

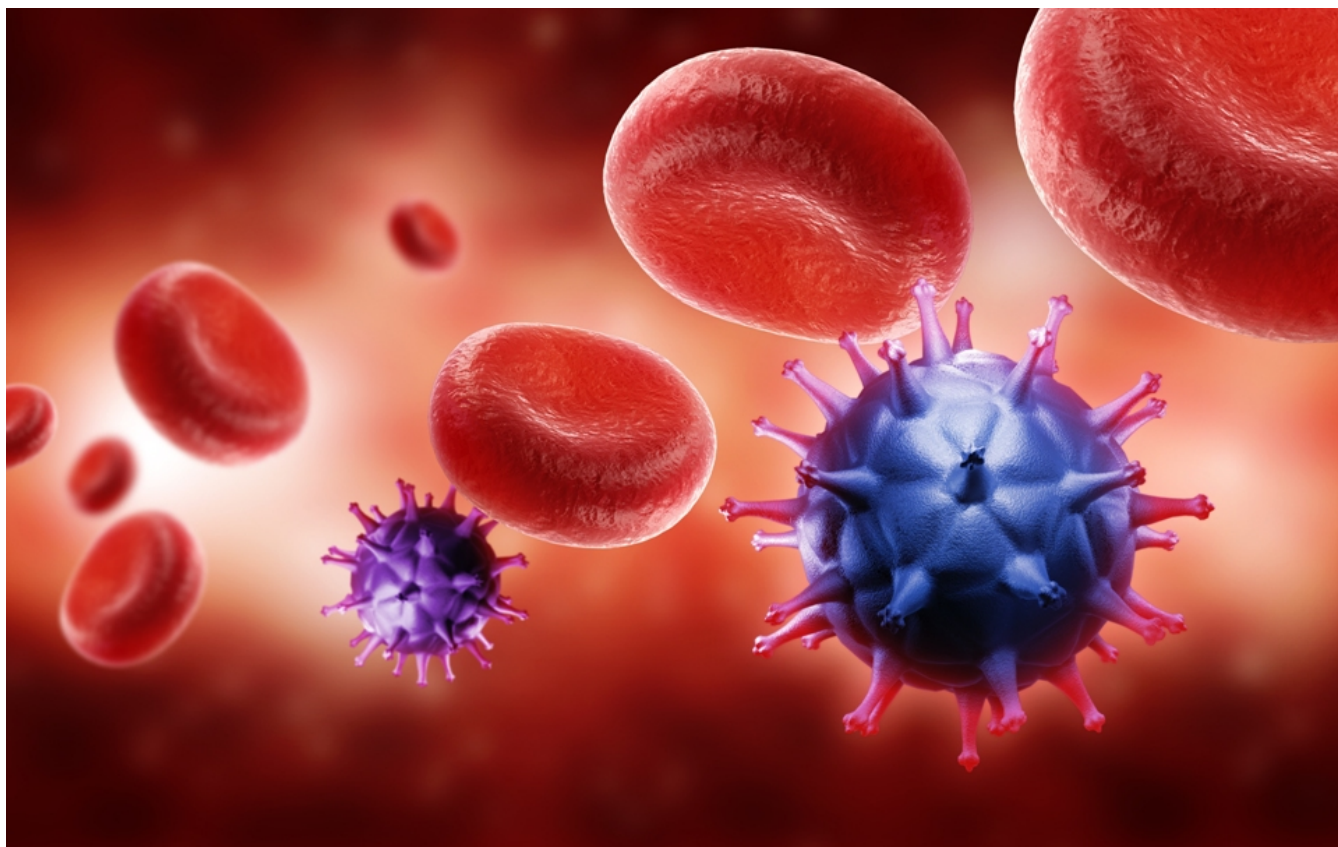


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## What Are Opportunistic Infections?

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## Basic Facts

HIV can eventually cause AIDS by attacking a type of white blood cell called a [CD4 cell](#). CD4 cells are the same cells in the [immune system](#) that are supposed to protect the body from disease. When your immune system loses too many CD4 cells, you are less able to fight off infections and can develop serious illnesses, [cancers](#), and neurological (nerve system) problems. These problems are called opportunistic infections (OIs) because they take advantage of the body's weakened defenses.

