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## **Pneumonias**

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## What Is Pneumonia?

Pneumonia refers to a common infection of the lungs caused by one of the following types of germs: bacteria, fungi, or viruses. The infection can involve one lung, both lungs or just part of a lung. Depending on your overall health, pneumonia and its symptoms can be mild or severe. In more severe cases, you may need to be in the hospital or could even die from pneumonia. In the US, more than 41,000 people died from the disease in 2021. Worldwide, pneumonia is the leading cause of death for children under the age of five. More than 740,000 children under the age of five died of pneumonia in 2019.

The symptoms listed in this section are common to all types of pneumonia. Some symptoms, like cough with sputum (mucus, phlegm), only apply to certain types of pneumonia (e.g., bacterial pneumonias). Similarly, some treatments, such as antibiotics, are only appropriate for some types of pneumonia (e.g.,

bacterial pneumonias, *Pneumocystis pneumonia*) but not for others (e.g., viral pneumonias). For specific information about each type of pneumonia, please scroll down.

## Symptoms

- Shortness of breath
- Cough with sputum (materials such as mucus and phlegm that are coughed up from the lungs)
- Dry cough (no mucus or phlegm with coughing)
- Fatigue
- Fever
- Chills

## Diagnosis

- Physical exam of the lungs with a stethoscope
- Chest X-ray
- Sputum, or mucus samples to test which germ is in the lungs. Sometimes a person can cough up the sputum. If not, a procedure known as bronchoalveolar lavage (BAL) can be done. In this procedure, a small tube is put down the windpipe. The tube lets a health care provider see the inside of the lungs and collect a sample of sputum.
- Arterial blood gases (ABGs) are drawn to measure the oxygen content of your blood; the lower the amount of oxygen in the blood, the more serious the pneumonia

## Treatment

- Antibiotics or antifungals or antivirals, if available (depending on the type of germ)
- Oxygen (if oxygen levels are low)
- Rest
- Fluids (liquids)
- Other medicines to help make breathing easier
- When pneumonia is severe, a person may not be able to breathe on her/his own. When this happens, a machine called a respirator (or ventilator) is used for a time while the antibiotics fight the infection and improve breathing.

## Prevention

There are many simple things you can do to avoid getting infected with the germs that cause pneumonia. These include washing your hands regularly, cleaning surfaces that are touched often and by many different people (countertops, phones, doorknobs), and coughing or sneezing into a tissue, or your elbow or sleeve. You can also prevent pneumonia by stopping or reducing [smoking](#), limiting the time you spend in or around smoke, and by getting vaccinated when appropriate. There are several adult and childhood vaccines that can prevent infection with the bacteria or viruses that cause pneumonia:

- Influenza (flu) vaccine
- Pneumococcus vaccine
- Measles vaccine (usually in childhood)
- Pertussis (whooping cough) vaccine
- Varicella (chicken pox) vaccine (usually in childhood)
- *Haemophilus influenzae* type b (Hib) vaccine (childhood vaccine not recommended for adults)
- COVID-19 vaccine
- RSV vaccine if older than 60 years

## Pneumonia and HIV

People living with HIV and not taking HIV drugs are more likely to get all types of pneumonia because they have a weakened [immune system](#). Certain pneumonias lead to an [AIDS diagnosis](#), for example *Pneumocystis* (PCP) pneumonia, recurrent (happens more than once) pneumonia, and active [tuberculosis \(TB\)](#).

## Viral Pneumonias

About one third of all pneumonias in the US each year are caused by viruses. The novel coronavirus ([COVID-19](#)), which led to a global pandemic beginning in early 2020, is one example of such a virus. The most common virus in adults is the flu virus (influenza). The most common virus in children younger than one year is respiratory syncytial virus (RSV). Adults over age 60 also get RSV. In children living with HIV, pneumonia caused by the cytomegalovirus can also occur.

## Symptoms

- Usually starts slowly (days to weeks)
- Fever, usually lower than 102°F (38.8°C)
- Cough with a small amount of mucus
- Tiredness
- Muscle aches

## Treatment

- Most of the treatment for viral pneumonia is rest, drinking plenty of fluids (liquids), and treating the symptoms. You can use over-the-counter medicines to reduce fever, body aches, and cough.
- Some anti-viral drugs are available by prescription only; ask your health care provider to see if any of these are right for you. Important: pneumonias caused by viruses cannot be treated with antibiotics.

## Prevention

- The influenza (flu) vaccine is recommended each year for all people but especially people living with HIV, since they often get pneumonia as a complication of the flu. The flu vaccine may increase your viral load for a short time, but it will soon return to its original level. This does not mean your HIV drugs are not working or you are developing [resistance](#).
- Vaccination against COVID-19 is recommended for everyone, including people living with HIV.

## Bacterial Pneumonias

Bacteria that cause pneumonia are commonly found in the nose and throat. In people living with HIV who have weakened immune systems, the bacteria can multiply and work their way into the lungs, causing pneumonia. The most common bacteria that cause pneumonia in the US are *Streptococcus pneumoniae* (pneumococcus).

