Introduction to Dissection

Lab Exercise #1: Blood Formed Elements

Lab Exercise #2: Histology of Blood Vessels and Bone Marrow

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   A. Human Heart Model
   B. Preserved Sheep Heart

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   Vessels Cranial to the Diaphragm

Lab Exercise #6: Model of Human Circulatory System:
   Blood Vessels of the Head, Trunk, and Upper Extremity

"Stuff to Know"
Dissection is the act of cutting apart or separating the tissues of the body for study. In both Anatomy and Physiology I and Anatomy and Physiology II, some of the laboratory exercises will involve dissection of preserved specimens. Because it is impractical to study preserved human specimens in our courses, the cat and various isolated organs from the pig, cow, and/or sheep will be dissected. These animals have many similarities to humans. Okay, so it might be a bit smelly and messy, but try to appreciate and make the most of the valuable opportunity to observe real body parts to enhance your understanding of anatomy!

**Materials:**

In Anatomy and Physiology I, dissection is limited and your instructor may provide the necessary dissection instruments for you. In Anatomy and Physiology II, dissection will be more extensive and each lab group should have at least one dissection kit.

A dissection kit should include:
1. a scalpel – sharp blade on a handle used to make cuts
2. a scissors
3. forceps – used to hold parts of a specimen
4. a blunt probe

Other materials that will be provided:
- disposable gloves
- dissection trays
- spray bottle of wetting solution/preservative
- cleaning supplies to wash the lab tables

**Guidelines for Dissection:**

For your safety, it is important to review the techniques of dissection.

1. Put on a pair of disposable gloves. If you are allergic to latex, inform your instructor. Nonlatex gloves are available.

2. Place the preserved specimen on a dissecting tray and make sure the entire tray is on the lab table. It will be unstable if part of it hangs over the edge.

3. While dissecting, cut as little as possible to expose parts as necessary.

4. The scalpel and scissors should only be used to make cuts. Never use them as pointers!

5. While cutting a specimen with the scalpel or scissors, hold the specimen with forceps. Never use your fingers!
6. The blunt probe should be the instrument that is used most often. It has a rounded tip, so it is safe to use as a pointer and also to tease through connective tissues to expose structures without cutting parts accidentally.

**Learning tip:** Swap and study! Trade dissected specimens with other lab groups. No two specimens will look exactly alike, so this will provide extra practice in identifying structures!

**Cleanup:**

1. Store or discard the dissected specimens as directed by your instructor.

2. Dispose of dissected scraps of tissue in the biohazard bag provided by your instructor, NEVER in the trash or down the sink!

3. Any waste fluids from the specimen must be poured into the appropriate waste collection bottle provided in the laboratory; NEVER pour waste fluids down the sink.

4. When finished using the dissection tools, clean and dry them carefully. Return them to your instructor or store them your the case.

5. Clean the dissecting trays and table tops as directed by your instructor.

6. Wash your hands thoroughly before leaving the laboratory.

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Not everyone has to dissect! Each lab group (up to 4 students) will work together. Some students prefer to dissect. Others like to stay clean and read the instructions and take notes for the group. However, remember that the more you participate in the lab exercise, the more you will learn and remember!
**Lab #1: Blood Formed Elements**

**Slide:** Blood, human

Examine the prepared blood smear with the light microscope and identify the following blood formed elements (see R p.14):

- erythrocytes
- neutrophils
- eosinophils
- monocytes
- small lymphocytes
- platelets

I. **ERYTHROCYTES** (red blood cells; rbc):

- anucleate, biconcave discs that stain pink
- most numerous of the blood cells
  - (males: $5.4 \times 10^6 / \text{mm}^3$ blood; females: $4.8 \times 10^6 / \text{mm}^3$ blood)
- approximately $7.7 \ \mu\text{m}$ diameter in dried smears; $8.6 \ \mu\text{m}$ in fresh smears

