

LAB 20: DISSECTION: PERICARDIUM, HEART, AND MEDIASTINUM

GOALS

1. Review the parts of the pericardium and spaces of the pericardial cavity.
2. Define the boundaries and subdivisions of the mediastinum.
3. Clean and review the structures of the superior and posterior mediastinum.
4. Review the blood supply and venous drainage of the posterior thoracic wall.
5. Clean the epicardium of the heart and identify the coronary arteries and cardiac veins.
6. Open the four heart chambers and study the internal anatomy.
7. Discuss the structure of the valves and interventricular septum.

PERICARDIUM

During 501, you opened the pericardium and removed the heart. Time for some reviewing!

EXAMINE the Layers of the Pericardium and the Pericardial Cavity.

The pericardium is a bag around the heart—the bottom of the bag is fused to the superior surface of the diaphragm, while the mouth of the bag is sealed around the great vessels that enter and exit the heart from above.

The outer part of the pericardium (the part we made a flap in) is formed from two fused layers = the external layer is the **fibrous pericardium**; the internal layer is the **parietal layer of the serous pericardium** (a serous membrane).

Grasp the pericardial flap between your fingers and feel the textures of the two layers. Both come from somatic mesoderm. Think of the fibrous pericardium as a detached part of the body wall (it peeled off the body wall in the embryo).

The heart is surrounded by a serous sac: the **serous pericardium**.

- The **parietal layer of the serous pericardium** is fused to the inside of the fibrous pericardium.
- The **visceral layer of the serous pericardium** (aka = **epicardium**) is the outer layer of the heart itself.
This layer is laden with fat in most hearts.

The epicardium continues superiorly from the heart's surface onto the roots of the great vessels that are entering and leaving the heart. Thus the pericardial sac surrounds not only the heart, but the roots of the great vessels as well.

The diagram on the right is a schematic coronal section of the heart and pericardium. The layers of the serous pericardium are indicated with the dashed line. Between the two layers is the **pericardial cavity**.

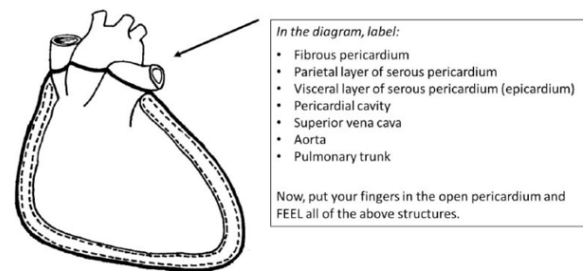


Figure 4.

Review the two specialized regions of the pericardial cavity:

- 1 **Transverse pericardial sinus:** A channel connecting the left and right sides of the pericardial cavity, posterior to the arterial end of the heart: behind the ascending aorta and pulmonary trunk.

CLINICAL CORRELATION



A cardiothoracic surgeon could pass a clamp into the transverse sinus and around the great arteries during heart surgeries.

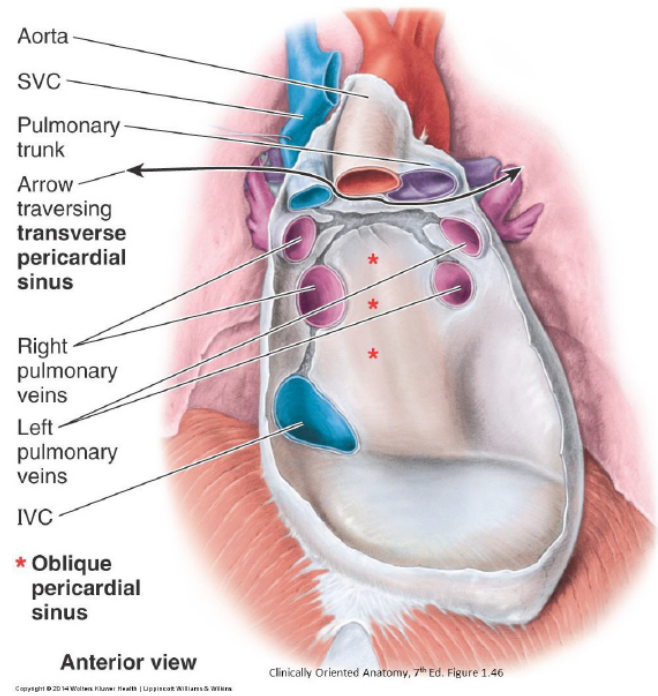


Figure 5.

- 2 **Oblique pericardial sinus:** find the cul-de-sac like space behind the base of the heart (left atrium), surrounded by the veins entering the heart. Here the serous pericardium reflects from the inside of the pericardial sac onto the **pulmonary veins**.

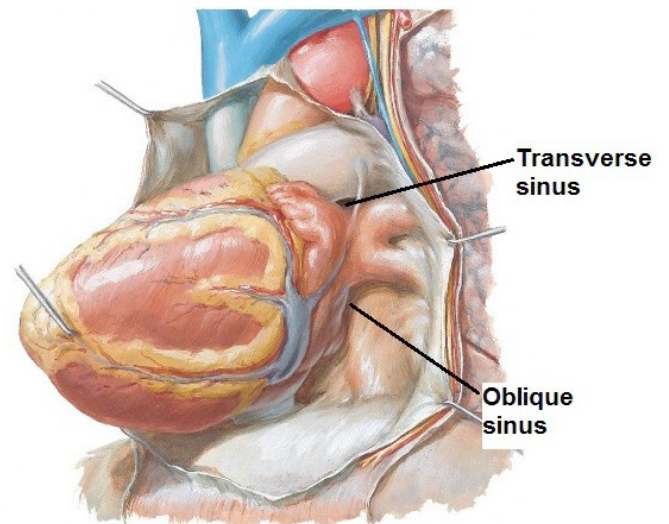


Figure 6. Netter, Atlas of Human Anatomy, Plate 212.



Figure 7.

There will be two paths for today's dissection:

1. the heart
2. the mediastinum (and as Robert Frost said, Sorry, I could not travel both!).

Half of your group should work on finding/reviewing the contents of the **mediastinum**, while the other half focuses on structures of the external and internal **heart**. Take turns showing each other what you found.

THE MEDIASTINUM

The mediastinum ("median septum") is the part of the thoracic cavity in the midline, between the two pleural sacs.

Review: Boundaries and Divisions of the Mediastinum

Boundaries:

- Superior to inferior: From the **superior thoracic aperture to the diaphragm**
- Anterior to posterior: from the **sternum/ costal cartilages to the bodies of the thoracic vertebrae**

Divisions:

- A horizontal plane drawn from the sternal angle to the IV disc between T-4/T-5 subdivides the mediastinum into **superior** and **inferior** parts.
- The pericardium and heart further subdivides the inferior mediastinum into **posterior**, **middle**, and **anterior** parts. The pericardium, heart, and roots of the great vessels constitute the middle mediastinum.

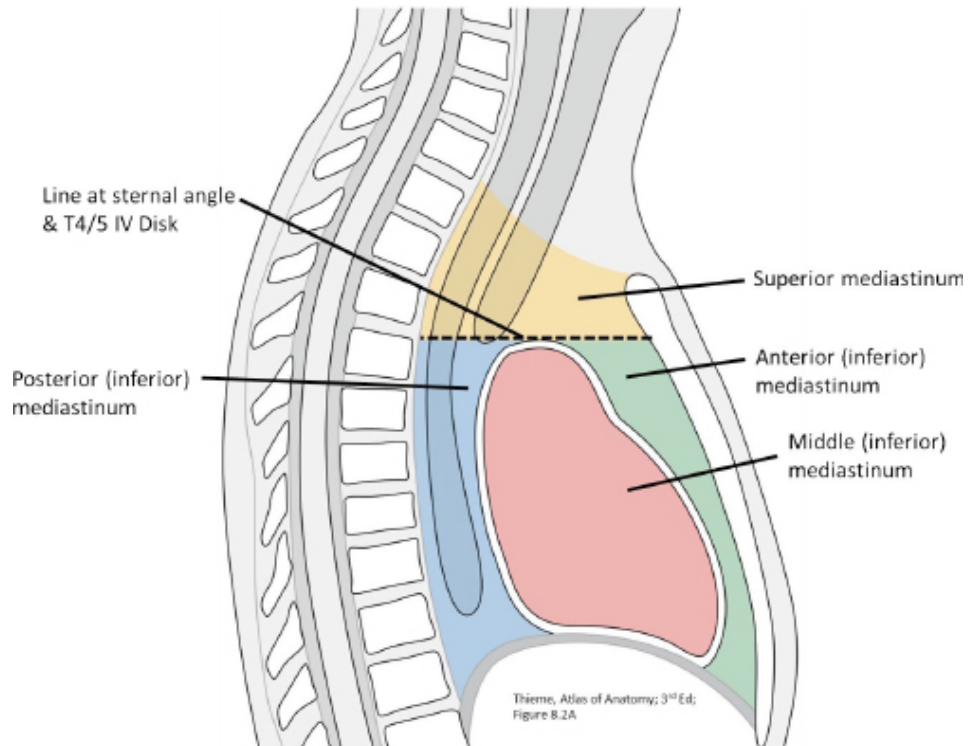


Figure 8.

