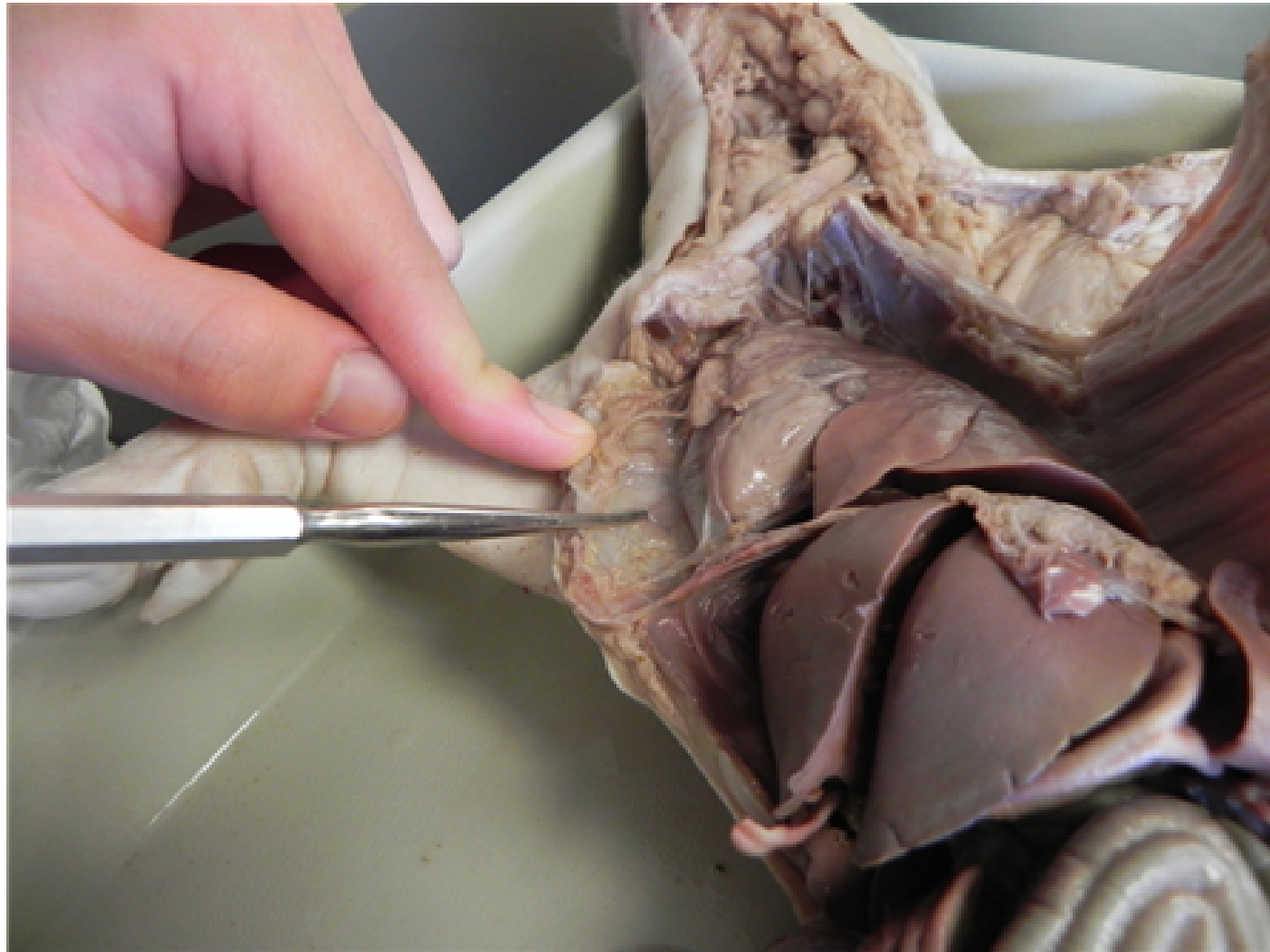


Fetal Pig Dissection Day 4

The Cardiorespiratory System



Objectives:

1. Identify and describe the function of the main organs and structures in the respiratory and circulatory systems.
2. Describe the movement of air into and out of the lungs.
3. Trace the flow of blood through the pulmonary and systemic circuits.
4. Describe how the circulatory and respiratory systems work together to bring about the integrated functioning of the body.
4. Understand portal circulation.
5. Understand mammalian fetal circulation from a mechanical and physiological perspective.
6. Apply this knowledge to organismal adaptive strategies and problems in human physiology.

Materials Needed: Ready.....go!



