

PCP PREVENTION



ways to prevent the common infection called pcp

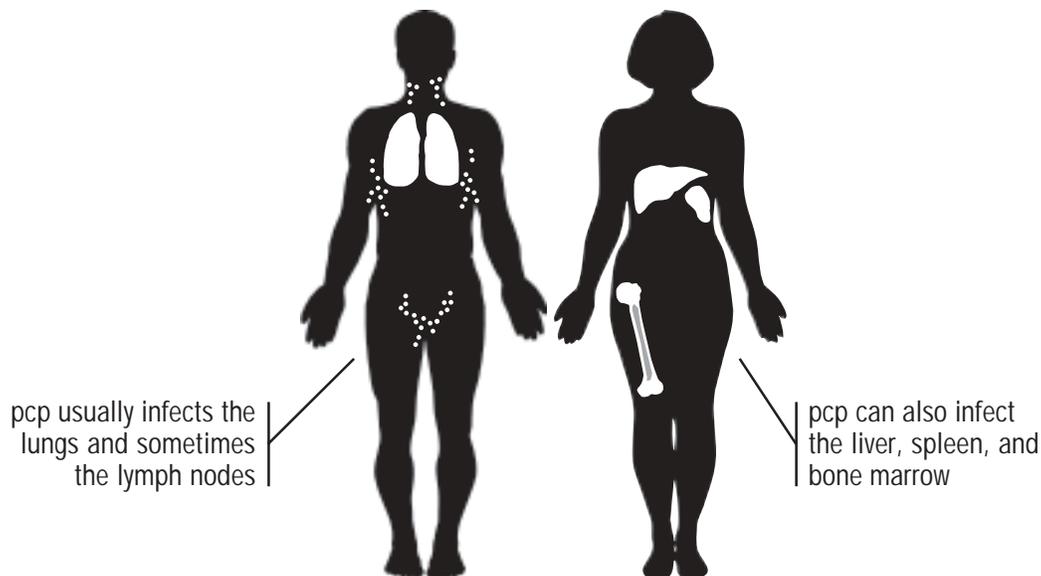
PCP is the abbreviation for *Pneumocystis carinii* pneumonia. Once thought to be caused by the protozoan called *Pneumocystis carinii*, it was recently discovered that a fungus called *Pneumocystis jiroveci* is responsible for causing the disease. However, most doctors and people living with HIV still refer to the disease as PCP.

A PUBLICATION FROM

PROJECT
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Information,
Inspiration and
Advocacy for People
Living With HIV/AIDS

MARCH 2004



Infection with *Pneumocystis jiroveci* leads to inflammation and fluid buildup in the lungs. Fluid buildup in the lungs is pneumonia. Pneumonia is the most common complication of *Pneumocystis jiroveci* infection, but other parts of the body can be affected, including the lymph nodes, spleen, liver and bone marrow. If left untreated, PCP will eventually result in respiratory failure and is almost always fatal.

PCP is an AIDS-defining illness. While extremely effective strategies for preventing and treating PCP are

available, it still remains one of the major causes of illness and death among people living with HIV/AIDS. This is largely because people start PCP prevention and/or treatment plans too late. Starting PCP prevention when the risk of PCP increases is key toward preventing this serious life-threatening condition.

This publication discusses the prevention of PCP. For more information on diagnosing and treating PCP, read Project Inform's publication, *PCP Treatment*, available at 1-800-822-7422 or www.projectinform.org.

how can you prevent PCP?



Anti-HIV therapy can greatly reduce the risk factors for developing PCP. When used as recommended it can significantly elevate CD4+ cell counts and reduce the risks for other illnesses. It should be considered the cornerstone of a PCP prevention strategy. When anti-HIV therapies are unable to keep CD4+ cell counts above 200 and percentages above 20, or when they cannot be used, other medications should be considered for preventing PCP. These include the four drugs explained below.

tmp/smx

TMP/SMX (trimethoprim + sulfamethoxazole; Bactrim or Septra) is generally regarded as both the treatment and preventive therapy (prophylaxis) of choice. It is effective in preventing PCP and other types of pneumonia, bacterial infection and toxoplasmosis (a protozoal infection often affecting the central nervous system/brain).

TMP/SMX is a combination of two antibiotics: trimethoprim (TMP) and sulfamethoxazole (SMX). SMX is a sulfa drug, and many people develop an allergic reaction to it. TMP/SMX can cause a number of side effects including rash, fever, nausea, vomiting, liver problems, sensitivity to sun light (*photosensitivity*) and loss of infection-fighting cells called neutrophils (*neutropenia*).

