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Gas Exchange Videos
Tuberculosis is a contagious bacterial infection of the lungs and can move to other organs. TB can be passed from person to person through airborne droplets. Infection from TB happens when the particles are small enough to reach the lungs. Some newer forms of TB have been found and are resistant to established antibiotics. People exposed to TB and are in an area where TB is widespread are at a higher risk of being infected with TB. People with a weaker immune system are also at a higher risk of being infected. Though TB may be inactive at first, it may become active once a person's immune system is weakened. Inactive TB has no symptoms. Symptoms of active TB include productive cough, chest pain when breathing/coughing, hemoptysis, poor appetite, fever/chills, fatigue, etc. CXR and sputum culture are ways to diagnose TB. A positive PPD for TB varies in induration depending on the person's immune system. Patients must complete the entire course of therapy to prevent the bacteria from becoming resistant to the treatment.
COPD is a condition which reduces the volume of air that passes through the lungs. Emphysema is categorized by damage to walls of the alveoli. Surface area for gas exchange is reduced and the volume of air passed through the lungs is reduced. Chronic bronchitis is categorized by inflammation in the lungs that also causes mucus to clog the lungs. COPD is caused by inhaling pollutants with smoking as the leading cause of COPD. Spirometry is one of the tools used to diagnose COPD. Spirometry measures the volume of air that moves in and out of the lungs. Arterial blood gasses are also used to diagnose COPD and measure the level of oxygen in the blood. The main treatments of COPD are medications and changing lifestyle. Patients with low oxygen levels may require supplemental oxygen as treatment for COPD.
Pneumonia is fluid in alveoli and varies in sensitivity with each person based on health. Pneumonia has different classifications depending on the part of the lung affected by the infection and how the person acquired it. Pneumonia can also be caused by bacterial or viral infections. SIgns and symptoms of pneumonia include cough, sputum production, fever/chills, sweating, chest pain, cyanosis, etc. The first step to diagnosing pneumonia is performing a lung assessment with special attention to lung sounds. Crackling and wheezing in the lungs are signs of pneumonia but a sputum culture will be a more specific diagnosis. Depending on the infection, different treatments may be used. Cultures must be taken before antibiotics are administered. Antibiotics must be taken as prescribed and must be taken in full in order to prevent creating a superinfection. Some preventative measures include staying healthy, quitting smoking and vaccination.
Chest tubes remove air or fluid in the pleural space of the lungs. This helps relieve pressure and expend the lungs for optimal gas exchange. Pneumothorax is defined by air in the pleural space while pleural effusion is defined by excess fluid in the pleural space. Different types of pleural effusion include hemothorax when blood enters the pleural space, empyema when pus enters the pleural space, and chylothorax when lymphatic fluid enters the pleural space. The difference in drainage systems are categorized by the type of suction. A wet suction drainage system utilizes a water seal and the height of the water level regulates the suction of the tube. A dry suction drainage system does not use a water column but instead uses a suction monitor that balances the suction of the tube. Bubbling and evaporation are normal with wet suction but are not found in dry suction. Dry suction includes higher pressure options compared to wet suction. Always monitor respiratory status in the patient as well as the drainage system for any potential problems. The drainage system must always be placed below the patient's chest in order to

prevent backflow. The output of drainage must also be monitored and documented accordingly. The water seal in the collection chamber allows air to be removed from the pleural space and prevents air from moving back into the space.