Chapter 37 **Circulatory and Respiratory Systems** **Name _____**

Lab Dissection - Respiratory System

Procedure

1. Make a median longitudinal incision through the muscles in the neck in order to expose the larynx and trachea. Do not sever the blood vessels or nerves located on either side of the trachea. Use Figures 1 and 2 as a guide for identification of these structures.

    a. The **trachea** contains rings of cartilage in its walls. Determine whether these rings are complete on the dorsal surface of the trachea.

    b. Remove muscular tissue from the larynx. Make a longitudinal incision through the ventral wall of the larynx and locate the **vocal folds**, which are two small, shelf-like membranes. These are poorly developed in the fetal pig.

    c. Locate the **hyoid bone** anterior to the larynx.

    d. The **sublingual** and **submandibular glands** are now visible adjacent to the larynx.

2. Identify the **thymus gland**. the large gland ventral to the heart. This gland consists of two major lobes which extend anteriorly into the neck region on either side of the trachea. The thymus is relatively large in the fetus.

3. The ventral neck muscles and the cervical part of the thymus gland cover the **thyroid gland**, the small, dark gland which lies on the upper trachea. Part the muscles and thymus gland to expose this gland.

4. Observe the large right and left common **carotid arteries** and the **internal jugular veins** on each side of the trachea.

5. The **vagus nerve** is the conspicuous white band that is bound to the dorsal surface of the common carotid artery. This nerve connects many of the thoracic and abdominal organs as part of the autonomic nervous system.

6. Free the trachea, laterally, from the preceding blood vessels and nerves. Lying along the trachea, and attached to it, are the two slender **inferior laryngeal nerves**. These nerves which are essential for speech in humans originate from the vagus nerve and, although they are small and delicate, are easily seen against the trachea on either side.

7. Locate the **esophagus**, the muscular tube dorsal to the trachea.

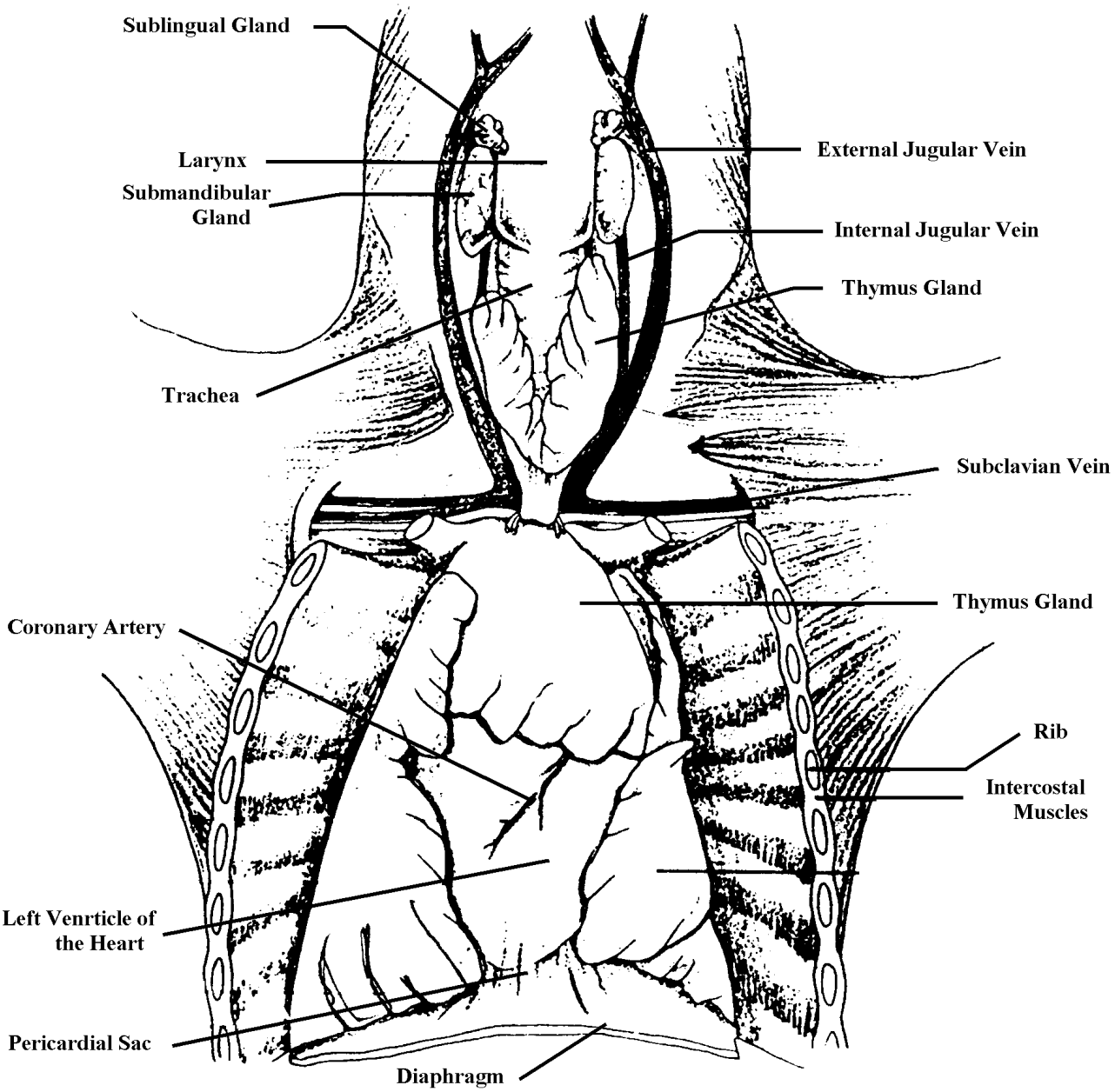
8. Examine the interior of the thoracic cavity.

