

Gas Exchange Reflection

After viewing the videos, I have a greater understanding of each disease and knowledge of chest tubes. I have learned that tuberculosis is one of the leading causes of infection and death in adults. The CDC has determined COPD to be the fourth leading cause of death in the United States. We will explore these diseases as well as sleep apnea, pneumonia, and chest tubes further in this reflection.

Tuberculosis is an infection of the lungs that is caused by mycobacterium tuberculosis. Although the disease begins in the lungs, it has the capability to rapidly spread to any organ of the body. Able to travel through the lymph nodes and bloodstream, the disease may affect the kidneys, bones, and the brain. Although a vaccine is available for the disease called BCG (Bacillus Calmette-Guerin), morbidity remains high in countries such as Africa, Southeast Asia, and the Western Pacific. TB is a highly contagious disease. Transmission occurs through the air by the inhalation of TB bacteria in the form of tiny water droplets that are able to remain floating in the air for several hours. Infection will occur when the particles are able to cross the upper respiratory defenses and reach the lobes of the lungs. Antibiotics were developed to help eliminate the disease, however, since then new forms of TB have become resistant to the existing antibiotics. Therefore, contracting a new form of the bacteria is more dangerous. Tuberculosis may be latent (bacteria is present but inactive). A person with latent TB will not exhibit symptoms and cannot spread the infection. Risk factors for TB include being exposed to someone with the disease and having a weak immune system. Signs and symptoms may be a productive cough for three or more weeks, chest pain, hemoptysis, fever and chills, and fatigue.

Chronic obstructive pulmonary disease (COPD) is an inflammatory lung disease that obstructs the airflow from the lungs. The two types of COPD are emphysema and chronic bronchitis. Damage takes place in the alveolar walls with emphysema. The alveoli will lose shape and create larger and fewer air sacks, therefore reducing the total surface area available for gas exchange. The volume of air exchanged will decrease as a result. Chronic bronchitis causes the lining of air passages to clog with mucus. This is due to the inflammation and swelling. Generally COPD is used to describe both diseases because they often occur together. COPD causes changes in the respiratory tract. Difficulties of these changes include: clogging of air passages due to mucus, inflammation or thickening of the walls of air passages, damage to alveolar walls, and loss of stretch ability of alveoli and air passages. Most COPD is caused by the inhalation of pollutants. Smoking and second-hand smoke, as well as fumes and chemicals in some work environments may result in the disease. It is important to note that smoking is the most common cause of COPD. Symptoms of COPD include: persistent cough with mucus, shortness of breath, frequent respiratory infections, and fatigue. Damage from COPD is irreversible, but there are medications that can slow the progression. A change in lifestyle, such as quitting of smoking is also beneficial. Supplemental oxygen is provided to patients with low oxygen levels in the blood. It is the only proven therapy known to extend the length and quality of life.

Sleep apnea can be caused by an obstruction of the airway during sleep. The blockage occurs at the back of the tongue when tissues are enlarged because of the fat storage. After falling asleep, the muscles also go to sleep. This allows the tongue to fall back and create the obstruction. Therefore, no air is able to get into the lungs. The drop in oxygen saturation will cause resistance to increase and then a signal is sent to the brain causing the person to wake up. Once awakened, the tongue will then move and open that airway back up, but a constant pattern will occur after falling back asleep and again blocking the airway. Risk factors of sleep apnea include: being male, obesity, race, nasal obstruction, genetics, and age.

Pneumonia is a common disease that causes inflammation of the air sacs in the lungs, allowing the sacs to fill with fluid or pus. Those most at risk are children under two, elders over sixty-five, smokers, and people with compromised immune systems. Types of pneumonia are determined by the area of the lungs which are infected. Bronchial pneumonia affects the bronchial tubes and lobar pneumonia may infect one or more of the five lobes. Signs and symptoms may include coughing with sputum, sweating, chills, chest pain with breathing and nausea and vomiting. If pneumonia is suspected, a sputum and blood test should be done to determine which organism is causing the infection and appropriate antibiotics can be prescribed.

Chest tubes are intended to remove fluid or air by being inserted into the pleural space, helping to re-expand the lung. Tubes may also be placed under the sternum into the mediastinum space to drain fluid buildup around the heart after a cardiac surgery. Pneumothorax is air entering the pleural space which causes the lungs to collapse, also requiring a chest tube. When caring for a patient with a chest tube it is important to monitor the patient's respiratory status, the drain system, and know what to do if there are complications with the chest tube. Always make sure that connections for the drainage system are secure and properly functioning. Document the color amount of output in the collection chamber. If the chest tube becomes dislodged, cover the site with a sterile dressing and tape on three sides. The physician should be notified immediately. Be familiar with all facility protocols regarding chest tubes. After removal respiratory status should be assessed and a chest x-ray may be performed to visualize current lung expansion.