Dissecting Tools
Dissecting Tray

Fetal Pig (Previously Tied Off)

Gloves (If Wanted)

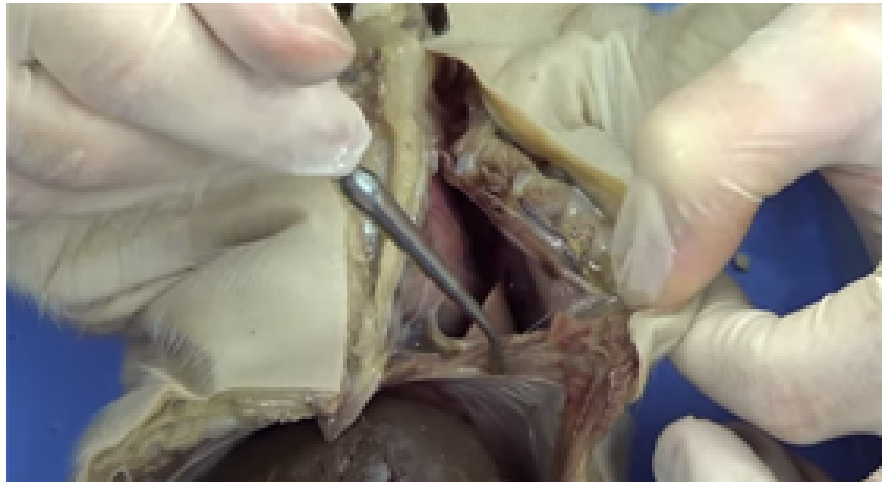
Lab Handout Day 4

Pen / Pencil



Make your incision from the diaphragm up to the chin. We are actually cutting right along side of the sternum.

Be careful to just cut the surface tissues and bones but try not to disrupt the organs underneath (take note not to cut the heart or thyroid in the chin area)



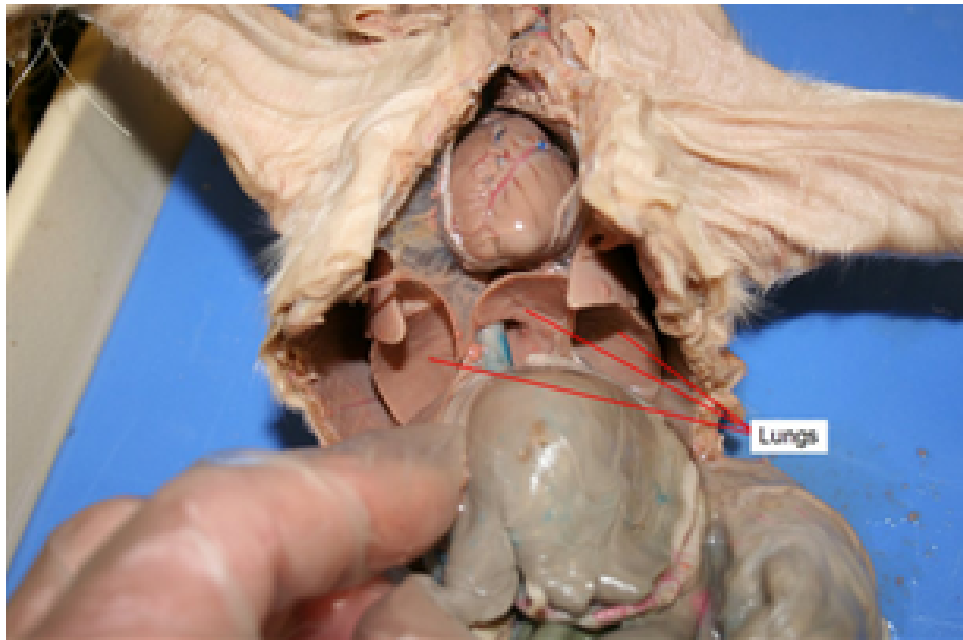
As you cut, notice the diaphragm. Do not cut through the diaphragm, just separate it from the tissues connecting it.

Do not be afraid to cut or break ribs in order to open the rib cage.

Remember: For the fetal pig, the diaphragm is not in use. Fetal pigs get oxygen through the umbilicus.

Locate the Lungs

Cut a small piece of the lower lobe of the lung to view. Notice how the inside of the lung is solid (except for spaces for bronchial tubes or blood vessels). If looked at under a microscope, we would see tons of nooks and crannies made by alveoli where gas exchange occurs across the respiratory membrane.



