

A & P 2 –Final Review

Mary Stangler Center for Academic Success

This review is meant to highlight basic concepts from the units covered in this course. It does not cover all concepts presented by your instructor. Refer back to your notes, unit objectives, labs, handouts, etc. to further prepare for your exam.

1. **Endocrine System Components**–Define the following:
 - a. Endocrine System:
 - b. Endocrine Glands:
 - c. Hormones:
 - d. Target Cells:
 - e. Receptors:
2. **Hormone Regulation:** Use TRH and TSH to describe how the endocrine system uses negative feedback to maintain homeostasis.
3. **Hormone Chemistry & Transport:** Compare lipid and protein hormones, explain what they are made of, how they travel in the blood and how they get into a target cell.

4. **Some Hypothalamic Hormones:** List the effect for each.

- a. Releasing/Inhibiting Hormones – Act on Anterior Pituitary

	<u>Hormone</u>	<u>Target Tissue</u>	<u>Effect</u>
i.	GnRH	Anterior Pituitary	
ii.	GHRH	Anterior Pituitary	
iii.	GHIH	Anterior Pituitary	

- b. Hormones – Stored/Secreted by Posterior Pituitary

	<u>Hormone</u>	<u>Target Tissue</u>	<u>Effect</u>
i.	ADH	Kidneys	
ii.	OXT	Uterus	

5. **Hormones Produced/Secreted by Anterior Pituitary** – list the effect(s) for each:

	<u>Hormone</u>	<u>Target Tissue</u>	<u>Effect(s)</u>
a.	ACTH	Adrenal Cortex	
b.	FSH	Ovaries	
		Testes	
c.	LH	Ovaries	
		Testes	
d.	GH	Bone, muscle, liver, fat	
e.	TSH	Thyroid Gland	

6. **Hormones – Stored/Secreted by Posterior Pituitary (produced by neurons in hypothalamus)** - list the effect(s) of each:

	<u>Hormone</u>	<u>Target Tissue</u>	<u>Effect</u>
a.	ADH	Kidneys	
b.	OXT	Uterus	
		Mammary glands	

7. **Pineal Gland** : which hormone does this gland secrete and when? What is its function?

8. **Thyroid Gland** – releases thyroid hormone and calcitonin.

a. Describe the effects of Thyroid Hormone (TH or T3/T4).

b. Describe the effects of calcitonin release. When would it be released? What cells are targeted?

9. **Parathyroid Glands & PTH** – Describe the effects of PTH. When would it be released? What cells does it target?

10. **Pancreas & Glucagon and insulin** - explain how blood glucose is maintained. Which hormones are released by the pancreas? What is the result of each? Which cells are targeted?

11. **Diabetes Mellitus** – why does this disorder occur? What happens to blood glucose levels in the blood? In the urine?

12. **Lymphatic System Structures** – define the following and give their functions.

- a. Lymph
- b. Lymphatic Capillaries & Vessels
- c. Lymph Nodes
- d. Lymphatic Cells
- e. Lymphatic Tissues
- f. Lymphatic Organs

13. **Lymph Flow** – use the following structural terms to describe how lymph flows in the body.

- a. Lymphatic Capillaries, Lymphatic Vessels, lymph nodes, Lymphatic Trunks (6), Right Lymphatic Duct, Thoracic Duct, Left/Right Subclavian Veins

14. **Three Lines of Defense Against Pathogens** – list the 3 lines of defense that protect the body.

15. **2nd Line of Defense: Nonspecific Responses** – describe the following:

- a. Fever –
- b. Inflammation – Give the Four Cardinal Signs of Inflammation
- c. Antimicrobial proteins –briefly explain Interferons and the Complement System
- d. Immune Surveillance - briefly explain NK cells and Macrophages .

16. **Pathogen-Specific Responses** - Describe each of the 2 main types of specific responses.

- a. Cellular (Cell-Mediated) Immunity: T Cells
- b. Humoral (Antibody-Mediated) Immunity: B Cells

17. **Leukocytes (White Blood Cells)** – describe the function of each in the immune system.

- a. Neutrophils
- b. Eosinophils
- c. Basophils
- d. Lymphocytes
- e. Monocytes

18. **Cellular (Cell-Mediated) Immunity**: T cells – describe the function of each type of T cell.

- a. Helper T Cells (TH Cells)
- b. Cytotoxic T Cells (TC Cells)
- c. Regulatory T Cells (TR Cells)
- d. Memory T Cells (TM Cells)

19. **Humoral (Antibody-Mediated) Immunity** – describe how antibodies are used in this type of immune response.

