Pathology Review Objectives

Cellular Biology

1. Identify and describe the eight major cellular functions: movement, conductivity, absorption, secretion, excretion, respiration, reproduction, and communication.
2. Identify and describe the three principal parts of a typical eukaryotic cell.
3. Describe the function of the nucleus and the cytoplasmic organelles
4. Describe the structure, composition, and function of the plasma membrane
5. Describe the two main processes associated with cellular metabolism and identify the processes as energy storing or energy yielding.
6. Describe the role of ATP in the transfer of energy to drive cellular processes.
7. Classify cellular transport mechanisms as active or passive.
8. List examples of the following transport mechanisms: diffusion, facilitated diffusion, phagocytosis, pinocytosis, active transport, osmosis, hydrostatic pressure, and filtration.
9. Contrast macromolecular transport by endocytosis and exocytosis.
10. Describe the mechanism which establishes and maintains the resting potential of a cell membrane.
11. List and describe the sequence of events involved in an action potential.
12. Describe the role of the Na^+/K^+ pump in generating an electrical and concentration gradient.
13. Identify and describe the phases of mitosis and cytokinesis.
14. Identify the purpose and function of growth factors.
15. Compare and contrast the three mechanisms that bind cells together: desmosomes, tight junctions, and gap junctions.
16. Describe the following primary modes of chemical signaling: hormonal, neurohormonal, paracrine, and autocrine.
17. Identify two mechanisms for tissue formation
18. Identify the location, appearance, and a major function of each of the following types of tissue: epithelial, connective, muscle, and nervous.

Altered Cellular and Tissue Biology

1. Identify and describe under which conditions the following cellular adaptations occur: atrophy, hypertrophy, hyperplasia, dysplasia, and metaplasia.
2. Identify and describe the mechanisms of cellular injury for the following causes: hypoxia, chemicals, free radicals, infectious agents, asphyxial injuries, immunological and inflammatory responses, genetic factors, nutritional imbalances, and physical trauma.
3. Describe the characteristics of the following intentional and unintentional injuries: blunt force injuries, sharp force injuries, and gunshot wounds.
4. Identify the cause and resulting manifestation of cellular damage due to the following cellular accumulations: water, lipids and carbohydrates, glycogen, proteins, pigments, calcium, and urate (uric acid).
5. Define necrosis and identify the five major types of cellular necrosis.
6. Identify and describe the mechanism and resulting damage of coagulative, liquifactive, caseous, fat, and gangrenous necrosis.
7. Compare and contrast cellular necrosis with apoptosis.
8. Describe the two general theories of aging and provide examples of the cellular changes supporting these theories.
9. Characterize somatic death and its manifestations