



Opportunistic Infections (OIs)

WHAT ARE OPPORTUNISTIC INFECTIONS?

In our bodies, we carry many germs—bacteria, protozoa, fungi, and viruses. When our immune system is working, it controls these germs. But when the immune system is weakened by [HIV infection](#) or by some medications, these germs can get out of control and cause health problems.

Infections that take advantage of weakness in immune defenses are called opportunistic. The phrase opportunistic infection is often shortened to OI.

The rates of OIs have fallen dramatically since the introduction of [antiretroviral therapy \(ART\)](#). However, OIs are still a problem, especially for people who have not been [tested](#) for HIV. Many people still show up in hospitals with a serious OI, often [pneumocystis pneumonia \(PCP\)](#). This is how they learn they have HIV.

TESTING FOR OIs

You can be infected with an OI and test positive for it even though you don't have the disease. For example, almost everyone with HIV tests positive for [cytomegalovirus \(CMV\)](#). But it is very rare for CMV disease to develop unless [CD4 cell counts](#) drop below 50 cells/mm³, a sign of serious damage to the immune system.

To see if you're infected with an OI, your blood might be tested for antigens (pieces of the germ that cause the OI) or for antibodies (proteins made by the immune system to fight the germs). If the antigens are found, it means you're infected. If the antibodies are found, you've been exposed to the infection. You may have been immunized against the infection, your immune system may have cleared the infection, or you may be infected. If you are infected with a germ that causes an OI, and if your CD4 cells are low enough to allow that OI to develop, your healthcare provider will look for signs of active disease. These are different for each of the OIs.

OIs AND AIDS

People who do not have HIV can develop OIs if their immune systems are damaged. For example, many drugs used to treat [cancer](#) suppress the immune system. Some people who get cancer treatments develop OIs.

HIV weakens the immune system so that OIs can develop. If you have HIV and develop OIs, you might have [AIDS](#). In the U.S. the Centers for Disease Control and Prevention (CDC) is responsible for deciding who has AIDS. The CDC has developed a list of about 24 OIs. If you have HIV and one or more of these official OIs, then you have AIDS. Read more about the criteria for [AIDS diagnosis](#).

WHAT ARE THE MOST COMMON OIs?

In the early years of the AIDS epidemic, OIs caused a lot of sickness and death. Once people started taking strong ART, however, fewer people got OIs. It's not clear how many people with HIV will get a specific OI.

In people assigned female at birth, health problems in the vaginal area may be an early sign of HIV. These can include pelvic inflammatory disease (PID) and bacterial vaginosis (BV), among others. Read more about HIV and people assigned female at birth.

The most common OIs are listed here, along with the CD4 cell count when the disease becomes active:

- [Candidiasis \(Thrush\)](#) is a fungal infection of the mouth, throat, and/or vagina. It can occur at any CD4 cell count, even with fairly high CD4 cells.
- [Cytomegalovirus \(CMV\)](#) is a viral infection that causes eye disease that can lead to blindness. It usually occurs at CD4 cell counts under 50 cells/mm³.
- [Herpes simplex virus \(HSV\)](#) is a viral infection that causes oral herpes (cold sores) or genital herpes. These are fairly common infections but if you have HIV, the outbreaks can be much more frequent and more severe. It can occur at any CD4 cell count.
- [Malaria](#) is a parasitic infection common in the developing world. It is more common and more severe in people with HIV.
- [Mycobacterium avium complex \(MAC\)](#) is a bacterial infection that causes recurring fevers, general sick feelings, problems with digestion, and serious weight loss. It usually occurs at CD4 cell counts under 50 cells/mm³.
- [Pneumocystis pneumonia \(PCP\)](#) is a fungal infection that causes pneumonia. It usually occurs at CD4 cell counts under 200 cells/mm³. Unfortunately, PCP is still a fairly common OI in people who have not been tested or

treated for HIV.

- [Toxoplasmosis \(Toxo\)](#) is a protozoal infection of the brain. It usually occurs at CD4 cell counts under 100 cells/mm³.
- [Tuberculosis \(TB\)](#) is a bacterial infection that affects the lungs and can cause meningitis. Everyone with HIV who tests positive for exposure to TB should be treated.

PREVENTING AND TREATING OIs

Most of the germs that cause OIs are quite common and you may already be carrying several of these infections. You can reduce the risk of new infections by keeping clean and avoiding known sources of the germs that cause OIs.

Even if you're infected with some OIs you can take medications that will prevent the development of active disease. This is called prophylaxis. The best way to prevent OIs is by taking strong [antiretroviral medications \(ARVs\)](#).

The [Fact Sheets for each OI](#) have more information on avoiding infection or preventing the development of active disease.

For each OI, there are [specific drugs](#), or combinations of drugs, that seem to work best. Refer to the fact sheets for each OI to learn more about how they are treated. Strong ART can allow a damaged immune system to recover and do a better job of fighting OIs. Read more about [immune restoration](#).

MORE INFORMATION

HIV.gov: [Guidelines for the Prevention and Treatment of Opportunistic Infections in Adults and Adolescents with HIV](#)

HIV.gov: [Opportunistic Infections](#)

NIH: [AIDS and Opportunistic Infections](#)

Avert: [HIV, OTHER HEALTH CONDITIONS AND OPPORTUNISTIC INFECTIONS](#)

healthline: [Opportunistic Infections in HIV](#)

Reviewed July 2025