

# *Pneumocystis* pneumonia (PCP)

## Summary

*Pneumocystis* pneumonia (PCP) is a type of pneumonia that can be life-threatening in people with weakened immune systems. People living with HIV whose CD4 counts are below 200 are at risk of developing PCP. The symptoms can include fever, shortness of breath, tightness or pain in the chest, fatigue, night sweats and a dry cough. Fortunately, there are medications that can effectively prevent and treat the illness.

Today, PCP is relatively rare; however, it remains common among people who do not know they have HIV, people who are not receiving ongoing HIV care, and people with severely weakened immune systems.

## What is PCP?

PCP is a type of pneumonia caused by a fungus called *Pneumocystis jiroveci*. This fungus does not make people with healthy immune systems sick but can cause a lung infection in a person who has a weakened immune system.

PCP is one of a number of infections that can develop in people who are living with HIV, called opportunistic infections. These occur only if your immune system is quite weakened and your body becomes vulnerable to infections that would not otherwise affect you. PCP is the most common opportunistic infection among people living with HIV.

Pneumonia is an infection and inflammation of the lungs. As the infection progresses, the air spaces in the lungs fill with fluid, making it more and more difficult to breathe.

## Who is at risk for PCP?

People who have a weakened immune system, due to HIV, cancer, long-term use of corticosteroid drugs or an organ or bone marrow transplant, are at risk of developing PCP.

# FACT SHEET

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People with HIV most at risk of developing PCP are those who:

- have a CD4 count below 200
- have a CD4 cell percentage below 14%
- have had a previous episode of PCP
- have a CD4 count below 300 with signs of a weakened immune system (such as recurrent oral thrush or bacterial pneumonia)

## Symptoms

The symptoms of PCP can include:

- shortness of breath
- fever
- tightness or pains in the chest
- dry cough
- fatigue
- feeling of weakness or malaise
- chills/sweats
- diarrhea
- weight loss

In people living with HIV, these symptoms may develop very gradually. At first, the symptoms may be so mild that they go unnoticed for several weeks.

Because PCP can be so dangerous if not treated early, *if you experience symptoms of PCP, such as a persistent dry cough or shortness of breath, it is important that you report them to a doctor as soon as possible.*

## Diagnosis

The symptoms of PCP are common to many infections, including the flu and common cold, so lab tests must be done to confirm the diagnosis. Your doctor may order one or more of the following tests:

- Induced sputum test—Breathing in a mist of salt water causes phlegm from the lungs (or

sputum) to be coughed up. The sputum sample is then tested in the lab to look for the fungus that may be causing an infection.

- Bronchoscopy with lavage—The bronchoscope is a very thin, flexible tube that is inserted through the nose, down the windpipe and into the lungs. It allows the doctor to look at the inside of the lungs. A salt-water solution is flushed down the tube (a process called *lavage*). This allows the doctor to collect a sample of cells and fluid from the lungs. When the solution is sucked back up the tube, the samples are sent to the lab for testing. A local anesthetic and muscle relaxing drugs may be given before a bronchoscopy is performed.

If PCP is diagnosed, other tests may be performed to find out how serious the pneumonia is.

These include:

- Pulmonary function tests—These tests give a doctor an idea of how well the lungs are working. They measure the capacity of the lungs to expand and hold air, the rate at which air flows in and out of the lungs, and the amount of oxygen that can pass from the lungs into the blood.
- Blood test (blood gases)—To find out how much oxygen is getting from the lungs into the blood, and how much carbon dioxide is getting from the blood to the lungs, a sample of blood may be taken from an artery so that arterial blood gases can be measured.

The results of these tests can help your doctor classify the PCP as mild, moderate or severe; choose the most suitable treatment; and determine whether medication can be taken at home or in hospital.

## Treatment

If you are diagnosed with an acute case of PCP and are not already taking anti-HIV drugs, it is recommended that you start, regardless of your CD4 count. This should strengthen your immune system and help you fight off the infection. Your doctor may suggest you start taking anti-HIV drugs after your PCP treatment is complete or two weeks after starting PCP treatment.

The most effective medication for treating PCP is a powerful combination of antibiotics called TMP/SMX (commonly sold under the brand names Septra or Bactrim). It contains two antibiotics: trimethoprim (TMP) and sulfamethoxazole (SMX). For most people with mild to moderate cases of PCP, taking this treatment orally, on an outpatient basis (at home), is very effective. People with severe PCP and other conditions that make it difficult to swallow medications may need to take the antibiotics intravenously (by IV) in the hospital. (TMP/SMX also protects against another opportunistic infection called toxoplasmosis.)

For people with moderate to severe cases of PCP, corticosteroid drugs are often prescribed in addition to TMP/SMX. Although long-term use of corticosteroids can weaken the immune system, short-term use can help to reduce inflammation and damage to the lungs.

Corticosteroids should be started as soon as possible—within 72 hours of starting TMP/SMX.

You may also be given oxygen to inhale through a mask, as part of your treatment.

Treatment for PCP usually lasts 21 days. The way you respond to the treatment depends on the drugs used, whether or not you have had previous episodes of PCP, the severity of the illness, the state of your immune system and when the treatment started.

Your doctor should monitor your treatment carefully. Common side effects from TMP/SMX include a rash, fever, nausea, vomiting, loss of appetite, low white blood cell count and low platelet count. Your doctor may recommend additional medications to manage these side effects.

Many HIV-positive people are allergic or hypersensitive to this medication. In these cases, alternative medications can be prescribed. There is evidence to suggest that in some cases where people are hypersensitive to TMP/SMX, starting with a small amount of TMP/SMX and increasing the amount until a full dose can be tolerated can help a person overcome adverse reactions, or help “desensitize” a person who is hypersensitive to the medication.

When taken by pregnant women, TMP/SMX may increase the risk of birth defects. Folic acid supplements may reduce this risk.

Because a woman with PCP also faces a higher risk of preterm labour and delivery, pregnant women who have PCP after 20 weeks of pregnancy should be monitored for early contractions.

If, after four to eight days of PCP treatment, the pneumonia has shown no sign of improvement or has worsened, your doctor may recommend another treatment. Other PCP treatments, such as dapsone and TMP, primaquine and clindamycin, or atovaquone, offer alternatives to people who cannot tolerate TMP/SMX.

Once the pneumonia has cleared up, your doctor may recommend that you take medication to prevent the infection from coming back. This preventive medication should be taken until your CD4 count stays above 200 for at least three consecutive months. Talk to your doctor before you start or stop taking any prescribed medications.

## Prevention

The best way to prevent PCP is to keep your immune system strong and your CD4 count well above 200. Taking anti-HIV drugs can help keep your CD4 count above 200.

If you smoke, another way you can help reduce the risk of getting PCP is to quit smoking.

Research has shown that smokers living with HIV are far more likely to develop PCP than non-smokers living with HIV.

Preventive medication should be taken by HIV-positive adults and adolescents, including pregnant women and people on anti-HIV drugs, whose CD4 count is below 200 or have a history of thrush. The medication used to treat PCP can also be taken to prevent it. The most effective preventive medication is TMP/SMX.

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## Disclaimer

Decisions about particular medical treatments should always be made in consultation with a qualified medical practitioner knowledgeable about HIV- and hepatitis C-related illness and the treatments in question.

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