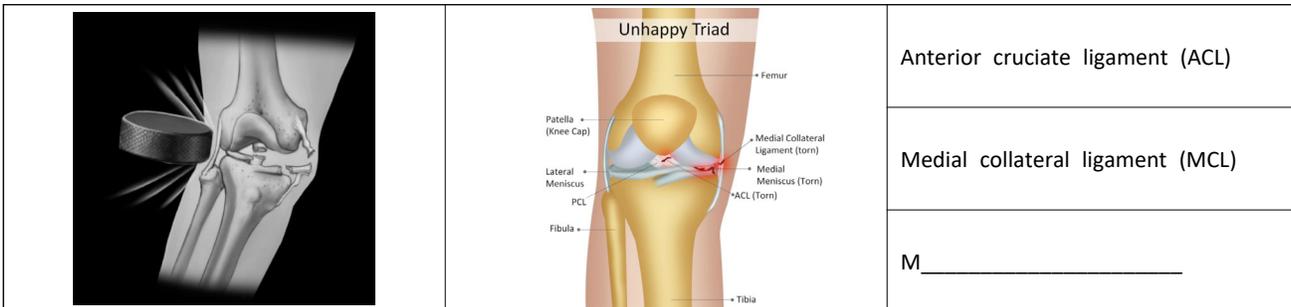


A 16-year-old gymnast presents with shin pain, disordered eating, and amenorrhea. The diagnosis of stress fracture is confirmed via bone scan. Your pharmacologic treatment recommendation would consist of:

- Bisphosphonates
- Supplemental calcium
- Oral contraceptive pills
- Hormone replacement therapy

- Treatment for the female athlete triad should include a multidisciplinary team approach, consisting of a gynecologist or primary care physician, dietitian, and psychologist.
- Pharmacologic treatment consists of 1000-1300 mg of calcium daily, 400-800 IU of vitamin D, and 60-90 mcg of vitamin K.
- The use of oral contraceptive pills and hormonal replacement has not been demonstrated to improve bone mineral density. Bisphosphonates have limited evidence as a basis for efficacy, and carry the risk of teratogenicity.



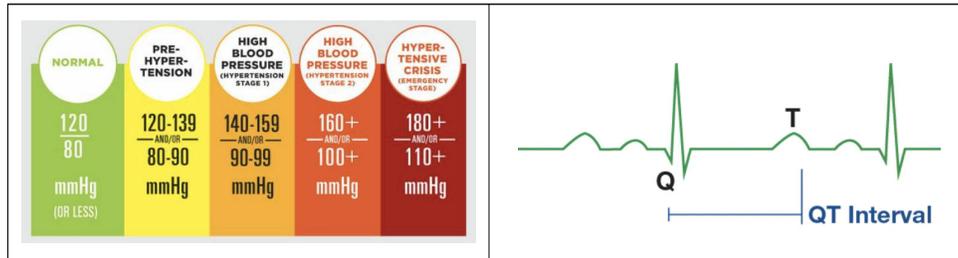
Which of the following structures would likely be injured during a collision resulting in knee valgus deformity?

- Lateral collateral ligament
- Lateral meniscus
- Medial meniscus
- Posterior cruciate ligament

- The Terrible Triad or O'Donoghue's refers to the damaged structures of anterior cruciate ligament, medial collateral ligament and medial meniscus.

MEDICAL TRIADS

	1	2	3
Unhappy Triad	ACL	MCL	Medial meniscus
Female Athlete Triad	Energy deficiency	Low Bone density	Menstrual disturbance
Cauda Equina syndrome	Low back pain	Saddle anesthesia	Bowel or bladder dysfunction
Meningitis	Headache	Fever	Nuchal rigidity
Reactive arthritis	Urethritis (can't pee)	Conjunctivitis (can't see)	Arthritis (can't climb a tree)
Meniere's disease	Hearing loss	Vertigo	Tinnitus
Normal Pressure Hydrocephalus	Dementia (wacky)	Wide gait (wobbly)	Urinary incontinence (wet)
Preeclampsia	Hypertension	Edema	Proteinuria
Endometriosis	Dysmenorrhea	Dyspareunia	Dyschezia
Ectopic pregnancy	Abdominal pain	Amenorrhea	Vaginal bleeding



Which of the following requires further evaluation before clearance for high school or college sports competition?