II. **LEUKOCYTES** (white blood cells; wbc)

A. **Granulocytes**

1. **Neutrophils**:
   - $10$ to $12 \ \mu\text{m}$ diameter
   - comprise $60$-$70\%$ of all leukocytes
   - polymorphic nucleus (2 - 5 lobes); looks like sausage links!
   - pale cytoplasm speckled with fine, pink to lavender granules

2. **Eosinophils**:
   - $10$ to $12 \ \mu\text{m}$ diameter
   - comprise $2$ to $4\%$ of all leukocytes
   - nucleus is polymorphic, often bilobed
   - round, red/red-orange cytoplasmic granules

3. **Basophils**:
   - $8$ to $10 \ \mu\text{m}$ diameter
   - comprise only $0.5$ to $1\%$ of all leukocytes (you get a gold star if you find one!)
   - irregularly shaped nucleus, often obscured by cytoplasmic granules
   - basophilic granules of various sizes that stain dark purple
B. Agranulocytes

1. Lymphocytes:
   ※ 7 to 15 µm diameter
   ※ comprise 20 to 25% of all leukocytes
   ※ most are small cells with a darkly stained, round nucleus surrounded by a thin rim of robin's egg blue cytoplasm

2. Monocytes:
   ※ 14 to 19 µm diameter
   ※ comprise 3 to 8% of all leukocytes
   ※ nucleus is variable in shape (oval, kidney or horse-shoe) and usually eccentric
   ※ cytoplasm is pale, grayish blue and frequently vacuolated

III. PLATELETS (Thrombocytes):

※ 250,000 - 400,000/ mm3
※ 2 to 4 µm
※ pale blue cytoplasm with fine granules
※ occur singly or in clusters
1. **HISTOLOGY OF BLOOD VESSELS** (see R. 41a):

   Observe the following slide and find examples of arteries and veins.

   *slide: Arteries and Veins or Artery, Vein and Nerve*

   **Identify the following:**
   - artery
     - tunica intima
     - endothelium
     - internal elastic membrane
   - tunica media
   - tunica adventitia
   - vein
2. **BONE MARROW** (see R. p10)

*slide: Bone Marrow, section*

Examine the histologic section of bone marrow. Note the presence of **sinusoids**, the numerous **hematopoietic cells** between the sinusoids, and the **adipocytes** (fat cells). Also observe the large cells called **megakaryocytes**. What is the function of these cells?
Lab #3: Activities with Simulated Blood

Objectives:
After completing this exercise, you should be able to:
◦ determine the ABO and Rh blood type of unknown simulated blood samples.
◦ prepare a blood smear of simulated blood
◦ examine a blood smear of simulated blood with the microscope to locate and identify red blood cells, white blood cells, and platelets.
◦ estimate the number of simulated red blood cells in a given area.

Materials:
◦ textbook
◦ simulated blood samples from Patients #1, #2, #3, and #4
◦ anti-A, anti-B, and anti-Rh simulated serum
◦ blood typing trays
◦ toothpicks
◦ microscope slides and coverslips
◦ compound light microscope

PART I: ABO/Rh Blood Typing
Each group of 2 to 4 students will determine the blood type of each of the four patients.

1. Place 5 drops of simulated blood from Patient #1 in each well on the blood typing tray.

2. Place 3 drops of anti-A simulated serum in Well A.

3. Place 3 drops of anti-B simulated serum in Well B.

4. Place 3 drops of anti-Rh simulated serum in Well Rh.

5. Use separate, clean toothpicks to stir the serum and simulated blood in each well for about 10 seconds.

6. Carefully examine each well to determine if the simulated blood in each well has agglutinated. Record the results and observations in the Data Table.

7. Thoroughly rinse the tray and dry it with a clean paper towel. Dispose of the toothpicks as directed by your instructor.

