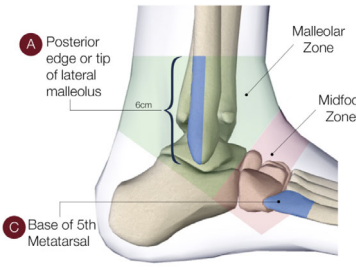
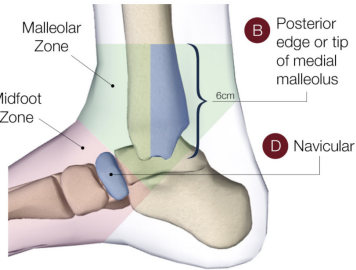


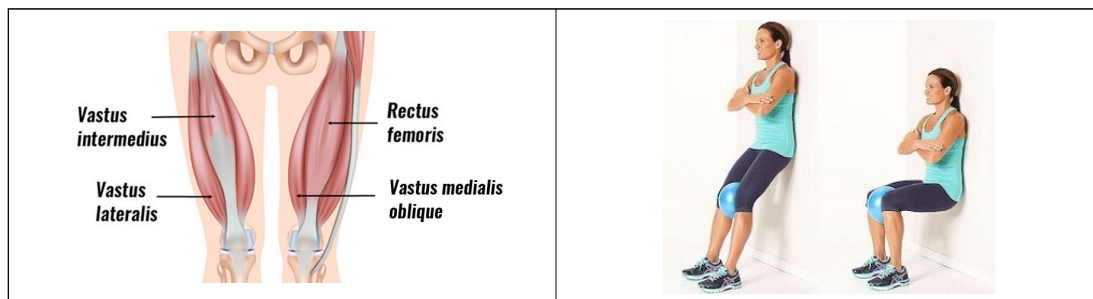
THE OTTAWA ANKLE & FOOT RULES

Lateral view	Medial view
 <p>A Posterior edge or tip of lateral malleolus</p> <p>Malleolar Zone</p> <p>Midfoot Zone</p> <p>6cm</p> <p>C Base of 5th Metatarsal</p>	 <p>Malleolar Zone</p> <p>Midfoot Zone</p> <p>6cm</p> <p>B Posterior edge or tip of medial malleolus</p> <p>D Navicular</p>
Ankle X-ray series	Foot X-ray series
<p>An ankle X-Ray series is only required if there is any pain in the malleolar zone + any of these findings:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Bone tenderness at A <input type="checkbox"/> Bone tenderness at B <input type="checkbox"/> An inability to bear weight both immediately and in the emergency department for four steps 	<p>A foot X-Ray series is only required if there is any pain in the midfoot zone + any of these findings:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Bone tenderness at C <input type="checkbox"/> Bone tenderness at D <input type="checkbox"/> And inability to bear weight both immediately and in the emergency department for four steps

A 20-year-old college recreational athlete presents to your clinic after injuring his right ankle during a flag football earlier in the day. On exam you note an antalgic gait, significant swelling, bruising, and tenderness to palpation at the anterior aspect of the lateral malleolus. No tenderness along the lateral and posterior aspect of the lateral malleolus, the medial malleolar region, or the foot. Regarding imaging, you order:

- A. MRI of the right ankle
- B. Radiographs of the right ankle
- C. Radiographs of the right ankle with stress views
- D. No imaging at this time

- Given the history and examination, this patient most likely has a lateral ankle sprain. The Ottawa ankle and foot rules offer a high degree of sensitivity for fractures of the foot and ankle in patients presenting with acute ankle or foot pain.
- While patient has pain in the lateral malleolar zone, he is able to bear weight, has no foot pain, and his ankle pain is not located at the posterior aspect of the distal 6 cm of the fibula; hence, he does not satisfy criteria for obtaining an x-ray (with stress views or otherwise). There is no indication for ordering a MRI at this time.



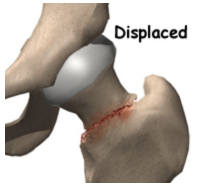


After immobilization, which is the most appropriate exercise recommendation in individuals with patellar dislocation?

