

Respiratory System - Disorders

Pneumonia

What is it?

Pneumonia is an inflammation that occurs within the airspaces (structures called alveoli) of the lungs. It can range in severity ranging from mild illness to death.

A pneumonia will fill up space in the lung with fluid reducing the air exchange that occurs there.

Pneumonia often arises due to a weakened immune system as a secondary infection.

Causes and Classifications

There are a number of classifications and **causes** of pneumonia:

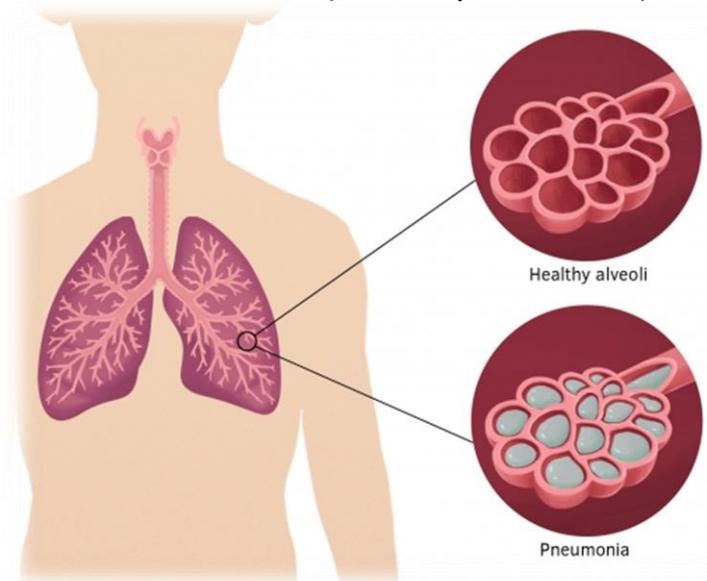
1. **Bacterial:** Often the Streptococcus pneumoniae or pneumococcus. Other bacteria that can cause pneumonia include **Mycoplasma** (under age 40 in crowded spaces), **Legionella** (outbreak related, Legionnaire's disease), and **Chlamydia** (mild, age 65+).
2. **Viral:** Most commonly caused in adults by the **Influenza Virus**, and in children the **Respiratory Syncytial Virus (RSV)**. Additionally, others such as **Parainfluenza**, and the common cold virus known as **Rhinovirus** can lead to pneumonia. *Viral pneumonia can weaken the immune system enough to lead to a bacterial pneumonia.*
3. **Fungal:** **Pneumocystis Jirovecii** causes Pneumocystis pneumonia and is a serious fungal infection. This might occur in people that suffer chronically weak immune systems (cancer, HIV/AIDS).

Causes and Classifications - continued

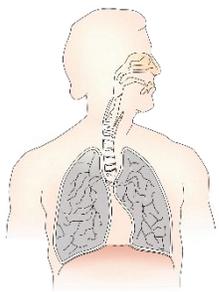
3. **Lipoid:** This is a class of pneumonia caused by **inhaled oils** and **fats**.
4. **Aspiration:** This is more common in the elderly when their ability to swallow is compromised. Due to the compromised airway they might aspirate (material goes into lungs instead of stomach or mouth) their **food/drink/vomit/saliva**.
5. **VAP-CAP-HAP:** To further narrow it down there is VAP-**ventilator** acquired pneumonia from being on a ventilator in hospital, CAP-**community** acquired pneumonia, and HAP-**hospital** acquired pneumonia. These can be bacterial, viral, or fungal but are used to further classify the source.

Risk Factors

- Age 65+ or 2 and under
- Swallowing problems
- Smoking
- Immuno-compromised (weak immune system)
- Chronic disease (COPD, cystic fibrosis)



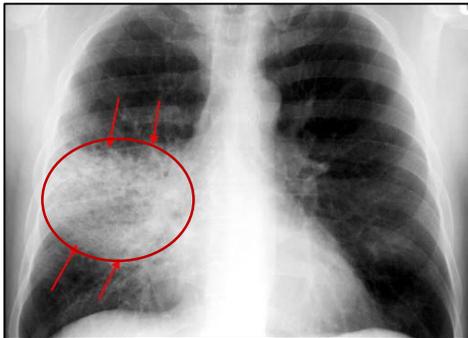
Above shows the air exchange structure (alveoli) filled with fluid in pneumonia



Respiratory System - Disorders

Assessment

- Auscultation will reveal crackles in lungs (generally coarse [low pitch popping])
- Chest X-Ray to look for consolidations (alveoli and small airways fill with dense material)
- Blood tests – Blood count (elevated white cells = infection), and culture (to see if bacteria is present in the blood)
- Pulse Oximetry – Probe on finger that measures the oxygen content in the blood (reduced in pneumonia due to impaired air exchange in the lungs)
- Bronchoscopy – For odd or severe cases a flexible tube with a light/camera is passed through the mouth/nose to look into the lungs, there may be a sample taken during the procedure



The red arrows point to a consolidation that, when paired with clinical history, point to a pneumonia

Treatment

- Bacterial: – Treated with antibiotics. Generally takes 1-3 days to start improving
- Viral: Might be treated with anti-viral medication, but generally just needs time to improve - 1-3 weeks
- Fungal: Anti-fungal medications can be given

Treatment - continued

- Increasing and encouraging fluids: this is very important (unless fluid-restricted), along with controlling fever (Tylenol and Advil work well)
- Rest: Pneumonia can cause some extreme fatigue and requires the person rest. Recovery can take weeks to months depending on severity

A medication with codeine like Tylenol #3 is not recommended as it can suppress the urge to cough up the material from the lungs.

Prognosis (Outlook)

While pneumonia in healthy adults has a fairly good outcome, resolving within a few days or weeks, it can be a death sentence for the very young, the very old, and the already sick.

If a person requires an Intensive Care Unit (ICU) stay for their pneumonia they have a 30% mortality rate.

Prevention

There are vaccines against certain kinds of pneumonia along with other conditions that may precede pneumonia like influenza.

This along with rigorous hand hygiene and avoiding sick people are the best defenses against developing a pneumonia.

Head Bobbing in Children

Pneumonia can cause respiratory distress as air exchange within the lungs is not as effective. Head bobbing is a sign that a child is in serious respiratory distress. This is due to the Sternocleidomastoid and Scalene muscles helping to breathe