- A blood pressure in a 13-year-old to be 150/80 and repeated 2 weeks later to be 147/78
- An echocardiogram revealing a left ventricular wall thickness of 11 mm
- An EKG revealing QT interval to be 400 milliseconds
- A concussion sustained 3 months ago without residual effects

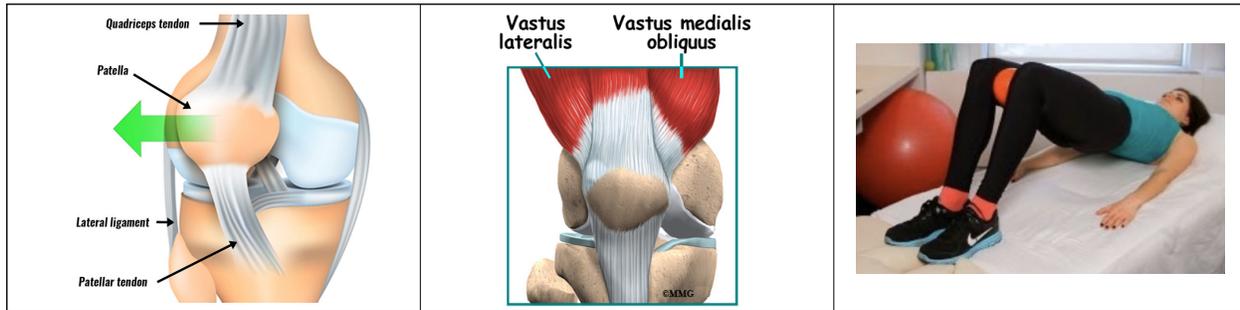
- Systemic hypertension is associated with cardiovascular disease. Exercise can elevate blood pressure to dangerous levels, increasing risk for such events as stroke or myocardial infarction. Athletes with hypertension require further medical evaluation in order to determine whether clearance for sports participation is appropriate.
- Concerns of a pathologically thickened left ventricular wall begins at approximately 13mm (the gray zone is 13-15 mm and there is overlap of an Athlete's heart versus potential Hypertrophic Cardiomyopathy). Prolonged QT Syndrome begins at greater than 450ms for men and greater than 470 ms in women.

Femoroacetabular impingement (FAI) is a condition in which extra bone grows along one or both of the bones that form the hip joint — giving the bones an irregular shape. Because they do not fit together perfectly, the bones rub against each other during movement.	
Cam impingement	Pincer impingement
<p>Cam impingement occurs because the ball-shaped end of the femur (femoral head) is not perfectly round.</p>	<p>Pincer impingement involves excessive coverage of the femoral head by the acetabulum.</p>

A 35-year-old man presents to your clinic with a 3-month history of groin pain exacerbated by activity. Anteroposterior films of the hip were normal. The magnetic resonance imaging of the hip reported a bony prominence at the femoral head-neck junction. What clinical exam finding is most likely to correlate with these radiographic "abnormalities"?

- Pain with resisted straight leg raise
- Pain with hip flexion, external rotation, and abduction
- Pain with sacral thrust
- Pain with hip flexion, internal rotation, and adduction