## Symptoms

- Usually starts quickly (within days)
- Fever
- Sweating
- Shaking/chills

- Cough that produces rust-colored or greenish mucus
- Faster breathing and heart rate
- Bluish colored lips or nails in advanced disease

## Treatment

- Bacterial pneumonias can almost always be treated with antibiotics

## Prevention

- There are two vaccines to prevent pneumococcal pneumonia: PPSV23 (Pneumovax) and PCV 13 (Prevnar 13). Both are recommended for all people living with HIV who are at least 19 years old to reduce the risk of developing pneumococcal pneumonia
- The Pneumovax vaccine is given once and repeated every five years
- The Prevnar 13 vaccine is only given once

## *Pneumocystis (jiroveci) Pneumonia (PCP)*

PCP is caused by a fungus called *Pneumocystis jiroveci*. A healthy [immune system](#) can control the fungus. However, in people living with HIV whose [CD4 cell](#) counts are below 200, *Pneumocystis* can be a problem.

PCP has been the most common [opportunistic infection](#) and the most common pneumonia in people living with HIV since the beginning of the AIDS epidemic. While PCP used to be deadly for many people living with HIV, it can now be prevented and treated. Drugs to prevent PCP are recommended for all people living with HIV whose CD4 cell counts are below 200. Taking drugs to prevent disease is called "prophylaxis".

## Symptoms

- Fever
- Shortness of breath or difficulty breathing, especially when the person is active
- Dry, non-productive cough (no mucus or phlegm)
- Weight loss

Anyone with these symptoms should see a health care provider immediately.

## Diagnosis

- Sputum, or mucus sample taken for special test for PCP
- Chest x-ray
- Because the chest x-ray may also appear normal in someone with PCP, diagnosis is usually based on a combination of factors: symptoms, physical exam, sputum sample, chest x-ray, amount of oxygen in the blood, and other blood tests.

## Treatment

- Antibiotics:
  - First-choice treatment is Bactrim or Septra for those not allergic to the sulfa that is in the drug
  - If you are allergic to sulfa, there are other antibiotics to treat PCP
- Prednisone (a steroid) can be used to reduce inflammation
- Usually treated for three weeks

- To avoid getting PCP again after the infection has been treated, a person stays on a lower dose of antibiotics until her or his CD4 count has been above 200 for at least three to six months. This is called "secondary prophylaxis."

## Prevention

- People with fewer than 200 CD4 cells/ml take oral Bactrim or Septra
- If you are allergic to sulfa, there are alternative drugs for prophylaxis (prevention)
- You may stop prophylaxis when your CD4 cell count rises above 200 for at least three to six months

## Tuberculosis (TB)

TB is often a lung infection, but it can affect almost any organ of the body. *Mycobacterium tuberculosis*, the bacterium that causes TB, can spread when a person with active TB disease coughs, sneezes or spits. Tiny droplets of fluid from the lungs are carried in the air and can be inhaled by someone nearby.

In healthy people, the immune system can usually prevent the bacteria from causing symptoms of TB (active disease). In people living with HIV, the bacteria may get out of control, resulting in active TB disease with symptoms. TB and HIV make each other worse. For more information on TB, please see our fact sheet on [Tuberculosis](#).

## Other (Rare) Causes of Pneumonia in People Living with HIV

- Cytomegalovirus
- Histoplasmosis
- Lymphocytic interstitial pneumonitis (LIP)
  - Seen generally in children under 13 years old
  - More common in women than men, often past age 40

You can find out more about these rare causes of pneumonia in our fact sheet on [Opportunistic Infections](#).

## Taking Care of Yourself

Pneumonias can be very serious for people living with HIV. However, there are many things you can do to avoid getting pneumonia, including getting vaccinated against pneumonia, flu, COVID-19, and RSV (if you are over 60). In addition, if your CD4 counts are low (below 200), you can take medicines to prevent getting pneumonia. It is important that you get regular medical care to make sure you are receiving the right treatments for you.

## Additional Resources

Select the links below for additional material related to pneumonias.

- [Pneumonia \(World Health Organization\)](#)
- [Pneumonia: An Infection of the Lungs \(US Centers for Disease Control and Preven...](#)
- [Bacterial Pneumonia \(POZ\)](#)
- [Pneumonia \(American Lung Association\)](#)
- [Pneumonia \(Mayo Clinic\)](#)
- [COVID-19 and People Living with HIV: Frequently Asked Questions \(Multiple organ...](#)
- [COVID-19 and Coronavirus in People Living With HIV \(aidsmap\)](#)

- [Pneumocystis Pneumonia \(PCP\) \(POZ\)](#)
- [Rates of Pneumonia and Pneumococcal Disease Remain High Among People with HIV \(...\)](#)
- [Pneumocystis Pneumonia \(US Centers for Disease Control and Prevention\)](#)
- [Pneumonia \(Cleveland Clinic\)](#)
- [Pneumocystis Pneumonia \(PCP\) \(CATIE\)](#)



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