Accute = immediately
Chronic = long-term

Welcome to Anatomy & Physiology

Aug 21, 2024

Basic Roots

Ana → apart — Physio → nature
tomy → to cut — ology → the study of

Structure vs. Function

- Structures are formed to function as efficiently as possible

Ex: Opposable thumbs, joints

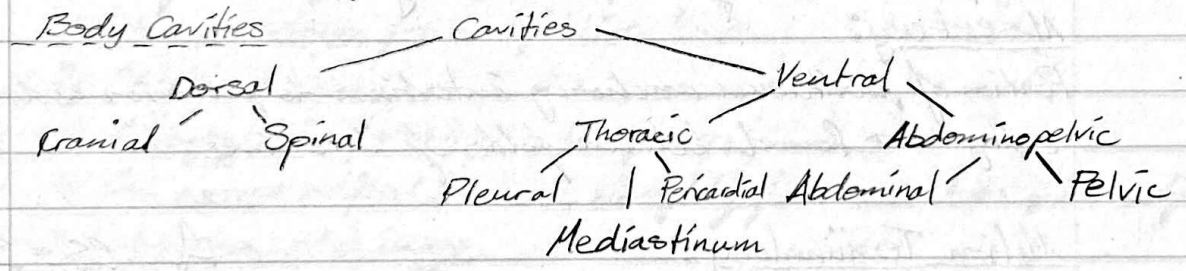
Characteristics of life

- Movement - Responsiveness - Growth - Reproduction - Restoration
- Digestion - Assimilation - Absorption - Circulation - Excretion

Requirements for life

- Water - Food - Oxygen - Heat - Pressure

Body Cavities



Body Positions & Membranes

26 Aug 2024

Anatomical Positions:
→ Feet together → face up → palms forward (up)

Prone → Face down — Supine → face up

Axial Skeleton → Skull, Vertebral Column, Ribs, & Sternum
Appendicular Skeleton → Limbs, Scapula, Pelvis, Clavicle

Membranes → Tissue surrounding organs to:
→ Protection → Provide Support → Lubrication → Increased blood flow

Thoracic cavity membranes:
→ Bilayered
↳ Visceral → On organ surface: delicate
↳ Parietal → toward body wall: tough
↳ Serous fluid found between layers
→ Thoracic cavity membranes are named for the organ they cover

Welcome to Anatomy & Physiology

Pericardium: Membrane around heart
Parietal pericardium: Toward body wall
Visceral pericardium: On surface of heart } Fluid between
Pleura: Membrane around lungs

Abdominal Cavity Membranes:
-> Membranes named after many different organs (generic names)
• Peritoneum -> covers most abdominal organs

Retroperitoneal:
-> behind peritoneum -> Ex: Kidneys
-> on posterial wall of abdominal cavity

Mesentery:
Portion of peritoneum anchoring intestines to posterior abdominal cavity -> found between folds of intestines

Motion Terminology Aug. 28. 2024
-> PRONATION (eversion) turning palm or sole of foot outward
-> SUPINATION (inversion) turning palm or sole of foot inward
-> Dorsiflexion - toe down } for foot (ankle joint)
-> Plantarflexion - toe up
• Flexion -> joint bends so angle decreases between limb sections
• Extention -> joint bends so angle increases "
-> Abduction - Movement of limbs away from midline of body
-> Adduction - Movement of limbs ~~away from~~ midline of body
↳ towards the

Directional Terminology
-> Ventral (Anterior) - Front of body (or organ)
-> Dorsal (Posterior) - Back
-> Superior (Cranial) Toward the head
-> Inferior (Caudal) Toward the feet (tail)
• Medial - Toward the middle
• Lateral - Toward the outside
-> Proximal - Closer to trunk attachment } Used with limbs
-> Distal - Away from trunk attachment

- Superficial - Toward the surface
- Deep - Away from the surface

Body Planes

- Sagittal - Right & Left
- Midsagittal, Median - Equal left & right
- Frontal, Coronal - Front & Back
- Transverse, Horizontal, Cross-Section - Top & Bottom
- Oblique - At an angle

Proper focusing technique (of microscope) Aug. 30. 2024

1 lower stage from objective lenses
2 Secure slide
3 Always begin focusing on low power
4 Use coarse adjustment to roughly focus, then fine adjustment to sharpen the image
5 After low power field is focused, to change magnification, rotate nose piece until desired lens
6 Never use coarse with any lens other than low power
7 Only use fine adjustment after focusing on low power
8 Rotate the lens until you hear a pop / click

