

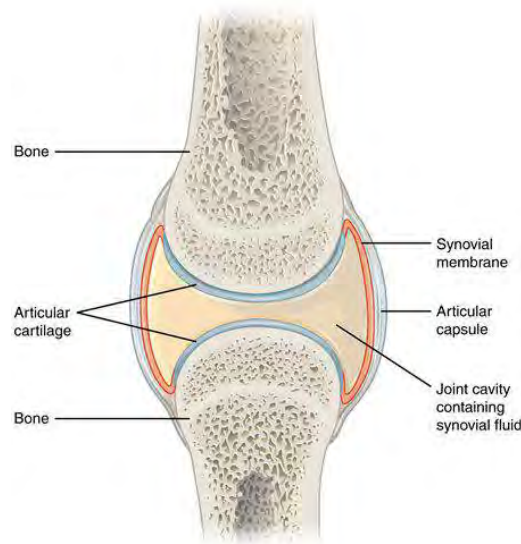
HS369 Exam 1 Guide

Introduction

- Anatomical Position
 - Prone-> face down
 - Supine-> face up (Hands can hold soup- supine)
 - No two bones of body are crossed, thumbs facing up and out
- Anatomical Planes
 - Sagittal/midsagittal/median divides into left and right with mid- being halves
 - frontal/coronal divides into front and back
 - transverse/horizontal divides into top and bottom
- Terms of Relationship
 - Anterior- front (ventral)
 - Posterior- back (dorsal)
 - Superior- closer to head
 - Inferior- closer to feet
 - Uterus inferior to stomach but heart is superior to the stomach
 - Medial- towards midline
 - Lateral- away from midline
 - Proximal and distal are only used when comparing locations of structure on limbs (ie elbow, wrist) and would not be used with structures on the trunk
 - Contralateral- structures on opposite sides of body
 - Ipsilateral- structures on same side of body
- <http://www.lamission.edu/lifesciences/aliant1/chap1-anatomical%20terminology.pdf>

Tissues (epithelial, connective, muscle, nervous)

- Epithelial
 - Cellular, polar (one side different from the other), attached, avascular, innervated, highly regenerative (capable of mitosis); usually anchored to connective tissue
 - Covers surfaces inside and out
 - Superficial skin and inner lining of organs, cavities, blood vessels
 - Made up almost entirely by cells
 - Ex: skin, inside of a blood vessel, surface of eyeball
 - Types of Epithelium:
 - Simple (one layer) squamous
 - Stratified (multiple layer) squamous (flat)
 - Simple cuboidal



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- Joint capsule of fibrous tissue, joint cavity enclosed by capsule, synovial membrane lining capsule, synovial fluid covering joint surfaces, hyaline (articular) cartilage covering joint surfaces
 - Hyaline cartilage helps form a gliding joint surface
- Synovial Fluid
 - Made by cells in synovial membrane
 - Nourishes the hyaline cartilage and ebbs through it as compression is applied (remember cartilage is avascular)-> movement is essential; sedentary lifestyles can compromise joint health
 - As surface cells struggle without nutrients, cracking occurs at joint surfaces and chondrocytes cluster together as they're dying. Over time, matrix thins and more cracks appear so if case is severe enough, you can expose bone (which is vascular) and cause joint pain
 - Composition is similar to blood plasma but +2 ingredients that add viscosity and lubrication (injecting these ingredients can relieve osteoarthritis symptoms)

- Scar tissue

- Staples hold epithelium and underlying ct together while fibroblasts secrete collagen
- To repair bone fractures and cuts to the skin, a collagen framework required for further repair
- Complex tissues can withstand forces in multiple direction whereas tendons can only handle forces in that one direction
 - In wound repair, the collagen framework is laid down quickly. Scar tissue therefore has two major differences from the neighboring dermal tissue that was formed during development: 1) the collagen network is thicker than the surrounding tissue and 2) the collagen is laid down from point A to point B, therefore, the collagen framework runs mostly parallel to each other rather than as a net in the neighboring tissue.
 - Think about collagen fiber orientation. Complex tissues like skin and ligaments have collagen fibers in multiple directions, while tissues like muscles and tendons only have collagen fibers in one direction
- The newly formed scar tissue cannot handle strain in all different directions
- Post surgery therapy, increase ability of scar tissue to move in all directions by applying forces in different directions around the scar