You already studied and dissected a number of the structures in the mediastinum during your cursory study of the thorax in FMS 501. In today's lab we will we expand our exploration of the superior and posterior mediastinum, and you should continue work cleaning these structures and studying their relationships.

SUPERIOR MEDIASTINUM

Main contents (shortened):

- Thymus
- SVC; Right and Left Brachiocephalic veins
- Arch of aorta and its 3 branches (**What are these?**)
- Vagus and phrenic nerves; Left recurrent laryngeal nerve
- Trachea, Esophagus, Thoracic duct

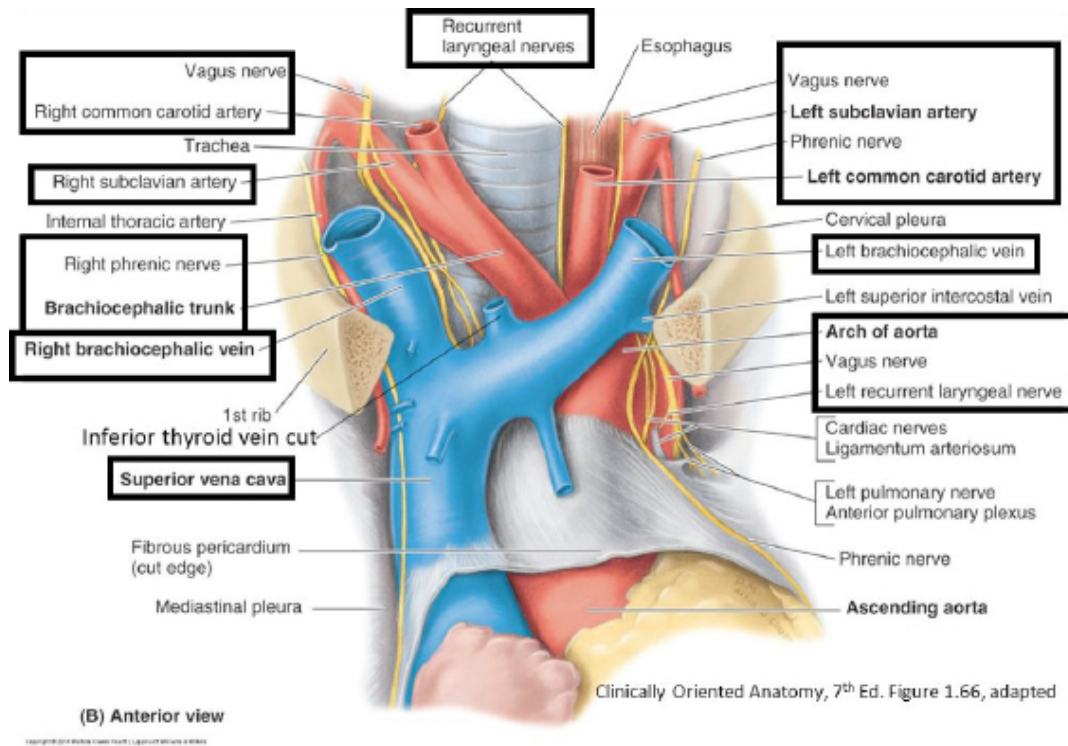


Figure 9.

Big Picture of Superior Mediastinum

Rules of thumb that tie in with all that neat embryology you are learning:

- 1 The derivatives of the embryonic **foregut** are placed in the CENTER of the superior mediastinum—verify this by locating the **trachea** and **esophagus** with blunt dissection.

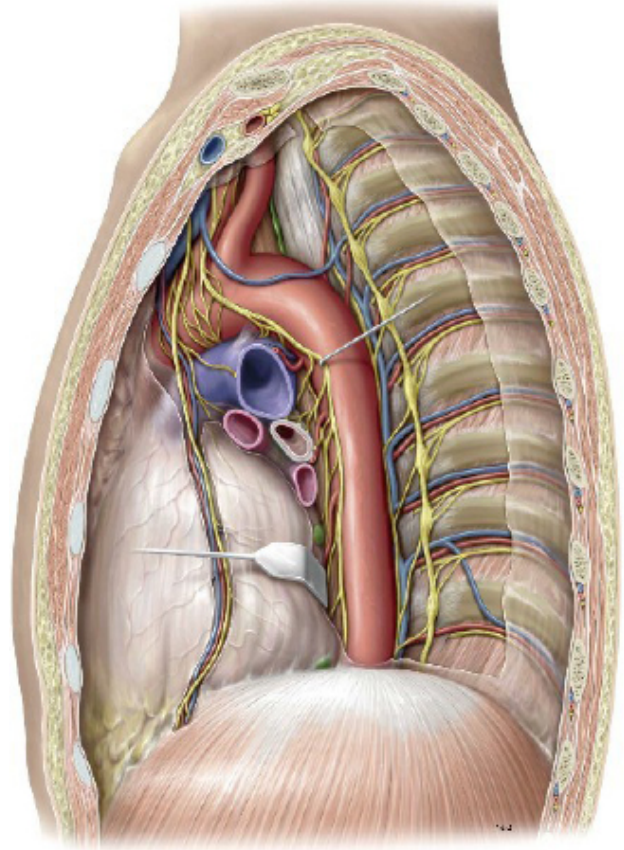


Figure 10.

- 2 Major arteries predominate on the LEFT side: verify this by locating the course of the **aorta**.
- 3 Major veins predominate on the RIGHT side: verify this by locating the **superior vena cava** and **azygos vein**.