Calculating total magnification:
Multiply ocular by objective:
Ex: High x ocular → 40 x 10 = 400
Low x ocular → 4 x 10 = 40

TM
=
Total Magnification

1 meter = 1,000,000 microns
1 mm = 1,000 microns

Clean lenses before and after each use

To find FOV → low power, use ruler, count mm in sight = diameter

(Low power TM) (Low power Diam) = (TM Field X) (Diam Field X)
50 5 mm 625 X
250 = 625 x → x = 0.4 mm

Ex

$(60)(10mm) = (1200)(x) \rightarrow 600 = 1200x \quad x = \frac{1}{2}mm$

250 μm

$(70)(7mm) = 2450x$

$490 = 2450x \quad x = 0.2mm \rightarrow 200\mu m$ TM Diam.

Critter = 100 μm

Test on Monday covers: Flow Chart, Cavities, Positions, Mentalness, Motion, Directional, Planes, Regional, Root Words

Review for test:

nephr-, nephro- kidney	osteo- bones
angi-, vessel	visc, viscero - internal
hist- tissue	-algia pain in ...
arthr-, arthro- joint	-blast bud
epi- above	-emia condition of blood
gastr-, gastro- stomach	-gen agent
hem-, hemo- blood	-itis inflammation
hepat- liver	-ectomy -tomy removal surg.
odont- teeth	-lysis breaking down
-stasis standing still	-oma tumor
	-osis abnormal condition

Bone Terms

trochanter: relatively large process

tubercle: small, knoblike process

tuberosity: knoblike process "usually" larger than tubercle

facet: small, nearly flat surface

condyle: rounder process that articulates with another bone

Bone Terms Review

condyle — rounded projection, articulates in joint
crest — ridge-like linear projection
epicondyle — projection above condyle
facet — small, mostly flat surface
fontanel — space between bones, baby skull, membrane
foramen — hole in bone for nerves, ligaments, arteries (vessels)
fossa — depression in bone, deep
fovea — small fossa, tiny
head — rounded projection ~~for articulation~~ @ end of bone
meatus — tunnel like cavern ~~for~~ within a bone
process — projection on surface of bone, ~~prominent~~
sinus — cavern in bone ~~for respiration~~
spine — thorn-like projection
suture — interlocking patter between bones
trochanter — relatively large process
tubercle — prob like process, small
tuberosity — knoblike process, "usually" larger than tubercle

Homeostasis

- Maintaining a constant, yet dynamic, internal Environment
(internal environment is fragile) oxymoron?

Feedback systems

- Biological mechanism designed to maintain set points & accomplish homeostasis

- Components:
1) set point — condition that is maintained
2) Receptors — Monitor & transmit information
3) Control center — compares & integrates information
4) Effectors — makes necessary changes → to set point

Negative feedback → changes in the opposite direction (Ex: temp., pain, pressure

Positive feedback → pushes conditions further away from set point

Mnemonics for Skull

Sept. 16. 2024

Mandible bone - Mewing bone
Palate - Palestine, blows through easily
Ethmoid - "Ethoy" my bicep
Lacrimal - looks like nacho
Frontal - Frontal forehead bone
Parietal - Pry it open to get to the brain
Sephnoid
Temporal bone -
Zygomatic arch - Punching bone
Maxilla - Upper mouth bone
Nasal -

Methods of Particle Movement Through the Body

Sept 18 2024

1) Diffusion → High to low concentration movement
★ Passive! → Moves to equilibrium Ex: Full spter medicine
2) Osmosis → Movement of water across membrane from high to low concentration Ex: Water into & out of cells
3) Dialysis → Seperating substances based on different diffusibilities across a membrane Ex: Kidney dialysis
4) Bulk flow → Movements of particles through body as a unit, usually due to pressure differences Ex: Blood, Air
5) Filtration → Process the seperates 1 or more components from a mixture, forced through pores Ex: White blood cells into tissues from capillaries