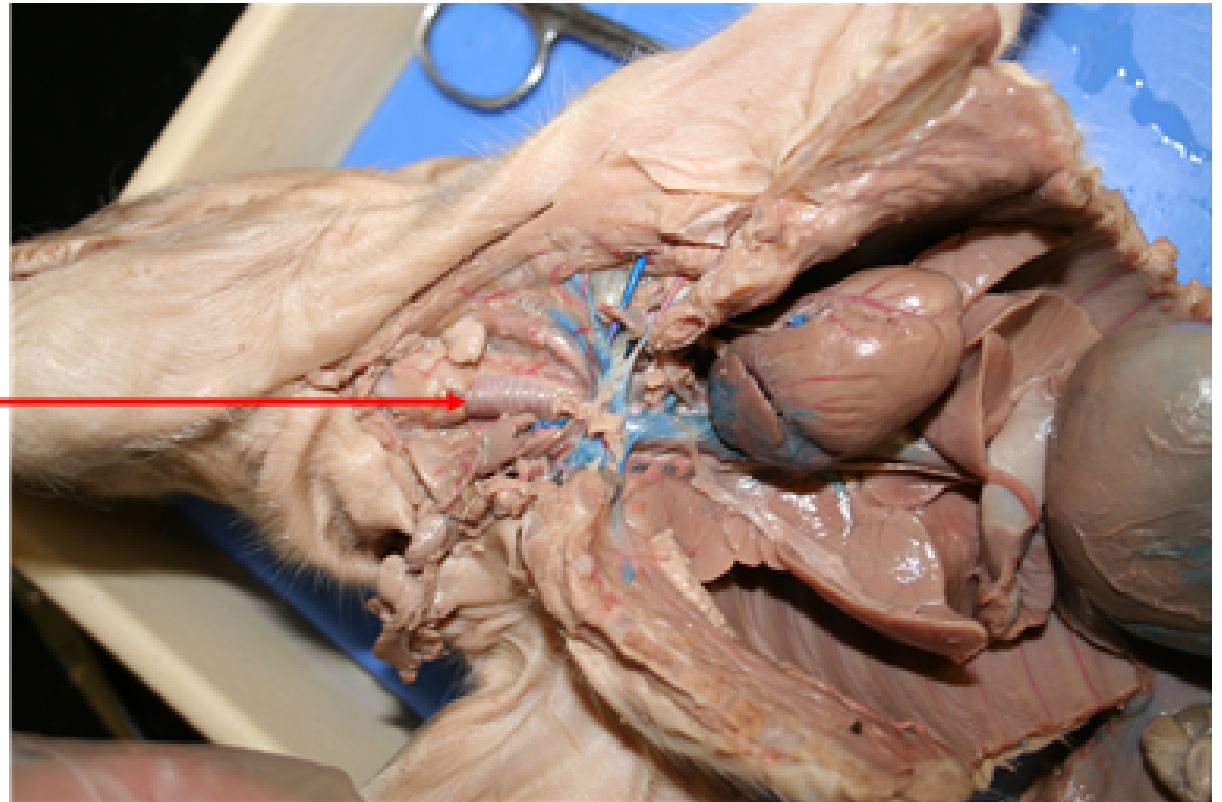
In a pig lung, the right lung has 4 lobes and the left lung has 3 lobes.



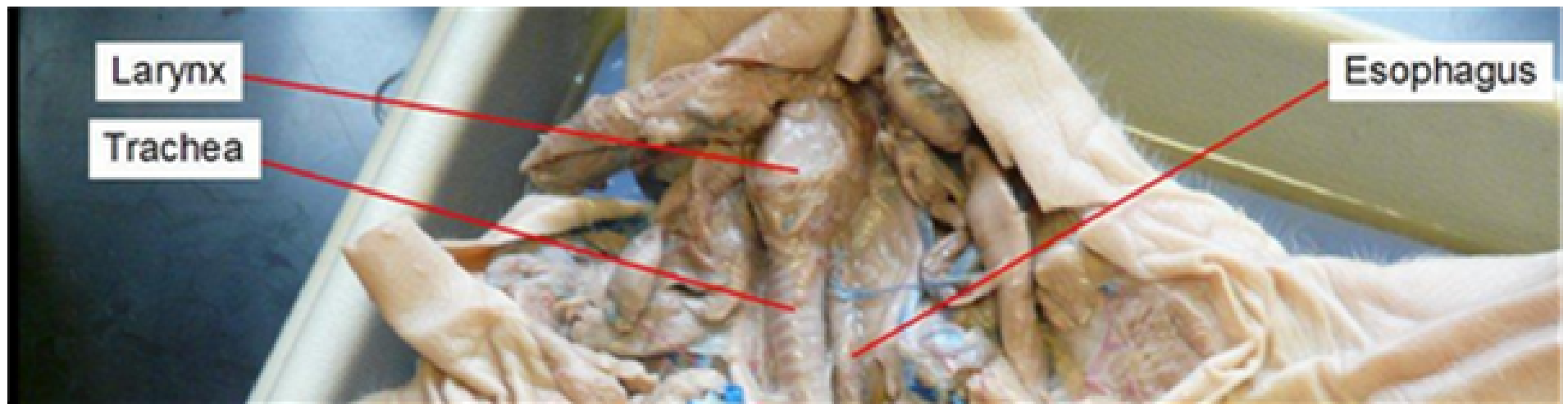
Fetal pig lungs are actually going to be firmer than adult pig lungs because they haven't been filled with air yet.

