 - Ankle sprain – The ligaments that hold the ankle bones in place can easily be overstretched.
 - Shin splints – The tissue that attaches the muscles of the lower leg to the shin bone may be pulling away from the bone, or it may be inflamed from overuse.
 - Muscle strains – tears in muscle that cause pain and or loss of function

Shoulder

Clavicle fracture

- It is often caused by a fall onto an outstretched upper limb or hand (a FOOSH), a fall onto a shoulder, or a direct blow to the clavicle
- Most common sites → midshaft (middle $\frac{1}{3}$) or distal $\frac{1}{3}$
 - Distal $\frac{1}{3}$ → AC joint → maximum tenderness on AC joint, distal part of the clavicle
- Distal Third Clavicle Fractures is associated with trauma and sports injury
- Usually occur after a direct, compressive force applied to the shoulder, after a fall or trauma → fall on adducted shoulder
- Relevant anatomy
 - AC joint stability consist of:
 - Static stabilizing factors
 - Acromioclavicular ligament
 - Function → provides anterior + posterior translation stability
 - Components: superior, inferior, anterior, posterior
 - Clinical significance → superior and posterior ligaments are most important
 - Coracoclavicular ligaments (trapezoid and conoid)
 - Function → provides superior + inferior translation stability
 - Components → trapezoid ligament (lateral), conoid ligament (medial, strongest)
 - Capsule
 - Dynamic stabilizing factors
 - Deltoid and trapezius act as additional stabilizers
- Coracoid → ant, inf and medial to acromion, palpable in the deltopectoral groove between the deltoid and pectoralis major muscles. known as the "Surgeon's Lighthouse" because it serves as a landmark to avoid neurovascular damage. Major

neurovascular structures enter the upper limb medial to the coracoid process, so that surgical approaches to the shoulder region should always take place laterally to the coracoid process.

- Acromion → more posterior.
- If the coracoclavicular ligaments is injured there will be displacement “bulging of the clavicle”, as the coracoclavicular ligaments is more important in stabilizing the clavicle in superior + inferior translation stability
- The lateral fragment is pulled down by the weight of the arm, while the medial fragment is held up by the sternomastoid muscle
- If the clavicle is not bulging and the x-ray is normal, and there is tenderness and pain→ suspect AC joint injury
- The muscles involved in clavicle fractures include the deltoid, trapezius, subclavius, sternocleidomastoid, sternohyoid, and pectoralis major muscles.
- The ligaments involved include the conoid ligament and trapezoid ligament.
- Presentation
 - Symptoms:
 - Tip of shoulder pain, Sharp pain when movement is made
 - Swelling
 - Often, after the swelling has subsided, the fracture can be felt through the skin.
 - Referred pain: dull to extreme ache in and around clavicle area, including surrounding muscles
 - Possible nausea, dizziness, and/or spotty vision due to extreme pain
 - Physical exam
 - AC joint deformity
 - Tenting of skin (impending open fracture)
- A computed tomography (CT) scan is occasionally needed to define the fracture configuration and to exclude a sternoclavicular dislocation
- Treatment
 - Analgesia for the pain and tetanus vaccination for any skin breaks. Antibiotics may be used if the bone breaks through the skin. Often, they are treated without surgery. In severe cases, surgery may be done.
 - Provide a sling, and pain relief, and to allow the bone to heal itself, monitoring progress with X-rays every week or few weeks. Surgery is employed in 5–10% of cases.
 - For the usual middle-third fracture, accurate closed reduction is neither possible nor essential. In most cases all that is needed is to support the arm in a sling until the pain subsides (usually 1–3 weeks).
 - Thereafter, active shoulder exercises should be encouraged.
 - By contrast, outer-third fractures are quite troublesome and may need open reduction and internal fixation.
- Complications:
 - Malunion is inevitable in displaced fractures; in children the bone is soon remodelled, but in adults the slight deformity has to be accepted unless there is a very unsightly bump with skin irritation.
 - Non-union sometimes occurs in middle-third fractures and is treated by bone graft and plating.

