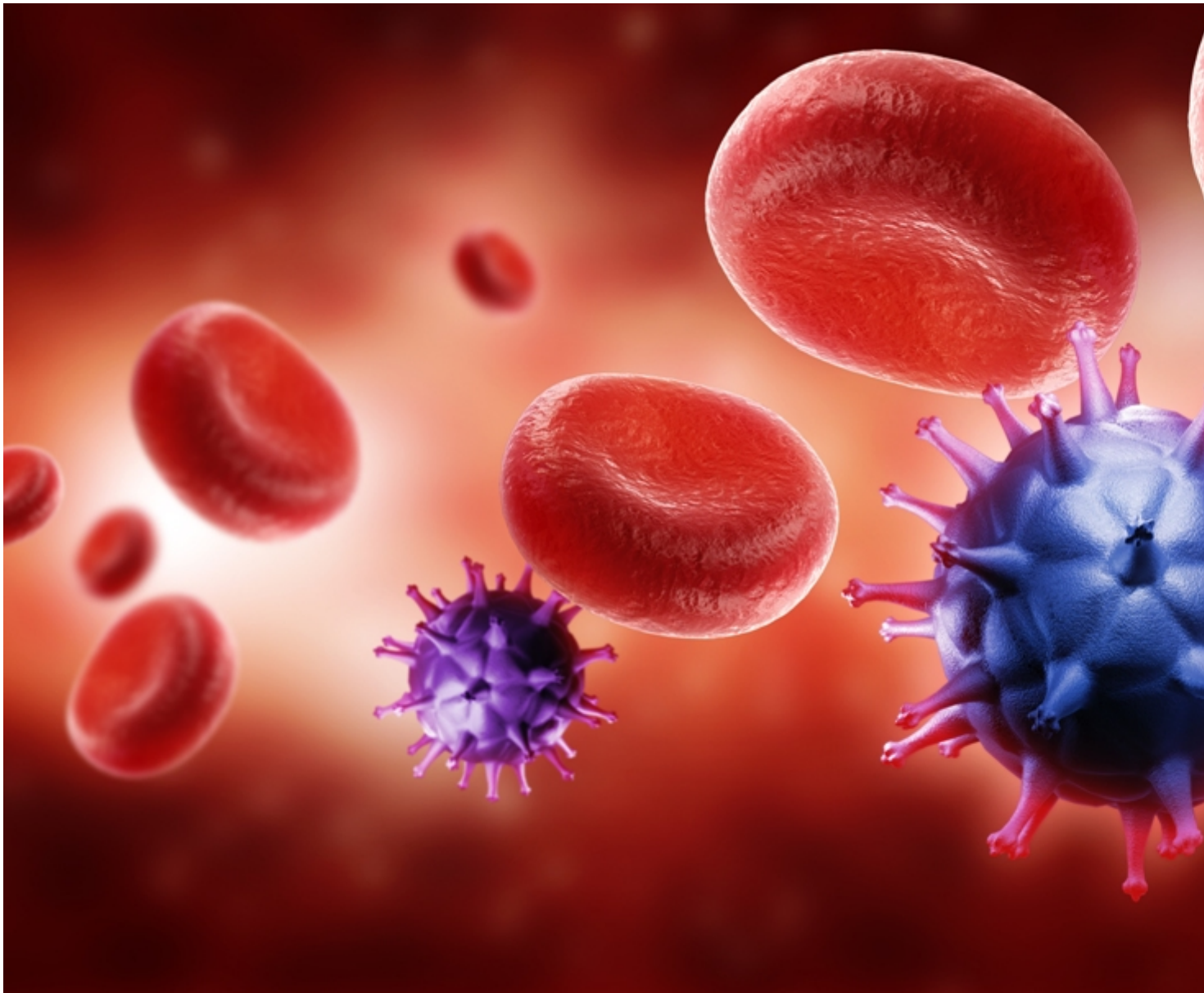


# What Are Opportunistic Infections? <sup>[1]</sup>

Submitted on Mar 29, 2017



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## Basic Facts

HIV can eventually cause AIDS by attacking a type of white blood cell called [CD4 cells](#) [2]. These are the same cells in the [immune system](#) [3] 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 infection and can develop serious illnesses, [cancers](#) [4], and neurological (nerve system) problems. These are called opportunistic infections (OIs), because they take advantage of the body's weakened defenses.

Many viruses can be controlled by the [immune system](#) [3]. But HIV takes over CD4 cells and turns them into virus factories that produce thousands of viral copies. As the virus multiplies, it damages or kills CD4 cells, which damages the immune system and weakens the body's defenses. OIs take an opportunity to infect you when your defenses are down. OIs 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) define a person living with HIV (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 one of the AIDS-defining conditions. The CDC has developed a list of more than 20 opportunistic infections that are considered [AIDS-defining conditions](#) [5].