- A. Gastrocnemius-soleus flexibility
- B. Biceps femoris flexibility
- C. Vastus medialis strengthening
- D. Iliopsoas strengthening

- Physical therapy in this patient should focus on strengthening of her medial quadriceps muscles and restoration of normal patellar motion.
- Surgery in select instances addresses realignment of the patella by a lateral retinacular release and/or medial retinaculum repair when torn. (*retinaculum = the fibrous tissue on the side of the kneecap)



- Stress fracture of the femoral neck are most commonly seen in athletes such as runners.
- Female Athletic Triad (Eating disorder + Osteoporosis + Amenorrhe) → Female are more common than males to experience stress fractures of the femoral neck.
- Beware of female runner with pain in the groin and normal X-rays.
- Clinical findings: groin pain, pain with weight bearing activity, negative x-ray in about 2/3 of the patients, MRI is the best study, exclude other causes of hip pain such as transient osteoporosis and avascular necrosis.

Compression fracture	Tension fracture	Displaced fracture
<ul style="list-style-type: none"> • Calus at the inferior aspect of the femoral neck • If the fracture involves <u>less than 50%</u> of femoral neck, it can be treated with non-weight-bearing and crutches as well as restricted activity • If the fracture involves <u>more than 50%</u> of femoral neck, it should be treated with screw fixation 	<ul style="list-style-type: none"> • Fracture at the superior aspect of the femoral neck • Adult bone is weak in tension • With tension the fracture will propagate • Treatment should be given with screw fixation 	<ul style="list-style-type: none"> • Will have bad prognosis especially with younger patients. • Risk of avascular necrosis and nonunion with displaced fracture • Emergency in younger patients: do reduction and screw fixation • Elderly patient with groin pain and normal X-ray – obtain MRI to rule out a stress fracture. Use prosthesis in elderly.
		

A 19-year-old long-distance runner presents with an insidious onset of left hip pain one month after increasing her mileage from 25 to 50 miles weekly. After obtaining a thorough history and performing a physical examination, you obtain an anteroposterior radiograph of the pelvis to evaluate the hip. The film is unremarkable. What is the next most appropriate step?

- Make her non-weight bearing with crutches and order a magnetic resonance image (MRI) of the hip.
- Refer her to physical therapy for a lower limb flexibility and strengthening program.
- Repeat plain films in 2 weeks.
- Administer corticosteroid via intra-articular hip injection.

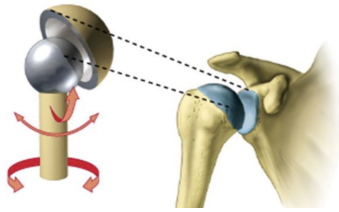
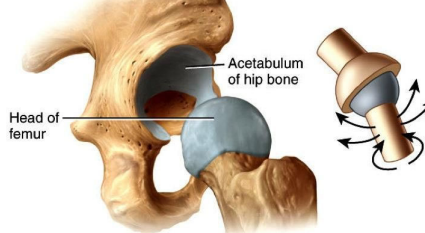
- This patient's history is suspicious for a **femoral neck stress fracture** (bone stress injury). She needs to be made non-weight bearing until this diagnosis is confirmed.
- Early identification avoids progression of the fracture and complications such as avascular necrosis.
- MRI is the preferred examination for identifying stress fractures and associated soft tissues disorders.

Displaced femoral neck fracture	Non-displaced femoral neck fracture
	

An 80-year-old female with osteoporosis and dementia trips and falls onto her hip. The patient was found on the ground with her limb in an externally rotated, abducted, and shortened position. X-rays of the hip most likely shows:

- Distal femoral fracture
- Femoral neck fracture
- Acetabular fracture
- Superior pubic ramus fracture

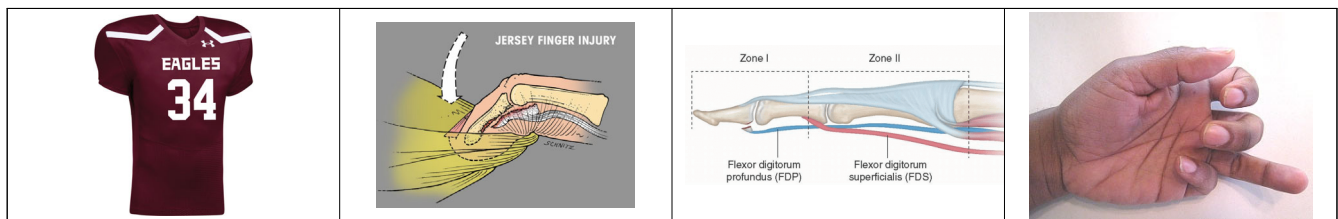
- Patients with a displaced femoral neck or intertrochanteric fracture lie with their limb externally rotated, abducted, and shortened.
- Patients with stress fractures or nondisplaced fractures of the femoral neck may have no obvious deformity.