Locate the Trachea

The trachea is the large air tube that lies anterior to the lungs. The trachea is easy to identify because of the cartilaginous rings that help keep it from collapsing as the animal inhales and exhales and to allow the esophagus to expand when swallowing. Trace the trachea to where it branches into the bronchi. (Do not damage any blood vessels as we will talk about them next.)



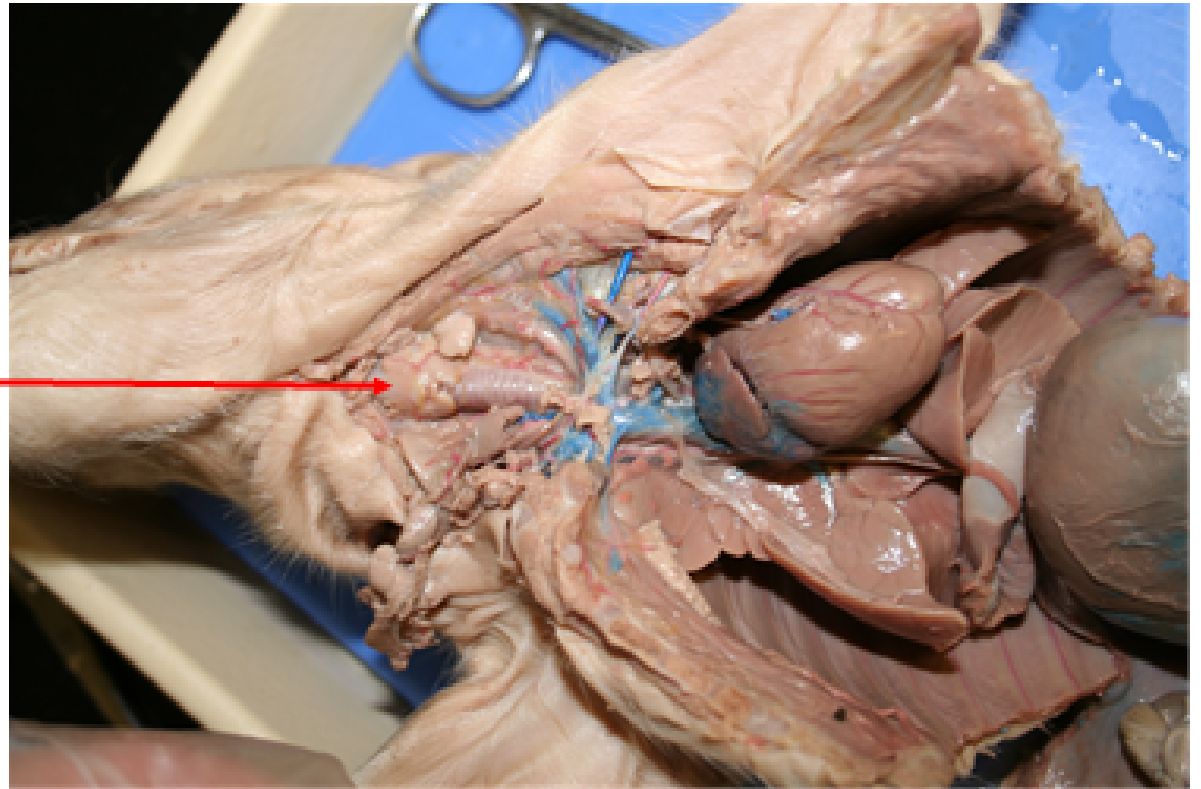
Now that the neck area is exposed you can also view the esophagus (digestive system) that lies posterior to the trachea.