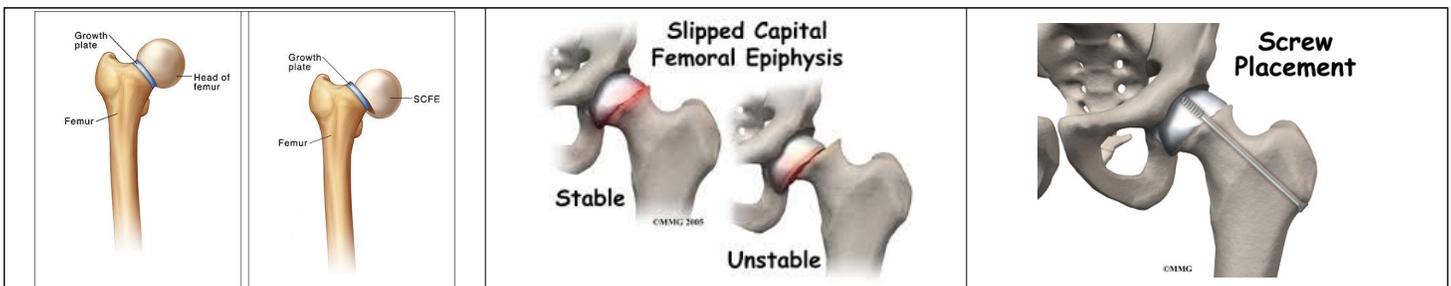
This patient has radiographic evidence of femoroacetabular impingement.	
<p>Cam impingement</p>	<ul style="list-style-type: none"> Cam impingement is described more commonly in active males and describes a non-spherical femoral head or osseous abnormalities of the femoral head-neck junction. These bony abnormalities have abnormal contact with the acetabulum in hip flexion, adduction, and internal rotation.
<p>Pincer impingement</p>	<ul style="list-style-type: none"> Pincer impingement describes abnormal contact between the femur and the acetabulum due to over-coverage of the femoral head from an abnormally deep or retroverted acetabulum.



A 22-year-old female gymnast presents to your clinic after an initial patellar dislocation during practice. She was treated in the emergency room with reduction of the patella and immobilization. Radiographs and magnetic resonance imaging of the knee are negative for fracture or evidence of osteochondral lesions. You choose to treat her with immobilization for 2 weeks and then begin physical therapy. The most appropriate therapy recommendation is to focus on improving:

- Flexibility of gastrocnemius-soleus complex
- Strength of the iliopsoas
- Flexibility of the biceps femoris
- Strength of the vastus medialis

- Physical therapy in this patient should focus on strengthening of her medial quadriceps and gluteal 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.



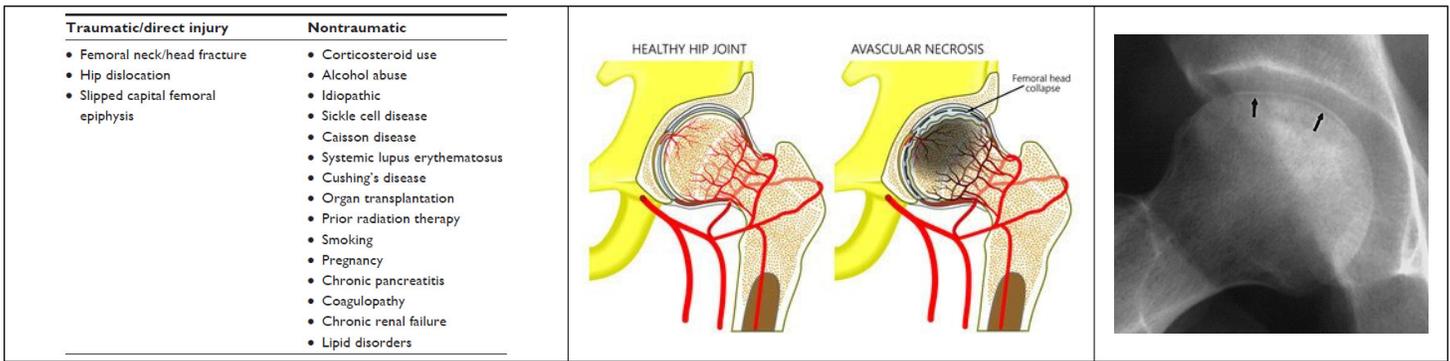
- Slipped capital femoral epiphysis (SCFE)** is a hip condition that occurs in teens and pre-teens who are still growing. For reasons that are not well understood, the ball at the head of the femur (thighbone) slips off the neck of the bone in a backwards direction. This causes pain, stiffness, and instability in the affected hip. The condition usually develops gradually over time and is more common in boys than girls.
- Treatment for SCFE involves surgery to stop the head of the femur from slipping any further. To achieve the best outcome, it is important to be diagnosed as quickly as possible. Without early detection and proper treatment, SCFE can lead to potentially serious complications, including painful arthritis in the hip joint.

A 14-year-old obese boy complains of left hip pain with decreased range of motion, and ambulates with a limp for the past 2 weeks. Radiographs of the hip are consistent with Slipped Capital Femoral Epiphysis. What is the most appropriate treatment at this time?