People with AIDS can rebuild their immune system with the help of HIV drugs, just like people living with HIV who do not have an AIDS diagnosis.

Many viruses can be controlled by the immune system. But HIV takes over CD4 cells and turns them

into virus factories that produce thousands of copies of HIV. As the virus multiplies, it damages or kills CD4 cells, which in turn damages the immune system and weakens the body's defenses. OIs take advantage of your body's lower defenses to infect you. They can lead to hospitalization and disability and are responsible for most of the deaths in people with AIDS (acquired immune deficiency syndrome).

The US Centers for Disease Control and Prevention (CDC) defines a person living with HIV and with a CD4 cell count of 200 or less as having AIDS. People are also diagnosed with AIDS if they have, or have had, an AIDS-defining condition. More than 20 opportunistic infections are considered [AIDS-defining conditions](#).

People with AIDS can rebuild their immune system with the help of HIV drugs, just like people living with HIV who do not have an AIDS diagnosis. You will still have a diagnosis of AIDS, even if your CD4 cell count goes back above 200, an OI is successfully treated, and your immune system is strong. However, this is just because of the way the public health system counts the number of people who have had advanced HIV disease. Having an AIDS diagnosis, once your cell count is back in the normal range, does not mean that you are sick or will get sick in the future. It is very much like having had a diagnosis of cancer that has been successfully treated or gone into remission.

## Preventing and Treating OIs

If your CD4 cell count falls below 200, taking appropriate medications can prevent many OIs from developing.

The best way to prevent OIs is to keep your immune system as strong as possible by taking HIV drugs as soon as you know that you are living with HIV. This allows the immune system to do its job of controlling infections.

If your CD4 cell count falls below 200, taking appropriate medications can prevent many OIs from developing. Taking medication to prevent disease is called "prophylaxis." For example, the CDC recommends that people living with HIV whose CD4 counts are below 200 take a daily antibiotic (trimethoprim-sulfamethoxazole, also known as Bactrim or Septra) or similar medication to avoid getting *Pneumocystis pneumonia* (also called *Pneumocystis jirovecii*, PJP).

Effective treatment options are available for most OIs. The earlier you tell your healthcare provider about any symptoms, the sooner you can get diagnosed and treated, and the better your chances that the treatment will work and that you will recover fully. You may be able to stop prophylaxis or maintenance treatments if your CD4 cell count goes up and stays up. However, you should not stop any treatment without talking first to your healthcare provider.

## Most Common OIs in People Living with HIV

Since combination antiretroviral treatment for HIV became available, the number of people living with HIV who have had opportunistic infections has dropped drastically. If you start HIV treatment early and continue to take your HIV drugs as they are prescribed, you will keep your immune system strong and likely never get one of these OIs. This means you will also likely never be diagnosed with AIDS.

Some of the most common opportunistic infections in people living with HIV include:

Opportunistic Infection Cause Location Symptoms When does it usually occur? Additional Information  
Candidiasis Fungus: overgrowth of yeast, most commonly *Candida albicans* Mouth (oral thrush), throat, esophagus (food tube), vagina (birth canal) Whitish coating on tongue; painful swallowing or sense of food sticking in throat; itching, burning in genital area More likely to develop deeper in the body (e.g., esophagus) when CD4 < 200 See our fact sheet on [Fungal Infections](#)  
Cytomegalovirus (CMV) Virus