Ball and socket joints	
Shoulder joint	Hip joint
<p>Movement in all three planes</p> <p>Shoulder and hip joints are ball and socket. This type of joint is multiaxial.</p> 	
↓	↓
Shoulder dislocation	Hip dislocation
Anterior > Posterior	Posterior > Anterior

In young athletes, the likelihood of a 2nd shoulder dislocation after experiencing a first-time dislocation is:

- A. Less than 20%
- B. Between 20-40%
- C. Between 40-60%
- D. Greater than 60%

- Recurrence rates of shoulder dislocations in young athletes (<30 years old) range from approximately 60-90%.
- The high re-dislocation rate is due to the fact that younger patients with strong, healthy rotator cuff tissue can withstand a high-energy insult but their weaker anterior static restraints (ie, labrum, shoulder capsule) cannot.
- Bracing may reduce the risk of recurrence, but restricts motion and may not be tolerated in certain sport-specific tasks such as throwing.

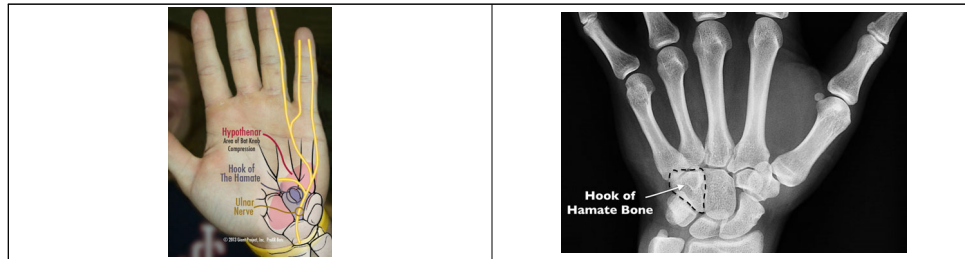


A football player presents to your office with pain in his ring finger after trying to tackle his opponent. On exam you notice that he is unable to flex his DIP actively while holding the PIP in extension. The most likely diagnosis is:

- A. Trigger finger
- B. Jersey finger
- C. Mallet finger
- D. Fractured finger

- Complete or incomplete injury to the flexor tendon (profundus and/or superficialis) may be spontaneous as in the case of rheumatoid arthritis or more commonly due to a traumatic nature as seen in athletes in sports like football or wrestling.
- The classic mechanism of injury in athletes is when a player's finger gets caught in the jersey of another when attempting to grab him.
- The profundus tendon is avulsed from its insertion and possibly accompanied by a bony fragment (usually the fourth digit). This is called Jersey Finger. The patient is unable to actively flex the DIP joint.
- In order to effectively test the function of the flexor digitorum profundus, the patient must flex the DIP while the examiner holds the PIP joint in extension.
- No imaging is really needed for diagnosis but plain films may show an avulsed fragment near the tendinous insertion.
- The treatment for Jersey Finger is hand surgery referral for early surgical repair.

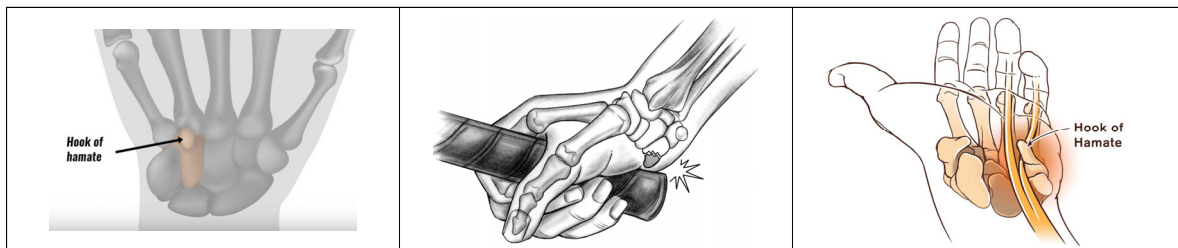
		<p>Some – Scaphoid Lovers – Lunate Try – Triquetrum Positions – Pisiform That – Trapezium They – Trapezoid Can't – Capitate Handle – Hamate</p>	<p>She – Scaphoid Looks – Lunate Too – Triquetrum Pretty – Pisiform Try – Trapezium To – Trapezoid Catch – Capitate Her – Hamate</p>
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Which carpal bone fracture is most associated with causing an ulnar neuropathy at the wrist?

