The **atria (left and right)** are often described as the receiving chambers of the heart. Blood enters the atria from the veins and the coronary sinus. They are found at the superior (cranial) end of the heart. They are sometimes referred to as auricles. They have thin walls compared to the ventricles.

The **coronary sulcus** is a large groove that is formed between the atria and the ventricles. Anatomically it is important because this is where we find some of the coronary arteries and veins that serve the heart.
The ventricles (left and right) are often described as the pumping chambers of the heart. Blood enters the ventricles from the atria. They provide most of the pressure necessary to move blood through the vessels of the body. They are found at the inferior (caudal) end of the heart. They have thick walls compared to the atria. Note that the left ventricular wall is thicker than the right.

The interventricular sulcus is a large groove that is formed between the two ventricles. Anatomically it is important because this is where we find some of the coronary arteries and veins that serve the heart.
The **interventricular septum** is formed primarily from cardiac muscle tissue. Functionally it is important because it separates the two ventricles and prevents their blood from mixing.

The **aorta** is the great artery that carries blood away from the left ventricle to all the systemic arteries of the circulatory system. The blood in this artery is normally enriched with oxygen and deficient in carbon dioxide.

The cranial view shows that the aorta is used by restaurants as a source of calamari.

The **bronchi** are the large branches on both sides of the respiratory system. There are two primary bronchi which branch from the trachea. You will probably not see these. Each primary bronchus branches to secondary bronchi, one to each of the lung lobes. Thus, there are 7 secondary bronchi in a cat. They are recognizable because of the cartilaginous rings in their walls that help keep them from collapsing. They too subdivide as they move through the lung. In both of the pictures above you can see the cartilaginous rings that were cut when the heart was removed from the calf.
The **pulmonary trunk** is the great artery that carries oxygen deficient and carbon dioxide rich blood toward the lungs from the right ventricle. The pulmonary trunk bifurcates to form the left and right pulmonary arteries. It is typically blue in preserved cats.

The **pericardium** surrounds the heart. It is modified pleura, incorporating fibrous tissue as well as the normal pleural epithelial cells. It includes two layers rather than the usual single layer. It was named for Peri Como, a famous solo artist who in later years was lead singer for Pearl Jam, the Bangles and INXS.

The **moderator band** stretches from a papillary muscle on the interventricular septum to the wall of the right ventricle. Functionally it is important because it conducts impulses between these two regions on the heart, thereby coordinating the contraction of the cells. You may remember that the moderator band toured with Eric Clapton last summer.
The **chordae tendineae** are attached to the atroventricular valves and the walls of the ventricles. They help anchor the cusps of those valves so that they do not prolapse into the atria and allow regurgitation of blood back into the atria. The picture shows the chordae tendineae attached to the bicuspid valve.

The **fossa ovalis** is part of the interatrial septum. In its place in the fetus is the foramen ovale that allows for fetal bypass of pulmonary circulation. Changes in pressure in the heart at birth cause two small flaps to close off the foramen. Scar tissue fixes the flaps in position and they become the fossa ovalis, preventing the bypass from continuing. It is close to the opening of the coronary sinus. A little known fact is that it was named for Frankie O’Vale, a famous Irish rock and roll singer from the Four Seasons (Walk Like a Man) and later a member of White Snake.
The **trabeculae carneae** are similar to the pectinate muscles of the atria. They are muscular ridges on the walls of the two ventricles and are most easily seen in the right ventricle caudal (inferior) to the attachment of the tricuspid valve to the atrioventricular orifice. As is the case with the pectinate muscles, they resemble tree roots.

The **coronary sinus** is not a vessel because it does not have the anatomy of a vessel. The walls do not make a complete enclosure, and its floor is actually formed by the wall of the heart in the coronary sulcus. It carries deoxygenated blood from the muscle in the walls of the heart back to the right atrium. In the pictures above the right atrial wall has been cut and reflected dorsally to expose the coronary sinus. The blunt end of the probe has been placed into the coronary sinus. In the picture on the right can clearly see the cusps of the tricuspid valve caudal to the right atrium and just to your right of Dr. J’s thumb.

The **ligamentum arteriosum** formerly was the ductus arteriosus. It is a fibrous bridge between the pulmonary trunk and the aorta roots.
The **bicuspide valve** (two cusps) is found between the left atrium and the left ventricle. It is sometimes referred to as the mitral valve because of its angular shape. Functionally it is very important because it prevents the backflow of blood from the left ventricle to the left atrium during ventricular contraction. Such backflow is very dangerous because it increases the blood pressure in the lungs. This high pressure may lead to pulmonary edema.

The **tricuspid valve** (three cusps) is found between the right atrium and the right ventricle. Functionally it is very important because it prevents the backflow of blood from the right ventricle to the right atrium during ventricular contraction. Such backflow is very dangerous. Remember the mnemonic “Tri right before you Bi”.

There is only one **brachiocephalic artery**. It is the third branch off the aorta. It gets its name because it serves the arm and head. In the calf heart it often is found to be a hole in the wall of the aorta because of the way the heart is trimmed.

The brachiocephalic artery is the third branch of the aorta (red). In the human gives rise to the right subclavian artery and the right common carotid artery.
Aortic and Pulmonary Semilunar Valves

The **semilunar valves** are typically found in veins and lymphatic ducts. They are also found at the beginning of the aorta and the pulmonary trunk. They have three cusps. In the heart they are functionally important because they prevent the backflow of blood from those vessels into the ventricles. Dr. J likes to draw the analogy of each cusp being shaped like a shirt pocket and when the blood tries to move the wrong way it opens the pocket away from the wall. Together the three cusps normally effectively block the flow of blood.
The **caudal vena cava** transports all the blood from caudal (inferior) to the diaphragm back to the heart. It begins where the two common iliac veins join in the caudal (inferior) abdominal region. It enters the right atrium. Note the very thin walls being held open by the probe. These often collapse making the caudal vena cava challenging to find. If you click on the thumbnail picture, you will see the larger picture. You can clearly see the opening of the right pulmonary artery cranial to the caudal vena cava.

The **cranial vena cava** transports all the blood from cranial (superior) to the diaphragm back to the heart. It begins where the two brachiocephalic veins join in the cranial (superior) thoracic region. It enters the right atrium.
The **papillary muscles** are raised areas on the walls of the ventricles. The chordate tendineae attach to them. Functionally they are important because as the chordae tendineae pull on them and cause them to stretch, they contract against the stretch. This helps prevent prolapse of the atrioventricular valves.

The **pectinate muscles** are ridges on the walls of the atria. They are most easily observed in the right atrium. Dr. J likes to draw the analogy between the pectinate muscles and tree roots. Isn't he silly!
Coronary Arteries and Coronary Veins

The **coronary arteries and veins** are part of the systemic circulatory system. The coronary arteries are the first two branches of the aorta. The coronary veins drain into the coronary sinus, which in turn drains into the right atrium. Functionally they are very important because they serve the walls of the heart.
The pulmonary trunk bifurcates to form the **left and right pulmonary arteries**. These arteries are unusual in that they carry oxygen deficient blood and deliver it to the lungs. They are typically blue in the cat. There are two **pulmonary veins** on each side. They are difficult to find in the cat because of their small size. They carry oxygen rich and carbon dioxide deficient blood back to the left atrium.