8. Repeat steps 1 through 7 with simulated blood from Patient #2, then Patient #3 and Patient #4.

9. Wash and dry the blood typing trays and return all the supplies to the appropriate space on the cart.

Lab #3 p.1
Recording and Understanding the Results:

Note: A positive test is indicated by a strong agglutination reaction.

Agglutination indicates that the simulated blood sample contains antigens (on the RBCs) that reacted with the antibodies in the serum.

Data Table: For the simulated blood sample from Patients #1 to #4, indicate yes (+) if agglutination occurred and no (-) if no agglutination was observed in each of the Wells.

From the recorded results, determine what antigens (A, B, and/or RH) are present on each of the Patients’ RBCs, then indicate the blood type of each patient (eg., A+, AB-, etc.)

<table>
<thead>
<tr>
<th>Simulated Blood Sample</th>
<th>Agglutination in Well A (with anti-A antibodies) yes (+)/no(-)</th>
<th>Agglutination in Well B (with anti-B antibodies) yes (+)/no(-)</th>
<th>Agglutination in Well Rh (with anti-Rh antibodies) yes (+)/no(-)</th>
<th>Antigens Present on the Patient’s RBCs (A, B, Rh)</th>
<th>Blood Type</th>
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<tbody>
<tr>
<td>Patient #1</td>
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<td>Patient #4</td>
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</tbody>
</table>
Lab #4: The Heart and Associated Blood Vessels

Materials: Human Heart Model and Preserved Sheep Heart

A. Human Heart Model

Identify the structures listed below. Use the diagrams in your textbook to help you!

EXTERNAL ANATOMY

adipose tissue
base - the superior, broad end of the heart
apex - the inferior, pointed end of the heart

anterior interventricular sulcus (groove) - anterior groove that separates the right and left ventricles externally

posterior interventricular sulcus (groove) - posterior groove that separates the right and left ventricles externally

coronary sulcus  (atrioventricular sulcus) - separates the atria from the ventricles

coronal arteries - vessels in the sulci that supply the myocardium; they arise from the aorta just above the aortic semilunar valve

coronary veins  (cardiac veins)

right auricle of the right atrium
left auricle of the left atrium
- these wrinkled, earlike flaps are the portions of the atria that are visible externally; they project from the chambers of the atria

LAYERS OF THE HEART WALL

endocardium
myocardium
epicardium (visceral layer of the serous pericardium)
CHAMBERS OF THE HEART

right atrium and left atrium
right ventricle and left ventricle

View these four chambers internally. The myocardium is thicker in the left ventricle because of the greater demand placed on the left ventricle, which must pump blood through the much longer systemic circulation.

interatrial septum - medial wall shared by the atria
fossa ovalis - an oval depression in the interatrial septum; it marks the site of the foramen ovale that was present in the fetal heart (to allow blood to pass from the right atrium to the left atrium, thus bypassing the fetal lungs).
pectinate muscle (pectin = comb) - the comblike ridges of muscle throughout most of the right atrium
interventricular septum - medial wall shared by the ventricles
trabeculae carneae - give the inner ventricular muscle a pitted and ridged appearance

VESSELS OF THE HEART

coronary sinus - a large chamber in the coronary sulcus that returns venous blood of the coronary circulation to the right atrium
pulmonary trunk - a large artery that arises from the right ventricle (Why is it colored blue??)
right pulmonary artery and left pulmonary artery - arise from the pulmonary trunk

Aorta
ascending aorta - large diameter vessel that exits from the LV of the heart
aortic arch - the portion of the aorta that curves to the left of the body; in humans, there are three branches that arise from the arch:
  1. brachiocephalic artery (brachiocephalic trunk; innominate artery)
    - supplies the right side of the head and right upper extremity
  2. left common carotid artery - supplies the left side of the head
  3. left subclavian artery - supplies the left upper extremity
descending aorta - the continuation of the aortic arch inferiorly

ligamentum arteriosum - a cordlike remnant of the ductus arteriosus. (In the fetus, the ductus arteriosus allows blood to pass directly from the pulmonary trunk to the aorta, thereby bypassing the nonfunctioning fetal lungs.)
pulmonary veins - there are 4 of these that enter the left atrium; (Why are they colored red??)
superior vena cava & inferior vena cava - both open into the right atrium