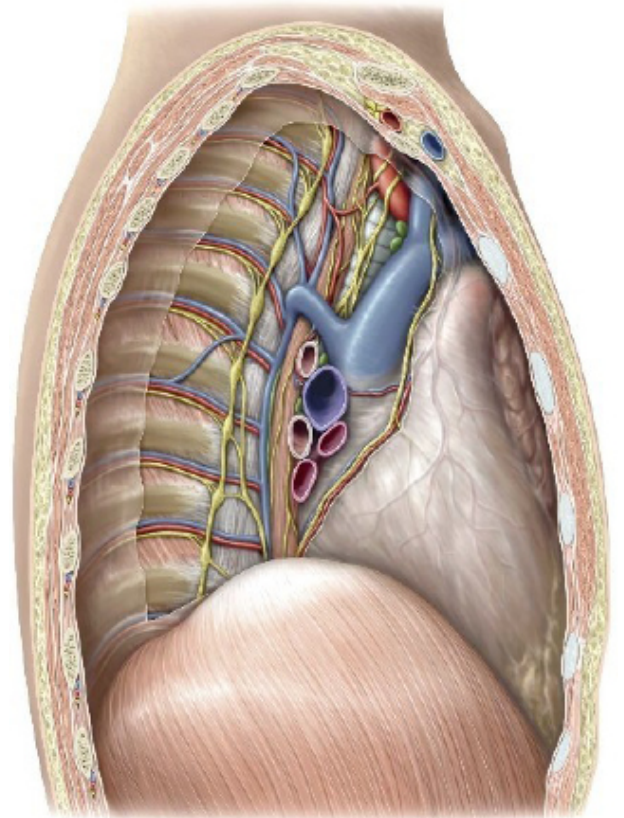


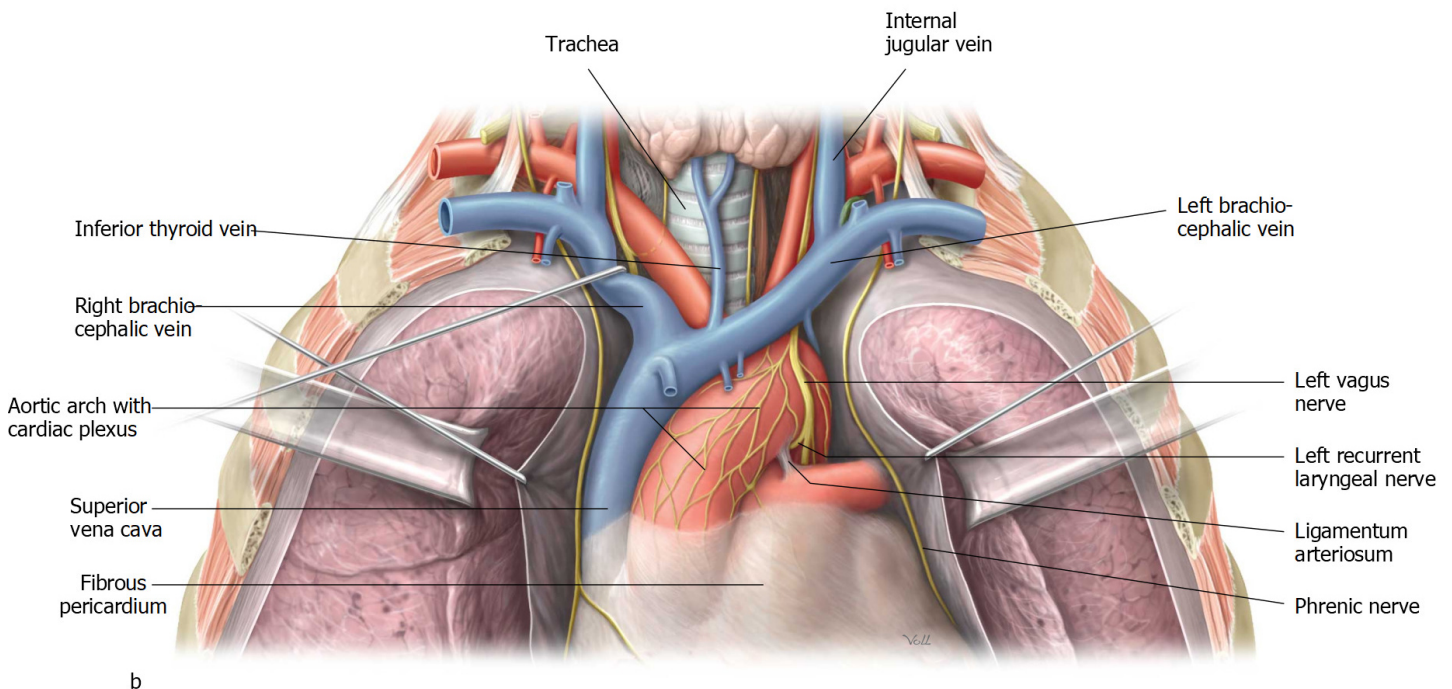
Figure 11.



Identify the veins, arteries, and nerves of the superior mediastinum.

Identify the major veins in the superior mediastinum.

- 1 Identify the **left** and **right brachiocephalic veins**. Which one is longer? Why? At the base of the neck, each brachiocephalic vein is formed by the union of the **internal jugular** and **subclavian veins**. The junctions of the internal jugular and subclavian veins on the left and right sides of the neck are called the **venous angles**.
- 2 Identify the **superior vena cava**.
- 3 Find the arch of the **azygos vein** as it passes over the root of the right lung to enter the SVC.



Schuenke, Atlas of Anatomy Vol. 2, 2nd Ed., Fig. 15.186 Ab, Illustrator: Wesker/Voll,
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Figure 12.

Review the major arteries in the superior mediastinum.

- 1 Follow the course of the aorta as it arches to the left.
- 2 Identify the three branches from the **arch of aorta**:
 - **Brachiocephalic artery**
 - **Left common carotid artery**
 - **Left subclavian artery**

- 3 Remove any mediastinal pleura covering the arch of the aorta. Take care not to damage the **phrenic nerve** or **vagus nerve** as they cross the aorta.
- 4 Clean tissue and nodes away from the concavity (under side) of the arch of the aorta to find the **ligamentum arteriosum**. It attaches between the left pulmonary artery and arch of aorta.



QUESTION

What was its function in prenatal life?

Clean and identify major nerves passing through the superior mediastinum.

- 1 Start at the **superior thoracic aperture** and locate the **phrenic** and **vagus nerves**. Both pass from the neck into the thorax sandwiched between the subclavian vein and artery.
 - The vagi are near the **common carotid arteries**.
 - The phrenic nerves are lateral to the vagi.
- 2 Carefully clean both sets of nerves with forceps and follow them into the superior mediastinum. The mediastinal pleura hides the nerves, so make sure it has been completely removed.

Phrenic nerves pass around the periphery of the pericardium on their way to the left and right domes of the **diaphragm**. You will find them tethered to the fibrous pericardium—they are located **ANTERIOR to the root structures of the lungs**. If they aren't already, carefully free them up and clean them with scissors and forceps.

Vagus Nerves target the esophagus, so they pass **POSTERIOR to the root structures of the lungs**.

Carefully free them up and clean them with scissors and forceps.

- The **right vagus** squeezes between the arch of the azygos and the trachea. Clean the right (lateral) side of the trachea to find the right vagus nerve.
- The **left vagus** passes onto the lateral surface of the arch of the aorta and is flattened and wide.

LOCATE and Clean the Recurrent Laryngeal Nerves

- 1 Trace the left vagus across the arch of the aorta. Make sure to clean and identify the **ligamentum arteriosum**.
- 2 The **left recurrent laryngeal nerve** leaves the vagus here, passes around the ligamentum arteriosum, and under the arch of the aorta.

- 3 Trace the right vagus across the proximal part of the **right subclavian artery**. The right recurrent laryngeal nerve branches from the vagus here and loops under the subclavian. There is no ligamentum arteriosum on the right, so the right recurrent laryngeal nerve departs from the vagus higher on the right than it does on the left. Development explains this—refer to the [Gross Anatomy textbook on Development of the Heart \(Fate of the aortic arches and asymmetry of the recurrent laryngeal nerves\)](#). (The **left 6th aortic arch artery** persists on the left to form the **ductus arteriosus—the recurrent laryngeal nerve loops around it**—there is no derivative of the 6th aortic arch on the right.)
- 4 Both recurrent laryngeal nerves ascend from their respective origins to the larynx (in the neck) in the **tracheo-esophageal grooves**. Use blunt dissection to separate the connective tissue between the trachea and esophagus to locate the recurrent laryngeal nerves.

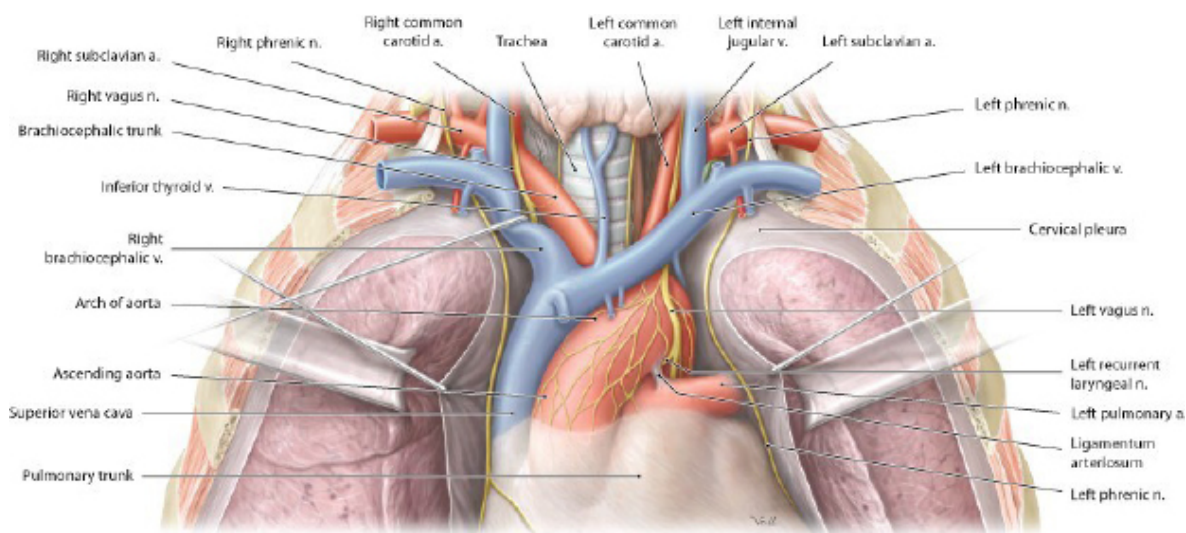


Figure 13. Superior mediastinum: Thymus removed.

POSTERIOR MEDIASTINUM



Remove the pericardium and then clean and identify structures of the posterior mediastinum.

Use scissors to cut away and remove the pericardium. There will most likely be stumps of the left and right pulmonary veins attached to the pericardium. They need to be removed as well.

Clean and examine the trachea and bronchi.

- 1 Locate the **tracheal bifurcation**.
- 2 Do you see a network of nerve fibers—kind of a stringy mess, anterior to the tracheal bifurcation? If so, this is the **cardiac plexus** of autonomic nerves.

