

## chapter 1

Exam Fall 14 Quiz 1

Define: histology microscopic anatomy

Cytology study of cells

Physiology study of diseases/disease process

- Begin with the subatomic particles and complete the organizational scheme.
  - subatomic particles → molecules → organelles → tissue → organs → systems → organism
- List two organs in the lymphatic system and the nervous system. Give two functions for each system.
  - Lymphatic:
    - tonsils/spleen
    - thymus/gland
    - protect from disease
    - direct stimuli
  - Nervous:
    - brain
    - direct stimuli
- Define homeostasis. Give an example. Differentiate positive and negative feedback.
  - Example of negative feedback: the ovary
- Explain how the body becomes too hot, indicate in the body relevant event.
  - to cool the body down
  - vasodilation - increase in rate of exchange
  - vasoconstriction - decrease in rate of exchange
- Name and describe the planes of dissection.
  - frontal - coronal
  - sagittal - midsagittal
  - transverse - horizontal
- Name three body cavities. Include their contents. Also include the tissues associated with one cavity and its location.
  - thoracic cavity - lungs & heart - two
  - abdominal cavity - peritoneal
  - pelvic cavity - peritoneal
- Where is the mediastinum located? Function?
  - in thoracic cavity
  - separates left and right lung
  - radius - fracturing/tearing/expand/tear it
- Name and differentiate two diagnostic procedures.
  - CT - (computed tomography) - 3D images of body
  - MRI - (magnetic resonance imaging) - shows different organ structures
- How many electrons in an atom of chlorine? Potassium?
  - Cl - 17
  - K - 19
- Name the following landmarks: a. superior, b. inferior, c. medial
- What directional term means toward the head? superior. Toward the middle? medial. Toward the back? posterior.

## chapter 2

Exam Fall 2014 Quiz 2

- What type of bond is between Sr and S? Name the cation.
  - ionic
  - Sr<sup>2+</sup> or a cation
- Differentiate isotopes and radioisotopes.
  - isotopes - same # of protons, different # of neutrons
  - radioisotopes - unstable isotopes of an element that emit radiation
- Name and describe two chemical bonds that are unstable and break down.
  - hydrogen bond
  - van der Waals force
- Why do elements have valence electrons?
  - they react with other atoms to become more stable
- Describe the two strong chemical bonds.
  - ionic bonds - transfer of electrons
  - covalent bonds - sharing of electrons
- Name two weak chemical bonds. Describe one.
  - hydrogen bond - attraction between a δ+ on hydrogen atom and δ- on oxygen or nitrogen
  - van der Waals force
- Using the concepts of hydrophobic, hydrophilic, and polar/non-polar, why does oil not dissolve in water?
  - oil does not dissolve in water because oil is hydrophobic and non-polar
  - water is polar and only dissolves things that are hydrophilic and polar
  - hydrophobic oil molecules will not dissolve in water because they do not have the same polarity as water molecules
  - hydrophilic molecules are attracted to each other more than water molecules
- Define chemical energy. Give an example.
  - ex: potential energy stored in a battery
  - ex: potential energy stored in a spring
  - ex: potential energy stored in a compressed gas
- Differentiate hydrolysis and dehydration. Give an example using a synthesis reaction.
  - hydrolysis - adding water to break apart
  - dehydration - removal of water
- List the categories of lipids. Give their m/s.
  - fatty acid - carbonyl
  - carbohydrate - oxygen
  - glycerol - alcohol
  - steroids - cholesterol
  - phospholipids - diglyceride & polyphosphate
  - glycolipids - carbohydrates & glycerol
- Draw and label a pH scale. Include examples of strong acids and bases, and weak acids and bases.
  - strong acids: HCl, H2SO4, HNO3
  - weak acids: acetic acid, citric acid
  - strong bases: NaOH, KOH
  - weak bases: ammonia, bicarbonate
- Name the following functional groups:
  - aldehyde
  - ketone
  - carboxylic acid
  - amine
  - alcohol
  - phosphate
  - nitro
  - hydroxyl
  - thiol