20. What is the role of B cells in **Humoral (Antibody-Mediated) Immunity**?

21. **Passive vs. Active Immunity** – describe how each is acquired.

- a. Passive Immunity
 - i. Naturally Acquired
 - ii. Artificial (Induced)

- b. Active Immunity
 - i. Naturally Acquired
 - ii. Artificial (Induced)

22. **Components of Whole Blood** - describe the main function of each component.

- a. Plasma
- b. Formed Elements
 - i. Erythrocytes – red blood cells (RBCs)
 - ii. Leukocytes – white blood cells (WBCs)
 - iii. Platelets – cell fragments

23. **Hemopoiesis** – what is it? Where does it occur?

24. **Whole Blood Measurements** – describe each.

- a. Hematocrit (Packed Cell Volume)
- b. RBC Count
- c. Hgb Concentration

25. **Blood Antigens & Antibodies** – define each as they relate to the blood cell and plasma.

- a. Antigens
- b. Antibodies

26. **ABO Blood Types** – give the type of antigen and antibodies for each blood type. Who can each donate to and receive from?

- a. Type A
- b. Type B
- c. Type AB
- d. Type O

27. **Hemostasis - Cessation of bleeding** - briefly describe what happens during each phase:

- a. Vascular Spasm –
- b. Platelet Plug Formation
- c. Coagulation (clotting) –

28. **Route of Blood Flow:** describe the direction of blood flow for each vessel type. Which areas under high pressure?

- a. Arteries
- b. Arterioles –
- c. Capillaries –
- d. Venules –
- e. Veins –

29. **Anatomy of Blood Vessels** – name the 3 layers of a vessel.
30. **Blood Flow Through Heart** – starting at the vena cava and ending at the aorta, explain how blood flows through the heart.
31. **Cardiac Electrical Conduction System** –starting with the SA node and ending with ventricular contraction, explain the electrical conduction system of the heart.
32. Explain what makes **heart sounds** (lub, dup) and what is happening when someone has a heart murmur.
33. **Cardiac Muscle – Specializations**
- What are Intercalated Discs ?
 - Why Does the Heart NOT Fatigue?
34. **Electrocardiogram (ECG or EKG)** – briefly describe the electrical activity of the heart.
35. **Respiratory Structures** – describe the basic location and/or function of the following:
- Vestibule -
 - Nasal Conchae (Turbinates) –
 - Nasal Meatuses -
 - Pharynx (Throat) -
 - Nasopharynx -
 - Oropharynx -
 - Larynx -
 - Glottis –
 - Epiglottis
 - Vestibular Folds –
 - Vocal Cords –
36. **Respiratory Tissues** – describe the cells of the following:
- Respiratory Epithelium
 - Respiratory Membrane
37. **Air Flow Through Respiratory Structures** – describe the structures air passes as it flows from the nasal/oral openings to the alveoli.

38. **Alveolar Cells** - give the function of each:

- a. Type I (Squamous) Alveolar Cells
- b. Type II (Great) Alveolar Cells
- c. Type III Alveolar Cells –

39. **Lungs - Pleural Membranes** – describe the location of each.

- a. Parietal Pleura –
- b. Visceral Pleura –
- c. Pleural Cavity –
- d. Pleural (Serous) Fluid

40. **Respiratory Muscles/Pressure/Volume** – describe the volume and pressure during inhalation and expiration.

41. **External Gas Exchange** – explain how gases are exchanged at the respiratory membrane.

42. **Internal Gas Exchange** – explain how gases are exchanged at the systemic capillaries.

43. **O₂ and CO₂ Transport** – how are each transported in the blood?

44. **Abbreviated Cheeseburger Digestion** – use the word banks to fill in the missing words

a. *WORDBANK: Amylase, Bolus, Cardiac, Chief, Chyme, Gastric lipase, Gastrin, Intrinsic factor, Lipase, Parietal, Pepsin, Peristalsis*

Take a bite, mechanical chewing, saliva mixed with food to make _____, saliva contains inactive lingual _____, and _____ that immediately begins digestion of carbohydrates.

The bolus is pushed to back of the pharynx, swallowed, and moves down esophagus by _____

Bolus enters stomach through _____ sphincter, stomach mechanically digests by churning.

Protein in the bolus causes the G cells of the stomach to release the hormone _____, which targets cells of the gastric pits: _____ cells secrete hydrochloric acid (HCl) and pepsinogen. _____ cells secrete hydrochloric acid (HCl) and intrinsic factor.