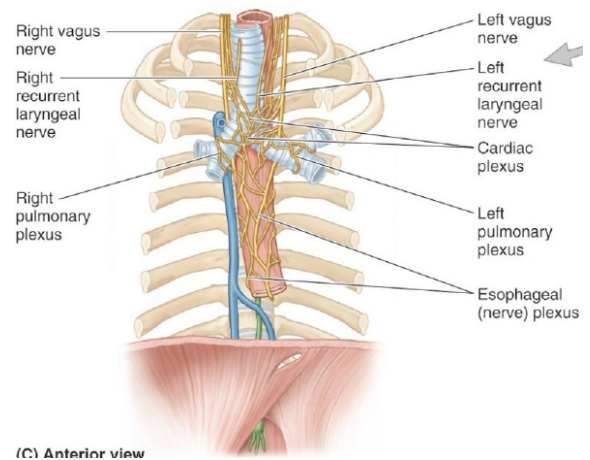


Figure 14. Clinically Oriented Anatomy, 7th ed., figure 168C, adapted.

Clean the azygos venous system.

The **azygos venous system** is composed of two vertical venous channels = the **azygos vein** proper on the right and the **hemi-azygos veins** on the left.

On the right side, clean the **azygos vein** (azygos means “unpaired”). Note that **right posterior intercostal veins** are tributaries of the azygos vein.

On the left, two venous channels receive the left posterior intercostal veins. Higher up on the left side is the **accessory hemi-azygos vein**. It usually receives blood via left posterior intercostal veins from the 3rd, 4th, and 5th intercostal spaces—but this is highly variable. Below, typically obscured by the diaphragm, is the **hemi-azygos vein**. It usually receives venous blood from the left 6th to the 11th intercostal spaces. Again, highly variable. *The accessory hemi-azygos vein and hemi-azygos vein may join, or each may pass independently across the vertebral column to drain into the azygos vein. Regardless of the pattern, venous blood from both the left and right sides of the posterior thoracic wall (posterior intercostal spaces) ultimately drains into the azygos vein.*

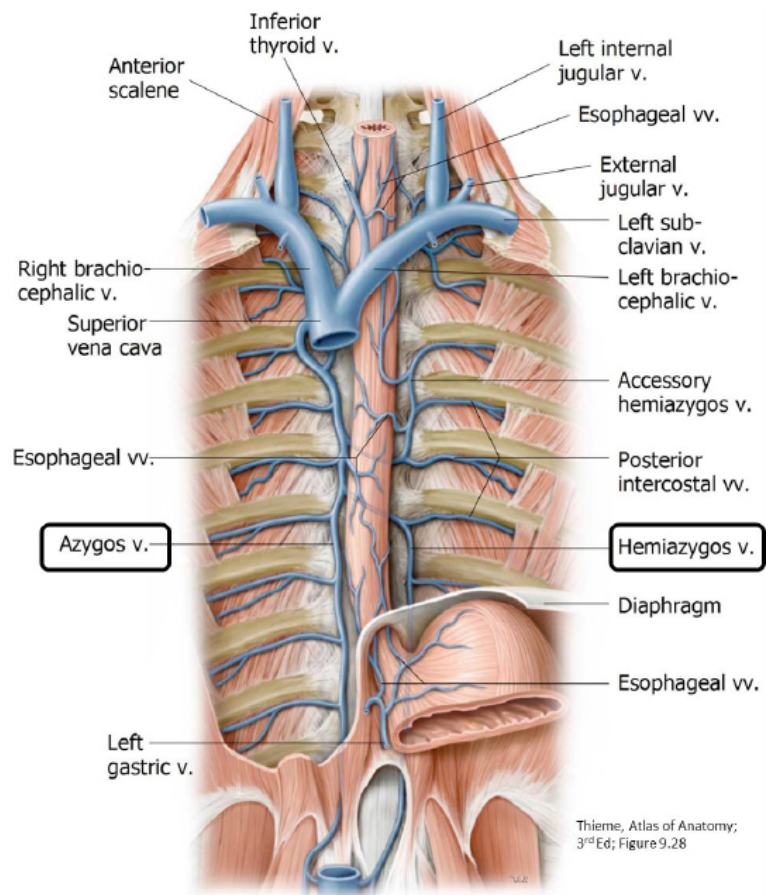


Figure 15.

Thieme, Atlas of Anatomy; 3rd Ed; Figure 9.28

Locate and clean the thoracic duct.

The thoracic duct is in the “Bermuda Triangle” of the posterior mediastinum. The three corners of the triangle are made up of the **esophagus**, **azygos vein**, and **descending aorta**. It is pale in color (why—what does it carry?) and somewhat beaded in appearance—its diameter is about the width of the tip of a blunt probe.

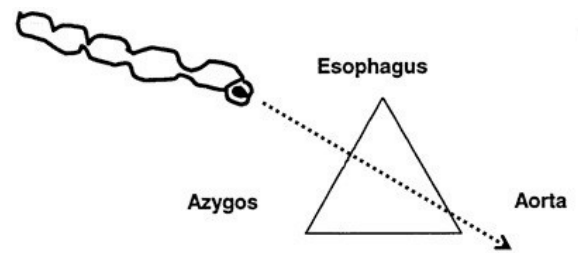


Figure 16.

HAVE YOU HEARD THE ONE ABOUT THE "FOUR FOWLS" OF THE MEDIASTINUM?



Yeah, there's:

- the vay-GOOSE
- the a-zy-GOOSE,
- the esoph-a-GOOSE,
- and the thoracic DUCK!

Hey—clean anatomy jokes are hard to come by!

QUESTION



How does the thoracic duct pass from the abdominal cavity into the thoracic cavity? (Be sure to name the specific opening it passes through!)

Clean and examine the sympathetic trunks.

On one side of the vertebral column, use forceps and blunt tools to clean off the loose connective tissue around the **sympathetic trunk**. This is tedious work so don't worry about creating a masterpiece.

One old dissection trick is to rub the area with the blunt end of your scalpel handle to liquefy the fatty tissue a bit—then wipe the area down with paper towels to remove the liquid fatty tissue.

The sympathetic trunk is part of the autonomic nervous system (ANS). It is a bilateral structure composed of interconnected **sympathetic (chain) ganglia**.

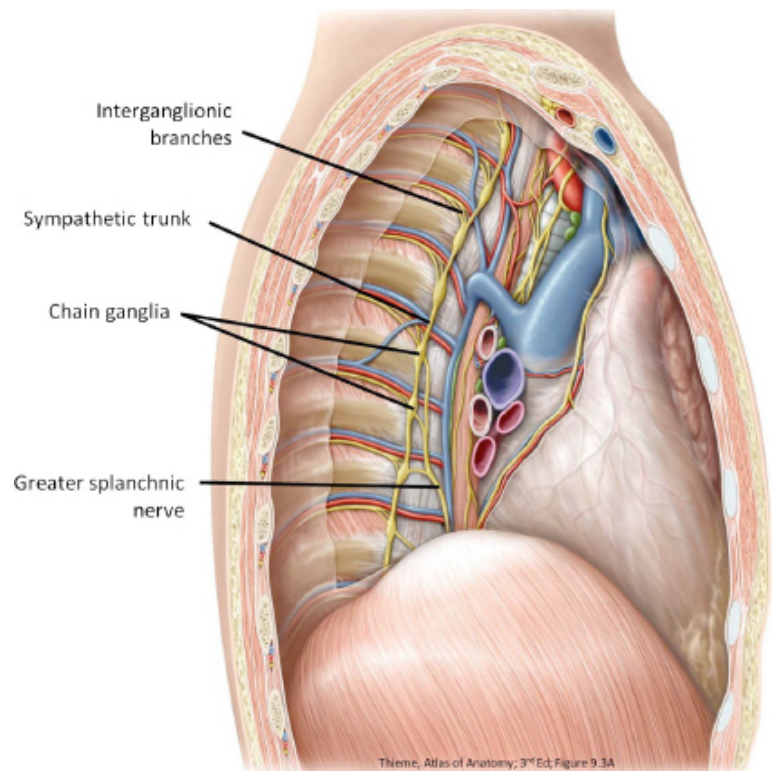


Figure 17. Sympathetic trunk: Right lateral view.

Trace the sympathetic trunk from the superior thoracic aperture down to the diaphragm.

QUESTION

Recall that autonomic innervation pathways always involve two neurons. Regarding the sympathetic pathway to the heart: Where are the cell bodies of the postganglionic sympathetic neurons that innervate the heart? Why are they located here?



(Hint: Think embryology!)

EXTERNAL HEART

REVIEW the external anatomy of the heart.

The heart is a modified blood vessel, so it has three layers (as vessels do).

The outer layer is the **epicardium** (aka = **visceral layer of serous pericardium**). It is a serous membrane = a single layer of epithelial cells (mesothelium) supported by a layer of connective tissue (which often contains considerable adipose tissue).



QUESTION

What are the other two layers of the heart?