## chapter 3

- Define and give a general example of an endothermic reaction.
  - endothermic - absorbs heat
  - example: photosynthesis
- Define exothermic. Give two examples.
  - exothermic - releases heat
  - examples: combustion, cellular respiration
- Draw a steroid. Name three examples of modified steroids.
  - steroid structure: four fused rings
  - examples: cholesterol, testosterone, cortisol
- Give the general structure of a phospholipid. Name two other modified lipids.
  - phospholipid: hydrophilic head, hydrophobic tail
  - modified lipids: sphingolipid, glycolipid
- Describe the basic structure of a protein.
  - primary - amino acid sequence
  - secondary - alpha helix, beta sheet
  - tertiary - complex folding
  - quaternary - assembly of subunits
- Differentiate a cofactor and a coenzyme.
  - cofactor - non-protein molecule
  - coenzyme - organic molecule
- Define denaturation. Can it be reversed? Explain.
  - denaturation: loss of structure of proteins
  - can't be reversed
- Define phosphorylation. How is this related to cellular energy?
  - phosphorylation: adding a phosphate group
  - related to cellular energy: ATP cycle
- Name and differentiate the types of nucleic acids.
  - DNA - double stranded
  - RNA - single stranded
- Define metabolic turnover. Give two specific examples.
  - metabolic turnover: replacement of chemical structures/compartments
  - examples: protein turnover, cell turnover
- Define phospholipid. How is this related to cellular energy?
  - phospholipid: hydrophilic head, hydrophobic tail
  - related to cellular energy: membrane fluidity
- What is an omega fatty acid?
  - omega fatty acid: unsaturated fatty acid
  - located at the end of the chain
- Draw and label a cell membrane. Include a function to each component.
  - phospholipid - barrier
  - protein - transport
  - channel - transport
  - carrier - transport
  - glycocalyx - flexibility

## chapter 10

- List 4 ways to organize muscle fibers. Give an example for each.
  - muscle fiber
  - myofibril
  - myosin
  - actin
- Describe the 3 classes of levers as applied to skeletal muscles. Include an example for each.
  - 1st class: fulcrum in middle
  - 2nd class: fulcrum at one end, load in middle
  - 3rd class: fulcrum at one end, load at other end
- Name the 6 types of muscles. Include their action and innervation. Are these intrinsic or extrinsic? Explain.
  - muscle types: skeletal, smooth, cardiac
  - actions: contraction, relaxation
  - innervation: somatic, autonomic
- Define hernia. List three possible causes, and three locations.
  - hernia: protrusion of an organ through a weak spot in the abdominal wall
  - causes: congenital, acquired, increased intra-abdominal pressure
  - locations: inguinal, femoral, umbilical
- Define retinaculum. Give two locations.
  - retinaculum: band of connective tissue that holds a structure in place
  - locations: wrist, ankle
- List the hamstrings. List the quadriceps. List the muscles of the rotator cuff.
  - hamstrings: biceps femoris, semitendinosus, semimembranosus
  - quadriceps: rectus femoris, vastus lateralis, vastus medialis, vastus intermedius
  - rotator cuff: supraspinatus, infraspinatus, teres minor, teres major
- Differentiate between ischemia and hypoxia.
  - ischemia: restricted blood flow to tissue
  - hypoxia: decrease in oxygen
- Draw and label a neuron.
  - cell body
  - axon
  - axon hillock
  - myelin sheath
  - synapse
- What organelle is associated with mitosis? Name two locations where these are present.
  - mitochondrion
  - locations: cytoplasm, nucleus
- List 4 structural classifications of neurons. Draw 1 multipolar.
  - unipolar
  - bipolar
  - multipolar
  - anaxonal
- Describe the steps in neural regeneration.
  - regeneration of myelin sheath
  - regeneration of axon
  - regeneration of cell body
- List the neuroglia found in the CNS. Function?
  - astrocyte - support, blood-brain barrier
  - oligodendrocyte - myelination
  - ependymal cell - produce CSF
  - microglia - phagocytosis