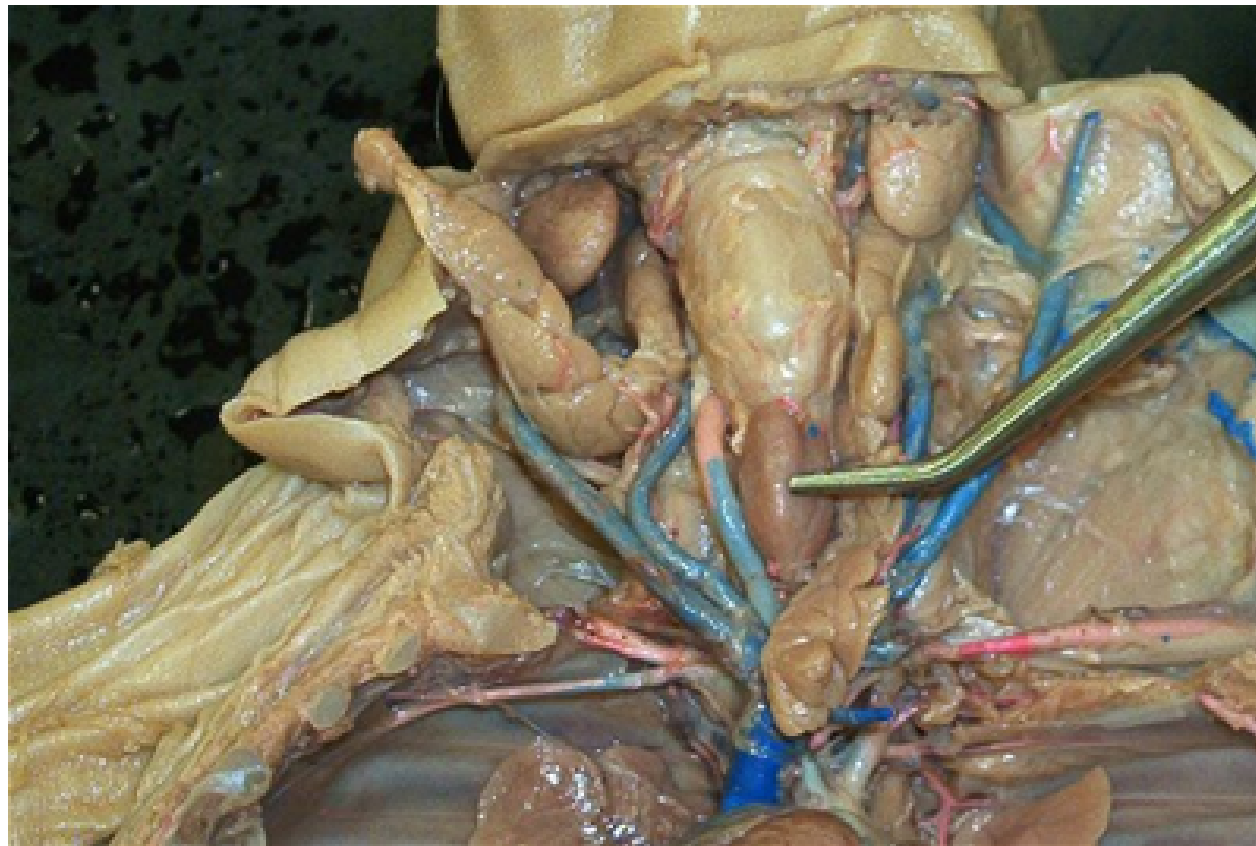
Locate the Larynx

At the top of the trachea find the hard, light-colored larynx or voice box. This organ contains the vocal cords that enable the animal to produce sound.

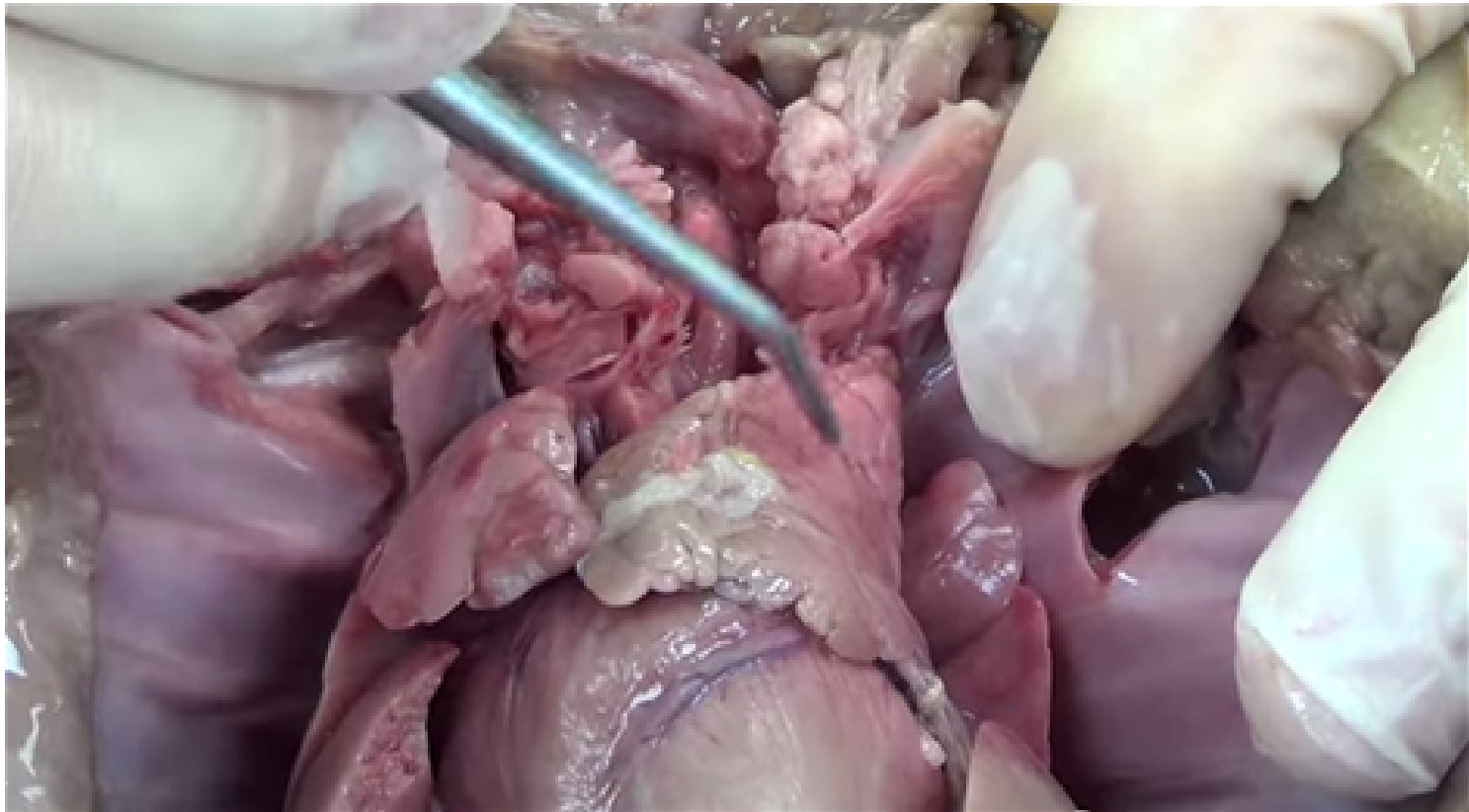
You may cut this open into the trachea to observe the inside if you would like.