People with AIDS can rebuild their immune system with the help of HIV drugs, just like people 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 does not mean 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

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 medication 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](#) [6] (PCP).

Effective treatment options are available in most cases if you develop an OI. The earlier you tell your health care provider about any symptoms, the sooner you can get diagnosed and

treated, and the better your chances that the treatment will work and you will make a full recovery. 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 discussing it first with your health care 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 gone down drastically. If you get on 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 <i>Candida albicans</i>	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 <sup>[7]</sup>
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	Common infection in people both with and without HIV infection.
Cryptococcosis (Crypto)	Fungus	Brain and spinal cord; causes meningitis, which is inflammation of lining of the brain and spinal cord	Headache, fever, general sense of feeling unwell	CD4 < 50	Treatment of Crypto in pregnant women should not include azole antifungals (e.g., fluconazole, ketoconazole), as these may damage the developing baby

<b>Opportunistic Infection</b>	<b>Cause</b>	<b>Location</b>	<b>Symptoms</b>	<b>When does it usually occur?</b>	<b>Additional Information</b>
Cryptosporidiosis	Parasite	Gut <sup>[8]</sup>	Profuse, watery diarrhea <sup>[9]</sup> , nausea, vomiting, stomach cramping	CD4 < 100	Since it lives in contaminated water and stool, it is important to wash hands well after using the bathroom and drink clean water
Mycobacterium avium complex (MAC)	Bacterium	Many different organs	Fever, chills, night sweats, weight loss, diarrhea, stomach pain	CD4 < 50	Prophylaxis recommended for CD4 < 50
<i>Mycobacterium tuberculosis</i> (TB) <sup>[10]</sup>	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 women <sup>[11]</sup> get tested for TB if not tested in year before pregnancy; also special considerations for treatment when pregnant
Pneumocystis pneumonia (PCP)	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 anti-HIV medication
Toxoplasmosis (Toxo)	Parasite	Brain, causing encephalitis (inflammation of the brain)	Headache, fever, confusion, weakness, seizures	Rare with CD4 < 200; usually in those with CD4 < 50	Prophylaxis recommended if CD4 < 100; to avoid Toxo, do not eat uncooked meat or touch cat feces, i.e. avoid handling litter boxes

# OIs and Women

Some opportunistic infections occur differently in women than in men:

- Men are eight times more likely than women to develop Kaposi's sarcoma (KS) [4]
- Women are more likely than men to develop bacterial pneumonia and yeast infections [7]
- Women may have higher rates of herpes simplex infections than men (though women are also more likely to be tested for herpes than men)

It is important for women living with HIV to have regular cervical cancer screenings and gynecological exams to identify infection, dysplasia, or cancer. Women can have abnormal cells grow on different parts of their reproductive systems (e.g., cervix, uterus, ovaries). 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 [4], which is a life-threatening illness and an AIDS-defining condition. For more information on women's health exams, see our fact sheet "Caring for a Woman's Body [12]."

In addition, it is important that women living with HIV have regular appointments with their HIV provider to check their overall health. Ongoing medical care allows for the effective prevention or early diagnosis and treatment of OIs. Ultimately, taking your HIV drugs regularly and staying as healthy as you can ? in body, mind, and spirit ? is the best way to avoid opportunistic infections. It will keep your viral load [13] undetectable and your CD4 count higher, thus making your immune system stronger and better able to fight off any type of infection.

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## Additional Resources

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

Opportunistic Infections (AIDS.gov) [24]

Opportunistic Infections (AIDS InfoNet) [25]

AIDS Signs and Symptoms (UCSF) [26]

Guidelines for Prevention and Treatment of Opportunistic Infections in HIV-infected Adults and Adolescents (CDC) [27]

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- [24] <http://aids.gov/hiv-aids-basics/staying-healthy-with-hiv-aids/potential-related-health-problems/opportunistic-infections/>
- [25] [http://www.aidsinfonet.org/fact\\_sheets/view/500](http://www.aidsinfonet.org/fact_sheets/view/500)
- [26] [https://www.ucsfhealth.org/conditions/aids/signs\\_and\\_symptoms.html](https://www.ucsfhealth.org/conditions/aids/signs_and_symptoms.html)

[27] [http://aidsinfo.nih.gov/contentfiles/adult\\_oi.pdf](http://aidsinfo.nih.gov/contentfiles/adult_oi.pdf)

[28] <https://www.cdc.gov/hiv/basics/livingwithhiv/opportunisticinfections.html>

[29] <http://www.avert.org/hiv-opportunistic-infections.htm>

[30] <https://aidsinfo.nih.gov/education-materials/fact-sheets/26/86/what-is-an-opportunistic-infection->