Lab #4  p.2
VALVES OF THE HEART

atrioventricular valves:
  cusp(s) of tricuspid valve  (right atrioventricular valve) - How many cusps does it have?
  cusp(s) of bicuspid valve  (mitral valve; left atrioventricular valve)
  papillary muscles
  chordae tendinae

semilunar valves:
  cusp(s) of aortic semilunar valve
  cusp(s) of pulmonary semilunar valve

B. Preserved Sheep Heart

Make a frontal section through the heart, beginning from the left side and extending the cut almost completely to the right side. (See me for assistance!!) You may make additional cuts if necessary.

☆ Remember: Use scalpels and scissors to cut ONLY, then put them away. Use forceps, not fingers, to hold something while cutting.

EXTERNAL ANATOMY

base
apex
anterior interventricular sulcus (groove)
posterior interventricular sulcus (groove)
coronary sulcus (atrioventricular sulcus) - separates the atria from the ventricles
adipose tissue - notice the accumulation of fat, especially in the sulci
coronary vessels (coronary arteries and coronary (cardiac) veins) - contained in the sulci and supply the myocardium. ☆ Don’t try to distinguish between the coronary arteries and coronary veins!

right auricle of the right atrium
left auricle of the left atrium

left ventricle - compress the ventricular chambers on each side of the interventricular sulcus. The side that feels thicker and more solid is the left ventricle.
right ventricle - feels thinner and somewhat flabby when compressed

LAYERS OF THE HEART WALL

endocardium
myocardium
epicardium (visceral layer of the serous pericardium)

Lab #4  p.3
CHAMBERS OF THE HEART
right atrium
left atrium
pectinate muscles - ridges of muscle in the right atrium
right ventricle
left ventricle
interventricular septum
trabeculae carneae - give the inner ventricular muscle a pitted and ridged appearance

VESSELS OF THE HEART
pulmonary trunk - exits from the right ventricle of the heart; The pulmonary divides into the right and left pulmonary arteries. You may see its division if it has not been cut too closely to the heart.
aorta - exits from the left ventricle; it is posterior to the pulmonary trunk and has a thicker wall; the aortic arch has one branch in the sheep:
  brachiocephalic (innominate) artery - this branch of the aortic arch can be identified, unless the aorta has been cut too close to the heart base.

(The brachiocephalic artery of the sheep later splits to form the carotid and subclavian arteries that supply the right side of the head and the right forelimb, respectively. Note that in the human heart the brachiocephalic artery, left common carotid artery, and left subclavian artery each arise as separate vessels from the aortic arch (see the model & diagrams of the human heart).

Turn the heart to view its posterior surface.
superior vena cava and inferior vena cava - both enter the right atrium.

VALVES OF THE HEART
Atrioventricular valves:
cusps of tricuspid valve (right atrioventricular valve)
  Insert a probe into the superior vena cava and use scissors to cut through its wall so that you can view the interior of the right atrium. Do not extend your cut entirely through the right atrium or into the ventricle or into your finger! Observe the tricuspid (right atrioventricular) valve. How many flaps (cusps) does it have?
cusps of bicuspid valve (left atrioventricular valve; mitral valve)
papillary muscles
chorda tendinae
cusps

Semilunar valves:
cusps of aortic semilunar valve
cusps of pulmonary semilunar valve

Lab #4  p.4
Sheep Heart:

Craniolateral view:

Caudal view:

Internal view, right side:
Lab #5: Circulatory System of the Cat: Vessels Cranial to the Diaphragm

R p.110 (heart & arteries) & p.111 (veins)

Materials: Preserved cat

The blood vessels carrying blood from the heart are arteries, and those carrying blood to the heart are veins. Your specimens have been doubly injected; the systemic arteries are injected with red latex and the systemic veins with blue latex. (Note: the color scheme is opposite in the pulmonary arteries and veins!!)