Locate these features:

- **Apex**
- **Base**
- **Sternocostal surface**
- **Diaphragmatic surface**
- **Left and right pulmonary surfaces**
- **Inferior border**



QUESTION

Which chambers of the heart are associated with each of the above surfaces?? We'll give you a hint and a head start: the Base of the heart is formed by the left atrium.

- Locate the **left and right auricles**. Clinicians sometimes call these the atrial appendages. The auricles (“ear-shaped”) are parts of the atria.
- The **coronary sulcus** is an external groove that separates the atria from the ventricles. It is filled with blood vessels and lots of epicardial fat.
- The **interventricular sulci (anterior and posterior)** are landmarks on the sternocostal and diaphragmatic surfaces, respectively. They indicate the location of the interventricular septum within the heart and can be used to demarcate the locations of the ventricles externally. They are filled with vessels.

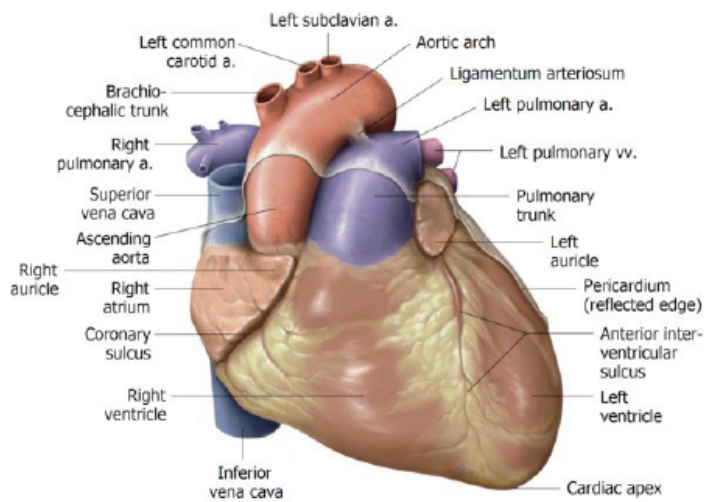


Figure 18. Surfaces of the heart. Anterior (sternocostal) surface. From: Gilroy, Atlas of Anatomy, 2nd ed., Illustrator: Wesker/Voll © 2018 Thieme Medical Publishers, Inc. All rights reserved.

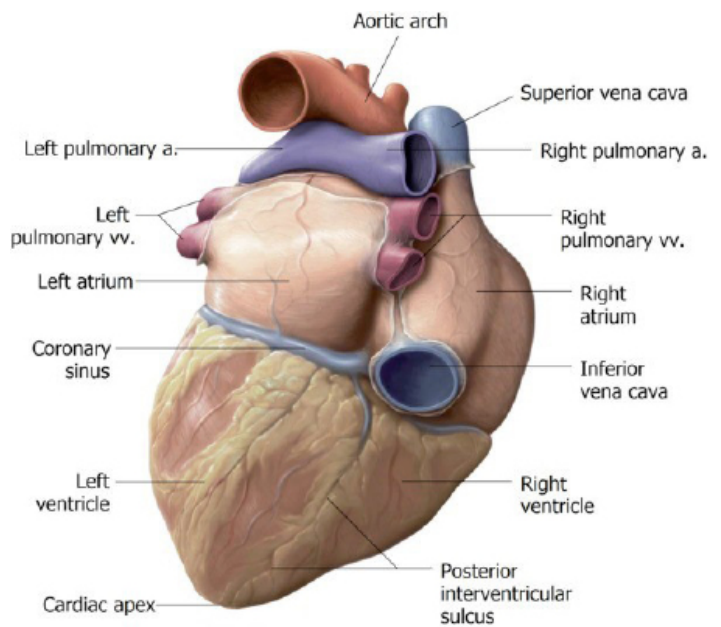


Figure 19. Surfaces of the heart. Inferior (diaphragmatic) surface. From: Gilroy, Atlas of Anatomy, 2nd ed., Illustrator: Wesker/Voll © 2018 Thieme Medical Publishers, Inc. All rights reserved.

EXAMINE THE CHEST RADIOGRAPH SHOWN HERE.

The **left** and **right borders** of the heart are clinical entities that are revealed against the dark lung fields adjacent to the heart. These borders are curved convex laterally.

QUESTION



Which chamber forms most of the left border?

QUESTION



Which chamber forms the right border?

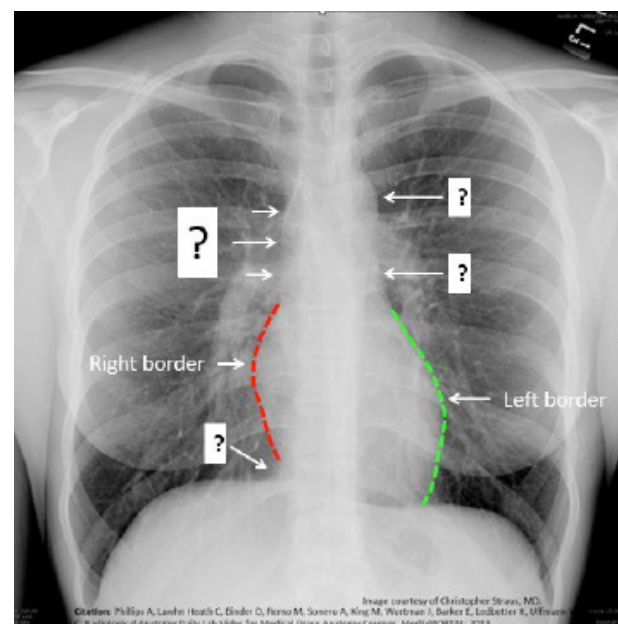


Figure 20.

QUESTION

Which vessels merge with the left and right borders of the heart to complete what is called the “cardiac silhouette”?



(For example: Can you see the SVC (above) and the IVC (below) merging with the right border of the heart? Which structures are seen on the left side?)



Clean and identify the coronary arteries and cardiac veins.

Use blunt dissection with fingers, forceps, probes, and scissors to remove the epicardium from the surface of the heart. Use paper towels to wipe up fat. It can be a messy job!

Hint: there is no need to remove all the fat; instead focus on cleaning the coronary vessels—use a probe to pull epicardium off the vessels and trace them along the grooves they run in

Clean and trace the right coronary artery.

- 1 In the **coronary sulcus**, find the **right coronary artery (RCA)** leaving the ascending aorta *under the right auricle*. Clinicians refer to this part of the RCA as the **“right main” coronary artery**.

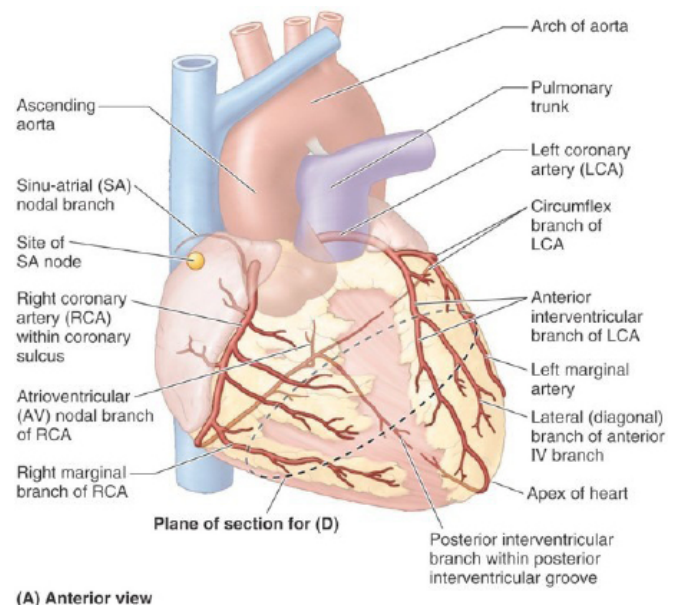


Figure 21.

- 2 Follow the RCA downward in the coronary sulcus and find the **right marginal artery** along the inferior border of the heart.
- 3 Continue following the RCA onto the diaphragmatic surface of the heart—it terminates in the posterior interventricular sulcus as the **posterior interventricular artery (posterior descending artery)**.
- 4 The posterior descending artery is a branch of the RCA in a **right dominant pattern of coronary circulation**.