- Spinal Cord Injury

- Simple reflexes left unaffected.
- He can feel along the soles of his feet.
- Soleus compromised so no plantar flexion.
- Will be in a wheelchair or need help with walking

- Meningitis

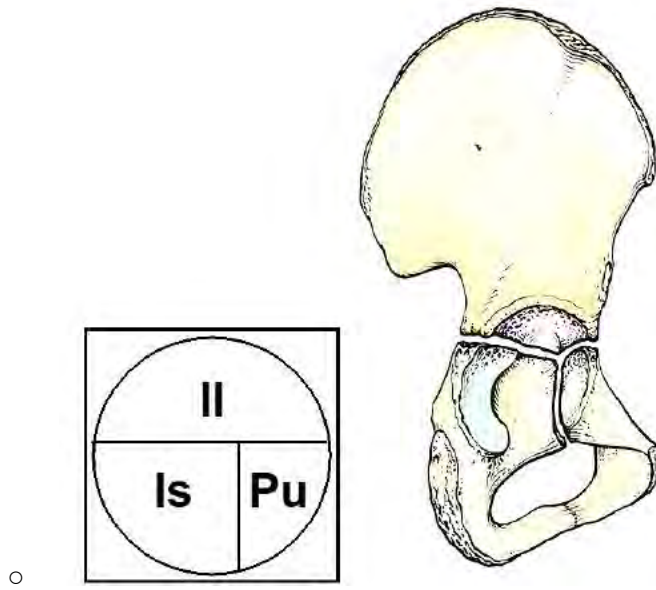
- Needle to get CSF goes into subarachnoid space of lumbar region of spinal cord
- Push cerebrum inward, damaging neuronal cell bodies
 - Gray superficial in brain, neuronal cell bodies
- Any neuronal damage is permanent but there is brain plasticity
- Spinal cord meninges are continuous with brain meninges and both are inflamed, explaining neck pain

- Additional function: its belly sits between the subclavian artery and clavicle.
Protects artery in clavicular fracture
- Trapezius
 - Upper fibers: elevation of scapula by pulling up on distal clavicle
 - Middle fibers: scapulae medially
 - Lower fibers: depression of scapula, upward rotation of glenoid cavity
- Latissimus dorsi
 - Wide origin, narrow insertion - produces lots of force
 - Inserts on anterior proximal surface of humerus
 - Adductor and medial rotator of humerus (think about swinging from trees or chopping wood)
- Levator scapulae, Rhomboids
 - Collective action: elevate, medially retract and/or stabilize the scapula during arm movements
- Pectoralis minor
 - Pectoralis minor inserts onto coracoid process
 - When it contracts, it pulls the coracoid process inferiorly, depressing the scapula
- Pectoralis major
 - Inserts on anterior side of humerus, pulls it anteriorly (humeral flexion) and medially across the chest, or adduction when abducted
 - Anterior wall of axilla
 - Origin on clavicle, sternum and costal cartilage, but common insertion for all fibers on greater tubercle.
 - Flexor and rotation
- Serratus anterior
 - Shoulder protraction
 - Insertion on inferior angle of scapula, so it protracts, and upwardly rotates scapula, contributes a bit to depression of scapula
- Deltoid
 - Anterior fibers: humerus flexion, internal rotation
 - Middle: abduction of humerus
 - Posterior fibers: humerus extension, exterior rotation
- Triceps
 - Triceps brachii has three heads:

- Tendons of...
 - Flexor digitorum profundus, flexor digitorum superficialis, flexor pollicis longus, median nerve... pass through the carpal tunnel
 - Flexor carpi radialis is embedded within the tendon
 - Palmaris longus
 - Flexor carpi ulnaris are outside the tendon
 - Outside carpal tunnel is ulnar artery and nerve, and tendon for palmaris longus
 - In tunnel is median nerve, flexor compartment tendons
 - With carpal tunnel syndrome, median nerve is impacted
- Palmar aponeurosis
 - Distally, flexor retinaculum gives way to palmar aponeurosis
 - Fascia covers tendons, blood supply, nerves and muscles
 - Connects on its distal side to the superficial transverse metacarpal ligament
- Posterior
 - Ligaments of all of the extrinsic finger extension muscles pass through extensor retinaculum. Function is to hold tendons in place and not let them wander medially / laterally
- Carpometacarpal joints
 - Carpometacarpal joint of thumb has its own synovial joint and a greater range of motion (abduction, adduction, flexion, extension, rotation)
 - Carpometacarpal joints of the fingers share one synovial cavity
 - All carpometacarpal joints are capable of flexion / extension
 - 3rd and 4th metacarpals have limited ROM and provide a stable axis for opposition, but 2nd and 5th (index and pinky) have greater ROM.