☆ As you dissect, carefully clean the connective tissues away from the vessels. Do not use a scalpel after the body cavity has been entered; forceps and a blunt probe are most suitable for the dissection of blood vessels. (Note: Veins are especially easy to tear and destroy. They have thinner walls than arteries because they are subject to less pressure. The smaller veins and even some of the larger ones are frequently not well injected with the blue latex. The veins on one side of your cat may be better than the other side.)

OPENING THE THORAX:

Open the thorax by making a ventral, longitudinal incision about 2 centimeters to the right of the midline, extending cranially to the apex of the thorax, and caudally to the cranial surface of the diaphragm. The incision should pass through the costal cartilages, which can be cut with a scalpel.

The diaphragm is a dome-shaped, transverse, muscular partition that is seen at the caudal end of the pleural cavities when the incision you are making is spread open. To detach the rib cage from the diaphragm, make another cut, just cranial to the diaphragm, that extends laterally and dorsally to the cat’s back on both the right and left side. Follow the line of attachment of the diaphragm but keep on the side of the pleural cavity. Using bone shears cut the ribs dorsally a short distance lateral to the vertebral column on each side.

Identify the lungs and the right and left pleural cavities that are now well exposed.

The space, or potential space, between the medial walls of the two pleural cavities constitutes the mediastinum. This space, however, is largely filled with structures that lie between the two cavities. For example, the pericardial cavity and heart, which form the large bulge medial and ventral to the lung, lie in the mediastinum.

The portion of the mediastinum ventral and cranial to the heart is occupied by the dark, irregularly lobulated thymus. The thymus is best developed in young animals, and may be difficult to find in older animals.
HEART:
Enter the pericardial cavity by slitting the outer wall of the pericardial sac that surrounds the heart.

The outer wall of the pericardial sac is lined by the parietal layer of the serous pericardium and is backed by the fibrous pericardium.

The epicardium (visceral layer of the serous pericardium) closely invests the heart and can not be easily separated from the underlying myocardium. Identify the apex and base of the heart.

Note the right auricle and left auricle and the right ventricle and left ventricle of the heart, and the coronary blood vessels that course in the interventricular sulci and the coronary grooves.

ARTERIES:

Pull the left lung ventrally and examine the region dorsal to it. Part of the descending aorta, called the thoracic aorta can be seen passing through the dorsal portion of the mediastinum. Tease deep to the aorta through the connective tissue and locate part of the esophagus.

Trace the part of the aorta that you just located superiorly to the heart. The aorta conveys oxygenated blood from the left ventricle to the body. Identify the following parts of the aorta:

- **ascending aorta** - first part leading from the left ventricle
- **aortic arch** - portion curved to the left
- **descending aorta** - the aortic arch then continues as the descending aorta, which passes dorsal to the left pulmonary artery and continuing down the left side of the vertebral column to the pelvis, where it divides into branches that supply the legs. More specifically, the descending aorta is called the thoracic aorta in the thoracic cavity and the abdominal aorta in the abdominal cavity. (We will trace the abdominal aorta in another lab.)

Trace the pulmonary trunk from the right ventricle of the heart and notice that it divides into the left pulmonary artery and right pulmonary artery shortly after it leaves the right ventricle.

Near the point of division, the pulmonary trunk is connected to the aorta by the ligamentum arteriosum, a cord of connective tissue representing the remnant of the ductus arteriosum of the fetal circulation. The left pulmonary artery passes ventral to the aorta to reach the left lung; the right pulmonary artery passes between the aortic arch and the heart to reach the right lung.

