**Question 1**

Which of the following statements regarding the mitral valve is CORRECT?

A The mitral valve is located posterior to the sternum at the level of the 3rd costal cartilage

B The anterior cusp is weaker than the posterior cusp

C The mitral valve has two cusps, anterior and posterior.

D The cusps receives tendinous cords from only one papillary muscle

Explanation (C)

The double leaflet mitral valve guards the left atrioventricular orifice. The mitral valve has two cusps, anterior and posterior. The anterior cusp is thicker and more rigid than the posterior cusp. The anterior cusp lies between the mitral and aortic orifices and thus lies between the inflow and outflow tracts of the left ventricle. The mitral valve is located posterior to the sternum at the level of the 4th costal cartilage. Each of its cusps receives tendinous cords from more than one papillary muscle.

Wikipedia

The aortic area, pulmonic area, tricuspid area and mitral area are areas on the surface of the chest where the heart is auscultated. Heart sounds result from reverberation within the blood associated with the sudden block of flow reversal by the valves closing. Because of this, auscultation to determine function of a valve is usually not performed at the position of the valve, but at the position to where the sound waves reverberate.

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| --- | --- | --- |
| [Aortic valve](https://en.wikipedia.org/wiki/Aortic_valve) (to [aorta](https://en.wikipedia.org/wiki/Aorta)) | right second [intercostal space](https://en.wikipedia.org/wiki/Intercostal_space) | upper right sternal border |
| [Pulmonary valve](https://en.wikipedia.org/wiki/Pulmonary_valve) (to [pulmonary trunk](https://en.wikipedia.org/wiki/Pulmonary_trunk)) | left second intercostal space | upper left sternal border |
| [Erb's point](https://en.wikipedia.org/wiki/Erb%27s_point_%28cardiology%29) | Left third intercostal space | left sternal border |
| [Tricuspid valve](https://en.wikipedia.org/wiki/Tricuspid_valve) (to [right ventricle](https://en.wikipedia.org/wiki/Right_ventricle)) | left fourth, fifth intercostal spaces | lower left sternal border |
| [Mitral valve](https://en.wikipedia.org/wiki/Mitral_valve) (to [left ventricle](https://en.wikipedia.org/wiki/Left_ventricle)) | left fifth intercostal space | left midclavicular line |

**Question 2**

Which is true regarding the pleural reflections

A The reflection lines are lines along which the visceral pleural changes direction as it passes form one wall of the pleural cavity to another

B The right and left side pleural reflections are symmetrical

C The sternal line of pleural reflection on the right side deviates at the level of the 6th coastal cartilage, but on the left at the 4th costal cartilage

D There are 3 pleural reflection lines: sternal, costal and mediastinal

Explanation (C)

Pleural reflections are abrupt lines along which the parietal pleura changes direction as it passes (reflects) form one wall of the pleural cavity to the other. Three pleural reflection lines outline the extent of the pleural cavity on each side: sternal, costal and diaphragmatic. The outlines of the right and left pulmonary cavities are asymmetrical (not mirror images) because of the heart on the left side imposing on the cavity. Deviation of the heart to the left side primarily affects the right and left sternal lines of pleural reflection. The sternal line of pleural reflection on the right side deviates at the level of the 6th costal cartilage, but on the left at the 4th costal cartilage.

**Question 3**

Which is true regarding the right vagus and phrenic nerves and their relations in the superior mediastinum?

A Right vagus nerve passes through the superior mediastinum to the right of the trachea, posterior to the right brachiocephalic vein, SVC and root of the right lung

B Right phrenic nerve enters the superior mediastinum between the brachiocephalic trunk and the origin of the brachiocepahlic vein

C Right phrenic nerve passes along the left side of the right brachiocepahlic vein, SVC and the pericardium over the right atrium

D Right vagus nerve enter the superior mediastinum posterior to the sternoclavicular joint and common carotid artery

Explanation (A)

The vagus nerves enter the superior mediastinum posterior to their respective sternoclavicular joints and brachiocephalic veins. The right vagus nerve (RVN) runs posteroinferiorly through the superior mediastinum on the right side of the trachea. It then passes posterior to the right brachiocephalic vein, SVC and root of the right lung. Here it divides into many branches contributing to the right pulmonary plexus. The RVN usually leave the RPP as a single nerve and passes to the oesophagus where it splits up again to contribute to the oesophageal plexus. RVN also contributes to the cardiac plexus. The left phrenic nerve enters the superior mediastinum between the subclavian artery and the origin of the brachiocepahlic vein. The right phrenic nerve passes along the right side of the right brachiocepahlic vein, SVC and the pericardium over the right atrium. It also passes anterior to the root of the right lung and descends on the right side of the IVC to the diaphragm, which it pierces near the caval opening

**Question 4**

Regarding the right coronary artery which of the following statements is correct?