HCl + pepsinogen → _____, which starts digesting proteins.

HCl + lingual lipase → _____, which starts digesting lipids (fats).

_____ binds to Vitamin B₁₂, allowing it to be absorbed.

When mixed with the digestive juices of the stomach, the bolus becomes _____.

b. *WORDBANK: Bicarbonate ions, Bile, Cholecystikinin, Duodenum, Pyloric valve, Secretin*

When the chyme has been churned and digested sufficiently, it is squirted through the _____ valve into the _____.

The endocrine cells of the duodenum detect the presence of lipids, which causes the production and release of the hormone _____, which travels in the bloodstream to the gall bladder, causing it to release _____.

Bile participates in lipid digestion.

Endocrine cells in the duodenum detect the presence of protein, which causes them to produce and release the hormone _____, which travels in the bloodstream to the pancreas, causing it to release enzymes for protein digestion for the completion of protein digestion.

Secretin also causes the pancreas to release _____ to neutralize H⁺ and thus buffer the pH in the duodenum.

c. **WORDBANK:** Carbohydrate, Carbohydrates/starches, lacteals, Lipids, Pancreozyamin, Protein, Villi

The endocrine cells of the duodenum also detect the presence of carbohydrates, causing the production and release of the hormone _____ which travels through the bloodstream to the pancreas, causing the release of pancreatic amylase enzymes for _____ digestion.

At this point Chemical and mechanical digestion has broken the food into its building blocks:

- _____ have been broken down into fatty acids and glycerides.
- _____ have been broken down into simple sugars (monosaccharides).
- _____ have been broken down into amino acids.

Peristalsis propels these nutrients, along with indigestible material (fiber), through the jejunum and ileum, where nutrient absorption occurs through _____.

Monosaccharides and Amino Acids are absorbed through the epithelium of the villi into the bloodstream by facilitated diffusion.

Fatty acids and glycerides (monoglycerides, triglycerides) are absorbed through the epithelium of the villi by simple diffusion. These nutrients are coated with proteins and released into the lymphatic system through _____, which are lymphatic capillaries in the villi.

d. **WORDBANK:** Ascending, Descending, Large intestine, Large intestine, Rectum, Sigmoid, Transverse, Vitamin K

Any remaining material which has not been absorbed is waste, and moves through the ileocecal valve into the _____.

The main functions of the _____ are to: Absorb water from the waste material. Compact the waste material into feces. Store the fecal material until defecation. Absorb vitamins produced by bacteria present in the large intestine. These bacteria feed on indigestible carbohydrates (cellulose) in the food, and produce _____ and flatus (gas). After passing through the ileocecal valve, the waste material is moved by peristalsis through the _____ colon to the _____ colon. The waste material stays in the transverse colon until ingestion of new food causes distension of the stomach and duodenum, stimulating mass movements of waste material from the transverse colon to the _____ colon, to the _____ colon, to the _____.

45. Functions of Urinary System – describe the function of each.

- a. Excretion
- b. Elimination –
- c. Metabolic Wastes
- d. Nitrogenous Wastes
- e. Urination
- f. Micturition

46. Kidneys –

- a. What makes up the outer covering?
- b. What is the interior of a kidney primarily made up of?

47. Renal Circulation – Describe the blood flow through a kidney from renal artery to renal vein.

48. Fluid Flow Through Urinary System – list the series of tubes from the renal corpuscle to the urethra.

49. Male Reproductive Anatomy – describe the function of each.

- a. Scrotum
- b. Dartos Muscle –
- c. Spermatic Cord
- d. Cremaster Muscle
- e. Testicular Artery –
- f. Pampiniform Plexus
- g. Ductus Deferens –
- h. Seminiferous Tubules
- i. Epididymis

50. Sperm Cell Production – differentiate between Spermatogenesis and Spermiogenesis.

51. Male Reproductive Hormones – give the function of each.

- a. GnRH & Gonadotropins -
- b. LH (Luteinizing Hormone) –
- c. FSH (Follicle Stimulating Hormone) –

52. Female Reproductive Structures – give the function of each.

- a. Uterine Wall
 - i. Perimetrium –
 - ii. Myometrium
 - iii. Endometrium –
 - a. Stratum Basalis –
 - b. Stratum Functional
- b. Ovaries -
- c. Oviduct

53. Hormones of Female Reproductive System - give the hormones produced/secreted by each structure, give a basic function of each.

- a. Hypothalamus
- b. Anterior Pituitary
- c. Posterior Pituitary
- d. Ovaries