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DEP:-DPT 2ND SEM

Q;-1 What will be the total lung capacity if (ERV) is 1000- ml (RV) residual volume is 1200-ml keeping the inspiraratory is 3000 ml.

Ans)-TLC =?

ERV =1000 ml

RV =1200ml

IC =3000ml

We know that

VC =IRV+VT+ERV.

So VC=IC +ERV …(i)

Putting the value in eq----(1)

VC =3000 +1000

VC=4000 ml

So total lung capacity

TLC =VC +RV

TLC= 4000+1200

TLC=5200 ml.

Q2:- what is pulmunary edema. Enlist the muscle of inspiration and muscles of expirations.

Ans :- pulmonary edema occurs in the same way that the edema occurs elsewhere in the body. Any factor that increase fluid filtration out of the pulmonary capalaries are that impedes pulmonary lamphetic function and cause the pulmonary interstitial fluid pressure to rise from the negative range into the positive range will cause rapid filling of the pulmonary interstitial spaces in alveoli with large amount of free fluid.

Muscles of inspiration

1-Diaphram

2- Muscles that raise the rib cage

1. External intercostals: Main muscles
2. Stemocleidomastoid muscles :lift upward on the sternum.
3. Anterior serrate:lift many of the ribs;and
4. Scalene ,which lift the first two ribs

Muscles of expiration

- Muscles that depress the chest cage

1. Abdominal recti: Main powerful effect
2. Abdominal muscles.
3. Internal intercostals
4.

Q :-3) Compare the properties of different blood groups also mark universal donor and universal recipient.

Ans:- THE ABO BLOOD GROUP

Although the **ABO blood group** name consists of three letters, ABO blood typing designates the presence or absence of just two antigens, A and B. Both are glycoproteins.

People whose erythrocytes have A antigens on their erythrocyte membrane surfaces are designated blood type A, and those whose erythrocytes have B antigens are blood type B.

People can also have both A and B antigens on their erythrocytes, in which case they are blood type AB.

People with neither A nor B antigens are designated blood type O.

ABO blood types are genetically determined.

Normally the body must be exposed to a foreign antigen before an antibody can be produced.

This is not the case for the ABO blood group.

Individuals with type A blood—without any prior exposure to incompatible blood—have preformed antibodies to the B antigen circulating in their blood plasma. These antibodies, referred to as anti-B antibodies, will cause agglutination and hemolysis if they ever encounter erythrocytes with B antigens. Similarly, an individual with type B blood has pre-formed anti-A antibodies. Individuals with type AB blood, which has both antigens, do not have preformed antibodies to either of these. People with type O blood lack antigens A and B on their erythrocytes, but both anti-A and anti-B antibodies circulate in their blood plasma.

RH BLOOD GROUPS

The **Rh blood group** is classified according to the presence or absence of a second erythrocyte antigen identified as Rh.

(It was first discovered in a type of primate known as a rhesus macaque, which is often used in research, because its blood is similar to that of humans.)

Although dozens of Rh antigens have been identified, only one, designated D, is clinically important.

Those who have the Rh D antigen present on their erythrocytes—about 85 percent of Americans—are described as Rh positive (Rh^+) and those who lack it are Rh negative (Rh^-).

Note that the Rh group is distinct from the ABO group, so any individual, no matter their ABO blood type, may have or lack this Rh antigen. When identifying a patient's blood type, the Rh group is designated by adding the word positive or negative to the ABO type.

For example, A positive (A^+) means ABO group A blood with the Rh antigen present, and AB negative (AB^-) means ABO group AB blood without the Rh antigen

The one who give blood is called the **DONOR .**

And the one who receive the blood is called the **Recipient .**

The antibody of the donor and antigen of the recipient are ignore mostly ,

Thus RBC of O group has no antigen and so agglutination does not occurs with any other group of blood so O group blood can be given to any blood group persons in the people with this blood group are called **UNIVERSAL DONOR**.

Plasma of AB group blood has no antibody this does not cause agglutination of RBC from any other group of blood

People with AB group can receive blood from any blood group person so people with this blood group are called **UNIVERSAL RECIPIENT.**

Q :4) **Explain respiratory membrane. what are the factor that affect diffusion of gases across the membrane.?**

Ans :- The respiratory membrane allows gases to be exchanged between the pulmonary capillaries, or blood vessels, and the respiratory units of the lungs, which consist of bronchioles, alveolar ducts, atria and alveoli.

