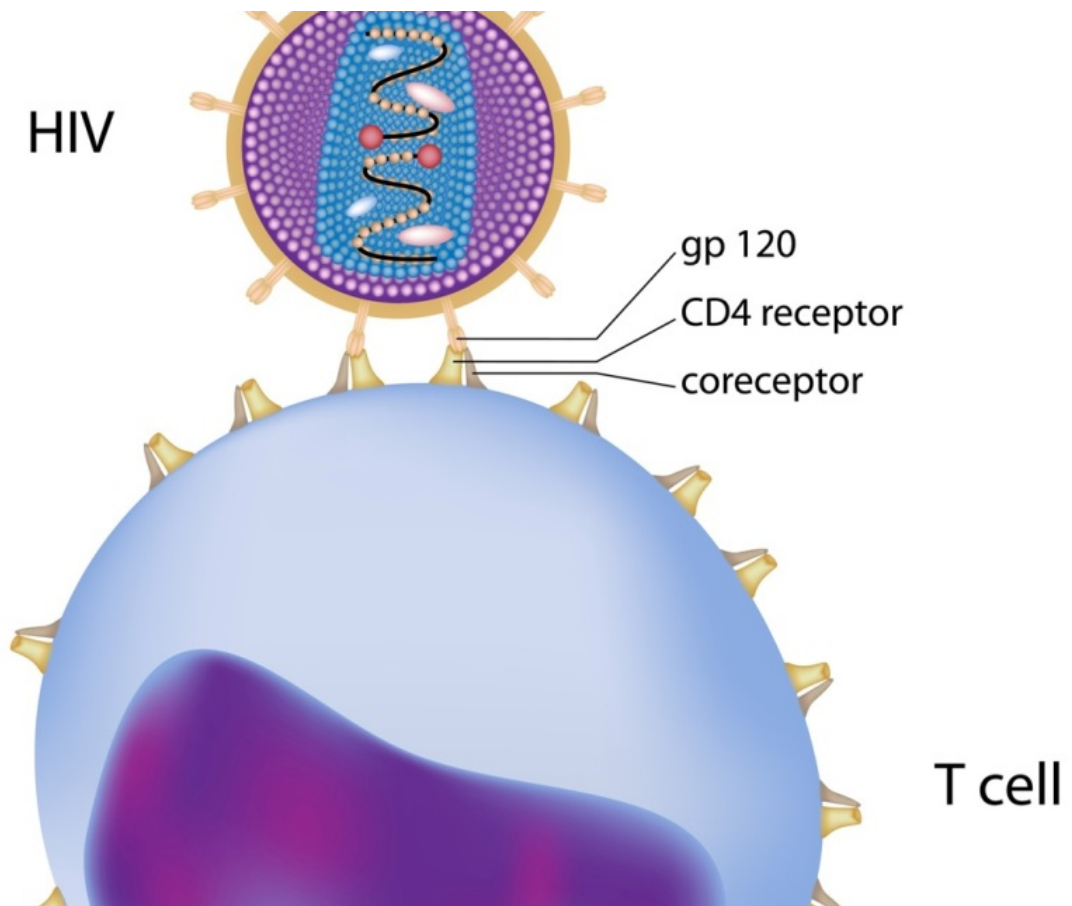




## Understanding CD4 Cells and CD4 Cell Tests

Submitted on Aug 14, 2023



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### Table of Contents

- [The Basics](#)
- [CD4 Count and HIV](#)
- [CD4 Count and HIV Treatment](#)
- [CD4 Cell Test](#)
- [The Bottom Line](#)

### The Basics

Your immune system protects your body by fighting germs (such as viruses, bacteria or fungi) and infections. White blood cells are an important part of your [immune system](#). HIV infects and destroys a type of white blood cell called a CD4 cell (sometimes called a T-cell or, more specifically, a CD4 T-cell).

As the immune system loses CD4 cells, it becomes weaker and is less able to fight off germs. When it loses a large number of CD4 cells, people living with HIV are at risk of developing AIDS-related [opportunistic infections](#) (OIs), which can cause serious illness or death.

The number of CD4 cells in your body shows the health of your immune system. A normal CD4 cell count is about 500 to 1,500 cells per cubic millimeter of blood (a cubic millimeter is a very small amount, about one drop). The number of CD4 cells a person has – their "CD4 count" – usually decreases as HIV disease gets worse. Your CD4 cell count can help your health care provider tell whether your current treatment and plan of care are working for you.

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## CD4 Count and HIV

Without HIV treatment, HIV infects and destroys more and more CD4 cells. As the CD4 count goes down, people living with HIV become more likely to develop OIs and [cancers](#).

- CD4 count > 500: People with CD4 counts above 500 cells usually have a fairly normal immune system and are at low risk for opportunistic infections
- CD4 count < 200: People with CD4 counts below 200 cells are diagnosed as having AIDS and are at risk for developing serious opportunistic infections such as *Pneumocystis pneumonia* (PCP), *Mycobacterium avium* complex (MAC), and cytomegalovirus (CMV). If your CD4 count drops below 200, your health care provider may recommend that you take medications to prevent these infections.