Locate the thyroid gland. The Thyroid gland is located underneath the larynx. This gland is part of the endocrine system and creates hormones for growth and development and controls metabolism.

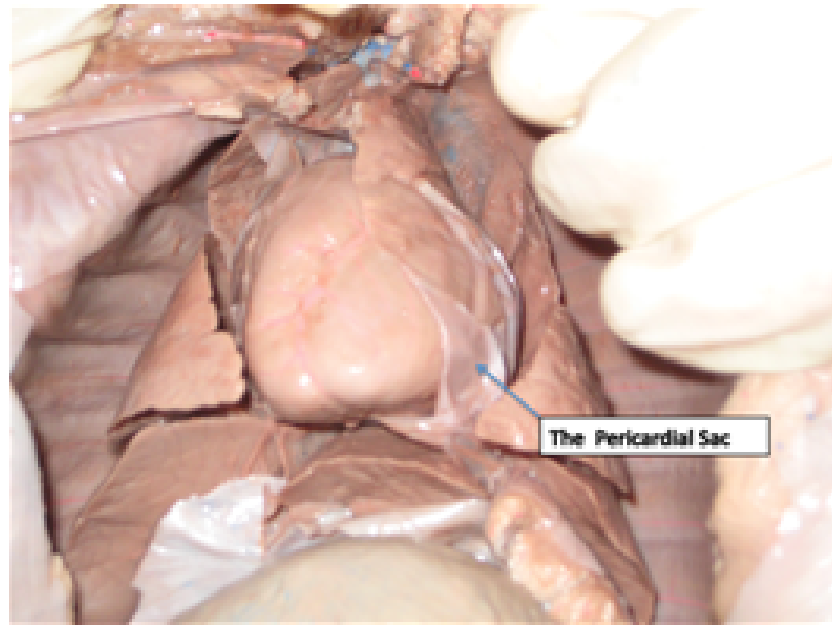


While examining the heart, you may see the thymus gland. The thymus gland lays over the heart and up into the chest cavity. The thymus is part of the endocrine system that produces mature t-cells that help the immune system fight germs.