CML

Hand



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- Pelvis:
 - Os coxae meet anteriorly at pubic symphysis, and posteriorly with sacrum
 - Obturator foramen, obturator membrane
- Pelvis - joints
 - Iliolumbar ligament: superior / inferior attachment between ilium and lumbar vertebra
 - Anterior and posterior sacroiliac ligaments: laterally attach ilium and sacrum
 - Sacrospinous attaches sacrum to ischial spine
 - Sacrotuberous attaches sacrum to ischial tuberosities
 - Sacrospinous and sacrotuberous stabilizes when there is an increase in weight in the trunk (weight gain, pregnancy)
 - Looser ligament issues lead to back issues and instability during increased weight bearing
 - Anterior and posterior sacrococcygeal ligaments attach sacrum to coccyx

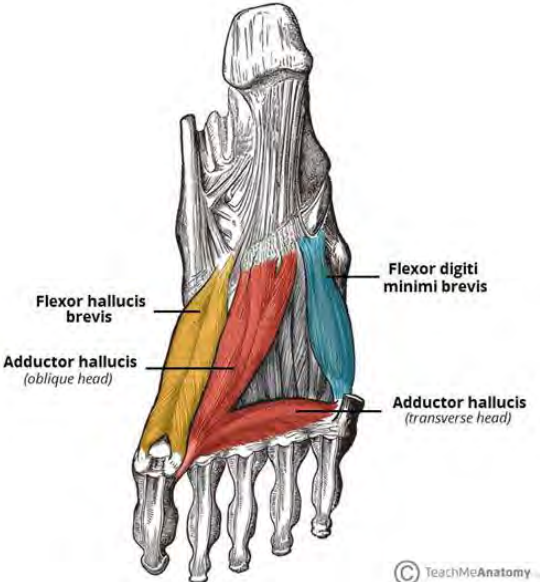
Pelvis 2 - Muscles and Organs

- Pelvic floor muscles
 - Sump pump contractions of these muscles move lymph and venous blood within the lymphatic circulation / veins
 - Sphincteric role for urethra and anus -> rings of muscle to close off cavities
 - Support for the abdominal and pelvic viscera

- The knee is most stable in extended position. It locks in place due to the cradles of femur in menisci. Tibia rotates internally a little during flexion, has to do with asymmetry and popliteus helps initiate flexion
- Knee rotation
 - Medial articular surface has more surface area
 - Lateral articular surface reaches extension first, but the larger medial surface continues to move a little, producing a small amount of external tibial rotation
 - Full extension is very stable, each femoral condyle is nestled within the meniscus
 - To move from extension to flexion, the tibia must rotate interiorly slightly to allow flexion to continue
- Popliteal fossa
 - Borders
 - Superolateral: biceps femoris
 - Superomedial: semimembranosus
 - Inferolateral and Inferomedial: lateral and medial heads of the gastrocnemius
 - Contents:
 - Nerves, veins, arteries, popliteal lymph nodes and lymphatic vessels, subcutaneous adipose
 - Superficial to deep: nerve, vein, artery
 - Veins are low velocity and blood flow, more superficial to arteries
 - Arteries have fast paced, high velocity and pressure blood flow
 - Nerves:
 - At superior edge of popliteal fossa, sciatic -> tibial, common fibular
 - While in the fossa, tibial nerve branches to innervate soleus, gastrocnemius, plantaris, popliteus
- Lower Leg Movements
 - Plantarflexion
 - Dorsiflexion
 - Eversion
 - Inversion
 - Flexion of toes
 - Extension of toes
- Osteology Lower Leg

Popliteal fossa:

nerve, vein,
artery, lymph

	<ul style="list-style-type: none"> • Adductor hallucis (oblique and transverse heads) 
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- Dorsal vs Plantar

Dorsal	<ul style="list-style-type: none"> • Extensor digitorum longus (extrinsic) • Extensor digitorum brevis (intrinsic) slightly deep to tendons • Dorsal surfaces of toes have extensor hoods / extensor expansions similar to hands
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