Shoulder impingement syndrome

- Also called subacromial impingement, painful arc syndrome, supraspinatus syndrome, swimmer's shoulder, and thrower's shoulder, is a clinical syndrome which occurs when the tendons of the rotator cuff muscles become thickened "space become relatively narrowed" and irritated as they pass through the subacromial space, the passage beneath the acromion. This can result in pain, weakness and loss of movement at the shoulder. Inflammation comes later on as tendinitis.
- The pain is often worsened by shoulder overhead movement and may occur at night, especially if the patient is lying on the affected shoulder
- The range of motion at the shoulder may be limited by pain. A painful arc of movement may be present during forward elevation of the arm from 60° to 120°. Passive movement at the shoulder will appear painful when a downwards force is applied at the acromion, but the pain will ease once the downwards force is removed
- When the arm is raised, the subacromial space (gap between the anterior edge of the acromion and the head of the humerus) narrows, through which the supraspinatus muscle tendon passes. Anything that causes further narrowing has the tendency to impinge the tendon and cause an inflammatory response, resulting in impingement syndrome. This can be caused by bony structures such as subacromial spurs (bony projections from the acromion), osteoarthritic spurs on the acromioclavicular joint, and variations in the shape of the acromion
- Muscles composing rotator cuff → Supraspinatus, Infraspinatus, Teres minor, Subscapularis.
- Diagnosis
 - History and physical exam:
 - On physical exam, the physician may twist or elevate the patient's arm to test for reproducible pain (Neer sign and Hawkins-Kennedy test).
 - Empty Can Test is used to assess the supraspinatus muscle and tendon. The patient's arm should be elevated to 90 degrees in the scapular plane, with the elbow extended, full internal rotation, and pronation of the forearm. This results in a thumbs-down position, as if the patient were pouring liquid out of a can. The therapist should stabilize the shoulder while applying a downwardly directed force to the arm, the patient tries to resist this motion. This test is considered positive if the patient experiences pain or weakness with resistance.
 - Empty can test:
 - <https://www.youtube.com/watch?v=D933tO-Anao>
 - <https://www.youtube.com/watch?v=qjHOqydDhxo>
 - Neer test → https://www.youtube.com/watch?v=U8-yLHQ_JaM
 - The physician may inject lidocaine (usually combined with a steroid) into the bursa, and if there is an improved range of motion and decrease in pain, this is considered a positive "Impingement Test". It not only supports the diagnosis for impingement syndrome, but it is also therapeutic
 - Plain x-rays
 - MRI is the best imaging test prior to arthroscopic surgery.
- Treatment:
 - Usually treated conservatively, but sometimes it is treated with arthroscopic surgery or open surgery

- Conservative treatment includes rest, cessation of painful activity, and physical therapy
- Therapeutic injections of corticosteroid and local anesthetic may be used for persistent impingement syndrome

Elbow

Tennis elbow' and 'golfer's elbow

- The cause of these common disorders is unknown, but they are seldom due to either tennis or golf.
- Most cases occur spontaneously as part of a natural degenerative process in the tendon aponeuroses attached to either the lateral or medial humeral epicondyle.
- Pain is probably due to a vascular repair process similar to that of rotator cuff tendinitis around the shoulder. Often there is a history of occupational stress or unaccustomed activity, such as house painting, carpentry or other activities that involve strenuous wrist movements and forearm muscle contraction
- More in amateur players than professional players
- Treatment
 - Rest, or avoiding the precipitating activity, may allow the lesion to heal. A splint and physiotherapy may help. If pain is severe, the area of maximum tenderness is injected with a mixture of corticosteroid and local anaesthetic

Tennis elbow

- Tennis elbow or lateral epicondylitis is a condition in which the outer part of the elbow becomes sore and tender at the lateral epicondyle.
- Signs and symptoms
 - Pain on the outer part of the elbow (lateral epicondyle), initiated or aggravated by movements such as pouring out tea, turning a stiff door-handle, shaking hands or lifting with the forearm pronated.
 - Point tenderness over the lateral epicondyle
 - Pain from gripping and movements of the wrist, especially wrist extension (e.g. turning a screwdriver) and lifting movements
- The elbow looks normal and flexion and extension are full and painless. Tenderness is localized to a spot just in front of the lateral epicondyle, and pain is reproduced by getting the patient to extend the wrist against resistance, or simply by passively flexing the wrist so as to stretch the common extensors.
- Tennis elbow is a type of repetitive strain injury resulting from tendon overuse and failed healing of the tendon

Golfer's elbow

- Medial epicondylitis, is tendinosis of the medial epicondyle
- The condition is called Golfer's Elbow because in making a golf swing this tendon is stressed, especially if a non-overlapping (baseball style) grip is used; many people, however, who develop the condition have never handled a golf club. It is also

sometimes called Pitcher's Elbow due to the same tendon being stressed by the throwing of objects such as a baseball, but this usage is much less frequent

- Owing to involvement of the common tendon of origin of the wrist flexors, pain is reproduced by passive extension of the wrist in supination.
- Treatment
 - NSAIDs: ibuprofen, naproxen or aspirin
 - Heat or ice
 - A counterforce brace or "forearm strap" to reduce strain at the elbow epicondyle, to limit pain provocation and to protect against further damage.