- A. Scaphoid fracture
- B. Lunate fracture
- C. Hamate fracture
- D. Capitate fracture

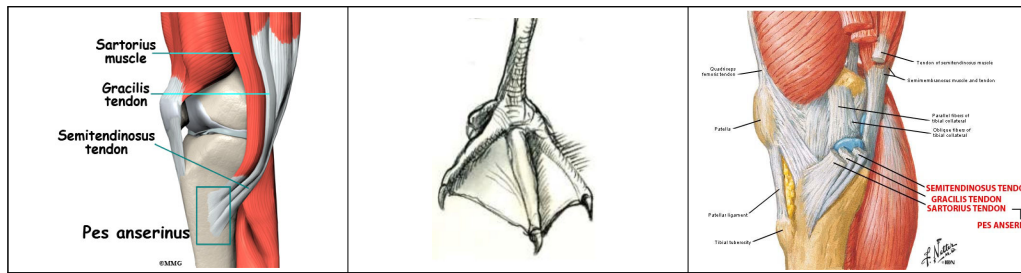
- The carpal bone fracture most associated with causing an ulnar neuropathy at the wrist is a **hamate** fracture as it is located on the ulnar aspect of the wrist at the same location where the ulnar nerve travels.
- The **scaphoid** and **lunate** bones are located on the radial aspect of the wrist and therefore a fracture will most likely not affect the ulnar nerve.
- **Capitate** fractures are especially rare because the capitate bone sits in a protected position in the hand.



A 27-year-old golfer presents with pain on the volar ulnar aspect of his hand. X-ray shows he has a fracture of the hook of his hamate bone. What is the treatment of choice?

- A. Refer to hand surgery
- B. Immobilize with casting
- C. Steroid injection
- D. Occupational therapy with modalities

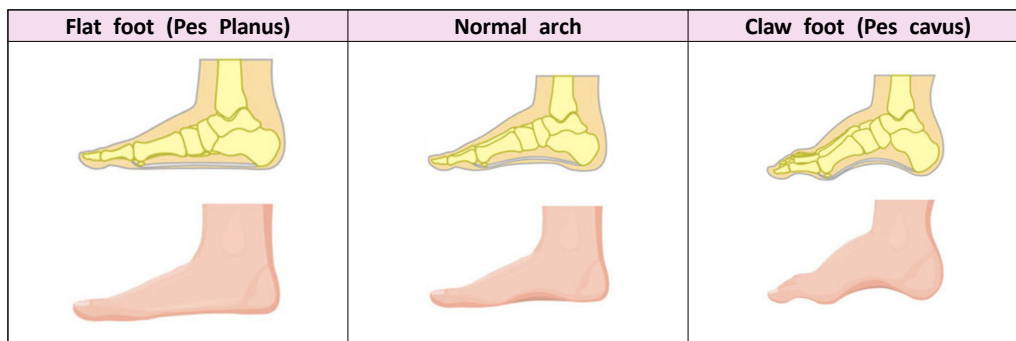
- **Hamate hook fractures** represent 2-4% of all carpal fractures and are a common injury in golf, baseball and hockey. Patients usually present with vague complaints of pain at the volar ulnar aspect of their hand with pain provoked when attempting a tight grip. Plain radiographs may not visualize the fracture thus a CT scan should be considered if one has a high suspicion for fracture.
- **Excision of the hook** of the hamate is considered the treatment of choice. Acute injuries and non-displaced fractures may be treated non-operatively but excision is the treatment of choice. Nonunion rates greater than 50% and as high as 80-90% can occur with conservative treatment. Therefore, all hamate hook fractures should be referred to a hand surgeon for possible surgical intervention.



Which muscle does NOT insert at the pes anserine?

- A. Gracilis
- B. Semitendinosus
- C. Semimembranosus
- D. Sartorius

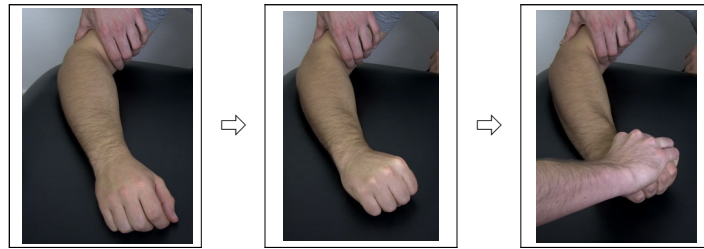
- Pes anserine bursa lies between the medial collateral ligament and the confluence of the sartorius, gracilis, and semitendinosus muscles along the proximal medial tibia distal to the joint line.
- The semimembranosus muscle attaches on the posterior aspect of the tibia.
- **Pes anserine bursitis** is an inflammation of the bursa located between the shinbone (tibia) and three tendons at the inside of the knee. It occurs when the bursa becomes irritated and produces too much fluid, which causes it to swell and put pressure on the adjacent parts of the knee.