Clinically Oriented Anatomy, 7th Ed. Figure 1.59, adapted

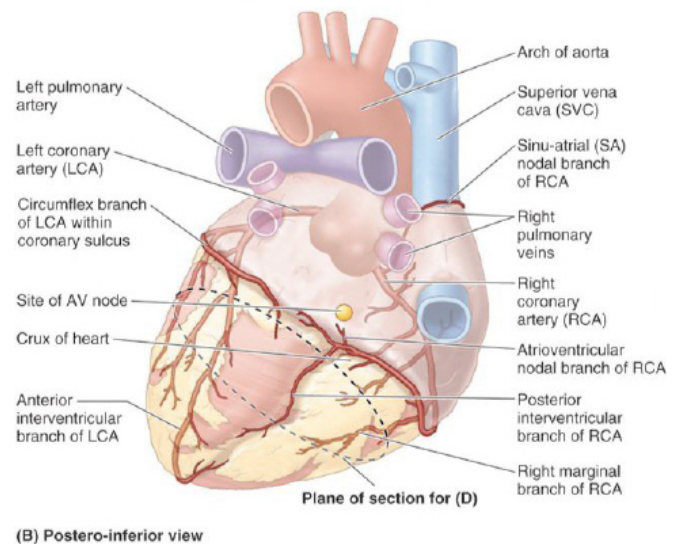


Figure 22.

QUESTION



Which cardiac vein runs parallel with the posterior descending artery in the posterior interventricular sulcus?

Clean and trace the left coronary artery and its major branches.

Find the (short) **left coronary artery** leaving the aorta posterior to the pulmonary trunk, under the left auricle. Clinicians refer to this short artery as the “**left main**” **coronary artery**. It immediately divides into:

- **Circumflex artery** travels in the coronary sulcus to the left and circles onto the left pulmonary surface of the heart.
- **Anterior interventricular artery** (or **left anterior descending artery = LAD**) descends in the anterior interventricular sulcus towards the apex of the heart.

The **great cardiac vein** travels with the anterior interventricular artery. Remember: “great aunt” (aunt = anterior).

Identify the Coronary Sinus.

Find the **coronary sinus** in the coronary sulcus on the diaphragmatic surface of the heart, below the left atrium (base). Most of the cardiac veins of the heart drain into the coronary sinus. The three largest of these are:

- **Great cardiac vein** (parallels anterior interventricular artery)
- **Middle cardiac vein** (parallels posterior interventricular artery)
- **Small cardiac vein** (parallels right marginal artery)



QUESTION

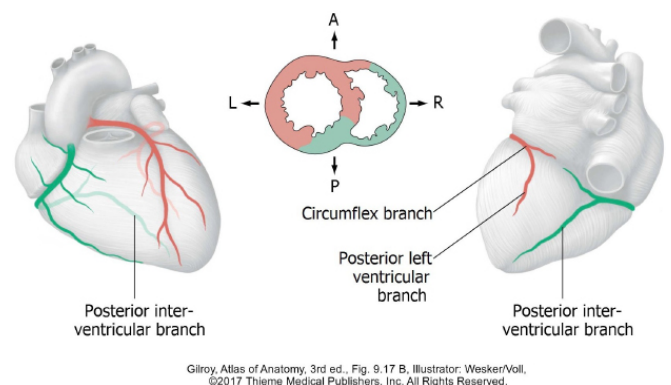
Where does the venous blood in the coronary sinus drain to?

Coronary Artery Dominance

Concept of coronary artery “dominance”: the coronary artery that gives rise to the **posterior interventricular artery** is said to be the dominant artery. The right dominant pattern is by far the most common (~70-80%). The other patterns are left dominant and co-dominant.

In a right dominant pattern, the coronary arteries supply these regions of the heart:

- **Right coronary artery** (green): Supplies the right atrium and most of the right ventricle; SA and AV nodes; posterior part of interventricular septum.
- **Left coronary artery** (red): Supplies the left atrium and most of the left ventricle; anterior part of the interventricular septum; AV bundle and bundle branches.



Gilroy, Atlas of Anatomy, 3rd ed., Fig. 9.17 B, Illustrator: Wesker/Voll, ©2017 Thieme Medical Publishers, Inc. All Rights Reserved.

Figure 23. Blood supply patterns: Right dominant hearts.

INTERNAL HEART



Open the heart chambers and inspect the internal anatomy of the heart.

For consistency, examine **Figure 24** and follow the instructions for opening the heart chambers.

- 1 **Atria:** Use scissors to cut flaps and open the right and left atria. (See Figure 24.)
- 2 **Ventricles:** Use scalpel or scissors to carefully open the ventricles as shown. (See Figure 24.)
 - **Right ventricle:** Cut an upside-down U in the anterior surface of the right ventricle and fold the flap of heart wall down. Don't cut into the pulmonary trunk. As you pass down along the right border of the interventricular sulcus, don't cut too deeply or you will sever the **moderator band** in the right ventricle.
 - **Left ventricle:** With a scalpel, start your incision near the apex and proceed upwards to the left of the interventricular sulcus, passing behind the pulmonary trunk and continuing your incision into the ascending aorta. You will have to transect the left coronary artery as you do so.
- 3 Carefully clean out any **clotted blood** in the chambers. Take care not to rip the chordae tendinae or the valves. Put the clotted blood into the orange tissue containers along with the other tissue waste.

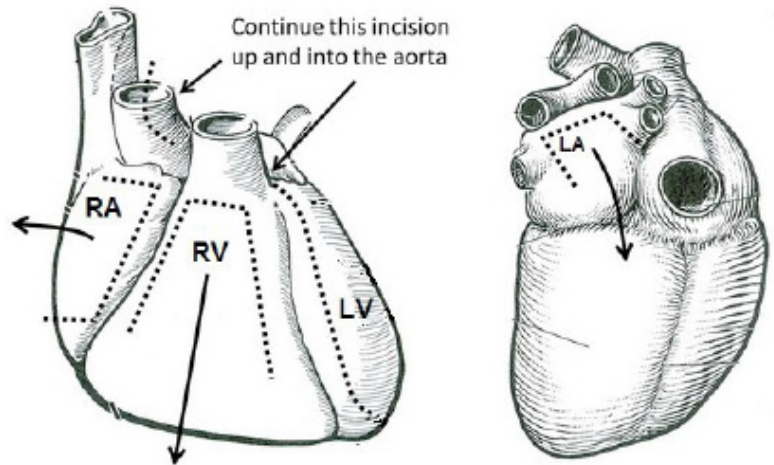


Figure 24.

POINTS TO PONDER

The internal atria have smooth and rough parts.

Smooth anatomy is present where the venous blood enters the atria. The embryonic process of intussusception incorporated nearby embryonic veins into the walls of the atria, forming the definitive smooth parts.

The rough parts of the atria (containing the pectinate muscle) are derived from the embryonic trabeculated primitive atrium. The auricles are the rough parts of the atria.

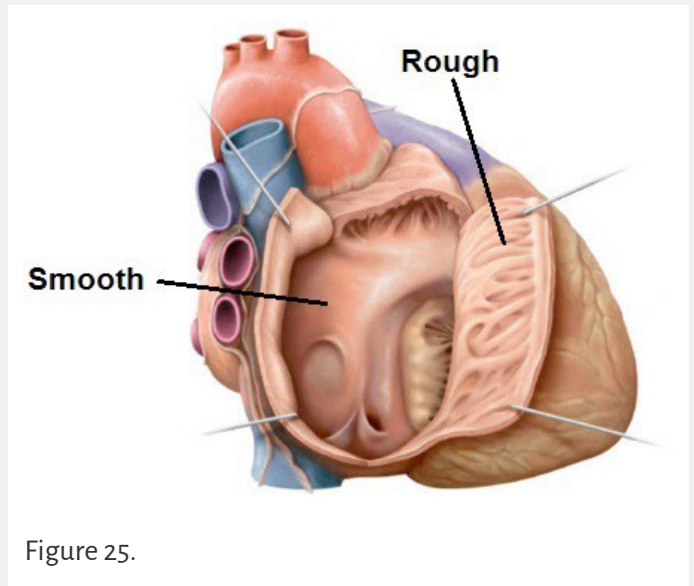


Figure 25.

The internal ventricles have inflow and outflow portions.

Inflow parts are directly below the atrioventricular valves. They receive the blood from the atria. The anatomy of the inflow parts is rough and presents features like trabeculae carneae.

Outflow portions have smooth anatomy; they are located below the semilunar valves. Blood enters the great arteries from the outflow portions.