Knee

ACL

- Anterior cruciate ligament injury is when the anterior cruciate ligament (ACL) is either stretched, partially torn, or completely torn. Injuries are most commonly complete tears.
- ACL direction, described from proximal to distal, → anteriorly, distally, medially. Starts from the medial surface of the lateral femoral condyle to tibial spine.
- Hamstrings is more important in stabilizing ACL deficient knee
- Quadriceps is more important in stabilizing PCL deficient knee
- ACL tear aspiration → blood (acutely)
 - Meniscal tear aspiration → synovial fluid
- Signs and symptoms
 - Symptoms include pain, a popping sound during injury “طقة”, instability of the knee, and joint swelling. Swelling generally appears within a couple of hours.
 - An individual may feel or hear a "pop" in their knee during a twisting movement or rapid deceleration, followed by an inability to continue participation in the sport and early swelling from hemarthrosis. This combination is said to indicate a 90% probability of rupture of the anterior cruciate ligament. An individual may experience instability in the knee once they resume walking and other activities, and they may feel their knee is "giving out".
 - Severe pain when bending the knee and buckling or locking of the knee during movement.
 - The player cannot complete the game → off field
 - There will be acute swelling within hours → because ACL is vascular structure “middle branch of geniculate artery” (note that meniscus is avascular → no bleeding so no acute swelling)
 - Knee flexion decrease pain → less pressure on the joint
 - Chronic Signs and symptoms → knee gives away رجلك بتخونك و بتقلت
 - Swelling → synovial fluid
 - Pain → mild pain
 - Click because of concomitant meniscal injury
- In approximately 50% of cases other structures of the knee such as ligaments, cartilage, or meniscus are damaged
- The underlying mechanism often involves

- Noncontact twisting injury (external rotation of femur against fixed tibia → most common)
- A rapid change in direction, sudden stop, landing following jumping, or direct contact
- Noncontact >>> contact injury
- Diagnosis is typically by physical examination and supported by (MRI)
- Prevention is by neuromuscular training and core strengthening.
- Risk factors:
 - ACL injury is most commonly a non-contact injury that occurs when an individual stop suddenly or plants his or her foot hard into the ground. ACL injury also has been linked to heavy or stiff-legged landing; the knee rotating while landing, especially when the knee is in an unnatural position.
 - Significantly, many ACL injuries occur in athletes landing flat on their heels. This movement directs the forces directly up the tibia into the knee, while the straight-knee position places the anterior femoral condyle on the back-slanted portion of the tibia. The resultant forward slide of the tibia relative to the femur is restrained primarily by the now-vulnerable ACL.
 - ACL injuries also can be caused by direct contact or trauma, such as in a motor vehicle collision or from a tackle in football. A severe form of ACL injury caused by direct contact is called the "unhappy triad" also known as the "terrible triad," or "O'Donoghue's triad."
 - The "unhappy triad" involves injury of the anterior cruciate ligament, the medial collateral ligament, and the medial meniscus.
 - Women in sports such as association football, basketball, and tennis are significantly more prone to ACL injuries than men. The discrepancy has been attributed to gender differences in anatomy, general muscular strength, reaction time of muscle contraction and coordination, and training techniques, hormonal effect
 - More neuromuscular instability
 - Increased ligamentous laxity
 - Narrow ACL
 - Muscle strength of quadriceps greater than hamstring
 - More valgus deformity in females
 - Intercondylar groove smaller in females
 - More in winter
 - More on العشب الصناعي
- Diagnosis
 - The anterior drawer test, and Lachman test are used during the clinical examination of suspected ACL injury. The Lachman test is recognized by most authorities as the most reliable and sensitive test, and usually superior to the anterior drawer test
 - Drawer test
 - The tibia is then drawn forward anteriorly.
 - If the tibia pulls forward or backward more than normal, the test is considered positive. Excessive displacement of the tibia anteriorly suggests that the ACL is injured, whereas excessive posterior displacement of the tibia may indicate injury of the posterior cruciate ligament.
 - Lachman test