- Conservative management for 3 months with monitoring by serial x-rays
- Prophylactic fixation of the unaffected hip
- Immediate referral to orthopedics for surgical intervention
- Non-weight bearing on the left lower extremity for 6 weeks



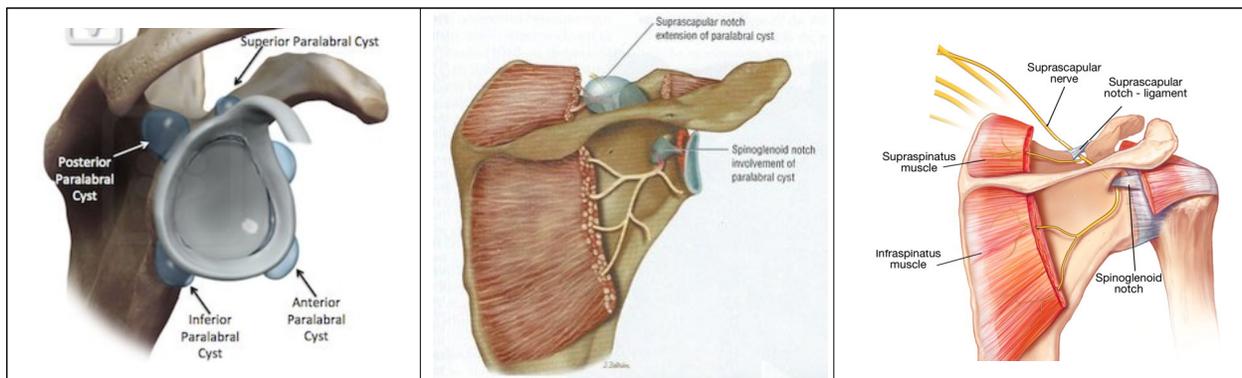
- Slipped Capital Femoral Epiphysis (SCFE)** is a condition in which a child's hip (the top part of the femur, or ball of the ball and socket joint of the hip) slips through the growth plate. Think of it as an ice cream scoop falling off of the ice cream cone. This can happen slowly over time, or it can happen immediately from a fall, car accident, or trauma, similar to a break or fracture. This usually happens during the adolescent years, most commonly between the ages of 11 to 13 years for females and 12 to 14 years for males.
- Immediate referral to orthopaedics for surgical intervention is recommended to prevent further complications.



A 40-year-old alcoholic presents with dull aching and throbbing pain in the groin and lateral hip for many months. He reports pain with internal rotation, flexion, and adduction of the hip joint. Gait is antalgic with a short stance phase. X-rays of the hip demonstrate a crescent sign. What is the most likely etiology?

- Fracture
- Osteonecrosis
- Osteoarthritis
- Osteoporosis

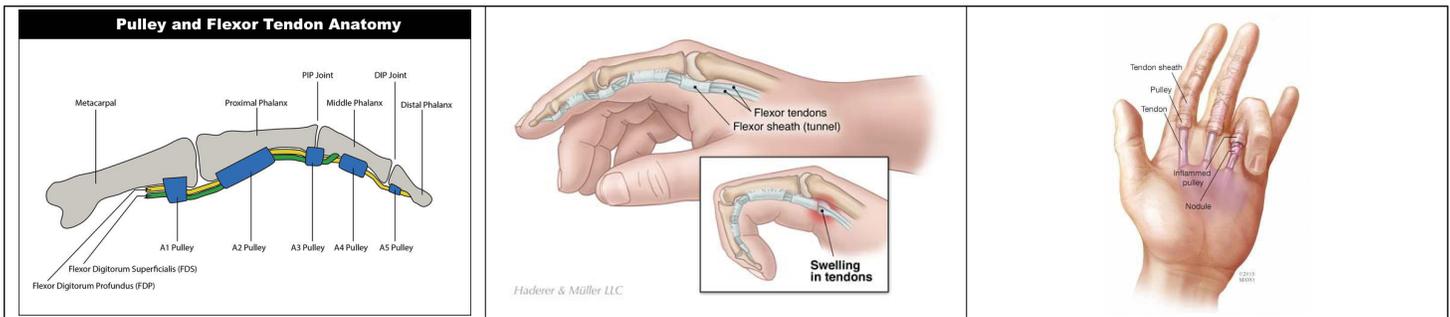
- Osteonecrosis of the hip** is a painful condition that occurs when the blood supply to the head of the femur (thighbone) is disrupted. Because bone cells need a steady supply of blood to stay healthy, osteonecrosis can ultimately lead to destruction of the hip joint and severe arthritis.
- Osteonecrosis is also called **avascular necrosis (AVN)** or aseptic necrosis. Although it can occur in any bone, osteonecrosis most often affects the hip. More than 20,000 people each year enter hospitals for treatment of osteonecrosis of the hip. In many cases, both hips are affected by the disease.
- Osteonecrosis of the femoral head in the early stages produces a superolateral rim of sclerosis extending to the articular surface.
- Ongoing ischemia leads to subchondral fracture as well as collapse. This appears as a "crescent sign" on radiographs.