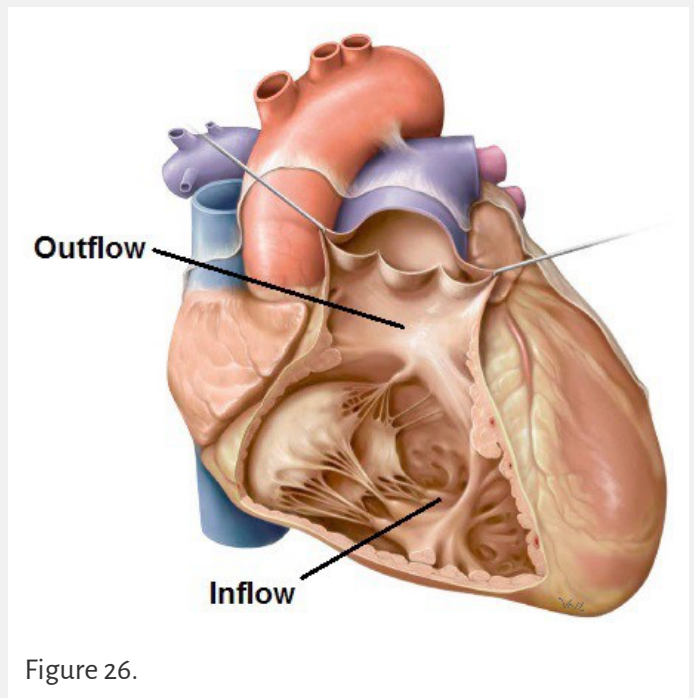


Figure 26.

Right Atrium

IDENTIFY:

- Openings of **SVC**, **IVC**, and **coronary sinus**
- **Sinus venarum** (the smooth part of the right atrium)
- Right auricle with **pectinate muscle**
- Crista terminalis = a ridge that demarcates the junction of the smooth and rough parts of the right atrium. The **sinoatrial (SA) node** is located approximately where the crista terminalis meets the SVC.
- In the **interatrial septum** find the **fossa ovalis** and the ridge above it, the **limbus fossae ovalis**.

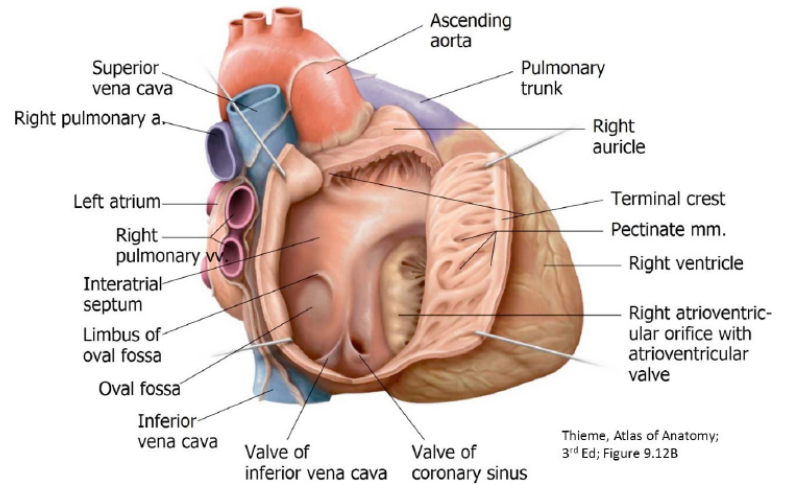


Figure 27.

Right Ventricle

IDENTIFY:

- **Tricuspid valve** (Right AV valve) with **anterior**, **posterior**, and **septal cusps**
- **Trabeculae carneae**
- **Papillary muscles**
- **Tendinous cords (chordae tendineae)**
- **Septomarginal trabecula** (aka = **Moderator band**)—connects the interventricular septum to the anterior papillary muscle and contains much of the **right bundle branch** (part of the heart's conducting system).
- **Infundibulum** (aka = conus arteriosus)—this is the outflow portion of the right ventricle
- **Pulmonary semilunar valve** with **right**, **left**, and **anterior cusps**
- Interventricular septum

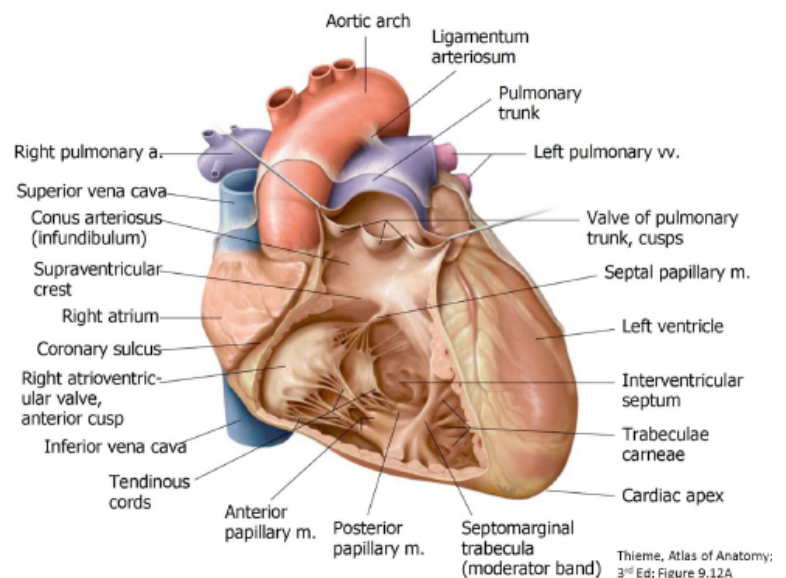


Figure 28.

Left Atrium

IDENTIFY:

- Externally, the left atrium forms the **base** of the heart
- Four **pulmonary veins** (open into the smooth part of the atrium)
- **Left auricle** with pectinate muscles
- Interatrial septum

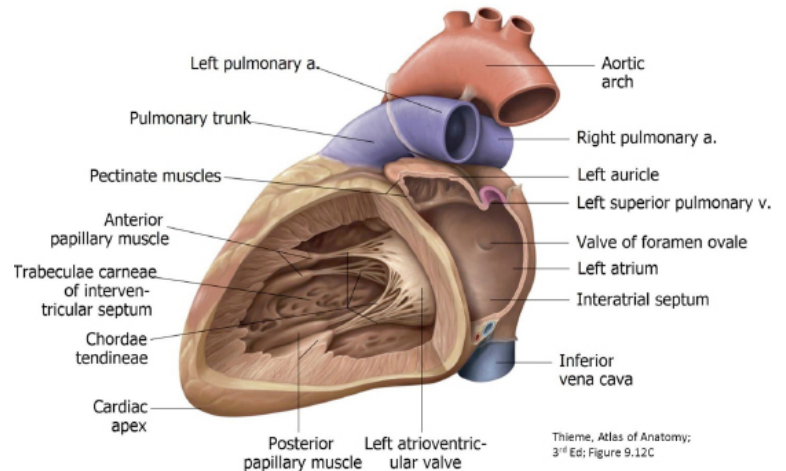


Figure 29.

Left Ventricle

IDENTIFY:

- **Mitral valve** (left AV valve) with **anterior** and **posterior cusps**
- **Trabeculae carneae**
- **Papillary muscles**
- **Tendinous cords (chordae tendineae)**
- **Aortic vestibule**—this is the outflow part of the left ventricle
- **Aortic semilunar valve** with **right, left, and posterior cusps**
- **Interventricular septum**

QUESTIONS ON ATRIOVENTRICULAR VALVES



What is their status during systole: open or closed?

What is their status during diastole?

What are the functions of the papillary muscles and tendinous cords?

The Semilunar Valves

The aortic valve has already been laid open by the incision you made earlier to open the left ventricle. Spread open the walls of the ascending aorta to demonstrate the architecture of the **aortic semilunar valve** (aortic valve). Peer down into the pulmonary trunk from above to inspect the **pulmonary semilunar valve** (pulmonic valve).

- The **pulmonary valve** has **right, left, and anterior cusps**
- The **aortic valve** has **right, left, and posterior cusps**
- Behind the three **aortic semilunar cusps** are swellings of the aortic wall called the **aortic sinuses** (right, left, and posterior).
- The **orifice of the right main coronary artery** is in the **right aortic sinus**. Verify this by inserting a probe into the right coronary artery.
- The **orifice of the left main coronary artery** is in the **left aortic sinus**. Verify this by inserting a probe.
- The posterior aortic sinus is empty—no coronary artery opens here. Thus, clinicians call the posterior cusp the “non-coronary” cusp.

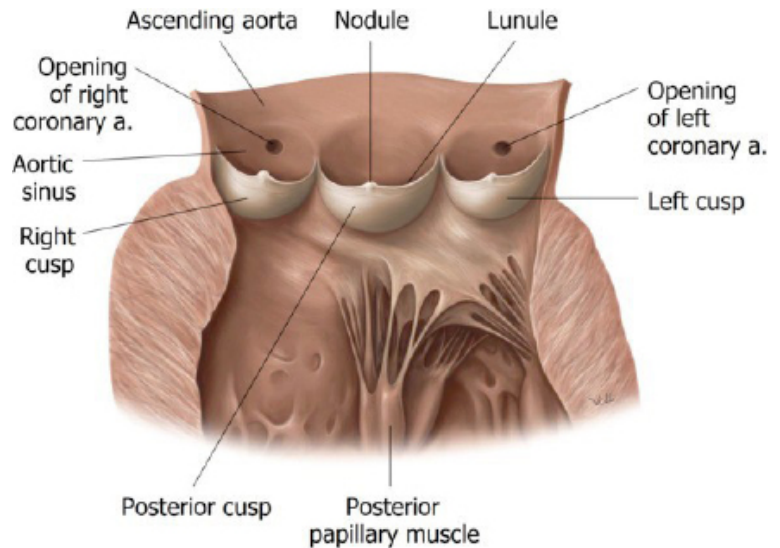


Figure 30.