This exchange transports oxygen from the alveoli into red blood cells and carbon dioxide from blood cells into the alveoli . An exchange of gases supplies oxygen to the cells and removes carbon dioxide, a waste product that is exhaled by the lungs.

Layers of respiratory membrane.

1. A layer of fluid containing surfactant that lines the alveolus and reduces the surface tension of the alveolar fluid.
2. The alveolar epithelium,whicj is composed of thin epithelial cells
3. An epithelial basement membrane
4. A thin interstitial space between the alveolar epithelium and the capillary membrane
5. A capillary basement membrane that in many places fuses with the alveolar epithelial basement membrane.
6. The capillary endothelial membrane despite the large number of layers,the overall thickness of the respiratory

membrane in some areas is as little as 0.2 micrometer and averages about 0.6 micrometers except where there are cell nuclei .from histological study it estimate the total surface area of RM is about 70 square meter in the healthy adult man. The total quantity of blood in the lung capillaries it any given instant is 60 to 140 ml. it is responsible of the rapidity of the respiratory exchange of O2 and CO2.

FACTOR THAT AFFECT THE RATE OF GAS DIFFUSION THROUGH THE RESPIRATORY MEMBRANE.

1. Thickness of the membrane
2. Surface area of the membrane
3. Diffusion coefficient of the gase and the substance of the membrane and
4. Partial pressure difference of the gase between the two sides of the membrane.

Q:-5 What is the difference between anatomical dead space and physiological dead space .what are the clinical manifestation of pulmonary effusion.?

introduction

- Dead space represents the volume of ventilated air that does not participate in gas exchange. The two types of

dead space are anatomical dead space and physiologic dead space.

1. Anatomical dead space

Anatomical dead space is represented by the volume of air that fills the conducting zone of respiration made up by the nose, trachea, and bronchi. This volume is considered to be 30% of normal tidal volume (500 mL); therefore, the value of anatomic dead space is 150 mL. Physiologic or total dead space is equal to anatomic plus alveolar dead space which is the volume of air in the respiratory zone that does not take part in gas exchange. The respiratory zone is comprised of respiratory bronchioles, alveolar duct, alveolar sac, and alveoli. In a healthy adult alveolar dead space can be considered negligible.

2. Physiological dead space

physiologic dead space is equivalent to anatomical. One can see an increase in the value of physiologic dead space in lung disease states where the diffusion membrane of alveoli does not function properly or when there are ventilation/perfusion mismatch defects.

Dead space and its effect on alveolar ventilation

Some of the air a person breathes never reaches the gas exchange areas but simply fills respiratory

passages where gas exchange does not occur, such as the nose, pharynx, and trachea. This air is called dead space air because it is not useful for gas exchange.

On expiration, the air in the dead space is expired first, before any of the air from the alveoli reaches the atmosphere. Therefore, the dead space is very disadvantageous for removing the expiratory gases from the lungs.

What is pleural effusion ?

Pleural effusion, sometimes referred to as “water on the lungs,” is the build-up of excess fluid between the layers of the pleura outside the lungs. The pleura are thin membranes that line the lungs and the inside of the chest cavity and act to lubricate and facilitate breathing. Normally, a small amount of fluid is present in the pleura.

symptoms of pleural effusion

Some patients with pleural effusion have no symptoms, with the condition discovered on a chest x-ray that is performed for another reason. The patient may have unrelated symptoms due to the disease or condition that has caused the effusion.Symptoms of pleural effusion include:

Chest pain

Dry, nonproductive cough

Dyspnea (shortness of breath, or difficult, labored breathing)

Orthopnea (the inability to breathe easily unless the person is sitting up straight or standing erect)

The most common causes of transudative (watery fluid) pleural effusions include:

- Heart failure
- Pulmonary embolism
- Cirrhosis
- Post open heart surgery

Exudative (protein-rich fluid) pleural effusions are most commonly caused by:

- Pneumonia
- Cancer
- Pulmonary embolism
- Kidney disease
- Inflammatory disease