ANATOMY II
LAB PRACTICAL I
REVIEW
Endocrine System

- What is the Endocrine System?
  - A method of communication between cells in the body wherein glands produce hormones, which affect distant target organs.

- What is an endocrine gland?
  - A gland that produces hormones
  - A gland that releases hormones into the blood

- What is a hormone?
  - A chemical message in the blood

- What is a target organ?
  - An organ or gland that receives hormonal stimulation
Endocrine System

- What are the different types of hormones?
  - Steroid
  - Monoamine
  - Peptide/Glycoprotein

- If hormones travel in the blood and come into contact with all tissues, why don’t they affect all tissues?
  - They require a receptor either on the cell surface (polypeptide) or inside the cell (steroid)
Endocrine System

- What are the endocrine organs?
  1 - Pineal Gland
  2 - Hypothalamus
  3 - Anterior Pituitary (Adenohypophysis)
  4 - Posterior Pituitary (Neurohypophysis)
  5 - Thyroid
  6 - Parathyroid
  7 - Thymus
  8 - Adrenal Glands
  9 - Kidneys (EPO)
  10 - Pancreas
  11 - Ovaries
  12 - Testes
Endocrine System

- What is the hypophyseal portal system?
  - Portal System that connects the hypothalamus to the anterior pituitary

- What is a portal system?
  - Any veins that lead to another capillary bed instead of going directly to the heart
Hormones of the Pineal Gland

- What hormones does the pineal gland make?
  - Melatonin
  - Serotonin

- What does the pineal gland regulate?
  - Circadian Rhythms and Biological processes such as puberty
Hormones of the Hypothalamus

- What are the hypothalamic hormones?
  - GHRH – Growth Hormone Releasing Hormone
  - Somatostatin (GHIH) – Growth Hormone Inhibiting Hormone
  - PRH – Prolactin Releasing Hormone
  - PIH (Dopamine) – Prolactin Inhibiting Hormone
  - GnRH – Gonadotropin Releasing Hormone
  - CRH – Corticotropin Releasing Hormone
  - TRH – Thyrotropin Releasing Hormone
Hormones of the Anterior Pituitary

- What are the hormones made by the anterior pituitary?
  - GH – Growth Hormone
  - PRL – Prolactin
  - Gonadotropins
    - FSH – Follicle Stimulating Hormone
    - LH – Luteinizing Hormone
  - ACTH – Adrenocorticotropic Hormone
  - TSH – Thyroid Stimulating Hormone
Hormones of the Posterior Pituitary

- What are the hormones of the Posterior Pituitary?
  - OT – Oxytocin
  - ADH – Antidiuretic Hormone

- Where are the hormones of the posterior pituitary made?
  - Hypothalamic Nuclei
    - Supraoptic and Paraventricular
Hormones of the Thyroid and Parathyroid Glands

- What hormones are produced by the thyroid gland?
  - T₃ and T₄
  - Calcitonin

- What hormones are produced by the parathyroid glands?
  - PTH – Parathyroid Hormone, calcitriol
Hormones of the Thymus

- What hormones are produced by the thymus?
  - Thymosin and Thymopoietin
Hormones of the Adrenal Glands

- What are the two layers of the adrenal glands?
  - Adrenal Cortex
  - Adrenal Medulla

- What hormones are made by the Adrenal Cortex?
  - Mineralocorticoids
  - Glucocorticoids
  - Gonadocorticoids

- What hormones are made by the adrenal medulla?
  - Epinephrine
  - Norepinephrine
Hormones of the Kidneys and Pancreas

- What hormone is made by the kidneys?
  - EPO – Erythropoietin

- What hormones are made by the Pancreas and what cells are they made by?
  - Insulin – Beta Cells
  - Glucagon – Alpha Cells

- What two types of tissue are in the pancreas?
  - Pancreatic Islets (Islets of Langerhans)
  - Acini Cells
Hormones of the Ovaries

- What hormones are made by the ovaries?
  - Progesterone
  - Estrogen
Hormones of the Testes