## chapter 4

- Explain cellular respiration that occurs without oxygen.
  - anaerobic - respiration w/o oxygen
  - glycolysis can be used in fermentation or lactic acid fermentation
- Describe protein synthesis.
  - transcription - mRNA synthesis
  - translation - protein synthesis
- What affects movement across the cell membrane? Include solubility and diffusion in your answer.
  - solubility: lipid soluble
  - diffusion: passive process, moves from higher to lower concentration
- Differentiate the types of tumors. Include the necessary tissue.
  - benign: stays in place
  - malignant: invades, metastasizes
- Use the concept of differentiation, and describe the function of a stem cell.
  - stem cell: undifferentiated cell that can differentiate into specialized cell types
- Give an example of active transport. Why might this occur?
  - active transport: moving molecules against their concentration gradient
  - example: sodium-potassium pump
- Describe the steps in cell division. Include 2 substrates and 1 inhibitory compound.
  - mitosis: prophase, metaphase, anaphase, telophase
  - substrates: DNA, ATP
  - inhibitory compound: cyclin-dependent kinase inhibitor
- List 4 characteristics of epithelial cells.
  - cell polarity
  - cell junctions
  - cell adhesion
  - cell communication
- Describe the types of epithelial cells. Include shape, organization, location, and function.
  - simple cuboidal: kidney
  - simple squamous: lining of body cavities
  - simple columnar: lining of gut
  - stratified squamous: skin
  - stratified columnar: lining of ducts
  - transitional: bladder
  - endothelial: blood vessels
  - epithelial: lining of organs
- What is occurring in the following?
  - cell division
  - cell death
  - cell migration

## chapter 5

- Draw a step of tubular structure, and label the apical surface, lumen, and basement membrane.
  - microvilli
  - lumen
  - basement membrane
- What is transitional epithelium? Name 1 location.
  - transitional epithelium: multi-layered epithelium that can stretch
  - location: urinary bladder
- Draw a simple cuboidal, a simple columnar, and a compound cuboidal epithelium.
  - simple cuboidal: kidney
  - simple columnar: lining of gut
  - compound cuboidal: sweat gland
- Name two fluid tissue cells and two muscle cells. Give a function for each.
  - fluid tissue: plasma cells, macrophages
  - muscle cells: skeletal muscle, cardiac muscle
- Define matrix. Give a specific example.
  - matrix: extracellular material
  - example: cartilage
- Name the different types of leukocytes. Assign a function to each.
  - monocytes
  - lymphocytes
  - neutrophils
  - eosinophils
  - basophils
  - macrophages
- Define a satellite cell. Give a location. Name the two daughter cells.
  - satellite cell: stem cell in adult skeletal muscle tissue
  - daughter cells: myoblasts
- Describe three processes that occur during wound healing.
  - inflammation
  - proliferation
  - remodeling
- Draw and label a neuron.
  - cell body
  - axon
  - axon hillock
  - myelin sheath
  - synapse
- Name the types of muscles. What characteristics do they have?
  - skeletal muscle: striated, voluntary, multinucleated
  - cardiac muscle: striated, involuntary, branched
  - smooth muscle: non-striated, involuntary

### chapter 6

1. List 4 functions of the skin. Include the connection between light and Vit. D absorption.

- 1. protection
- 2. regulation of body temperature
- 3. Vitamin D synthesis
- 4. excretion of waste

2. Describe the layers of the epidermis.

- 1. stratum corneum
- 2. stratum granulosum
- 3. stratum spinosum
- 4. stratum basale

3. List 3 common skin malignancies.

- 1. basaloid carcinoma
- 2. squamous cell carcinoma
- 3. melanoma

4. Describe the ABCD system of cancer detection.

- 1. Asymmetry
- 2. Border
- 3. Color
- 4. Diameter

5. Name 2 sources and 2 functions of EGF.

- 1. keratinocytes
- 2. sebaceous glands
- 3. accelerating the production of keratin
- 4. stimulating epidermal development