Most commonly eyes; also lungs, brain, and gut In the eyes, CMV causes black spots ('floaters'), blind spots, & distorted vision CD4 < 50 Asymptomatic or mild infection in people both with and without HIV Cryptococcosis (Crypto) Fungus Brain and spinal cord; causes meningitis, which is an inflammation of the lining of the brain and spinal cord. It can also cause systemic blood infection or pneumonia. Headache, fever, general sense of feeling unwell CD4 < 50 Cryptosporidiosis Parasite [Gut](#) Lots of watery [diarrhea](#), nausea, vomiting, stomach cramping CD4 < 100 Since the parasite lives in contaminated water and stool, it is important to wash hands well after using the bathroom and to drink clean water *Mycobacterium avium* complex (MAC) Bacterium Many different organs Fever, chills, night sweats, weight loss, diarrhea, stomach pain CD4 < 50 Prophylaxis is no longer recommended but could be considered in those not taking ART *Mycobacterium tuberculosis* ([TB](#)) Bacterium Lungs; also liver, heart, gut, and brain Cough, weight loss, fever, night sweats, tiredness. Symptoms usually worsen over several weeks, not days. Any CD4 count, but more likely to affect heart, gut, & brain with CD4 < 200 CDC recommends [pregnant people](#) get tested for TB if not tested in year before pregnancy; also special considerations for treatment when pregnant *Pneumocystis pneumonia* (PJP) Fungus Lungs Shortness of breath, fever, dry cough CD4 < 200 Prophylaxis recommended if CD4 < 200 Progressive multifocal leukoencephalopathy (PML) Virus Brain Changes to personality, thinking, vision, speech, or balance CD4 < 200 Treatment is HIV drugs Recurrent pneumonia Bacterium Lungs Chest pain, cough, fever, chills At higher risk when CD4 < 100 Pneumonia and flu vaccinations recommended Toxoplasmosis (Toxo) Parasite Brain, causing encephalitis (inflammation of the brain) Headache, fever, confusion, weakness, seizures Generally seen in those with CD4 < 50 Prophylaxis recommended if CD4 < 100 and an antibody test indicates a previous infection; to avoid Toxo infections, do not eat undercooked meat or touch cat poop, i.e. avoid handling litter boxes

## OIs and Women

Some opportunistic infections occur differently in women than in men:

- Men are more likely than women to develop [Kaposi sarcoma \(KS\)](#)
- Women are more likely than men to develop bacterial pneumonia and [yeast infections](#)

It is important for women living with HIV to have regular cervical cancer screenings and gynecological exams. Women can have abnormal cells grow on different parts of their reproductive systems (e.g., cervix, uterus, ovaries) due to the human papilloma virus (HPV). This abnormal cell growth is called dysplasia and can lead to cancer. Dysplasia is often more severe and difficult to treat in women living with HIV than in HIV-negative women. Untreated dysplasia can lead to cervical [cancer](#), which is a life-threatening illness and an AIDS-defining condition. For more information on women's health exams, see our fact sheet on [Gynecologic Care and HIV](#). A vaccine against HPV is available and can reduce the chances of dysplasia.

In addition, it is important that women living with HIV have regular appointments with their HIV provider to check their overall health. If you see a healthcare provider regularly, he or she can help you prevent OIs, and diagnose and treat any infections early on. Ultimately, taking your HIV drugs regularly and staying as healthy as you can is the best way to avoid opportunistic infections. Properly taking your medications will keep your [viral load](#) undetectable and your CD4 count higher, thus making your immune system stronger and better able to fight off any type of infection.

## Additional Resources

Select the links below for additional material related to opportunistic infections.

- [Opportunistic Infections \(HIV.gov\)](#)
- [Infectious Diseases: AIDS \(University of California-San Francisco\)](#)
- [HIV and Other Health Conditions \(Be in the Know\)](#)

- [HIV and Infections \(MedlinePlus\)](#)
- [What Is an Opportunistic Infection? \(HIVinfo\)](#)
- [Preventing Opportunistic Infections in HIV/AIDS \(Stanford Medicine Health Care\)](#)
- [Common Opportunistic Infections and HIV-Related Cancers \(US Department of Veter...](#)
- [Preventing Opportunistic Infections \(OIs\) \(US Department of Veterans Affairs\)](#)
- [Opportunistic Infections \(OIs\) \(International Association of Providers of AIDS ...](#)
- [For Providers: Opportunistic Infections Image Library \(US Department of Veteran...](#)



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