- Bridge-enhanced ACL repair (the "BEAR" procedure. Using a sponge filled with the patient's blood to stimulate healing and reconnection of the ACL).
- Autograft (from the patient's body), hamstring (gracilis and semitendinosus) or part of the patellar ligament are the most common donor tissues used in autografts. Because the tissue used in an autograft is the patient's own, the risk of rejection is minimal.
- Allograft (from another body, either a cadaver or a live donor) → The patellar ligament, tibialis anterior tendon, or Achilles tendon may be recovered from a cadaver and used in ACL reconstruction. The Achilles tendon, because of its large size, must be shaved to fit within the joint cavity.
- Open surgery → arthrotomy
- Arthroscopy → most common

PCL

- Posterior cruciate ligament injury
- The function of the PCL is to prevent the femur from sliding off the anterior edge of the tibia and to prevent the tibia from displacing posterior to the femur. Common causes of PCL injuries are direct blows to the flexed knee, such as the knee hitting the dashboard in a car accident or falling hard on the knee, both instances displacing the tibia posterior to the femur.
- PCL direction is → posteriorly, distally, laterally; and it starts from medial femoral epicondyle to Posterior tibia, below the articular surface
- The posterior drawer test is one of the tests used by doctors and physiotherapists to detect injury to the PCL.
- Surgery to repair the posterior cruciate ligament is controversial due to its placement and technical difficulty
- Less common than ACL
- Posterior cruciate ligament. It originates from the lateral edge of the medial femoral condyle and the roof of the intercondylar notch then stretches, at a posterior and lateral angle, toward the posterior of the tibia just below its articular surface.
- Treatment
 - It is possible for the PCL to heal on its own. Surgery is usually required in complete tears of the ligament. Surgery usually takes place after a few weeks, in order to allow swelling to decrease and regular motion to return to the knee. A procedure called ligament reconstruction is used to replace the torn PCL with a new ligament, which is usually a graft taken from the hamstring or Achilles tendon from a host cadaver. An arthroscope allows a complete evaluation of the entire knee joint, including the patella, the cartilage surfaces, the meniscus, the ligaments (ACL & PCL), and the joint lining. Then, the new ligament is attached to the bone of the thigh and lower leg with screws to hold it in place

Meniscal tear

- A tear of a meniscus is a rupturing of one or more of the fibrocartilage strips in the knee called menisci. When doctors and patients refer to "torn cartilage" in the knee, they actually may be referring to an injury to a meniscus at the top of one of the tibiae
- Acute ACL → more commonly associated with lateral meniscus tear
- Chronic ACL → more commonly associated with medial meniscus tear
- Mechanism of injury: contact trauma.
- Acute complaint: pain, swelling but after several hrs, locking, click (pop).
- Chronic complaint: locking and click
- Timing
 - Acute → in pediatric patients → needs surgery
 - Chronic → in old patients → not necessarily needs surgery
- Types:
 - Vertical tear
 - Bucket-handle (special type of vertical tear)
 - Horizontal tear
 - Radial tear
 - Meniscal cyst associated with horizontal tear if no tear we call it meniscal ganglion.
- Meniscus is avascular while ACL and PCL → vascular
- Meniscus is repaired (sutured), but not reconstructed
- A tear of the medial meniscus can occur as part of the unhappy triad, together with a tear of the anterior cruciate ligament and medial collateral ligament.
- Meniscus repair rate of healing is higher if there is accompanying ACL reconstruction, as this ACL reconstruction will cause bleeding (vascular structure) and bleeding will stimulate healing
- Physical examination:
 - The knee is examined for swelling. In meniscal tears, pressing on the joint line on the affected side typically produces tenderness. The McMurray test involves pressing on the joint line while stressing the meniscus (using flexion–extension movements and varus or valgus stress). Similar tests are the Steinmann test (with the patient sitting) and the Apley grind test (a grinding maneuver while the person lies prone and the knee is bent 90°). Bending the knee (into hyperflexion if tolerable), and especially squatting, is typically a painful maneuver if the meniscus is torn. The range of motion of the joint is often restricted.
- Dx → MRI
- Tx
 - Presently, treatments make it possible for quicker recovery. If the tear is not serious, physical therapy, compression, elevation and icing the knee can heal the meniscus. More serious tears may require surgical procedures. Surgery, however, does not appear to be better than non-surgical care.
 - Initial treatment may include physical therapy, bracing, anti-inflammatory drugs, or corticosteroid injections to increase flexibility, endurance, and strength
 - Surgery: open or arthroscopic
 - Repair or removal (meniscectomy) or reconstruction (transplantation)