Branches of the brachiocephalic and subclavian arteries:

In the cat, the aortic arch gives rise to two arteries:

- **brachiocephalic (innominate) artery** - supplies the head, neck, and right pectoral appendage
- **left subclavian artery** - supplies the left pectoral appendage.
Follow the brachiocephalic artery. At about the level of the 2nd rib, the brachiocephalic artery divides into the **right subclavian artery** (which supplies the right pectoral appendage) and the **right common carotid artery** and **left common carotid artery** (which supply the head region).

The **internal mammary artery** supplies the ventral thoracic wall.

Lateral to the 1st rib, the subclavian artery continues into the axilla (armpit) as the **axillary artery**. Distally, the axillary continues into the arm region as the **brachial artery**. Distal to the elbow, the brachial artery is continuous with the radial artery and gives rise to the ulnar artery.

**VEINS:**

The **pulmonary veins** return oxygenated blood from the lungs to the left atrium. There may be 2 or more of these in the cat; the human has 4. To identify the pulmonary veins, pull the heart away from the lung on one side and examine the root of the lung. From each lobe a vein (usually uninjected) will be seen passing toward the dorsal side of the heart.

The **inferior vena cava** (post cava) joins the right atrium. It returns all blood to the heart from areas caudal to the diaphragm.

The **superior vena cava** (precava) also joins the right atrium. It returns all blood to the heart from areas cranial to the diaphragm, except that from the wall of the heart itself. Which vessels carry deoxygenated blood from the wall of the heart?

The **azygous vein** is located on the right side along the vertebral column. It joins the superior vena cave just before the latter joins the right atrium. The azygous collects blood from the thoracic wall from the intercostal tributaries, and some from the diaphragm, esophagus, and bronchi. (The human has accessory azygous veins.)
The **right and left brachiocephalic (innominate) veins** join to form the superior vena cava.

Each **subclavian vein** joins an **external jugular vein** to form a brachiocephalic vein.

The external jugular vein returns blood primarily from structures of the head region located outside the cranial cavity.

The subclavian is a continuation of the axillary vein; therefore it returns blood from the pectoral extremity. The **axillary vein** is located in the axilla. It is a continuation of the **brachial vein** from the arm.
Lab #6: Model of Human Circulatory System: Blood Vessels of the Head, Trunk, and Upper Extremity

Materials: Model of the human circulatory system. Using the diagrams in your textbook to assist you, be able to identify the following on the model of the human circulatory system:

**Organs:**
- heart
  - right atrium and left atrium
  - right ventricle and left ventricle
- lungs

**Arteries of the head, trunk, and upper extremity:**
- pulmonary trunk
  - right pulmonary artery
  - left pulmonary artery
- ascending aorta
- aortic arch
  - brachiocephalic artery (brachiocephalic trunk)
    - right common carotid artery
    - right subclavian artery
    - right axillary artery
    - right brachial artery
      - right radial artery
      - right ulnar artery
  - left common carotid artery
  - left subclavian artery
    - left axillary artery
    - left brachial artery
      - left radial artery
      - left ulnar artery

**Veins of the head, trunk, and upper extremity:**
- pulmonary veins
- superior vena cava
left brachiocephalic vein
  • left internal jugular vein
  • left subclavian vein

right brachiocephalic vein — this is visible but appears very short on this model
  • right internal jugular vein
  • right subclavian vein
    • right cephalic vein
    • right basilic vein
    • median cubital vein
Lab #1: Blood Formed Elements
Erythrocytes
Leukocytes
Granulocytes:
  Neutrophils
  Eosinophils
Agranulocytes:
  Lymphocytes
  Monocytes
Platelets

CHAMBERS OF THE HEART
  right atrium
  left atrium
  interatrial septum
  fossa ovalis
  pectinate muscle
  right ventricle
  left ventricle
  interventricular septum
  trabeculae carneae