Structural Levels of Organization

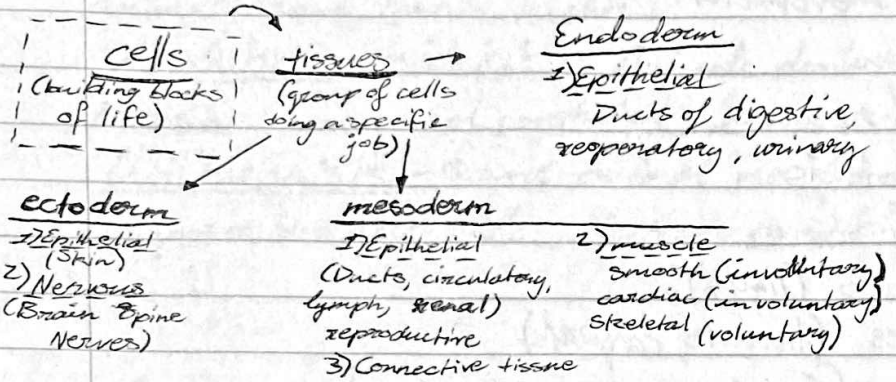
→ Gastrula → 2 weeks after fertilization, embryo differentiates tissues: 3 layers: Ectoderm, mesoderm, endoderm, endoderm is at the center, ectoderm on outside
→ Epithelial Tissue → forms skin or forms of inner lining ducts (any tube or vessel)

(ask about lissence plate story)

Structural Levels of Organization in Body

Sept. 18 2024

Cells → Tissues → Organs → Systems



Cartilage - Padding between bones, reduces friction between bones
↳ Protect your cartilage, it cannot be replaced

Tendons - Connect muscles to bones

Ligaments - Connect bones to bones

Fascia - Like spiden web, connective tissue in muscles

Descriptions of Systems (p 12-14)

1) Integumentary - Hair, Skin & nails
2) Skeletal - Bones, ligaments, & cartilage working as framework for body.
3) Muscular - Allows for parts of the body to be expanded or contracted
4) Nervous System - Communicate to muscles, etc. through neuro transmitters
5) Endocrine - Excrete hormones to alter metabolism
6) Cardiovascular - Pumps blood & its cargo to all parts of the body
7) Lymphatic - Defends and maintains the body from harmful agents
8) digestive - Breaks down food into useable nutrients, excretes waste
9) Respiratory - Exchanges oxygen for carbon dioxide with blood
10) Urinary - filters waste from blood, maintains cells' solution concentrations
11) Reproductive - Allows organisms to produce seperate organisms like them.

Oct 9 2024

Skeletal System

Skeletal System Functions

1) Support
2) Allow movement
3) Protection
4) Mineral reserve
5) Hemopoiesis

Bone Classifications

1) Long bones (limbs)
2) Short bones (tarsals, carpals)
3) Flat bones (Cranium, Ribs, sternum)
4) Irregular bones (Pelvis, Vertebrae

