

I'd number 16463

Course Title: anatomy

Summer Semester

Instructor:

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Max Marks: 50

Note: There are FIVE questions, each carry 10 marks with grand total of 50 marks.
ATTEMPT all questions.

Q 5 how is the mediastinum divided ?

Ans 5 The mediastinum is the area between the sternum, the two pleural cavities,

and the vertebral column . Though thick, it is a movable

partition that extends superiorly to the thoracic outlet and the root of the neck

and inferiorly to the diaphragm. It extends anteriorly to the sternum and

posteriorly to the vertebral column. It contains the remains of the thymus, the

heart and large blood vessels, the trachea and esophagus, the thoracic duct

and lymph nodes, the vagus and phrenic nerves, and the sympathetic trunk

The mediastinum is divided into superior and inferior mediastina by an

imaginary plane passing from the sternal angle anteriorly to the lower border

of the body of the fourth thoracic vertebra posteriorly This

plane is a noteworthy landmark in that it marks several key structures. From

anterior to posterior, these are the:

Joint between the manubrium and body of the sternum

Second costosternal joint

Demarcation between the ascending aorta and the arch of the aorta

Demarcation between the arch of the aorta and the descending thoracic

aorta

Bifurcation of the trachea

Level of the left primary bronchus

T4 intervertebral disc

The inferior mediastinum is further subdivided into the middle

mediastinum, which consists of the pericardium and heart; the anterior

mediastinum, which is a space between the pericardium and the sternum;

and the posterior mediastinum, which lies between the pericardium and the

vertebral column.

For purposes of orientation, it is convenient to remember that the major

mediastinal structures are arranged in the following order from anterior to

posterior.

Superior Mediastinum

(1) Thymus, (2) large veins, (3) large arteries, (4) trachea, (5) esophagus and

thoracic duct, and (6) sympathetic trunks.

The superior mediastinum is bounded in front by the manubrium sterni

and behind by the first four thoracic vertebrae (see Fig. 5.2).

Inferior Mediastinum

(1) Thymus, (2) heart within the pericardium with the phrenic nerves on each

side, (3) esophagus and thoracic duct, (4) descending aorta, and (5)

sympathetic trunks.

The inferior mediastinum is bounded in front by the body of the sternum

and behind by the lower eight thoracic vertebrae

Q 1 explain mechanics of breathing?

Ans Muscles of inspiration

1. Diaphragm

it is the most important muscle for inspiration.

When the diaphragm contracts, the abdominal contents are pushed downward, and the ribs are lifted upward and outward, increasing the volume of the thoracic cavity.

2. External intercostals and accessory muscles

are not used for inspiration during normal quiet breathing.

are used during exercise and in respiratory distress.

B. Muscles of expiration

Expiration is normally passive.

FEV1 FVC = 0.8

Because the lung–chest wall system is elastic, it returns to its resting position after inspiration.

Expiratory muscles are used during exercise or when airway resistance is increased because of disease (e.g., asthma).

1. Abdominal muscles compress the abdominal cavity, push the diaphragm up, and push air out of the lungs.

2. Internal intercostal muscles

pull the ribs downward and inward.

1 At rest (before inspiration begins)

a. Alveolar pressure equals atmospheric pressure.

Because lung pressures are expressed relative to atmospheric pressure, alveolar pressure is said to be zero.

b. Intrapleural pressure is negative.

The opposing forces of the lungs trying to collapse and the chest

wall trying to expand create a negative pressure in the intrapleural space between them. Intrapleural pressure can be measured by a balloon catheter in the esophagus.

c. Lung volume is the FRC.

2. During inspiration

a. The inspiratory muscles contract and cause the volume of the thorax to increase. As lung volume increases, alveolar pressure decreases to less than atmospheric

pressure (i.e., becomes negative). The pressure gradient between the atmosphere and the alveoli now causes air to flow into the lungs; airflow will continue until the pressure gradient dissipates.

b. Intrapleural pressure becomes more negative.

Because lung volume increases during inspiration, the elastic recoil strength of the lungs also increases. As a result, intrapleural pressure becomes even more negative than it was at rest.

Changes in intrapleural pressure during inspiration are used to

measure the dynamic

c. Lung volume increases by one TV.

At the peak of inspiration, lung volume is the FRC plus one TV.

3. During expiration

a. Alveolar pressure becomes greater than atmospheric pressure.

The alveolar pressure becomes greater (i.e., becomes positive) because alveolar gas is compressed by the elastic forces of the lung. Thus, alveolar pressure is now higher than atmospheric pressure, the pressure gradient is reversed, and air flows out of the lungs.

b. Intrapleural pressure returns to its resting value during a normal (passive) expiration.

However, during a forced expiration, intrapleural pressure actually becomes positive.

This positive intrapleural pressure compresses the airways and makes expiration

more difficult.

In chronic obstructive pulmonary disease (COPD), in which airway resistance is increased, patients learn to expire slowly with “pursed lips” to prevent the airway collapse that may occur with a forced expiration.

c. Lung volume returns to FRC

Q2 what do you know origin of diaphragm?

Ans 2 Diaphragm

The diaphragm is a thin muscular and tendinous septum that separates the chest cavity above from the abdominal cavity below. Structures that pass between the thoracic and abdominal cavities (e.g., esophagus, aorta) must either pierce the diaphragm or go around the diaphragm.