A Supplies 60% of atrio-ventricular (AV) nodes

B Supplies 30% of sino-atrial (SA) nodes

C The RCA arises form the anterior aortic sinus

D Its course is through the left auricle and infundibulum

Explanation (C)

Courses through the right ventricle; supplies the sino-atrial (SA) node in 60% of people and the AV node in 80% of people. It supplies most of the right atrium, most of the right ventricle, part of the left ventricle (the diaphragmatic surface), part of the IV septum, usually the posterior third.

Note: RCA arises form the anterior aortic sinus, newer sources (current text book) say the right aortic sinus. The LCA arises from the left posterior aortic sinus. Newer sources say left aortic sinus. No artery arises form the posterior aortic (non-coronary) sinus

I have left the question and answers as is. Please be aware of the current text book reporting: right aortic sinus

**Question 5**

Regarding the phrenic nerve, which of the following statements is correct?

A Each phrenic nerve supplies only one side of the diaphragm

B They give of a recurrent laryngeal nerve branch

C They arise principally from C5 nerve root

D Structures relating to both phrenic nerves are identical

Explanation (A)

Right phrenic nerve is medially related to venous structures whereas the left phrenic nerve is related to arterial structures; arise principally from C4-but remember that the total origin is C3-C5; the recurrent laryngeal branch is a branch of the vagus nerve

**Question 6**

Regarding the Internal thoracic artery, which of the following statements is correct?

A Gives off two anterior intercostal branches to the 5 superior intercostal spaces

B It descends straight down 1 cm medially to border of sternum

C The internal thoracic artery is crossed near their origins by the ipsilateral phrenic nerve

D It is a branch of 2nd part of subclavian artery

Explanation (C)

Arises in the root of the neck, descends into the thorax posterior to the clavicle and first costal cartilage. It descends 1 cm lateral to the border of the sternum. It is a branch of the first part of the subclavian and gives off 2 anterior intercostal arteries in each intercostal space. It directly supplies the superior 6 intercostal spaces. Therefore the total number of branches is 12

**Question 7**

Which of the following statements is correct regarding the oesophagus?

A Ends at the cardiac orifice of the stomach at level T10

B Is narrowest at the commencement at the cricopharyngeal sphincter

C Is 28cm long

D Begins at the lower border of the thyroid cartilage

Explanation (B)

The esophagus, a muscular tube, 25 cm long begins at the lower border of the cricoid cartilage at C6, passes through the diaphragm at the level of T10 and ends at the cardiac orifice at the level of T11 which is the cardiac orifice. Is narrowest at the commencement at the cricopharyngeal sphincter (upper esophageal sphincter). Other sites of constriction include thoracic constriction: where it is crossed by the aortic arch and then by the left main bronchus. Diaphragmatic constriction: where it passes through the esophageal hiatus of the diaphragm

**Question 8**

Which is true in respect of the anatomy of the trachea?

A It starts at the level of the cricoid cartilage which is around C6

B In the first year of life the trachea is 5mm in diameter

C It is 20cm long and bifurcates below the manubrium sterni

D It has a 3.5cm diameter in adults

Explanation (A)

Trachea is 10cm long and 2,5cm in diameter. In the first year of life it is 3mm in diameter

**Question 9**

Regarding the coronary arteries, which of the following statements is correct?

A 40% of sino-atrial (SA) nodes are supplied by the right coronary artery

B The right coronary artery has a posterior interventricular branch

C The circumflex is the artery most affected by disease

D 50% of atrio-ventricular (AV) nodes are supplied by the right coronary artery

Explanation (B)

80% of atrio-ventricular (AV) nodes are supplied by the right coronary artery (RCA), 60% of sino-atrial (SA) nodes are also supplied by the RCA. The anterior interventricular artery is most affected by disease

**Question 10**

With regard to the bronchopulmonary segments, all of the following statements are true except?

A Material aspirated tends to lodge in apical segment of the right lower lobe B There are approximately 9 segments in each lung

C The superficial bronchial veins of the right main bronchus drain into the azygos vein

D The lingular portion of the superior left lobe is divided into an upper and lower segment

Explanation (B)

There are 10 bronchopulmonary segments in each lung. Aspirated material by supine, comatose or anaesthetised patients tends to lodge in apical segment of the right lower lobe as patients. The bronchial veins fall into a superficial system draining from the hilar region and visceral pleura in to the azygos vein on the right and the accessory hemiazygos vein on the left. The deep system from the deeper lung tissue drain to a main pulmonary vein or directly into the left atrium

Note: clinical Moore says there may be 8 segments in the left lung depending on the combintation of segments. If you group the apical and posterior segments=apicoposterior and the anterior and medial basal segments=anteriomedial, you get eight.