A mother presents to your clinic with her 7-year-old boy. She states that her son is active in sports, and one of his coaches noted to her that he is "quite flat-footed" and should be evaluated. He does not complain of any pain or functional limitations. On exam you note that he has flexible bilateral pes planus feet, no pain on palpation, with a normal gait. You tell the mother:

- A. Most cases of "flat feet" are painless and do not cause problems
- B. A MRI should be obtained to evaluate for tarsal coalition
- C. Her son should use supportive footwear
- D. Refer her son to a podiatrist for custom corrective orthotics

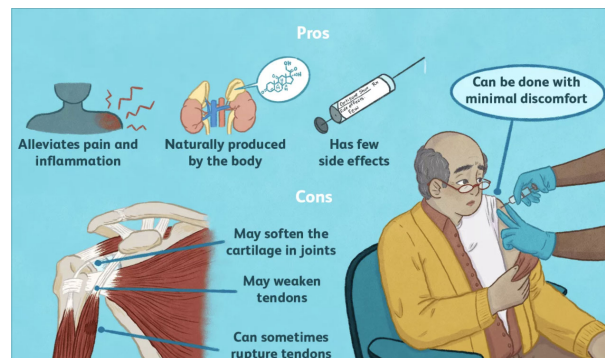
- The majority of children with pes planus will develop an arch as they mature. Some children fail to do so but most do not have pain or limitations. There is no indication for intervention at this time, alterations in footwear or orthotics.
- Tarsal coalition (an abnormal connection that develops between two bones in the tarsal bones) may be a cause of pes planus in children, but this condition results in an inflexible foot; furthermore, the child is not experiencing pain.
- Some advocate walking/playing without footwear and engaging in intrinsic foot muscle strengthening exercises in order to help develop the arch, but there is little evidence to support this.



A 48-year-old left hand dominant administrative assistant is seen in your clinic for left lateral elbow pain. The patient states it is worse on Fridays and improves on Mondays. She describes the symptoms as focal and non-radiating. She denies prior injuries. Which of the following tests is most likely to be positive?

- A. Froment's
- B. Cozen's
- C. Hawkin's
- D. Phalen's

- Tennis Elbow or lateral epicondylitis typically presents in the dominant elbow of patients who are 45 to 54 years of age.
- High-risk occupations include a combination of repetitive and forceful movements of the arms. The extensor carpi radialis brevis (ECRB) is the most common muscle tendon involved with this condition.
- Palpation of the lateral epicondyle is often painful.
- The tennis elbow test, also referred to as Cozen's test, is considered positive if pain occurs at the lateral epicondyle of a fully extended elbow with resisted wrist extension.



Which of the following is the most significant complication of a cortisone injection for tendonitis?

- A. Exacerbation of pain
- B. Depigmentation
- C. Tendon rupture
- D. Risk of bone fracture

- Corticosteroid injections for tendonitis can have both short- and long-term complications.
- **Short-term complications** include shrinkage (atrophy) and lightening of the color (depigmentation) of the skin at the injection site, introduction of bacterial infection into the body, local bleeding from broken blood vessels in the skin or muscle, and aggravation of inflammation in the area injected because of reactions to the corticosteroid medication (post-injection flare). In people who have diabetes, cortisone injections can elevate their blood sugar. Tendons can be weakened by corticosteroid injections in or near tendons and tendon ruptures as a result have been reported thus making tendon rupture a feared complication of corticosteroid injection for tendonitis.
- **Long-term complications** depend on the dose and frequency of the injections. With higher doses and frequent administration, potential side effects include thinning of the skin, easy bruising, weight gain, puffiness of the face, acne (steroid acne), elevation of blood pressure, cataract formation, osteoporosis and avascular necrosis.
- Pain and soreness at the injection site can occur but is not a feared complication of injection. Risk of bone fractures is not a direct complications of corticosteroid injections.