

Pneumonias ^[1]

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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, pneumonia can require hospitalization and even lead to death. In the US, 1.1 million people were hospitalized with pneumonia in 2010, and almost 50,000 died from the disease. Worldwide, pneumonia is the leading cause of death for children under the age of five. Almost one fifth of all deaths of children under the age of five are due to pneumonia each year.

The symptoms, diagnoses, and treatments listed in this section are broad symptoms common to all types of pneumonia. Some symptoms, like cough with sputum, are characteristic of only certain types of pneumonia (e.g., bacterial pneumonias). Similarly, some treatments, like antibiotics, are indicated for only some types of pneumonia (e.g., bacterial pneumonias, *Pneumocystis* pneumonia) and not for others (e.g., viral pneumonias). For information specific to 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 samples for stain and culture, which show what germ is present 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, sputum is obtained by placing a small tube down the windpipe that enables the provider to see the inside of the lungs and collect a sample of sputum.
- Arterial blood gases (ABGs) are drawn to measure oxygen content; the lower the amount of oxygen in the bloodstream, the more serious the pneumonia

Treatment

- Antibiotics (if caused by bacteria)
- Oxygen (if oxygen levels are low)

- Rest
- Fluids
- 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 temporarily 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 [2], limiting the time you spend in or around smoke, and by getting vaccinated when appropriate. There are several vaccines that can prevent infection with the bacteria or viruses that cause pneumonia:

- Influenza (flu) vaccine
- Pneumococcus vaccine
- Measles
- Pertussis (whooping cough)
- Varicella (chicken pox)
- *Haemophilus influenzae* type b (Hib)

Pneumonia and HIV

People living with HIV (HIV+) are more vulnerable to pneumonias of all kinds because they have a weakened immune system [3]. Certain pneumonias lead to an AIDS diagnosis [4], such as *Pneumocystis* (PCP), recurrent pneumonia (more than once in a year's time), and active tuberculosis (TB) [5].

Pneumocystis (jiroveci) Pneumonia (PCP)

PCP is caused by a fungus called *Pneumocystis jiroveci*. A healthy immune system [3] can control the fungus. However, in HIV+ people with CD4 cell [6] counts below 200, *Pneumocystis* can be a problem.

PCP has been the most common opportunistic infection [7] and the most common pneumonia in HIV+ people since the beginning of the AIDS epidemic. While PCP used to be fatal for many HIV+ people, it is now preventable and treatable. Drugs to prevent PCP are recommended for all HIV+ people with CD4 cell counts below 200. Taking drugs to prevent disease is called *prophylaxis*.

Symptoms

- Fever
- Shortness of breath or difficulty breathing, especially with activity
- Dry, non-productive cough
- Weight loss

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

Diagnosis

- Sputum sample taken for special stain for PCP
- Chest x-ray may have a characteristic appearance
- Because the chest x-ray may also appear normal in someone with PCP, diagnosis is usually based on a combination of factors, including 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, but many are allergic to the sulfa contained in the drug (desensitization may be used to overcome allergic reactions)
- 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 is above 200 for at least three to six months. This is called "secondary prophylaxis."

Prevention

- People with fewer than 200 CD4 cells take oral Bactrim or Septra
- If allergic to sulfa, there are alternative drugs for prophylaxis
- May discontinue prophylaxis when CD4 cell count rises above 200 for at least three to six months

Bacterial Pneumonias

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

Symptoms

- Onset usually quick (within days)
- Fever
- Sweating
- Shaking/chills
- Cough that produces rust colored or greenish mucus
- Increased breathing and pulse rate
- Bluish colored lips or nails

Treatment

- Bacterial pneumonias are almost always treatable with antibiotics

Prevention

- The Pneumovax 23 vaccine (made by Merck) is recommended for all HIV+ people 19 years of age or older to reduce the risk of developing pneumococcal pneumonia. The vaccine may be repeated in five to seven years.
- In 2012, the CDC recommended that all HIV+ people 19 years of age or older also receive the Prevnar13 vaccine (made by Pfizer)

Viral Pneumonias

About one third of all the pneumonias in the US each year are caused by respiratory viruses. The most common viral cause of pneumonia for adults is the flu virus (influenza). The most common viral cause of pneumonia in children younger than one year of age is respiratory syncytial virus (RSV). In HIV+ children, cytomegalovirus-associated pneumonias are also common.

Symptoms

- Onset usually gradual; days to weeks
- Fever, usually less than 102°F (38.8°C)
- Cough with a small amount of mucus
- Tiredness
- Muscle aches

Treatment

- Most of the treatment for viral pneumonia involves rest, drinking plenty of fluid, 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; see your health care provider to see if any of these are right for you.

Prevention

- The influenza (flu) vaccine is recommended each year for HIV+ people since pneumonia often occurs as a complication of the flu

Tuberculosis (TB)

TB often occurs as a lung infection, but 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 HIV+ people, the bacteria may get out of control, resulting in active disease with symptoms. TB and HIV make each other worse. Worldwide, TB is the leading cause of death in HIV+ people. For more information on TB, please see our article on [Tuberculosis](#) [5].

Other (Rare) Cases of Pneumonia in HIV+ People

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

Conclusion

Pneumonias can be very serious for HIV+ people. However, ongoing medical care allows for the effective prevention or early diagnosis and treatment of pneumonias

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- [inflammation of the lungs](#) [9]
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- [arterial blood gases](#) [21]
- [oxygen](#) [22]

Additional Resources

Select the links below for additional material related to pneumonias.

[HIV/AIDS: Pneumocystis jiroveci pneumonia \(PCP\) \(womenshealth.org\)](#) [23]

[Pneumonia Can Be Prevented ? Vaccines Can Help \(CDC\)](#) [24]

[Pneumocystis Pneumonia \(CDC\)](#) [25]

[PCP \(AIDSmeds.com\)](#) [26]

[Pneumonia \(American Lung Association\)](#) [27]

[PCP \(AIDS InfoNet\)](#) [28]

[Pneumonia \(WHO\)](#) ^[29]

[Breathhtaking Mortality: Bacterial Pneumonias and HIV \(AIDSmap\)](#) ^[30]

[PCP Prevention \(Project Inform\)](#) ^[31]

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- [23] <https://www.womenshealth.gov/hiv-aids/opportunistic-infections-and-other-conditions/pneumocystis-jiroveci-pneumonia-and-hiv-aids.html>
- [24] <http://www.cdc.gov/features/pneumonia/>
- [25] <http://www.cdc.gov/fungal/diseases/pneumocystis-pneumonia/index.html>
- [26] <http://www.aidsmeds.com/OIs/PCP1.htm>
- [27] <http://www.lungusa.org/lung-disease/pneumonia/>

[28] http://www.aidsinfonet.org/fact_sheets/view/515

[29] <http://www.who.int/mediacentre/factsheets/fs331/en/>

[30] <http://www.aidsmap.com/Breathtaking-mortality-bacterial-pneumonia-and-HIV/page/1839297/>

[31] <http://www.projectinform.org/pdf/pcppx.pdf>