MEMORY AID



Both semilunar valves have right and left cusps. If you remember that the pulmonary trunk is located anterior to the ascending aorta, then you will remember that the pulmonary valve has an anterior cusp, while the aortic valve has a posterior cusp.



QUESTIONS ON AORTIC AND PULMONARY VALVES

Are they open or closed during systole? During diastole?

CHALK TALK



Let's have some fun tracing the flow of blood through the heart. Start this exercise in the right atrium = trace the flow of blood through the right side of the heart—to the lungs—back to the left side of the heart—then out to the tissues of the body via the aorta. Name all the valves and great vessels the blood passes through.

Interatrial and Interventricular Septa

Place an index finger in one atrium and thumb in the other and grasp the **interatrial septum** between them.

- Feel the **fossa ovalis**. Note how thin the interatrial septum is here and how it is thicker above the fossa ovalis.

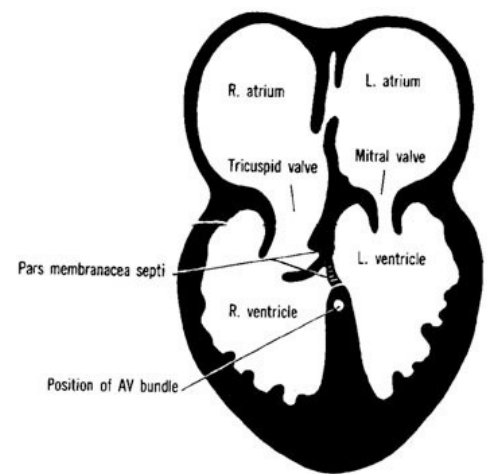


Figure 31.

CLINICAL CORRELATION

The fossa ovalis marks the location of a right-to-left shunt in the fetus. What was this opening called in the fetus?



A ridge, the limbus fossae ovalis, arches above the fossa ovalis. Which embryonic structure (septum) formed the limbus? Which embryonic structure (septum) formed the floor of the fossa ovalis? Reviewing the development of the interatrial septum will explain why the septum is thin in the fossa ovalis and thicker above at the limbus.

Do a similar thing in the two ventricles.

- Feel low in the interventricular septum. This thick portion is the **muscular interventricular septum**.
- Work your way up high near the attachment of the septal cusp of the tricuspid valve in the right ventricle. How does the IV septum feel here? It should be much thinner—this is the **membranous interventricular septum**.

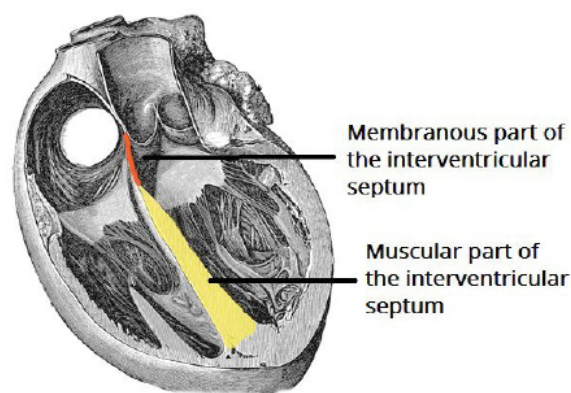


Figure 32.

The septal cusp attaches to the membranous IV septum at its midpoint.

- Above the attachment of the septal cusp, the IV septum actually overlaps a bit of the right atrium.
- Place your index finger high up in the **aortic vestibule** (outflow portion) of the left ventricle and your thumb in the right atrium. Pinch down—between thumb and finger is the **atrioventricular portion of the membranous interventricular septum**. This demonstrates that a small part of the left ventricle overlaps the right atrium! See Figure 32.

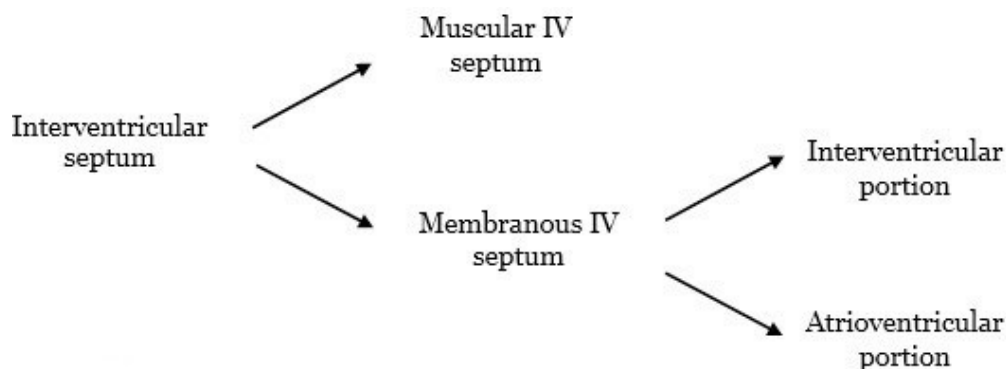


Figure 33.

When you have finished this session, return the lungs, heart, and chest plate to your donor.



Clean off trays and tabletops, and make sure all tissue scraps go into the orange tissue containers.

CHECKLIST, LAB #20

REVIEW AND MAKE SURE YOU HAVE IDENTIFIED EACH OF THE STRUCTURES BELOW.

PERICARDIUM & HEART

- ☐ Fibrous pericardium
- ☐ Parietal layer of serous pericardium
- ☐ Visceral layer of serous pericardium
- ☐ Pericardial cavity
- ☐ Transverse pericardial sinus
- ☐ Oblique pericardial sinus

SUPERIOR MEDIASTINUM

- ☐ Superior thoracic aperture
- ☐ Trachea
- ☐ Esophagus
- ☐ L & R brachiocephalic veins
- ☐ Superior vena cava
- ☐ Aorta: ascending, arch, and descending
 - ☐ Brachiocephalic artery (trunk)
 - ☐ L common carotid artery
 - ☐ L subclavian artery
- ☐ Ligamentum arteriosum
- ☐ L & R phrenic nerves

- L & R vagus nerves
- L & R recurrent laryngeal nerves

POSTERIOR MEDIASTINUM

- Azygos vein
- Hemi-azygos and accessory hemi-azygos veins
- Descending thoracic aorta
- Esophagus
- Thoracic duct
- Sympathetic trunk w/ chain ganglia

EXTERNAL HEART

- Great vessels of heart
 - Superior vena cava
 - Inferior vena cava
 - Pulmonary trunk w/ pulmonary arteries (R & L)
 - Superior and inferior pulmonary veins (R & L)
 - Aorta
- Heart surfaces
 - Anterior; diaphragmatic; left and right pulmonary
- Auricles of heart (atrial appendages)
- Heart borders (best seen on X-ray):
 - Left, right, and inferior
- Coronary sulcus

- Coronary sulcus
- Anterior & posterior interventricular sulci
- Right coronary artery & branches
 - Right marginal artery
 - Posterior interventricular artery (posterior descending artery)
- Left coronary artery & branches
 - Circumflex artery
 - Anterior interventricular artery (aka LAD)
- Coronary sinus
- Cardiac veins (great, middle & small)

INTERNAL HEART

- Interatrial septum
- Internal features of right atrium:
 - Fossa ovalis and limbus fossae ovalis
 - Openings of IVC, SVC, and coronary sinus
 - Sinus venarum (smooth part of the right atrium)
 - Right auricle w/ pectinate muscle
 - Crista terminalis
- Right AV (Tricuspid) valve:
 - Anterior, posterior and septal cusps

- Internal features of right ventricle:
 - Trabeculae carneae
 - Papillary muscles
 - Tendinous cords (chordae tendineae)
 - Septomarginal trabecula (moderator band)
 - Infundibulum (conus arteriosus) = the outflow part of the right ventricle
- Pulmonary (semilunar) valve:
 - Left, right and anterior cusps
- Left atrium w/left auricle, pectinate muscles, and openings of pulmonary veins
- Mitral (Left AV) valve
 - Anterior and posterior cusps
- Internal features of left ventricle:
 - Trabeculae carneae
 - Papillary muscles
 - Tendinous cords (chordae tendineae)
 - Aortic vestibule = the outflow part of the left ventricle
- Aortic (semilunar) valve:
 - Left, right and posterior cusps
- Interventricular septum:
 - Muscular IV septum
 - Membranous IV septum