In rare instances, rashes and other side effects may be early warning signs of the potentially fatal Stevens Johnson Syndrome—the development of severe blistering and casting off of skin and mucous membranes. Although this is very rare, people should alert their doctors at the first sign of rashes or other possible side effects.

Because TMP/SMX is so successful at preventing PCP, many doctors feel that it's worth it for people who have had milder allergic reactions to TMP/SMX or other sulfa drugs to try *desensitization*. This involves starting TMP/SMX at very small doses and gradually increasing the dose until a therapeutic level

1 is reached. Up to 70% of people who try desensitization can use TMP/SMX without other major problems. Because of the risk of a more severe reaction in this process, people should undergo desensitization with an experienced doctor.

TMP/SMX is usually given as a double-strength tablet of TMP 800mg/SMX 100mg. It may be prescribed either once daily or three times per week. Some doctors occasionally prescribe one single-strength tablet (TMP 400mg/SMX 50mg) once a day. This strategy may be less likely to prevent bacterial pneumonia and toxoplasmosis than taking a double-strength tablet once a day.

dapsone

2 Dapsone (with or without pyrimethamine) is another antibiotic that can be taken in pill form. It has been shown to be nearly as effective as TMP/SMX, although it must be combined with pyrimethamine to also be effective against toxoplasmosis. Its side effects include rash, nausea and in some cases hepatitis. Although dapsone may be a reasonable alternative for people who are allergic to TMP/SMX, up to 50% may also be allergic to dapsone. It is typically prescribed as a 50mg pill twice a day or a 100mg pill once a day.

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atovaquone

Atovaquone (Mepron) has been shown to be as effective as dapsone in preventing PCP. It has fewer and different side effects than dapsone (primarily gastrointestinal), but it's a lot more expensive. Atovaquone is also likely active against toxoplasmosis, but not against bacterial pneumonia. It's prescribed as an oral suspension of 1,500mg one per day, taken with a meal. Because of cost, it's usually only considered for people who cannot tolerate TMP/SMX and/or dapsone, or those who are suspected to not tolerate these alternatives well.

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aerosolized pentamidine

Aerosolized pentamidine (Nebupent) treatment is the least often used and involves breathing a fine mist of the drug into the lungs through a machine called a nebulizer. Although it has not proven to be as effective as TMP/SMX, it's a reasonable alternative for people who cannot tolerate either TMP/SMX or dapsone.

The main advantage of aerosolized pentamidine is that it has relatively few side effects. The primary side effect, a metallic taste in the mouth, typically disappears rather quickly. It can also cause coughing fits, especially among smokers.

Because aerosolized pentamidine is concentrated in the lungs, it's not effective in preventing (or treating) PCP in other parts of the body. It is also not as effective as TMP/SMX in preventing other bacterial pneumonias or toxoplasmosis. This coupled with its inferiority in preventing PCP are the main disadvantages of this therapy.

Most people taking this therapy go into a clinic once a month for treatment. Researchers have found that the type of nebulizer used can make a big difference in terms of effectiveness. A Respirgard II™ nebulizer should be used for taking aerosolized pentamidine therapy.

What are the symptoms of PCP?

During the first phases of PCP, a person may not realize that the infection is present and worsening. Although PCP is reproducing in the lungs, there may be no symptoms. As an untreated infection advances, respiratory problems develop. A cough is usually present (non-productive, or producing only a white, frothy sputum), as are shortness of breath (especially with exertion) and wheezing.

Smokers may have a productive cough. Some report a "catching" sensation in the chest when inhaling deeply. People frequently have recurrent fevers, weight loss and malaise. Symptoms often worsen gradually over a period of weeks or months, although some may experience a more rapid course of disease. Anyone experiencing these symptoms should report them to their doctor as soon as possible.

Who is at risk of getting PCP?

The greatest risk for developing PCP occurs when the CD4+ cell count is below 200 or the CD4+ cell percentage falls below 14. Most cases, especially those where PCP "breaks through" preventive therapy, occur when the CD4+ cell count is below 100.