- What hormones are made by the testes?
  - Testosterone
Endocrine System

- Be able to identify the following:
  - Thyroid
  - Thymus
  - Pancreas
  - Adrenal Glands
  - Ovaries
  - Testes
Cat Dissection – Endocrine System

1 – Thyroid
2 – Thymus
3 – Pancreas
4 – Adrenal Gland
Cat Dissection

1. Trachea
2. Kidney
3. Uterus
4. 6.
Blood

- What are the two parts of blood?
  - Plasma
  - Formed Elements

- What is plasma made of?
  - Water (92%)
  - Plasma Proteins (7%)
  - Other Nutrients (<1%)

- What are the Formed Elements?
  - Erythrocytes (RBCs)
  - Leukocytes (WBCs)
  - Platelets (Thrombocytes)
Blood

- What do mature red blood cells lack that allows them to have a biconcave shape?
  - A nucleus
- What do erythrocytes do?
  - Carry oxygen and carbon dioxide
- What is the molecule in erythrocytes that binds to oxygen?
  - Hemoglobin
    - Heme
Blood

- What are the two major groups of leukocytes?
  - Granulocytes
  - Agranulocytes

- What are the granulocytes and their defining characteristics?
  - Neutrophils – Multi-lobed nucleus and light pink granules
  - Eosinophils – Bi-lobed nucleus and dark red granules
  - Basophils – Dark purple granules

- What are the agranulocytes and their defining characteristics?
  - Lymphocytes – Small, with very little cytoplasm
  - Monocytes – Very large, with blue cytoplasm
Blood Tests

- What is a hematocrit?
  - Packed cell volume, represents the volume of red blood cells, though WBC and plasma volume can also be found

- What is a Differential White Blood Cell Count?
  - Count 50 Leukocytes and categorize them, then multiply by two.
    - Order of counting
    - Count from left of slide to right
Blood Cell Identification

1. Monocyte
2. Eosinophil
3. Erythrocyte
4. Lymphocyte
5. Basophil
6. Platelet
7. Neutrophil
Quiz Time

- Take a blood cell cookie and identify it, then describe its function.
Blood Vessel Anatomy

- What are the layers of an artery or vein?
  - Tunica Interna
  - Tunica Media
  - Tunica Externa
  - Serosa (arteries only)

- What do veins have that arteries don’t?
  - Valves

- Are veins or arteries thicker and why?
  - Arteries, because they have to withstand more pressure
Blood Vessels
Arteries of the Head, Neck, and Arms

1. Brachiocephalic
2. Subclavian
3. Axillary
4. Brachial
5. Radial
6. Ulnar
7. Common Carotid
8. External Carotid
9. Internal Carotid
10. Carotid Sinus
Blood Vessels
Arteries of the Torso and Abdomen

1. Right Common Carotid
2. Brachiocephalic
3. Left Subclavian
4. Inferior Mesenteric
5. Left Common Iliac
6. Internal Iliac Arteries
7. Right External Iliac
8. Superior Mesenteric
9. Right Gonadal
10. Abdominal Aorta
11. Right Renal
12. Celiac Trunk
13. Gastric
14. Splenic
15. Gastric
16. 1
17. 2
18. 3
19. 4
20. 5
Blood Vessels

Arteries of the Lower Extremities
Blood Vessels

Veins of the Lower Extremities
Blood Vessels
Veins of the Torso and Abdomen

1. Superior Vena Cava
2. Brachiocephalic
3. Jugular
4. Subclavian
5. Hepatic
6. Inferior Vena Cava
7. Left Renal
8. Left Gonadal
9. External Iliac
10. Right Renal
11. Right Gonadal
12. Internal Iliac
13. Common Iliac
Blood Vessels
Hepatic Portal System

1. Inferior Mesenteric Vein
2. Inferior Vena Cava
3. External Iliac Vein
4. Superior Mesenteric Vein
5. Hepatic Portal Vein
6. Splenic Vein
7. Gastric Vein
8. Common Iliac Vein
9. Internal Iliac Vein
Blood Vessels
Veins of the Head, Neck, and Upper Extremities