General notes

- Presentation
 - Instability of knee joint, knee gives way → ACL
 - Locked knee especially during flexion (inability to fully extend the knee) → meniscal tear “bucket handle”
- Valgus stresses are resisted by the fascia lata, pes anserinus, superficial and deep layers of the medial collateral ligament (MCL) and the tough posteromedial part of the capsule.
- The main checks to varus angulation are the iliotibial tract and the lateral collateral ligament (LCL).
- Ligament injury → The knee is painful and, in contrast to the story in meniscal injury, swelling appears almost immediately. Tenderness is most acute over the torn ligament, and stressing one or other side of the joint may produce excruciating pain.
- Partial tears permit no abnormal movement, but the attempt always causes pain. Complete tears permit abnormal movement, which sometimes causes surprisingly little pain.
- Sideways tilting (varus/valgus) is examined, first with the knee at 30 degrees of flexion and then with the knee straight. Movement is compared with the normal side. If the knee angulates only in slight flexion, there is probably an isolated tear of the collateral ligaments; if it angulates in full extension, there is almost certainly rupture of the capsule and cruciate ligaments as well as the collateral ligament.
- Anteroposterior stability is assessed first by placing the knees at 90 degrees with the feet resting on the couch and looking from the side for posterior sag of the proximal tibia; when present, this is a reliable sign of PCL instability. The Lachman test is a reliable way of showing up ACL instability; anteroposterior glide is tested with the knee flexed 20-30 degrees
- Tx
 - Sprains and partial tears → intact fibers splint the torn ones and spontaneous healing will occur. The hazard is adhesions, so active exercise is prescribed from the start. Aspirating the hemarthrosis may help ease the pain and is necessary if the skin is threatened. However, strict aseptic conditions must be ensured.
 - Complete tears
 - Isolated tears of the MCL or the LCL can be treated as above
 - Isolated tears of the ACL may be treated by early operative reconstruction if the individual is a professional sportsman
 - Isolated tears of the PCL are usually treated conservatively.
- X-rays
 - Plain x-rays may show that the ligament has avulsed a small piece of bone – the MCL usually from the femur, the LCL from the fibula, the ACL from the tibial spine and the PCL from the back of the upper tibia. Another sign is an avulsion fracture off the edge of the lateral tibial condyle (the so-called Segond’s fracture), indicating an ACL injury.
- Complications
 - Adhesions
 - If partial ligament tear is not actively exercised, torn fibers stick to intact fibers and to bone. The knee ‘gives way’ with catches of pain; localized tenderness is present, and pain occurs on medial or lateral

rotation. The obvious confusion with a torn meniscus can be resolved by repeating an MRI.

- Instability
 - Instability tends to get worse and ultimately predisposes to osteoarthritis (OA).
- Medial collateral ligament→ Its primary function is to resist valgus forces on the knee.
- An MCL injury can be very painful and is caused by a valgus stress to a slightly bent knee, often when landing, bending or on high impact. It may be difficult to apply pressure on the injured leg for at least a few days.

