

Airway Clearance Indications: Obstructive Airway Diseases

Pneumonia

Pneumonia refers to infection or inflammation of one or both lungs most often caused by bacterial or viral pathogens. Aspiration of stomach contents, foreign bodies or inhalation of chemical irritants can also result in pneumonia. Regardless of underlying cause, all forms of pneumonia are characterized by purulent (pus-filled) fluid and mucus surrounding the alveoli (air sacs) or interstitial spaces and interfering with effective oxygen flow and gas exchange. Pneumonia affects 3,000,000 people in the United States each year and results in more than 500,000 hospitalizations and 60,000 deaths annually. Pneumonia may affect a single lobe of one lung (called 'lobar' pneumonia) or may be diffuse and spread between many lobes (bronchial pneumonia or bronchopneumonia). Anyone can get pneumonia, but the elderly, young children and people with underlying chronic diseases, immune deficiencies or limited mobility are typically more susceptible.

What Happens in Pneumonia?

The goal of respiration is the effective exchange of gases. Oxygen, required by every cell in the body, is taken in with each inspiration and carbon dioxide (CO₂) is expelled with each expiration. Gas exchange takes place in the tiny air sacs called alveoli found at the distal (far) ends of the bronchial tubes. Optimal gas exchange occurs when the alveoli remain open, elastic and filled with air. When airflow to the alveoli is impaired by obstruction or scarring or the alveoli are unable to fully expand, gas exchange is impaired. The bacteria, viruses and toxic insults that cause pneumonia trigger a cascade of defense reactions in the lung resulting in the hypersecretion of pus-laden mucus, plugging the airways and impairing effective alveolar gas exchange.

How Airway Clearance Therapy Can Help Pneumonia

Keeping the airways clear of excess secretions and thereby reduce the incidence of inflammation and/or infection and is crucial to maintaining respiratory health. Airway clearance therapy using High Frequency Chest Wall Oscillation (HFCWO) has been demonstrated by clinical study to promote excess mucus clearance and improve bronchial drainage. Shear forces are created by HFCWO treatment that mechanically releases adhered secretions from the walls of the pulmonary tract. HFCWO has also been shown to reduce the viscosity of secretions which significantly improves mobilization of excess mucus. By replicating cough, HFCWO can effectively mobilize pulmonary secretions from smaller airways to larger airways where they can be coughed out, swallowed or suctioned.



Symptoms of Pneumonia:

- Shortness of breath
- Chest pain
- Fever
- Chills
- Purulent (pus-filled), colored sputum
- Muscle aches
- Loss of appetite
- Cyanosis (blue color of the skin, especially around the lips)
- Hemoptysis (coughing up blood)

For More Information on Pneumonia:

1. Medline Plus fact sheet: <http://www.nlm.nih.gov/medlineplus/pneumonia.html>
2. Fact sheet from the Nemours Foundation:
<http://kidshealth.org/parent/infections/lung/pneumonia.html>
3. Fact sheet from the Mayo Clinic: <http://www.mayoclinic.com/health/pneumonia/DS00135>
4. Fact sheet from eMedicine:
http://www.emedicinehealth.com/bacterial_pneumonia/article_em.htm