Which of the following muscles can weaken if the nerve traversing the spinoglenoid notch is impinged by the superior labral cysts associated with posterior glenoid labral tears?

- Infraspinatus
- Supraspinatus
- Teres minor
- Subscapularis

- Paralabral cysts** are swellings that arise around the socket of the shoulder joint (glenoid). They are pockets of joint fluid that develop outside of the joint under tears of the labrum.
- Labral cysts arising from labral tears can extend to nearby structures. A labral cyst associated with a posterior labral tear can dissect its way to the spinoglenoid notch and affect the branch of the suprascapular nerve that innervates the infraspinatus. Therefore, if the nerve in this notch is affected, then isolated infraspinatus weakness can result.



A patient who enjoys playing racquetball presents to your office with a trigger finger. You proceed with a corticosteroid injection. What would be your immediate next step in the treatment of this patient?

- Referral to a hand surgeon
- Splint finger in extension
- Modify racquet handle
- Repeat injection in 2 weeks

- A **trigger finger** is a stenosing tenosynovitis. It develops due to repetitive trauma that causes an inflammatory process to the flexor tendon sheath of the digits. This process forms a nodule in the tendon resulting in abnormal gliding through the pulley system. As the digit flexes, the nodule passes under the pulley system and gets caught on the narrow annular sheath resulting in the finger locked in a flexed position.
- In an athlete, it often occurs in racquet and club sports. A nodule forms from overuse or direct pressure at the flexor tendon sheath which leads to mechanical catching under the A1 pulley at the MCP level.
- A corticosteroid injection into the nodule or thickened tendon sheath can improve symptoms in up to 90% of cases. Modification of the racquet handle or grip may facilitate recovery, therefore the immediate next step in the treatment of this patient after a corticosteroid injection would be to recommend the patient modify the grip on their racquet handle.
- Splinting the finger in extension is not beneficial to the patient. There is no need for referral to the hand surgeon as 90% of patients treated with a corticosteroid injection will benefit from the injection. There is also no need to repeat the injection in 2 weeks as the most immediate next step in treatment would be to modify the causative agent of injury.

CLASSIFICATION OF NERVE INJURY

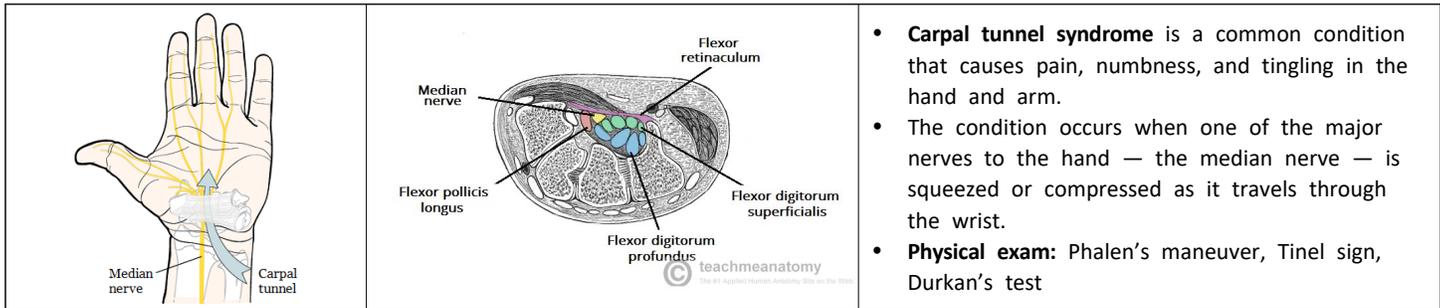
	Seddon classification (1943)	Sunderland Classification (1990)
Neuropraxia	Neuropraxia	Grade I
Axonotmesis	Axonotmesis	Grade II, Grade III, Grade IV
Neurotmesis	Neurotmesis	Grade V