The origin of the diaphragm can be divided into three parts: a sternal part arising from the posterior surface of the xiphoid process, a costal part arising from the deep surfaces of the lower six ribs and their costal cartilages, and a vertebral part arising by vertical columns (crura) and from the arcuate ligaments. The

right crus arises from the sides of the bodies of the first three lumbar vertebrae and the intervertebral discs. The left crus arises from the sides of the bodies of the first two lumbar vertebrae and the intervertebral disc. Lateral to the crura, the diaphragm arises from the medial and lateral arcuate ligaments. The medial arcuate ligament extends from the side of the body of the second lumbar vertebra to the tip of the transverse process of the first lumbar vertebra.

Q 3 classifications of ribs according to their connection to the sternum

Ans : Ribs

Ribs (cost- is Latin for "rib") are the elongate, flattened, arched bones that form a large part of the thoracic wall. The posterior (dorsal; vertebral) end of each rib articulates with one or two thoracic vertebrae. The anterior (ventral; sternal) ends have variable relations that allow the ribs to be categorized as "true" ribs, "false" ribs, or "floating" ribs.

: True ribs (pairs 1 to 7) are connected directly to the sternum via

individual costal cartilages. False ribs (pairs 8 to 10) are connected to the sternum via individual costal cartilages that join together and attach collectively to the seventh costal cartilages. Floating ribs (pairs 11 to 12) do not attach to the sternum.

Typical Ribs

All ribs share a common structural floor plan. A typical rib is a long, twisted, flat bone having a rounded, smooth superior border and a sharp, thin inferior border. The anterior end of each rib is attached to the

Q6 briefly discuss the structure of lung

Ans LUNGS

During life, the lungs are soft and spongy and very elastic. If the thoracic cavity were opened, the lungs would immediately shrink to one third or less in volume. In the child, they are pink, but with age, they become dark and mottled because of the inhalation of dust particles that become trapped in the phagocytes of the lung. City dwellers and coal miners show this especially well. One lung lies on each side of the mediastinum. Therefore, the heart and

great vessels and other structures in the mediastinum separate them from each other. Each lung is conical, covered with visceral pleura, attached to the mediastinum only by its root, and suspended free in its own pleural cavity

Each lung has a blunt apex, which projects upward into the neck for about 1 in. (2.5 cm) above the clavicle; a concave base that sits on the diaphragm; a convex costal surface, which corresponds to the concave chest wall; and a concave mediastinal surface, which is molded to the pericardium and other mediastinal structures . At about the middle of this surface is the hilum, a depression in which the root of the lung attaches. The structures that enter or leave the lung (i.e., the bronchi, pulmonary artery and veins, lymph vessels, bronchial vessels, and nerves) form the root of the lung. The root is surrounded by a tubular sheath of pleura, which joins the mediastinal parietal pleura to the visceral pleura covering the lungs

: The anterior lung borders are thin and overlap the heart. The cardiac notch is a concave indentation of the anterior margin of the left lung that leaves the anterior surface of the heart relatively

exposed The lingula is the tonguelike projection of the anterior margin of the left lung that extends from the inferior end of the cardiac notch. The posterior border of each lung is thick and lies beside the vertebral column.: Lobes and Fissures

Deep fissures divide the right and left lungs into unequal numbers of lobe : In both lungs, the upper lobes lie more anteriorly, whereas the lower lobes lie more posteriorly. The middle lobe is a small triangular lobe that lays anteroinferiorly, between the other two lobes, bounded by the horizontal and oblique fissures.

Bronchopu

First Rib

The first rib is important clinically because of its close relationship to the lower nerves of the brachial plexus and the main vessels to the arm, namely, the subclavian artery and vein This rib is small and flattened from above downward. The scalenus anterior muscle is attached to its upper surface and inner border. Anterior to the scalenus anterior, the subclavian vein

crosses the rib; posterior to the muscle attachment, the subclavian artery and the lower trunk of the brachial plexus cross the rib and lie in contact with the bone.

Cervical Rib

A cervical rib (i.e., a rib arising from the anterior tubercle of the transverse process of the seventh cervical vertebra) occurs in about 0.5% of humans. It may have a free anterior end, may be connected to the first rib by a fibrous band, or may articulate with the first rib. The importance of a cervical rib is that it may cause pressure on the lower trunk of the brachial plexus, causing pain down the medial side of the forearm and hand and wasting of the small muscles of the hand. It can also exert pressure on the overlying subclavian artery and interfere with the circulation of the upper limb.

: bronchopulmonary segment. As the bronchi become smaller, irregular plates of cartilage, which become smaller and fewer in number, gradually replace the tracheal rings. The smallest bronchi divide and give rise to bronchioles, which are <1 mm in diameter. Bronchioles possess no cartilage in their walls and are

lined with columnar ciliated epithelium. The submucosa possesses a complete layer of circularly arranged smooth muscle fibers.

The bronchioles then divide and give rise to terminal bronchioles, which show delicate outpouchings from their walls. Gaseous exchange between blood and air takes place in the walls of these outpouchings, which explains the name respiratory bronchiole. The diameter of a respiratory bronchiole is about 0.5 mm. The respiratory bronchioles end by branching into alveolar ducts, which lead into tubular passages with numerous thin-walled outpouchings called alveolar sacs. The alveolar sacs consist of several alveoli opening into a single chamber. A rich network of blood capillaries surrounds each alveolus. Gaseous exchange takes place between the air in the alveolar lumen and the alveolar wall into the blood within the surrounding capillaries.

Q4 what do you know about general features ribs

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