A&P 22 Respiratory System Essay

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OpenStax College. Anatomy & Physiology, OpenStax-CNX Web site. http://cnx.org/content/col11496/1.6/, Jun 11, 2014

4. Chapter: A&P 22 Respiratory System Essay

1. A&P 22 Respiratory System Essay Questions

4.1.1. Visit this site (http://openstaxcollege.org/l/asthma) to learn more...

Author: OpenStax College

Visit this site (http://openstaxcollege.org/l/asthma) to learn more about what happens during an asthma attack.

What are the three changes that occur inside the airways during an asthma attack?

- Inflammation and the production of a thick mucus; constriction of the airway muscles, or bronchospasm; and an increased sensitivity to allergens.

Check the answer of this question online at QuizOver.com:
Question: Visit this site http://openstaxcollege OpenStax College Anatomy Quest

4.1.2. Watch this video (http://openstaxcollege.org/l/spirometers) to lear...

Author: OpenStax College

Watch this video (http://openstaxcollege.org/l/spirometers) to learn more about lung volumes and spirometers.

Explain how spirometry test results can be used to diagnose respiratory diseases or determine the effectiveness of disease treatment.

- Patients with respiratory ailments (such as asthma, emphysema, COPD, etc.) have issues with airway resistance and/or lung compliance.
  Both of these factors can interfere with the patient's ability to move air effectively. A spirometry test can determine how much air the patient can move into and out of the lungs.
  If the air volumes are low, this can indicate that the patient has a respiratory disease or that the treatment regimen may need to be adjusted.
  If the numbers are normal, the patient does not have a significant respiratory disease or the treatment regimen is working as expected.

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4.1.3. Watch this video (http://openstaxcollege.org/l/oxyblood) to see the...

Author: OpenStax College

Watch this video (http://openstaxcollege.org/l/oxyblood) to see the transport of oxygen from the lungs to the tissues.

Why is oxygenated blood bright red, whereas deoxygenated blood tends to be more of a purple color?

- When oxygen binds to the hemoglobin molecule, oxyhemoglobin is created, which has a red color to it.
  Hemoglobin that is not bound to oxygen tends to be more of a blue-purple color.
  Oxygenated blood traveling through the systemic arteries has large amounts of oxyhemoglobin.
  As blood passes through the tissues, much of the oxygen is released into systemic capillaries.
  The deoxygenated blood returning through the systemic veins, therefore, contains much smaller amounts of oxyhemoglobin.
  The more oxyhemoglobin that is present in the blood, the redder the fluid will be.
  As a result, oxygenated blood will be much redder in color than deoxygenated blood.

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4.1.4. Describe the three regions of the pharynx and their functions.

Author: OpenStax College

Describe the three regions of the pharynx and their functions.

- The pharynx has three major regions. The first region is the nasopharynx, which is connected to the posterior nasal cavity and functions as an airway.
  The second region is the oropharynx, which is continuous with the nasopharynx and is connected to the oral cavity at the fauces.
  The laryngopharynx is connected to the oropharynx and the esophagus and trachea.
  Both the oropharynx and laryngopharynx are passageways for air and food and drink.

4.1.5. If a person sustains an injury to the epiglottis, what would be the...

Author: OpenStax College

If a person sustains an injury to the epiglottis, what would be the physiological result?

- The epiglottis is a region of the larynx that is important during the swallowing of food or drink.
  As a person swallows, the pharynx moves upward and the epiglottis closes over the trachea, preventing food or drink from entering the trachea.
  If a person's epiglottis were injured, this mechanism would be impaired.
  As a result, the person may have problems with food or drink entering the trachea, and possibly, the lungs.
  Over time, this may cause infections such as pneumonia to set in.

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4.1.6. Compare and contrast the conducting and respiratory zones.

Author: OpenStax College

Compare and contrast the conducting and respiratory zones.

- The conducting zone of the respiratory system includes the organs and structures that are not directly involved in gas exchange, but perform other duties such as providing a passageway for air, trapping and removing debris and pathogens, and warming and humidifying incoming air.
  Such structures include the nasal cavity, pharynx, larynx, trachea, and most of the bronchial tree.
  The respiratory zone includes all the organs and structures that are directly involved in gas exchange, including the respiratory bronchioles, alveolar ducts, and alveoli.