Lasts calls the lingular portions-superior and inferior segments. CM says superior and inferior portions

**Question 11**

Which of the following is a correct relationship as regards the chest wall?

A The intercostal artery lies between the nerve and vein

B The neurovascular bundle lies between the external and internal intercostals

C The intercostal artery is more superficial than the vein

D The transversus muscle lies between the internal and external intercostals

Explanation (A)

The neurovascular bundle lies between the internal intercostal and innermost intercostal muscles. The transverse muscle lies below the internal intercostal muscles. The intercostal artery is not more superficial than the vein

**Question 12**

Which of the following levels is correct in relation to the oesophageal opening in the diaphragm?

A T10

B T6

C T12

D T8

Explanation (A)

T8- vena cava foramen

T10- oesophagus

T12- Aortic opening

Nice way to remember: T8 - vena cava (8 letters) T10 - oesophagus (10 letters) T12 - aortic hiatus (12 letters)

**Question 13**

Which of the following statements is true in relation to the trachea?

A Its lower end is behind the manubrium

B Drains into the axillary lymph nodes

C Enters the thoracic inlet slightly to the left of midline

D Is supplied by glossopharyngeal nerve

Explanation (A)

The trachea commences at C6 level, 5cm above the jugular notch. It enters the thoracic inlet in the midline and passes downwards and backwards behind the manubrium to bifuricate into the two main bronchi. The trachea is 10cm long and 2cm wide, It drains into the posterior group of deep cervical and paratracheal lymph nodes. It is innervated by afferent fibres from vagi and recurrent laryngeal nerves

Note: The current textbook writes that the trachea ends at the level of the sternal angle by dividing into left and right main bronchi.The sternal angle is the join between the manubrium and the body of the sternum

**Question 14**

Which of the following is the most anterior structure in the thoracic inlet?

A Subclavian vein

B Thoracic duct

C Right subclavian artery

D Vagus nerve

Explanation (A)

Think of the edge of the right axilla on top of the 1st rib: vein anteriorly (thus approach for subclavian CVCs), scalenus anterior (which the phrenic nerve runs over), followed by the subclavian artery (which the right vagus runs over medially, then give off the recurrent laryngeal branch under and behind the subclavian artery).

**Question 15**

Which of the following statements is correct in relation to the diaphragm and its openings?

A Is supplied by C4, 5, 6

B Has an aortic opening opposite T12

C Has a vena caval opening at T10

D Has the oesophageal opening opposite the T8 vertebrae

Explanation (B)

The diaphragm’s motor supply is solely from the phrenic nerves, supplied by C3, 4, 5 (but mostly C4).

Openings:

T8=venae cava opening: transmits the inferior vena cava and the right phrenic nerve

T10=oesophageal opening: transmits the oesophagus accompanied by the vagal trunks, oesophageal branches of the left gastric artery, veins and lymphatic.

T12=aortic opening: transmits the aorta with the azygos vein to the right and the thoracic duct leading up from the cistern chyli between them

**Question 16**

Which structure passes through the diaphragm with the oesophagus?

A Thoracic duct

B Azygous vein

C Phrenic nerve

D Vagal trunk

Explanation (D)

The vagal trunks and the oesophageal branches of the left gastric artery, veins and lymphatics accompany the oesophagus as it passes through the diaphragm

**Question 17**

With regard to the coronary arteries, which of the following statements is correct?

A Right coronary artery (RCA) supplies the SA node in 60% of patients

B Right coronary artery (RCA) arises from the posterior coronary sinus

C There are no arteriolar anastomoses between left and right

D Left coronary artery (LCA) supplies the AV node in 80% of patients

Explanation (A)

The RCA arises form the anterior aortic sinus and the LCA from the left posterior aortic sinus.

Note: The above statement is from lasts anatomy. In CM it simple states that RCA arises form the right aortic sinus and the LCA form the left aortic sinus

The RCA supplies the sino-atrial (SA) node in 60% of patients and the AV node in the majority (80%) of patients (via the nodal artery form the posterior descending artery). The posterior descending artery (the posterior interventricular branch) is supplied by the RCA. Anastomoses exist at the termination of the right and left coronary arteries in the atrioventricular groove and between their interventricular and conus branches

**Question 18**

Which of the following muscles is not used in forced expiration?