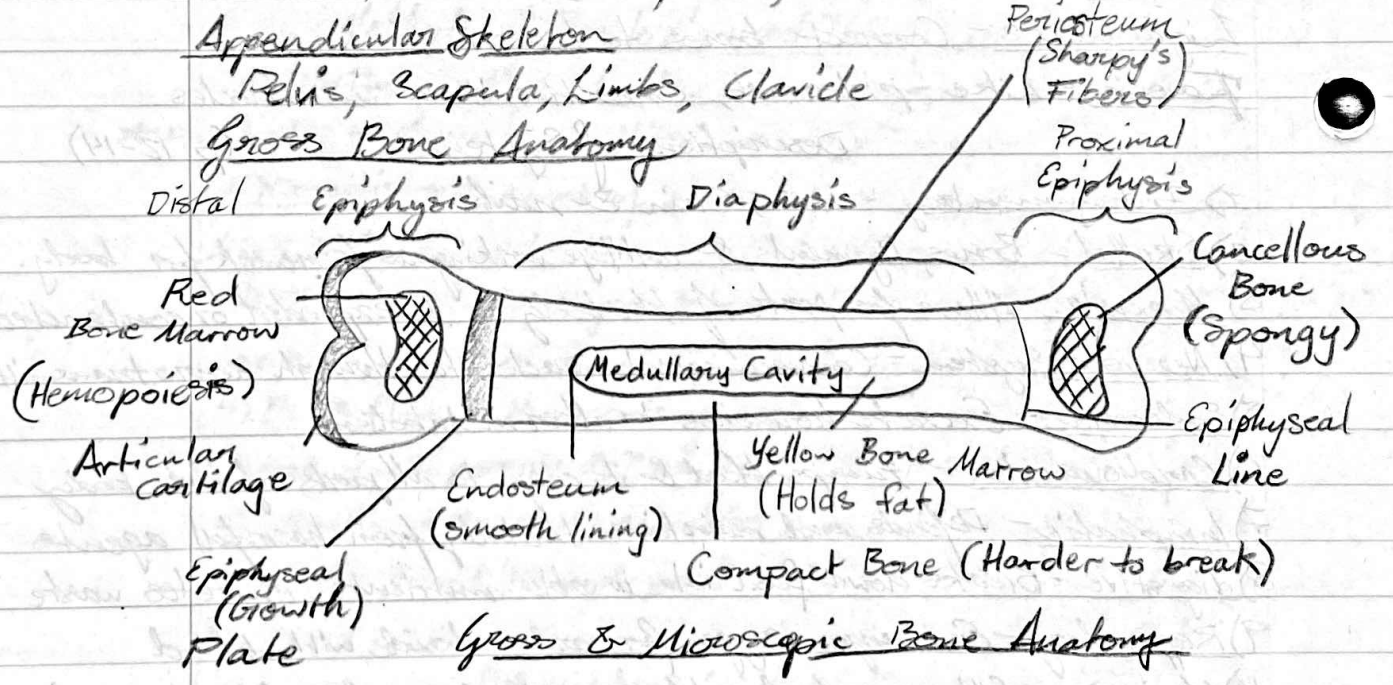
Axial Skeleton

skull, Vertebral column, Ribs, Sternum

Appendicular Skeleton

Pelvis, Scapula, Limbs, Clavicle

Gross Bone Anatomy



Gross & Microscopic Bone Anatomy

Animal Rights Wrap-Up

16 Oct 2024

Abolitionists – Use of animals is wrong because animals have human rights

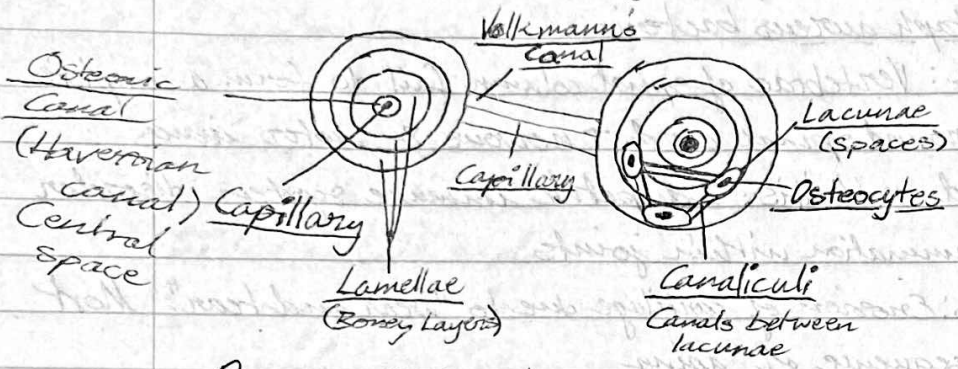
Absolute Dominionists – Animals don't have rights, there are no moral constraint on the use of animals

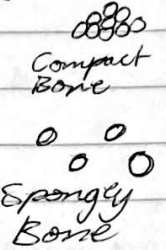
Utilitarianists – some animal uses for human purposes are acceptable while some are not

Microscopic Bone Anat.

Oct 30 2024

Osteon (Haversian system) - Structural & Functional unit of bone

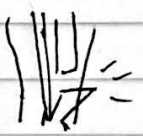




Bone Fractures & Healing

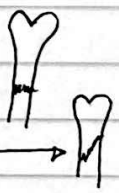
Nov. 4 2024

- simple fracture: stays in the skin →
- compound fracture: bone cuts through the skin →
  - complete: fracture goes all the way through the bone
  - incomplete: fracture only goes through part of the bone



★ Displaced: bones no longer in proper alignment
★ Non-displaced: bones still in proper alignment

→ Transverse: fracture across or @ right angle to bone →
→ Oblique: fracture occurs at other than a right angle →



- Comminuted fracture: fragmentation of the bone
- Spiral fracture: fracture caused by twisting
- Greenstick fracture: incomplete, fracture on convex surface in bend of bone
- Fissured fracture: incomplete "crack", usually in outer part of bone, sometimes called "hairline" fracture

Bone healing

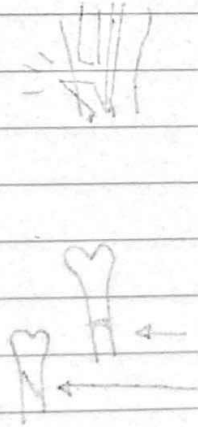
1: Align ends of bone
2: Secure fracture site, if possible (cast)
3: Blood clot or hematoma forms ("procallus" in bone)
4: In a week, cartilaginous callus forms (cartilage)
5: 3-6 weeks: osteoblast invade & bony callus forms
6: At end, osteoclasts reshape bone back to original form

meningitis

Metastatic: Moved

Bone diseases

- Osteoporosis: Bones lose volume & mineral content, spaces in bone form
- Osteomyelitis: Infection of periosteum, marrow or bone due to presence of staph aureus bacteria
- Spina bifida: Vertebrae of spinal column fail to form a complete bony arch around spinal cord → nervous & motor issues
- Rheumatoid arthritis: Idiopathic immune system disorder causing inflammation within joints
- Osteoarthritis: Erosion of cartilage due to "wear and tear". Most often a consequence of aging
- Metastatic calcification: Deposition of calcium in body a places where not usually found