Check the answer of this question online at QuizOver.com:
Question: Compare and contrast the conducting and OpenStax College Anatomy

4.1.7. Compare and contrast the right and left lungs.

Author: OpenStax College

Compare and contrast the right and left lungs.

- The right and left lungs differ in size and shape to accommodate other organs that encroach on the thoracic region.
  The right lung consists of three lobes and is shorter than the left lung, due to the position of the liver underneath it.
  The left lung consist of two lobes and is longer and narrower than the right lung.
  The left lung has a concave region on the mediastinal surface called the cardiac notch that allows space for the heart.

Check the answer of this question online at QuizOver.com:
Question: Compare and contrast the right and left OpenStax College Anatomy

4.1.8. Why are the pleurae not damaged during normal breathing?

Author: OpenStax College

Why are the pleurae not damaged during normal breathing?

- There is a cavity, called the pleural cavity, between the parietal and visceral layers of the pleura. Mesothelial cells produce and secrete pleural fluid into the pleural cavity that acts as a lubricant. Therefore, as you breathe, the pleural fluid prevents the two layers of the pleura from rubbing against each other and causing damage due to friction.

Check the answer of this question online at QuizOver.com:
Question: Why are the pleurae not damaged during OpenStax College Anatomy Quest

4.1.9. Describe what is meant by the term "lung compliance."

Author: OpenStax College

Describe what is meant by the term "lung compliance."

- Lung compliance refers to the ability of lung tissue to stretch under pressure, which is determined in part by the surface tension of the alveoli and the ability of the connective tissue to stretch. Lung compliance plays a role in determining how much the lungs can change in volume, which in turn helps to determine pressure and air movement.

Check the answer of this question online at QuizOver.com:
Question: Describe what is meant by the term lung OpenStax College Anatomy

4.1.10. Outline the steps involved in quiet breathing.

Author: OpenStax College

Outline the steps involved in quiet breathing.

- Quiet breathing occurs at rest and without active thought.
  During quiet breathing, the diaphragm and external intercostal muscles work at different extents, depending on the situation.
  For inspiration, the diaphragm contracts, causing the diaphragm to flatten and drop towards the abdominal cavity, helping to expand the thoracic cavity.
  The external intercostal muscles contract as well, causing the rib cage to expand, and the rib cage and sternum to move outward, also expanding the thoracic cavity.
  Expansion of the thoracic cavity also causes the lungs to expand, due to the adhesiveness of the pleural fluid.
  As a result, the pressure within the lungs drops below that of the atmosphere, causing air to rush into the lungs.
  In contrast, expiration is a passive process. As the diaphragm and intercostal muscles relax, the lungs and thoracic tissues recoil, and the volume of the lungs decreases.
  This causes the pressure within the lungs to increase above that of the atmosphere, causing air to leave the lungs.

4.1.11. What is respiratory rate and how is it controlled?

Author: OpenStax College

What is respiratory rate and how is it controlled?

- Respiratory rate is defined as the number of breaths taken per minute. Respiratory rate is controlled by the respiratory center, located in the medulla oblongata.
  Conscious thought can alter the normal respiratory rate through control by skeletal muscle, although one cannot consciously stop the rate altogether.
  A typical resting respiratory rate is about 14 breaths per minute.

Check the answer of this question online at QuizOver.com:
Question: What is respiratory rate and how is it OpenStax College Anatomy Quest

4.1.12. Compare and contrast Dalton's law and Henry's law.

Author: OpenStax College

Compare and contrast Dalton's law and Henry's law.

- Both Dalton's and Henry's laws describe the behavior of gases.
  Dalton's law states that any gas in a mixture of gases exerts force as if it were not in a mixture.
  Henry's law states that gas molecules dissolve in a liquid proportional to their partial pressure.

4.1.13. A smoker develops damage to several alveoli that then can no longer...

Author: OpenStax College

A smoker develops damage to several alveoli that then can no longer function. How does this affect gas exchange?

- The damaged alveoli will have insufficient ventilation, causing the partial pressure of oxygen in the alveoli to decrease.
  As a result, the pulmonary capillaries serving these alveoli will constrict, redirecting blood flow to other alveoli that are receiving sufficient ventilation.