1. Internal Jugular
2. External Jugular
3. Subclavian
4. Axillary
5. Brachial
6. Radial
7. Ulnar
8. Brachiocephalic
Heart Anatomy

- What are the layers of the heart?
  - Endocardium
  - Myocardium
  - Epicardium

- What is the serous membrane of the heart and what are its layers?
  - Pericardium
    - Visceral Pericardium
    - Pericardial Cavity
    - Parietal Pericardium
    - Fibrous Pericardium
Heart Anatomy

- What are the four chambers of the heart?
  - Right and Left Atria
  - Right and Left Ventricles
- What separates the left and right atria?
  - Interatrial Septum
- What separates the left and right ventricles?
  - Interventricular Septum
- What are the arteries that feed the heart?
  - Coronary Arteries
- What are the veins that drain the heart?
  - Cardiac Veins and Coronary Sinus
Heart Anatomy

- What are the four heart valves?
  - Bicuspid Atrioventricular Valve
  - Tricuspid Atrioventricular Valve
  - Pulmonary Semilunar Valve
  - Aortic Semilunar Valve
- What anchors the Atrioventricular valves?
  - Chordae Tendinae
- What anchors the chordae tendinae?
  - Papillary muscles
- What are arteries leading away from the heart?
  - Pulmonary Arteries and Aorta
- What are the veins leading to the heart?
  - Inferior/Superior Vena Cava and Pulmonary veins
What is the pathway of blood through the heart coming from the body?

- Inferior and Superior Vena Cava
- Right Atrium
- Tricuspid Atrioventricular Valve
- Right Ventricle
- Pulmonary Semilunar Valve
- Pulmonary Trunk and Arteries

- Body
- Aorta
- Aortic Semilunar Valve
- Left Ventricle
- Bicuspid Atrioventricular Valve
- Left Atrium
- Pulmonary Veins

- Lungs
Pathway of Blood

1 – Blood comes in via the Inferior and Superior Vena Cava

2 – Blood Drains into the Right Atrium

3 – Blood flows through the Tricuspid Valve

4 – Blood is forced into the Right Ventricle

5 – Blood is pushed out through the Pulmonary Semilunar Valve

6 – Blood travels through the pulmonary trunk and arteries to the lungs

7 – Blood returns from the lungs in the pulmonary arteries

8 – Blood fills the Left Atrium

9 – Blood is pushed through the Bicuspid Valve

10 – Blood fills the Left Ventricle

11 – Blood is pushed out through the Aortic Semilunar Valve

12 – Blood flows through the Aorta to the body
Heart Dissection
Cardiovascular Physiology

- What is Systole?
  - Ventricular Contraction
- What is Diastole?
  - Ventricular Relaxation
- What is the Cardiac cycle?
  - One complete heartbeat
    - Atrial contraction/relaxation and ventricular contraction/relaxation
- What is the normal length of the cardiac cycle?
  - 0.8 seconds
  - Atrial contraction
    - 0.1 second
  - Ventricular contraction
    - 0.3 seconds
  - Quiescent period
    - 0.4 seconds
Cardiac Cycle

![Diagram of the cardiac cycle showing pressure and volume changes, along with the timing of valve closures and heart sounds represented by the ECG graph.](image-url)
Ausculating Heart Sounds

- What valve can be heard at 1?
  - Pulmonary Semilunar
- What valve can be heard at 2?
  - Bicuspid Atrioventricular Valve
- What Valve can be heard at 3?
  - Tricuspid Atrioventricular Valve
- What valve can be heard at 4?
  - Aortic Semilunar Valve
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Electrocardiogram

- What does the P-wave represent?
  - Atrial Depolarization
- What does the QRS complex represent?
  - Ventricular depolarization
- What does the T-wave represent?
  - Ventricular Repolarization
- Why can’t you see Atrial Repolarization on an ECG?
  - Atrial Repolarization happens at the same time as ventricle depolarization and is obscured by the much larger electrical signal

- When holding your breath, does heart rate increase or decrease?
  - Decrease
- After a burst of strenuous activity, does heart rate increase or decrease?
  - Increase
Questions

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