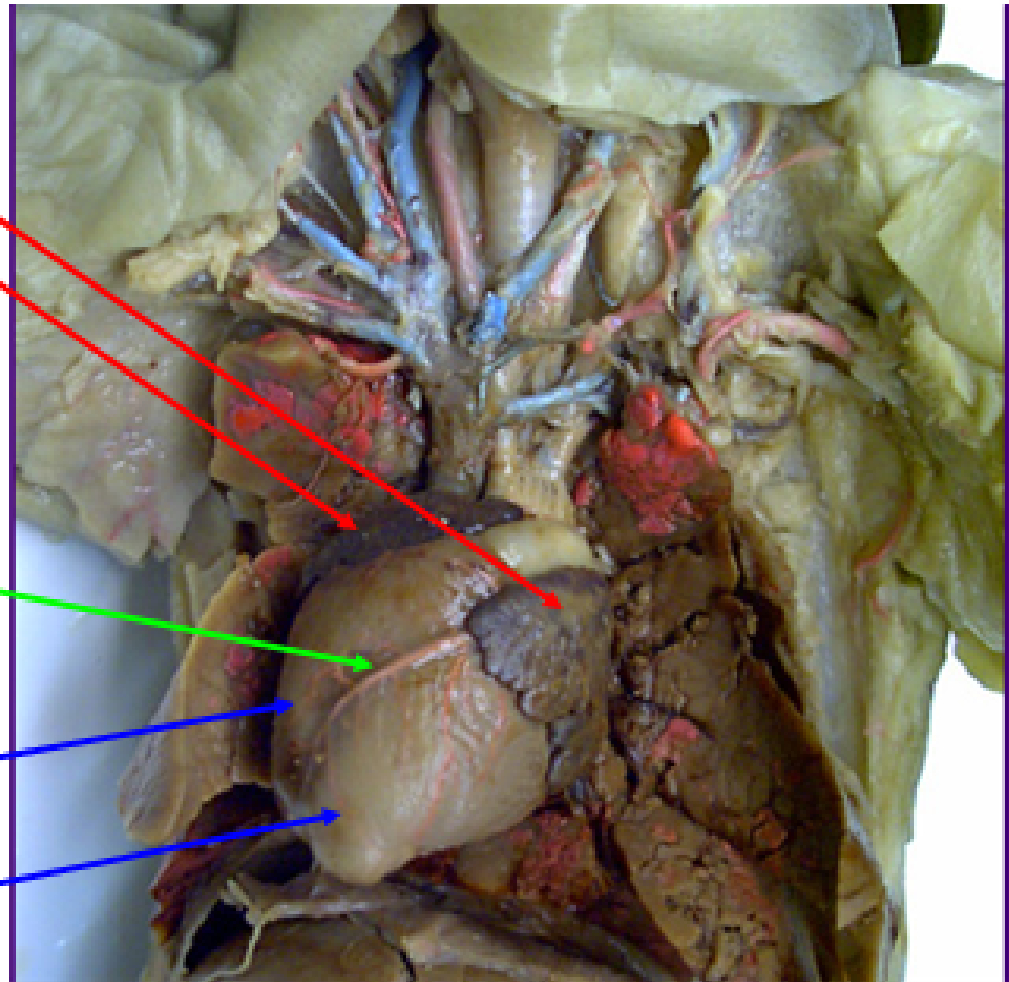
Locate the Pericardial Sac

This is a fluid filled sac that protects the heart and reduces the amount of friction that occurs when the heart beats. Gently remove the pericardial sac so that we can examine the heart.