A diaphragm

B internal oblique muscles

C external oblique muscles

D rectus abdominis

Explanation (A)

The major role of the diaphragm is inspiration, but it is also involved in abdominal straining. The external intercostals are the most active in inspiration and the internal intercostals in expiration

Whether expiration is quiet or forced (coughing, sneezing, blowing) the diaphragm is wholly passive, its relaxed fibres being elongated by pressure from below. The most important muscles of forced expiration include those of the abdominal wall-rectus abdominis, internal and external oblique muscles and the transverse abdominis muscle.

Note: the intercostal muscles are used for inspiration but paralysis of the intercostal muscles alone does not seriously affect breathing because the diaphragm is so effective. The anatomy TB states: main action of external intercostals is forced inspiration

**Question 19**

Which structure passes directly behind the hilum of the right lung?

A Internal mammary artery

B Right phrenic nerve

C Hemi-azygous vein

D Right vagus nerve

Explanation (D)

**Question 20**

Which is the correct layout of structures form anterior to posterior in the superior mediastinum?

A Lymphoid system, respiratory system, blood vascular, alimentary system, lymph vascular system

B Lymphoid system, respiratory system, blood vascular, lymph vascular system, alimentary system

C Lymphoid system, blood vascular, respiratory system, alimentary system, lymph vascular system

D Lymphoid system, blood vascular, respiratory system, alimentary system, nervous system

Explanation (C)

Within the superior mediastinum, structures occur in systemic layers form anterior to posterior.

1-Lymphoid system-thymus

2-Blood vascular system-veins than arteries

3-Respiratory system-trachea

4-Alimentary system-oesophagus

5-Lymph vascular system-thoracic duct, bronchomediastinal trunks, posterior mediastinal lymph nodes.

Thre nervous system does not have its own layer, rather it is integrated into layer 2 (phrenic and vagus) and between layers 3 and 4 (recurrent laryngeal nerves)

**Question 21**

The motor supply to the diaphragm is by the follwing nerve

A Intercostal nerves

B Vagus nerve

C Subcostal nerves

D Phrenic nerve

Explanation (D)

Diaphragm innervation

Motor supply: phrenic nerves (C3-C5)

Sensory supply: centrally by the phrenic nerves, peripherally by the intercostal nerves (T5-T11) and the subcostal nerves (T12)

**Question 22**

Which part of the heart does the right coronary artery NOT SUPPLY?

A Usually the posterior third of the interventricular septum

B Most of the right ventricle

C The posterior inferior surface of the left ventricle

D The right atrium

Explanation (C)

The RCA typically supplies the following:

The right atrium

Most of the right ventricle

The diaphragmatic surface of the left ventricle

Usually the posterior third of the interventricular septum

The SA node (60%)

AV node (80%)

**Question 23**

Which is true regarding the aortic arch and its relations?

A The trachea lies behind and to the left of the aortic arch.

B The aortic arch becomes the descending aorta at the level of T4

C The bifurcation of the pulmonary artery and the right main bronchus are found at the level of the arch

D Ligamentum venosum connects the left pulmonary artery to the aortic arch

Explanation (B)

The arch of the aorta begins at the level of the upper border of the second sternocostal articulation of the right side, and runs at first upward, backward, and to the left in front of the trachea; it is then directed backward on the left side of the trachea and finally passes downward on the left side of the body of the fourth thoracic vertebra, at the lower border of which it becomes continuous with the descending aorta (posterior to the 2nd intercostal joint). It thus forms two curvatures: one with its convexity upward, the other with its convexity forward and to the left. Its upper border is usually about 2.5 cm. below the superior border to the manubrium sterni.

Relations.—The arch of the aorta is covered anteriorly by the pleurae and anterior margins of the lungs, and by the remains of the thymus. As the vessel runs backward its left side is in contact with the left lung and pleura. Passing downward on the left side of this part of the arch are four nerves; in order from before backward these are, the left phrenic, the lower of the superior cardiac branches of the left vagus, the superior cardiac branch of the left sympathetic, and the trunk of the left vagus. As the last nerve crosses the arch it gives off its recurrent branch, which hooks around below the vessel and then passes upward on its right side. The highest left intercostal vein runs obliquely upward and forward on the left side of the arch, between the phrenic and vagus nerves. On the right are the deep part of the cardiac plexus, the left recurrent nerve, the oesophagus, and the thoracic duct; the trachea lies behind and to the right of the vessel. Above are the innominate, left common carotid, and left subclavian arteries, which arise from the convexity of the arch and are crossed close to their origins by the left innominate vein. Below are the bifurcation of the pulmonary artery, the left bronchus, the ligamentum arteriosum, the superficial part of the cardiac plexus, and the left recurrent nerve. The ligamentum arteriosum connects the commencement of the left pulmonary artery to the aortic arch.

Note: The bifurcation of the pulmonary artery occurs under the concavity of the arch and the right main bronchus begins at the upper border of T5