However, people experiencing fungal infections (such as thrush/yeast infections), recurrent fevers and people who have had their spleen removed are at increased risk of PCP regardless of their CD4+ cell count (such as above 200). Also, all women can experience drops in CD4+ cell counts during the third trimester (months 7–9) of pregnancy. So, HIV-positive pregnant women may sometimes need medication to prevent PCP during this period.

Studies show that people living with HIV who smoke develop PCP more quickly than non-smokers after their CD4+ cell counts drop below 200. Quitting smoking and remaining smoke-free for at least one year reduces this risk.

Other factors that can increase the risk of developing PCP after CD4+ counts drop include a history of lung problems or other types of pneumonia. People who have had PCP and been successfully treated are at high risk of getting PCP again. For this reason, it's recommended that people remain on PCP prevention for life or until they have sustained CD4+ cell count increases as a result of anti-HIV therapy.





Special considerations for pregnant women

In general, women who are pregnant or thinking of becoming pregnant should follow the standard preventive treatment guidelines for PCP. Theoretically, however, there are some concerns that most of the available therapies may harm the developing child during its first three months. Pregnant women who are reluctant to use oral PCP preventive treatment may feel more comfortable using aerosolized pentamidine as it's primarily absorbed in the lungs only and less likely to expose the developing child to the drug.

Special considerations for children

PCP prevention with TMP/SMX beginning at age 4–6 weeks is recommended for all children born to HIV-positive women. TMP/SMX



should be stopped in children determined not to be infected with HIV. Children who are confirmed to be HIV-infected or whose status is uncertain should continue

TMP/SMX for the first year of life. The need for treatment after age one should be determined on the basis of age-specific CD4+ cell counts.

What about stopping preventive or maintenance therapy?

Standard guidelines for people who have been successfully treated for a bout of PCP recommend using continued PCP maintenance therapy for life. (NOTE: Maintenance therapy doses are the same as PCP preventive therapy.) The exception to this rule involves people who start anti-HIV therapy during or after PCP treatment and who experience sustained increases in their CD4+ cell counts.

The *U.S. Public Health Service Guidelines for the Prevention of Opportunistic Infection* recommends that people continue PCP prevention until CD4+ counts have increased above 200 for at least three months. However, some studies of immune reconstitution following anti-HIV therapy show that sustained CD4+ cell count increases lasting at least six months may provide a better and safer indication of true immune reconstitution. For this reason, some doctors recommend waiting until CD4+ cell counts have gone above 200 for six months before stopping PCP prevention or maintenance therapy. PCP prevention should be started again whenever CD4+ cell counts drop below 200, CD4+ percentages drop below 14, or there's evidence of persistent fungal infections and/or fever.



the bottom line on pcp prevention

- › PCP is preventable.
- › The best PCP prevention is keeping CD4+ cell counts above 200. Anti-HIV therapy is the first line of defense against PCP.
- › Anyone with recurrent fever, shortness of breath and/or a cough should immediately report their symptoms to a doctor and discuss PCP.
- › PCP prevention is indicated when CD4+ cell counts are 200 or less, or CD4+ percentages are 14% or less.
- › PCP prevention is also indicated—regardless of CD4+ cell count/percent—if a person has fungal infections (like thrush/yeast), recurrent fevers or if a person has had the spleen removed.
- › TMP/SMX is the preventive therapy of choice though other treatments are available, including dapsone, atovaquone and aerosolized pentamidine. Its major side effects are rash and sulfa drug reactions.
- › Dapsone is often considered a second choice for PCP prevention. It may not be as effective as TMP/SMX. About 50% of people who cannot tolerate TMP/SMX because of sulfa drug sensitivity also have difficulty with dapsone.
- › Atovaquone has different side effects than TMP/SMX and dapsone. Thus, it's an option for those who don't tolerate these alternatives. One of its main drawbacks is its high cost.
- › Aerosolized pentamidine is the least effective PCP prevention, but it's a reasonable option for those who cannot tolerate other easier-to-take preventive medicines. Also, there may be unique advantages of aerosolized pentamidine as PCP prevention for pregnant women.
- › Working through tolerability with TMP/SMX is important, if possible. It is the most effective treatment should someone “break through” and develop PCP despite preventive therapy.
- › HIV-positive pregnant women and children may have special prevention concerns.
- › People who have sustained (3 or more months) HIV suppression and increases in CD4+ cell counts following anti-HIV therapy may be able to stop PCP prevention.
- › People who respond well to anti-HIV therapy after successfully treating PCP may be able to eventually stop taking maintenance therapy.