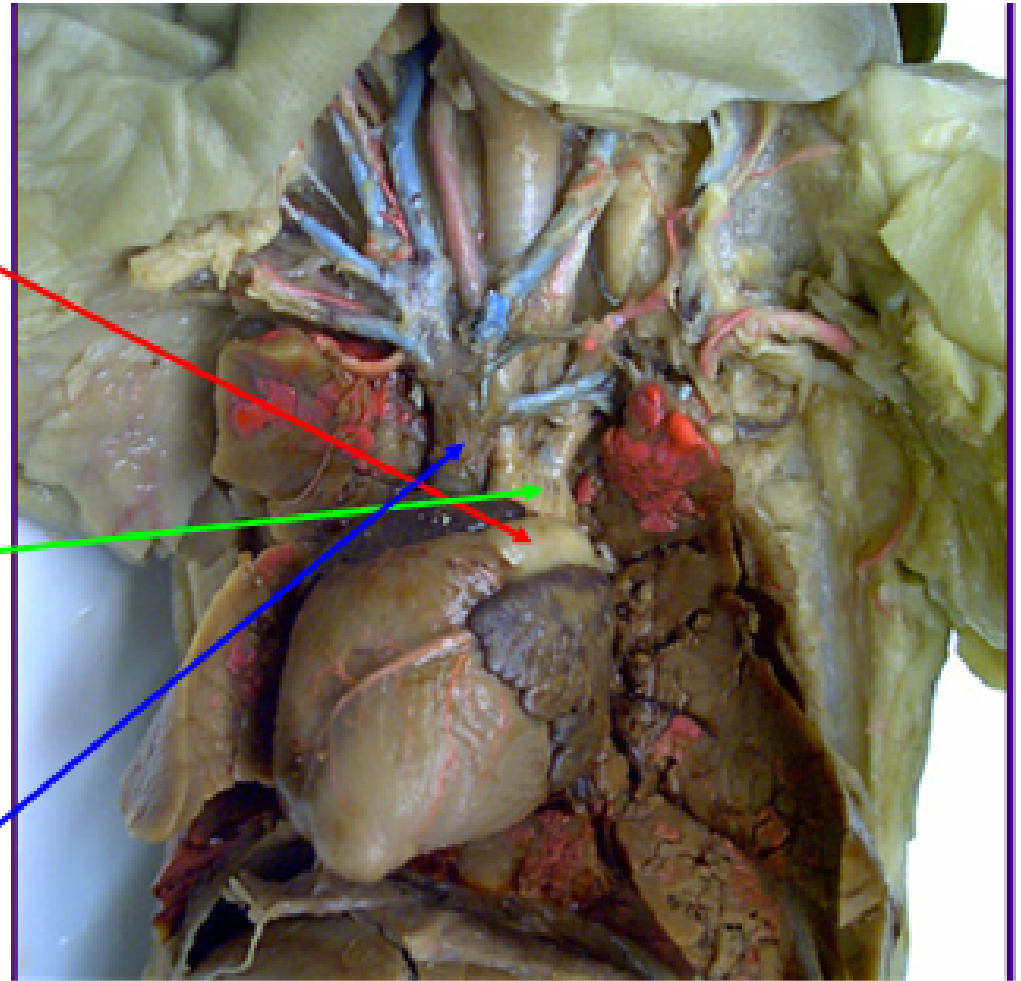
Locate the Heart

- Look for two darker areas towards the top of the heart. These are the atria. You can lift them up with your probe.
- Notice a dark blood vessel spiraling around the heart. This is the coronary artery. It also separates right from left ventricles
- Look for the two muscular ventricles towards the apex of the heart.



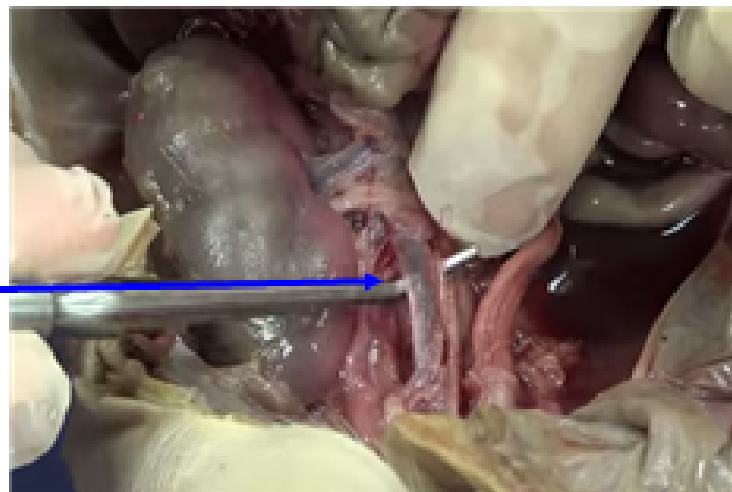
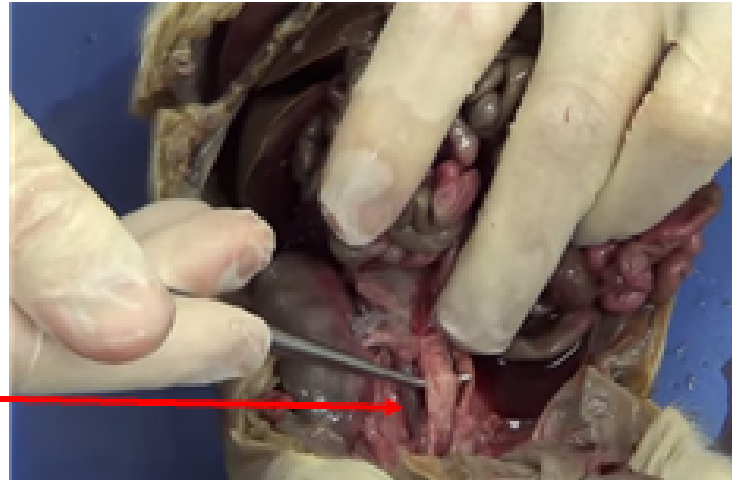
Heart Cont.

- Locate the pulmonary trunk continuing to the pulmonary arteries. This takes blood from the heart to the lungs to get oxygenated.
- Gently shift things around to look for the aortic arch and ascending aorta. This supplies blood from the heart to the upper parts of the body.
- Also locate the superior vena cava. This returns blood to the heart from the upper parts of the body.



Heart Cont.

- To find the descending aorta / abdominal aorta you can look between the legs before it branches to the femoral arteries. This supplies blood to the lower parts of the body.
- Right next to the aorta is the blue inferior vena cava which returns blood to the heart from the lower parts of the body.



Attempt to remove the heart by severing any attached blood vessels and set the heart on the tray. Cut the heart into dorsal and ventral halves and observe the inside of the heart. Locate the AV valves and chordae tendinae. **BE VERY CAREFUL AS YOU CUT!**