Injury grade	Etiology	Patho-anatomy	Recovery potential
Neuropraxia	Nerve compression injury	Reversible conduction block	Good
Axonotmesis	Nerve crush injury	Interruption of axon continuity with Wallerian degeneration	Fair
Neurotmesis	Nerve transection injury	Damage to axons and supporting connective tissues/nerve trunk rupture	None without surgery

What outcome can an athlete experiencing an axonotmesis nerve injury (Grade 2 Seddon classification) expect?

- Immediate recovery and excellent prognosis
- Good rate of recovery with significant improvement
- Little neurologic recovery
- Surgery is required

- Grade 2 Seddon Classification means disruption of axonal continuity has occurred. Recovery requires axonal regeneration with expectations of significant improvement and good recovery occurring over weeks to months postinjury, though dependent on the distance between site of lesion and end organ.

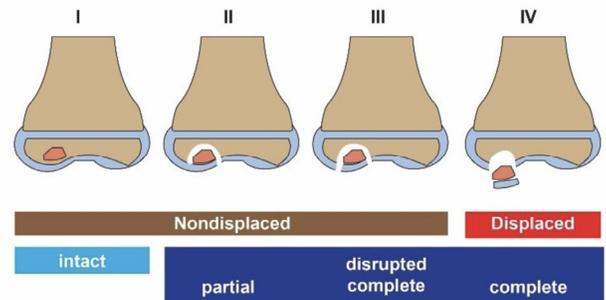


Which of the following is **NOT** contained within the carpal tunnel?

- A. Extensor digitorum
- B. Median nerve
- C. Flexor digitorum profundus
- D. Flexor Pollicis Longus

- The borders of the carpal tunnel are made up of an **anterior border** which is the transverse carpal ligament which runs from the hamate and pisiform medially to the scaphoid and trapezium laterally. The **posterior border** of the tunnel is made up of the carpal bones.
- The **contents** of the carpal tunnel are the median nerve which provides motor innervation to the first and second lumbricals and the thenar muscles **except** the deep portion of the flexor pollicis brevis and sensory innervation to the thenar eminence, the palmar aspect of the first to third digits and the lateral half of the fourth digit. The tendons that run inside the carpal tunnel are the flexor digitorum superficialis, the flexor digitorum profundus and the flexor pollicis longus.

- **Osteochondritis dissecans (OCD)** is a joint condition that occurs when bone separates from cartilage and starts to die. It's usually due to a lack of blood flow to the bone.
- When small pieces of the separated bone and cartilage start to break loose, it can cause pain and reduce your range of motion in the affected area.
- Osteochondritis dissecans happens most often in the knee, elbow, or ankle.



A 12-year-old boy presents to you for right ankle pain. His parents brought a recent MRI, and a grade 3 osteochondritis dissecans lesion is noted at the talar dome. You recommend:

- A. Refraining from sports participation and initiate physical therapy
- B. Weight bearing as tolerated in a walking boot for 3-6 weeks and then re-evaluate
- C. Non-weightbearing in a short leg cast for 6 weeks and then re-evaluate
- D. Referral to orthopedic surgery for surgical fixation

- Osteochondritis dissecans is a disorder characterized by loss of integrity of the subchondral bone in a focal area of the joint. The injury may be staged with MRI.

Grade I (continuous with underlying bone) Grade II (partially continuous)	Grade III (discontinuous but not dislocated) Grade IV (loose body)
conservative measures such as splinting, rest, and physical therapy being valid options	require referral to an orthopedic surgeon for consideration of surgical fixation, removal, or other procedures.