

Blood Work: Two common tests to use for HIV disease

Two of the most common tests that you and your doctor will use to monitor your health are CD4 counts and viral load tests. CD4 counts indicate the state of your immune system—your body’s defense against disease. Viral load tests indicate how active HIV is. At first, these tests should be taken about 2–4 weeks apart to establish a baseline level. After that, they should be repeated about every 3 months. Using viral load tests, CD4 counts and other information about your health help provide a clearer picture of your risk of disease progression, the state of your immune system, and your body’s ability to fight HIV.

CD4 count tests

Your doctor normally will order tests of several types of white blood cells (WBCs). One is a B cell, which is involved in the production of antibodies and with infections outside cells. Another WBC is a CD8 cell, which deals with infections inside cells. The third type is a CD4 cell, which “helps” B and CD8 cells do their jobs. These WBCs are also called *lymphocytes*.

In HIV-negative people, normal CD4 counts are 600–1,500/mm³ of blood. Normal CD8 counts are 300–800/mm³. In general, an HIV-negative person has 2 CD4 cells for every CD8 cell in their blood.

However, in HIV disease the virus normally causes a slow decline in CD4 cells over time. And, among those not on HIV therapy, it’s common for the normal CD4/CD8+ ratio to be reversed. Normal CD4s in people with HIV is 350–800.

Besides looking at these cell counts, it’s also helpful to look at your relative percentages of CD4 and CD8 cells. The CD4 percentage is the percentage of CD4 cells in the total white blood count. The normal range is 28–58%. A CD4 percentage below 14% is an AIDS diagnosis.

Why do you use CD4 cell counts?

CD4 counts tell you how many of these cells are present but not how they function. Using these along with viral load tests provides a more complete picture of your health and response to therapy. It’s also the best way to foresee problems that may develop. CD4 counts are the best guide for when to start preventive therapy for opportunistic infections, or OIs.

CD4 counts may vary and do not fully define your level of health or ill-



ness. Tests can vary due to the time of day, an active infection, lack of sleep, stress and other factors. Variations in the lab that’s used, as well as how quickly the test is done after your blood is drawn, can also affect test results. Therefore, it’s important to look at your CD4 count trends over time and not be alarmed by any one test result.

CD4 cell counts and when to start therapy

There’s no single, right answer to the question of when to start HIV treatment. A cautious approach suggests checking CD4 counts more often when a person is not on therapy. A more aggressive approach suggests offering therapy no matter the CD4 count. In spite of the actual CD4 count, therapy may be justified if there’s a dramatic falling trend in CD4s over time.

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Research clearly shows that HIV therapy benefits people with CD4 counts below 200, and best started before counts fall below 350. The updated Federal *Guidelines* now recommend everyone below 500 CD4s should be on therapy. Although they're backed by a great deal of clinical study, it's not the last word.

You should also consider other information about your health, such as the trend in your CD4s and viral load. Are they stable, decreasing or increasing? What is your general health? Are you ready to start taking meds and able to cover their cost? Any lifestyle issues that need addressed first, such as depression or addiction?

What do CD4 counts mean?

ABOVE 500 CD4s

- No unusual conditions are likely. Maintain good health habits and good health care, including vaccines and nutrition.

200–500 CD4s

- Higher risk for shingles, thrush, skin infections, bacterial sinus and lung infections, and TB.
- Serious OIs are rare, such as PCP, MAC and CMV.
- HIV therapy is recommended when CD4 counts fall below 500, and definitely below 350.

50–200 CD4s

- Increased risk for PCP and other serious OIs.
- Preventive treatment for PCP is indicated.
- If counts are below 100, consider preventive treatment for MAC, CMV and invasive fungal infections.

BELOW 50 CD4s

- Increased risk for serious OIs, including MAC and CMV.
- Continue preventive meds.

Viral load tests

Viral load tests measure the amount of HIV in a small drop of blood. The genetic material that it measures is called HIV RNA. When HIV levels fall, it's a sign that potent HIV treatment is working. When they increase, the regimen may no longer be working. In this case, CD4 counts will also likely fall. Changes in viral load usually happen more rapidly than CD4s.