6. How are sweat glands formed?

7. List 2 types of hairs. Include a location for each.

- 1. vellus
- 2. terminal

8. List 4 functions of the sebaceous gland.

- 1. lubricate
- 2. excrete
- 3. secrete
- 4. regulate

9. Name and differ bet. 2 types of sweat glands.

- 1. apocrine
- 2. eccrine

10. What makes up granulation tissue?

11. Differ bet. the types of burns. Include the types of plasma and sepsis in your answer.

12. Describe the injury repair sequence.

13. Differ bet. primary and secondary intention.

### chapter 7

1. List 4 types of bone based on shape. Include examples of each.

- 1. long
- 2. short
- 3. flat
- 4. irregular

2. Draw and label a long bone. Include compact and spongy bone.

3. Name the major vessels. What does it come from?

4. What is another name for spongy bone?

5. Describe the ossification process.

6. Describe the homeostasis of blood calcium. Include the glands, hormones, the bone cells affected, and their location.

7. List 6 types of fractures. Describe 3. Which would be the hardest to heal?

8. Name three sinuses and give three functions.

9. Differ bet. rickets and scurvy.

10. Define the term false rib. Number?

11. List 3 differences bet. male and female pelvis.

### chapter 9

1. Name the neurotransmitter(s) for the various types of muscles.

2. List 3 functions for the skeletal muscle.

3. Begin with the muscle cell membrane and name the c.c.t.s that are contractile to the periphery.

4. Describe the embryonic development of muscle tissue.

5. Name the myo of a muscle fiber. Function?

6. Draw and label a sarcomere.

7. What is the function of the following: myofibrin, myosin, actin, tropomyosin, troponin.

8. Describe the function of the following: myofibrin, myosin, actin, tropomyosin, troponin.

9. Differ bet. twitch and tetanus.

10. Differ bet. summation and tetanus.

11. How does CP affect muscle contraction?

12. Describe two diseases that cause paralysis.

### chapter 11

Using the concept of electrochemical gradient, (a) explain which ion is responsible for the depolarization phase of the action potential. (b) do the same for the repolarization phase.

1. Name 4 types of ion channels. Give an example of each.

2. List three differences between graded response and an action potential.

3. Describe the concept of hyper-polarization. Give two examples of ion movement.

4. Explain the concept of summation. Where does it occur?

5. Where is the initial segment located? Why?

6. Describe the refractory periods associated with a neuron.

7. Compare the types of neurons based on size. Give a specific example for each.

8. Differ bet. a chemical and an electrical synapse.

9. Define neuromodulator. Include the opioids.

### chapter 8

1. What is the correct term for calcium release? Why?

2. Name three types of joints based on motion. Give an example of each.

3. Draw and label a typical joint.

4. List 4 functions for synovial fluid. Describe 1.

5. Differ bet. a sprain and a strain.

6. Differ bet. a bursa and a bursitis.

7. List 4 types of synovial joints. Give an example of each.

8. Describe two problems that might occur with an I.V. disk. Why might the spinal cord be in jeopardy?

9. Name 3 ligaments that stabilize the elbow.

10. Name 3 ligaments that stabilize the hip joint.

11. Describe three diseases that affect the joint.

### chapter 12

1. Name 3 classes of neurotransmitters from table. Include a specific example, mechanism of action and location.

2. Define presynaptic inhibition. Give a specific example. Do the same for presynaptic facilitation.

3. Differ bet. spatial and temporal summation.

4. Draw and label a section of the cerebellum.

5. Define plexus. Include the myo and an advantage.

6. List the spinal segments for the brachial plexus. List 4 nerves, their specific spinal segments, and their target.

7. List the spinal segments for the lumbar plexus. List 3 nerves, their specific spinal segments, and their target.

8. Name the types of neural circuits. Draw any 2.

9. List the myo of the muscle spindle. Why?

10. Name the meninges. Describe their organization and include any spaces.