VESSELS OF THE HEART
  coronary sinus
  pulmonary trunk
    right pulmonary artery
    left pulmonary artery
  aorta
    ascending aorta
    aortic arch
    brachiocephalic artery
    left common carotid artery
    left subclavian artery
    descending aorta
  ligamentum arteriosum
  pulmonary veins
  superior vena cava
  inferior vena cava

VALVES OF THE HEART
atrophicventricular valves:
  cusps of tricuspid valve
  cusps of bicuspid valve
  papillary muscles
  chordae tendinae
semilunar valves:
  cusps of aortic semilunar valve
  cusps of pulmonary semilunar valve

Lab #2: Histology of Blood Vessels and Bone Marrow
1. BLOOD VESSELS
   slide: Arteries and Veins
   artery
     tunica intima
     endothelium
     internal elastic membrane
     tunica media
     tunica adventitia
   vein
2. BONE MARROW, SECTION
   sinusoids
   hematopoietic cells
   adipocytes
   megakaryocytes

Lab #3: Heart & Assoc. Bld Vessels
A. HUMAN HEART MODEL
EXTERNAL ANATOMY
  adipose tissue
  base
  apex
  anterior interventricular sulcus
  posterior interventricular sulcus
  coronary sulcus
  coronary arteries
  coronary veins
  right auricle of right atrium
  left auricle of left atrium
LAYERS OF THE HEART WALL
  endocardium
  myocardium
  epicardium

B. PRESERVED SHEEP HEART
EXTERNAL ANATOMY, SHEEP HEART
  base
  apex
  anterior interventricular sulcus
  posterior interventricular sulcus
  coronary sulcus
  adipose tissue
  coronary vessels
Lab 3B, continued:

right auricle of the right atrium
left auricle of the left atrium
left ventricle
right ventricle

LAYERS OF THE HEART WALL, SHEEP
endocardium
myocardium
epicardium

CHAMBERS OF THE HEART, SHEEP
right atrium
left atrium
right ventricle
left ventricle
interventricular septum

VESSELS OF THE HEART, SHEEP
pulmonary trunk
aorta
  - brachiocephalic artery
superior vena cava
inferior vena cava

VALVES OF THE HEART, SHEEP
atrioventricular valves:
  - cusps of tricuspid valve
  - cusps of bicuspid valve
  - papillary muscles
  - chorda tendinae
semilunar valves:
  - cusps of aortic semilunar valve
  - cusps of pulmonary semilunar valve

Lab #5: Circulatory System of the Cat:
Vessels Cranial To The Diaphragm

diaphragm
thymus
pericardial cavity
pericardial sac
heart
apex of heart
base of heart
parietal layer of the serous pericardium
fibrous pericardium
epicardium (visceral layer of the serous pericardium)
right auricle of the right atrium
left auricle of the left atrium
right ventricle
left ventricles

Lab #6: Model: Human Circ. System:
Blood Vessels of the Head, Trunk, and Upper Extremity

ORGANS:
heart
  - right atrium
  - left atrium
  - right ventricle
  - left ventricle
lungs

Stuff to Know” p. 2
Lab 6, continued:

Arteries of head, trunk, and upper extremity:
pulmonary trunk
  right pulmonary artery
  left pulmonary artery

ascending aorta
aortic arch
  • brachiocephalic artery
    right common carotid artery
    right subclavian artery
    right axillary artery
    right brachial artery
      right radial artery
      right ulnar artery
  • left common carotid artery
  • left subclavian artery
    left axillary artery
    left brachial artery
      left radial artery
      left ulnar artery

Veins of the head, trunk, and upper extremity:
pulmonary veins

superior vena cava
left brachiocephalic vein
  • left internal jugular vein
  • left subclavian vein

right brachiocephalic vein — *this is visible but is appears very short on this model*
  • right internal jugular vein
  • right subclavian vein
    right cephalic vein
    right basilic vein
    median cubital vein