People should generally avoid getting viral load tests done during an active infection (like a cold or flu), after routine vaccinations (like flu or tetanus) or during flare-ups of infec-

tions (like a cold sore). These can all cause HIV levels to increase 10–100 times, but they usually return to normal within a few weeks afterwards. A sudden rise in viral load should be checked again 2–4 weeks later.

Viral load tests should be done more often when making decisions about treatment. A test should also be done 3–4 weeks after starting or changing treatment. Because various tests can vary slightly in their results, people using a specific test should continue to use that test to get accurate results and trends over time.

Viral load and women

HIV levels are thought to be somewhat different for women and men, although there remains some degree of debate about this. Women may have a “naturally” lower viral load than men, especially in early HIV infection. Because the current federal guidelines base its decisions for starting therapy more on CD4 count than on viral load, this probably does not impact treatment for many women. However, for women, viral load above 30,000, or even 60,000, may indicate a “high” HIV level.

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Viral load tests

Interpreting viral load results

Results from viral load tests can be difficult to understand. Some general guidelines are found below. As with CD4 counts, the *trend* of viral loads over time is the most important. Both the size (how large a change) and duration (how long it lasts: week, month, year) of changes in HIV levels are important in assessing these results.

- Viral load below 10,000 copies/ml is generally considered “low.”
- Viral load above 100,000 copies/ml is generally considered “high.”
- Low, stable and decreasing viral load is considered a good thing.
- High or increasing viral load calls for attention as it may point to the failure of a regimen.

The minimum reliable change in a viral load test is a 3-fold change, or a 1/2 log. This means 3 times larger or smaller than the last test result. Thus, a change from 20,000 to 10,000 (2-fold) would not be significant. When starting a new regimen, you would want to see a 10-fold (1 log) or more decrease in your HIV levels. (For more information on “logs,” read Project Inform’s publication, *Blood Work: A Complete Guide*.)

People with “undetectable” viral load should remember that it does not mean that their HIV is gone. What it means is that it’s simply present in too small a quantity for the test

to detect. For example, if the sensitivity of the test you have done is 50 and you have less than 50 copies of HIV in your blood sample, then your viral load is said to be *undetectable*.

Viral load “blips”

As viral load tests have gotten better over the years at detecting HIV in the blood, they’ve unexpectedly caused some worry for individuals and their doctors. Because these tests are now very sensitive, they may show detectable HIV occasionally (though at low levels), such as 75 or 250 copies.

The US Guidelines addressed this issue by stating that “blips” (viral loads <400) are not uncommon in successfully treated patients and are not believed to show reproducing HIV or mean that the regimen will fail.

Viral load, disease progression and HIV treatment

Higher HIV levels often relate to lower CD4 counts, more rapid declines in CD4s and more rapid disease progression. People with HIV levels over 100,000 are 10 times more likely

to move on to AIDS over the next 5 years than those with levels below 100,000. People with constant HIV levels below 10,000 seem to have a lower risk of disease progression.

Viral load tests provide information on how effective an HIV regimen is. This helps people make decisions about starting, stopping and switching therapy. A viral load that doesn’t change significantly after starting treatment is a sign that the drug(s) aren’t working. An increasing viral load while on treatment is a sign that the regimen is no longer working.

Viral load is only measured in the blood. Most of the time there’s a strong relationship between levels of HIV in the blood and in other body fluids like semen and vaginal fluids. What that means is just because your HIV level is undetectable it doesn’t mean that you can’t pass HIV onto another person. For now, there isn’t conclusive research to fully understand this issue. For more information about safer sex and prevention concerns for positive people, read Project Inform’s publication, *Sex and Prevention Concerns for Positive People*.



FACING NEW DECISIONS? WONDERING WHAT’S THE NEXT STEP?

HIV Health InfoLine: 1-800-822-7422 (toll-free)
10a–4p, Monday–Friday, Pacific Time