    a. Note that the thoracic cavity is divided into two lateral **pleural cavities**. which contain the lungs. The **pericardial sac,** which contains the **heart**. is located in the space (mediastinum) between the lungs.

    b. The **pleura** is a double layered membrane which lines the thorax. That portion of the pleura lining the thoracic wall is called the **parietal pleura**; that which covers and adheres to the lungs is called the **visceral pleura**.

    c. The **pericardium**, the membrane surrounding the heart, is also composed of two layers: the outer parietal layer and the inner visceral attached to the heart. Much of the parietal pleura forming the medial walls of the pleural cavities is tightly bound to the parietal pericardium.

Figure 1 Superficial View of the Thoracic Cavity with the Neck Dissected



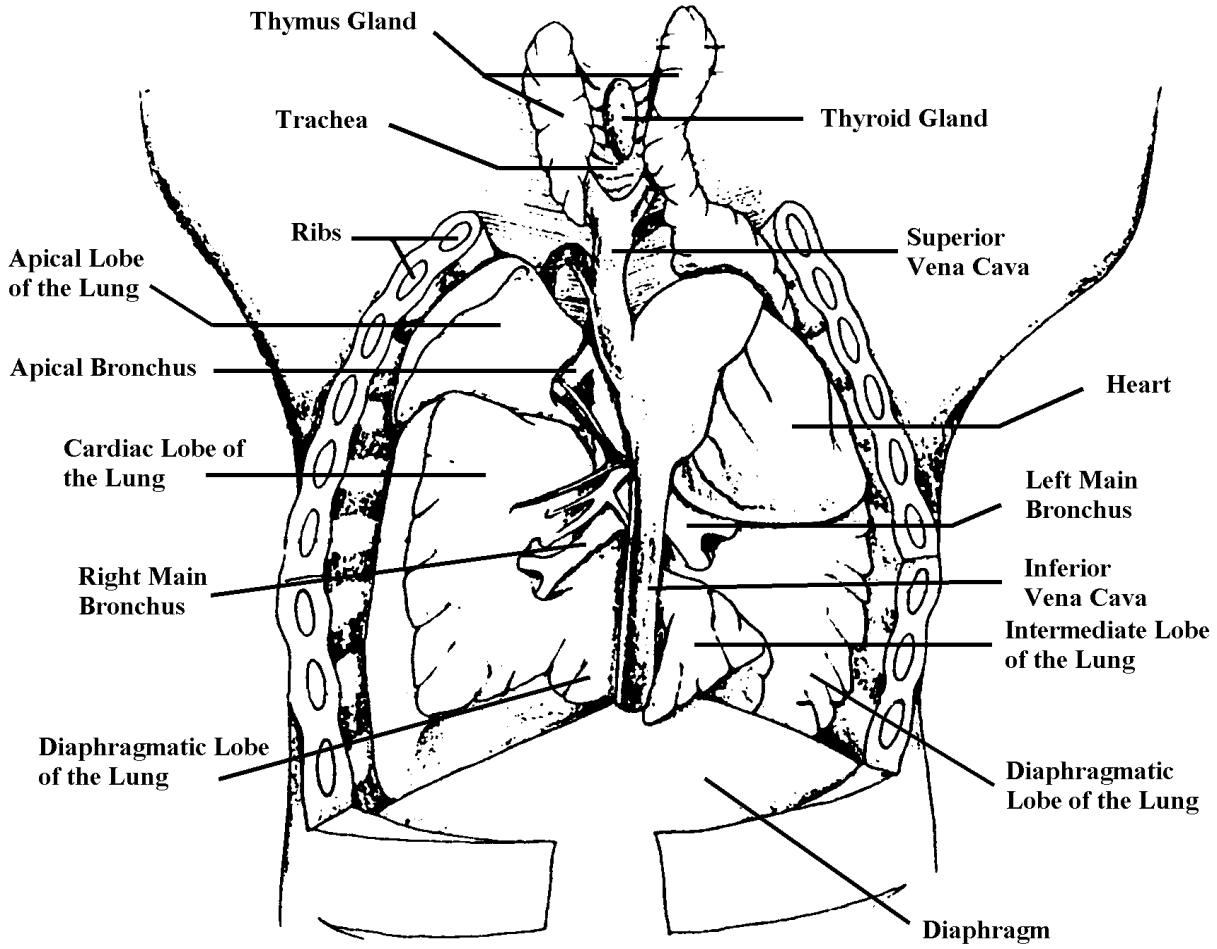
9. Remove thymus tissue in the thoracic cavity in order to study the lungs.

   a. Note that the lung is attached to other structures in the thorax only by the **root**. The **root of the lung** is formed by the bronchus, pulmonary artery and vein, bronchial arteries and veins, nerves, lymphatic vessels, and bronchial lymph nodes, all encircled by pleura.

   b. Determine the number of lobes in each lung. Each lung is divided into three major lobes: apical, cardiac, and diaphragmatic. The right lung has an intermediate lobe beneath the apex of the heart.

   c. Cut off a small section of the left lung, and note the density of the lung. The lungs have not yet filled with air, since they are nonfunctional before birth.

Figure 2 Dissection of the Organs of the Thoracic Cavity of the Fetal Pig



10. The trachea branches into a right and left bronchus dorsal to the heart. In order to locate the right bronchus, push the heart to the left side of the thoracic cavity; then locate the inferior end of the trachea dorsal to the heart and right pulmonary blood vessels. Try not to sever the pulmonary blood vessels. Locate the apical bronchus which leaves the trachea anterior to its termination and supplies the right apical lobe. Note the right main (primary) bronchus which supplies the right cardiac and diaphragmatic lobes, and the small branch of the bronchus which supplies the intermediate lobe. Then scrape away the right cardiac lobe of the lung, bit by bit, noting the organization of the bronchial tree and blood vessels and locate a primary bronchus. Leave the vessels intact. The branches of the bronchi can be identified by the cartilage in the walls.

11. Locate the **phrenic nerve**. It is the conspicuous white line that passes along the pericardium to the diaphragm on either the right or left side of the heart.

12. Lift up the left lung and remove some of the parietal pleura dorsal to the lung to locate the esophagus. Follow the esophagus to the diaphragm.