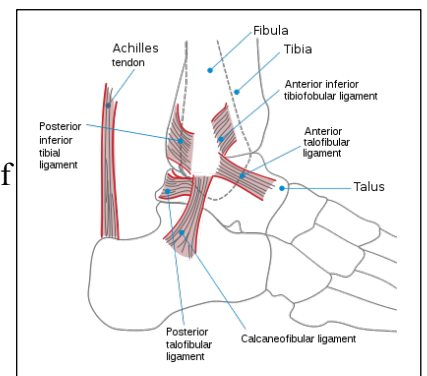
Ankle

Ankle sprain

- Sprained ankle, also known as an ankle sprain, twisted ankle.
- Mostly Inversion (lateral) ankle sprain, as fibula reduce eversion movement and strain
- Signs and symptoms
 - Knowing the symptoms that can be experienced with a sprain is important in determining that the injury is not really a break in the bone. When a sprain occurs, blood vessels will leak fluid into the tissue that surrounds the joint. White blood cells responsible for inflammation migrate to the area, and blood flow increases as well. Along with this inflammation, swelling from the fluid and pain is experienced. The nerves in the area become more sensitive when the injury is suffered, so pain is felt as throbbing and will worsen if there is pressure placed on the area. Warmth and redness are also seen as blood flow is increased. Also present is a decreased ability to move the joint, and difficulty using the affected leg.
- Cause
 - Movements - especially twisting, turning, and rolling of the foot - are the primary cause of an ankle sprain
- Most common ligaments affected in ankle sprain
 - Anterior talofibular ligament “ATFL” > calcaneofibular ligaments > Posterior talofibular ligament “PTFL”
 - Calcaneofibular ligaments is the strongest ligament in ankle joint
- Classification
 - Ankle sprains are classified grade 1, 2, and 3. Depending on the amount of damage or the number of ligaments that are damaged, each sprain is classified from mild to severe.
 - Grade 1 sprain is defined as mild damage to a ligament or ligaments without instability of the affected joint.
 - Grade 2 sprain is considered a partial tear to the ligament, in which it is stretched to the point that it becomes loose.
 - Grade 3 sprain is a complete tear of a ligament, causing instability in the affected joint. Bruising may occur around the ankle.
 - Inversion (lateral) ankle sprain
 - The most common type of ankle sprain occurs when the foot is inverted too much, affecting the lateral side of the foot. When this type of ankle sprain happens, the outer, or lateral, ligaments are stretched

too much. The anterior talofibular ligament is one of the most commonly involved ligaments in this type of sprain. Approximately 70-85% of ankle sprains are inversion injuries.

- When the ankle becomes inverted, the anterior talofibular and calcaneofibular ligaments are damaged. This is the most common ankle sprain.
- Eversion (medial) ankle sprain
 - A less common type of ankle sprain is called an eversion injury, affecting the medial side of the foot. This happens when the foot, instead of the ankle rotating medially resulting in an eversion (the foot being rolling to the inside), the ankle rotates laterally resulting in an eversion (when the foot rolls to the outside). When this occurs, the medial, or deltoid, ligament is stretched too much.
- Diagnosis
 - The diagnosis of a sprain relies on the medical history, including symptoms, as well as making a differential diagnosis, mainly in distinguishing it from strains or bone fractures. The Ottawa ankle rule is a simple, widely used rule to help differentiate fractures of the ankle or mid-foot from other ankle injuries that do not require x-ray radiography. It has a specificity of nearly 100%, meaning that a patient who tests negative, according to the rule almost certainly does not have an ankle fracture.
 - Ottawa rule
 - Ankle X-ray is only required if:
 - There is any pain in the malleolar zone; and,
 - Any one of the following:
 - Bone tenderness along the distal 6 cm of the posterior edge of the tibia or tip of the medial malleolus, OR
 - Bone tenderness along the distal 6 cm of the posterior edge of the fibula or tip of the lateral malleolus, OR
 - An inability to bear weight both immediately and in the emergency department for four steps.
 - Additionally, the Ottawa ankle rules indicate whether a foot X-ray series is required. It states that it is indicated if:
 - There is any pain in the midfoot zone; and,
 - Any one of the following:
 - Bone tenderness at the base of the fifth metatarsal (for foot injuries), OR
 - Bone tenderness at the navicular bone (for foot injuries), OR
 - An inability to bear weight both immediately and in the emergency department for four steps.
- Treatment
 - Initial treatment commonly consists of rest, icing, compression and elevation (which is often referred to by the mnemonic RICE or sometimes PRICE with P being "protection"). RICE helps limit the amount of swelling to the area, and "facilitates venous and lymphatic drainage"



Shin splints, also known as **medial tibial stress syndrome (MTSS)**:

- Is "pain along the inner edge of the shinbone (tibia)." Shin splints are usually caused by repeated trauma to the connective muscle tissue surrounding the tibia. They are a common injury affecting athletes who engage in running sports or other forms of physical activity, including running and jumping. They are characterized by general pain in the lower region of the leg between the knee and the ankle. Shin splints injuries are specifically located in the middle to lower thirds of the anterior or lateral part of the tibia.
- Shin splints are the most prevalent lower leg injury and affect a broad range of individuals. Sudden increase in intensity or frequency in activity level fatigues muscles too quickly to properly help absorb shock, forcing the tibia to absorb most of that shock. This stress is associated with the onset of shin splints
- Dx → Shin splints can be diagnosed by a physician after taking a thorough history and performing a complete physical examination. The physical examination uses gentle pressure to determine whether there is tenderness over a 4–6 inch section on the lower, inside shin area. The pain has been described as a dull ache to an intense pain that increases during exercise, and some individuals experience swelling in the pain area. People who have previously had shin splints are more likely to have it again
- Tx → Typical treatments include rest, ice, strengthening and gradually returning to activity