

CD4 cell counts

Last updated February 2012/ Due for review February 2014

T-cells (or T-lymphocytes) are white blood cells that play important roles in the immune system. There are two main types of T-cells. One type has molecules called CD4 on its surface; these 'helper' cells organise the immune system's response to bacteria, fungi and viruses. The other T-cells, which have a molecule called CD8, destroy cells that are infected and produce antiviral substances.

HIV is able to attach itself to the CD4 molecule, allowing the virus to enter and infect these cells. Even while a person with HIV feels well and has no symptoms, billions of CD4 cells are infected by HIV and are destroyed each day, and billions more CD4 cells are produced to replace them.

Uses of CD4 counts

Doctors use a test that 'counts' the number of CD4 cells in a cubic millimetre of blood. A normal CD4 count in a healthy, HIV-negative adult can vary but is usually between 600 and 1200 CD4 cells/mm³ (though it may be lower in some people). Your doctor will normally just talk about your CD4 cell count as a number.

Most people with HIV find that their CD4 count falls over time. This often happens at a variable rate, so the count can still be quite stable for long periods. It is useful to have your CD4 count measured regularly for two reasons:

- To monitor your immune system and help you decide whether and when to start to take HIV treatment and other treatments to prevent infections.
- To help monitor the effectiveness of HIV treatment you are taking.

It is recommended that you start HIV treatment when your CD4 cell count is around 350. Starting treatment at this time (rather than waiting until your CD4 cell count is lower) reduces your risk of HIV-related illnesses and some other serious illnesses as well.

If it drops below 200 to 250, or you are diagnosed with HIV at a low CD4 count, you are at increased risk from serious infections and it is very important that you start HIV treatment. At this point your doctor should also offer drugs to try to prevent such infections, such as cotrimoxazole (*Septtrin*) for PCP pneumonia.

One effect of anti-HIV drugs may be to improve the state of your immune system. This is roughly reflected in an increase in your CD4 count. Evidence suggests that the cells' ability to fight infections is also improved. For example, people taking anti-HIV drugs who find their CD4 count rises and stays above 250 may no longer need to take additional treatments like cotrimoxazole.

Monitoring the changes in your CD4 count while you are taking anti-HIV drugs can help you and your doctor to decide whether your treatment is working, or whether it is time to try different treatment options. A fall in CD4 count would be a sign that your treatment is not working and you may need to consider switching to another combination. However, the CD4 count isn't the only consideration when making these decisions; you should also take account of your viral load results, how well you feel, whether you have any symptoms, which treatments you've used before and therefore which options remain.

In some cases, in order to help understand changes in your CD4 count, your doctor may also assess what proportion of all lymphocytes are CD4 cells. This is called the CD4 percentage. In HIV-negative people a normal result is around 40%. A CD4 percentage which falls below about 15% is understood to reflect a risk of serious infections.

Understanding the results

It's also known that CD4 cell counts can differ between different ethnic groups. For example, people of Chinese and north Indian origin have naturally lower CD4 cell counts than people from western countries.

Factors other than HIV can affect your CD4 count including infections, time of day, smoking, stress and which laboratory tests the blood sample. So it's important to watch the trend in your CD4 count over time, rather than to place too much emphasis on a single test that may be misleading.

Only about 2% of the body's CD4 cells are in the blood; the rest are in tissues such as lymph nodes. Changes in your CD4 cell count (which looks only at the blood) may reflect the movement of cells into and out of the blood, rather than changes in the total number of CD4 cells in your body.

Doctors will normally suggest measuring your CD4 count every three to six months if you have a relatively high count, have no symptoms and are not taking anti-HIV drugs. They may suggest more frequent counts if you are facing decisions such as starting treatment, if you develop HIV-related symptoms, or if the decline in CD4 cells seems to be speeding up.

Once you're taking stable HIV treatment, then it's likely that your CD4 cell count will be checked every three months or so during routine clinic visits. If your treatment has been working well for a long time, then there may be longer intervals between your CD4 cell tests. Some doctors think once a year could be sufficient.

For more information on CD4 counts, you may find our booklet *CD4, viral load & other tests* useful. You can read this on our website (visit www.aidsmap.com/booklets) or contact us to request a copy by emailing info@nam.org.uk or calling 020 3242 0820.

Evidence