## CD4 Count and HIV Treatment

**Your CD4 cell count can help your health care provider tell whether your current treatment and plan of care are working for you.**

Several different organizations and institutions make recommendations about when to start HIV treatment. The US Department of Health and Human Services (DHHS), WHO (World Health Organization), EACS (European AIDS Clinical Society), BHIVA (British HIV Association), and the IAS-USA (International AIDS Society USA) all recommend that HIV treatment be offered to all people living with HIV, regardless of their CD4 count. Research shows that people living with HIV who start treatment right after diagnosis, while their CD4 counts are still high, have a much lower risk of developing other illnesses or dying.

The DHHS treatment guidelines state:

- HIV treatment is recommended for anyone who is living with HIV, no matter their CD4 count
- HIV treatment is also strongly recommended if you are in one or more of the following situations, no matter your CD4 count:
  - You have or had symptoms of AIDS (such as opportunistic infections)
  - You are [pregnant](#)
  - You have HIV-related kidney disease
  - You need treatment for [hepatitis B \(HBV\)](#) and/or [hepatitis C](#)
- The guidelines also point to several conditions that increase the need for treatment, such as a CD4 count that drops quickly (by more than 100 cells per year) or a higher viral load (more than

100,000 copies)

- HIV drugs should be offered to people who are at risk of [transmitting HIV](#) to their sexual partners

Many people see their CD4 counts increase when they [start effective HIV treatment](#). If the drugs succeed in slowing or stopping HIV from making copies of itself, fewer new CD4 cells will be infected and your CD4 count may go up. However, your CD4 count can also go down again if you stop taking your HIV drugs correctly, or if your HIV becomes [resistant](#) to the drugs. Along with your [viral load](#), your CD4 count is an important tool for monitoring your HIV, and how well your HIV drugs are working.

## CD4 Cell Test

The CD4 cell test is a simple blood test ordered by your health care provider. When you first start receiving care for HIV, you should get a "baseline" CD4 cell test. This baseline test gives a picture of your immune system when you first enter into care. Later tests can be compared against this first result to see how things are changing over time and with treatment.

**Try not to worry too much about a single abnormal test result; trends over time are usually more important.**

In the beginning, you may get your CD4 count checked about every three to six months, or as often as your health care provider recommends. You will need more frequent CD4 cell tests if your count is low or falling, or if you are starting or changing treatment. If you have been on HIV drugs for over two years, are virally suppressed and have a CD4 count over 300, your provider may suggest that you only need to get your CD4 count checked once a year.

Many factors can affect your CD4 count, including the time of day, level of stress, your menstrual cycle, and infections such as the flu. If you get a result back that surprises you or your health care provider, he or she will probably want you to get a second test. The second test will confirm any unexpected results or show that the first test's results were random – the result of lab error or an unimportant occurrence. Try not to worry too much about a single abnormal test result; trends over time are usually more important.

In addition to your CD4 cell count, your health care provider will want to check your CD4 percentage. This number tells you what percent of your total lymphocytes (a kind of white blood cell) are CD4 cells. A normal CD4 cell percentage is about 30 to 60 percent.

The CD4 percentage is sometimes a more reliable measurement than the CD4 count because it tends to change less between measurements. Think of it this way: 50 pennies may sound more than two quarters, but both are 50% of one dollar.

While the CD4 percentage gives information about the health of your immune system, the CD4 count is the preferred measurement for determining whether your HIV disease is progressing (getting worse). Currently, treatment guidelines for adults are based on CD4 counts and not on CD4 percentages.

If you begin treatment when your CD4 count and percentage are low (CD4 count <200), it may take longer for your CD4 numbers to increase. However, if your viral load is below detectable levels, then the virus is not growing or spreading – an encouraging result. Sometimes watching your CD4 cells and percentage increase can take lots of time and patience.

## The Bottom Line

Because HIV infects and kills CD4 cells, CD4 counts usually drop as HIV disease gets worse. Taking

effective combinations of HIV drugs will stop your CD4 count from dropping and improve your health.

Your CD4 count is an important indicator of the strength of your [immune system](#). Keeping track of the trends in your CD4 count can help you and your health care provider make decisions about starting and changing treatment. Seeing your health care provider regularly and getting regular CD4 cell tests—along with viral load tests and other blood tests to check for treatment side effects—is an important way to take charge of your health.

## Additional Resources

Select the links below for additional material related to understanding CD4 and CD8 cells.

- [CD4 Cell Counts \(aidsmap\)](#)
- [Understanding Your Lab Work \(Blood Tests\) \(POZ\)](#)
- [What Do My Lab Results Mean? \(Infographic\) \(HIVinfo\)](#)
- [CD4 Count \(or T-Cell Count\) \(US Department of Veterans Affairs\)](#)
- [Monitoring Your Health \(CATIE\)](#)
- [CD4 Lymphocyte Count \(MedlinePlus\)](#)
- [CD4 Cell Count \(International Association of Providers of AIDS Care\)](#)
- [Interpreting CD4 Results: CD4 Count and CD4 Percentage \(i-base\)](#)
- [About Your Viral Load and CD4 Cell Count: 5 Facts to Know \(US Centers for Disea...](#)



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