Dec 4 2024

Skeletal System Review

* (5) (a) support the body (b) allow for movement (c) protect organs
(d) Mineral reserves (e) Hemopoiesis

* (6) (a) long bones → femur, humerus, radius, ulna, tibia, fibia
(b) short bones → carpals, tarsals (c) flat bones → ribs, skull bones
(d) irregular bones → vertebrae

(7) 1. Realign bones 2. Set bones 3. Hematoma 1 week 4. Cartilaginous callus
3-6 weeks after 6 weeks
5. Osteoblasts replace cartilaginous callus 6. Osteoclasts remove extra bone

(8) compound: bones break through skin
simple: bone stays within skin

Dec 4 2024

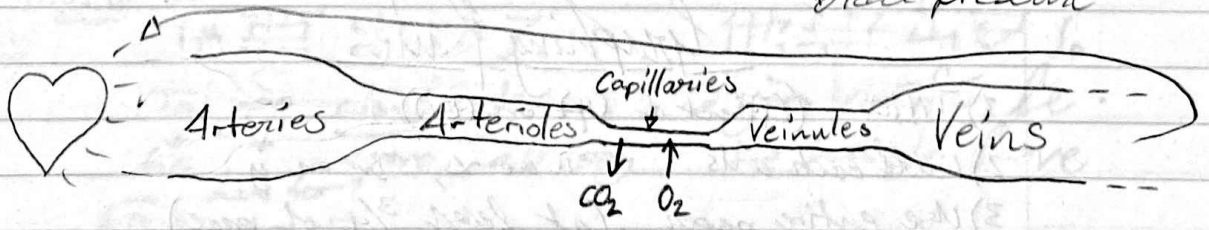
Diastole / Systole

- Diastole – Phase of heartbeat or cardiac cycle between contractions, relaxation, ventricles refill with blood
- Systole – Phase of the heartbeat or cardiac cycle when the heart contracts & pumps blood into the arteries

On the graph, when 2 lines intersect or you encounter a bump, peak, or valley something significant has happened

Ejection fraction → portion of blood ejected from the heart with each systole of the ventricles → normal is about 60%

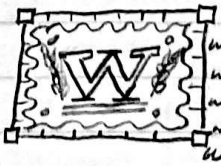
Sphygmology → study & examination of pulse & blood pressure



Practice Quiz: Wiggers Diagram

1. Maximum ventricular volume because the atrium contracted
2. The bicuspid valve opens because there is higher pressure in atrium
3. Blood moves from atrium to ventricle because of atrial systole (Rest of)
4. H, when blood in the aorta presses back against the valve & generates higher pressure in the aorta (incisura)
5. Aortic semilunar valve opens because pressure is higher in the ventricle than in the aorta
6. Bicuspid valve closes because there is higher pressure in ventricle than atrium, doesn't allow backflow of blood.
7. Cardiac cycle

(Use more descriptive answers)



Billy Wilkerson was waytain while we were whipping Willis with wailing wretches.

Dec. 9. 2024.

Pulse

↳ Expansion of an artery due to ejection of blood from the heart

Tachycardia → heart beats faster than usual, above 100 bpm at rest
↳ Indicator of acute health conditions
Bradycardia → slower than usual, less than 60 bpm at rest
↳ Unless conditions appearant, less than 60 is ok
A Taking pulse is non-invasive, tells a lot, painless, & inexpensive
Increased heart rate: Exercise, fever, warm air temperature, high emotions, high blood pressure
Decreased heart rate: arrythmias/electrical issues, fitness, decreased blood pressure

My resting HR: 60-64

Dec. 11, 2024

Graphing Rules

1) Title (Effect of (IV) on (DV))
2) Label each axis IV on x, DV on y
3) Use entire paper (at least 3/4 of page)
4) Proper number spacing (doesn't have to start @ 0)
5) Use straight edge
6) Make a key (use different colors for multiple bars or lines)
↳ (different patterns if nothing else)

(You change the independent variable)

The Effect of Different Activities on the HR of People in Our Anatomy Class

Dear ~