Check the answer of this question online at QuizOver.com:
Question: A smoker develops damage to several alveoli OpenStax College Anatomy

4.1.14. Compare and contrast adult hemoglobin and fetal hemoglobin.

Author: OpenStax College

Compare and contrast adult hemoglobin and fetal hemoglobin.

- Both adult and fetal hemoglobin transport oxygen via iron molecules.
  However, fetal hemoglobin has about a 20-fold greater affinity for oxygen than does adult hemoglobin.
  This is due to a difference in structure; fetal hemoglobin has two subunits that have a slightly
  different structure than the subunits of adult hemoglobin.

Check the answer of this question online at QuizOver.com:
Question: Compare and contrast adult hemoglobin and OpenStax College Anatomy

4.1.15. Describe the relationship between the partial pressure of oxygen an...

Author: OpenStax College

Describe the relationship between the partial pressure of oxygen and the binding of oxygen to hemoglobin.

- The relationship between the partial pressure of oxygen and the binding of hemoglobin to oxygen is described by the oxygen-hemoglobin saturation/dissociation curve. As the partial pressure of oxygen increases, the number of oxygen molecules bound by hemoglobin increases, thereby increasing the saturation of hemoglobin.

4.1.16. Describe three ways in which carbon dioxide can be transported.

Author: OpenStax College

Describe three ways in which carbon dioxide can be transported.

- Carbon dioxide can be transported by three mechanisms: dissolved in plasma, as bicarbonate, or as carbaminohemoglobin.
  Dissolved in plasma, carbon dioxide molecules simply diffuse into the blood from the tissues.
  Bicarbonate is created by a chemical reaction that occurs mostly in erythrocytes, joining carbon dioxide and water by carbonic anhydrase, producing carbonic acid, which breaks down into bicarbonate and hydrogen ions.
  Carbaminohemoglobin is the bound form of hemoglobin and carbon dioxide.

4.1.17. Describe the neural factors involved in increasing ventilation duri...

Author: OpenStax College

Describe the neural factors involved in increasing ventilation during exercise.

- There are three neural factors that play a role in the increased ventilation observed during exercise. Because this increased ventilation occurs at the beginning of exercise, it is unlikely that only blood oxygen and carbon dioxide levels are involved.
  The first neural factor is the psychological stimulus of making a conscious decision to exercise.
  The second neural factor is the stimulus of motor neuron activation by the skeletal muscles, which are involved in exercise.
  The third neural factor is activation of the proprioceptors located in the muscles, joints, and tendons that stimulate activity in the respiratory centers.

4.1.18. What is the major mechanism that results in acclimatization?

Author: OpenStax College

What is the major mechanism that results in acclimatization?

- A major mechanism involved in acclimatization is the increased production of erythrocytes.
  A drop in tissue levels of oxygen stimulates the kidneys to produce the hormone erythropoietin, which signals the bone marrow to produce erythrocytes.
  As a result, individuals exposed to a high altitude for long periods of time have a greater number of circulating erythrocytes than do individuals at lower altitudes.

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Question: What is the major mechanism that results OpenStax College Anatomy

4.1.19. During what timeframe does a fetus have enough mature structures to...

Author: OpenStax College

During what timeframe does a fetus have enough mature structures to breathe on its own if born prematurely?

Describe the other structures that develop during this phase.

- At about week 28, enough alveolar precursors have matured so that a baby born prematurely at this time can usually breathe on its own.
  Other structures that develop about this time are pulmonary capillaries, expanding to create a large surface area for gas exchange.
  Alveolar ducts and alveolar precursors have also developed.

Check the answer of this question online at QuizOver.com:
Question: During what timeframe does a fetus have OpenStax College Anatomy

4.1.20. Describe fetal breathing movements and their purpose.

Author: OpenStax College

Describe fetal breathing movements and their purpose.

- Fetal breathing movements occur due to the contraction of respiratory muscles, causing the fetus to inhale and exhale amniotic fluid.
  It is thought that these movements are a way to "practice" breathing, which results in toning the muscles in preparation for breathing after birth.
  In addition, fetal breathing movements may help alveoli to form and mature.

Check the answer of this question online at QuizOver.com:
Question: Describe fetal breathing movements and OpenStax College Anatomy Quest