OTHER TESTS THAT MAY HELP INFORM TREATMENTS DECISIONS

RESISTANCE TESTING

The most common test used to measure possible drug resistance is known as 'genotyping'. The purpose of this test is to detect the presence of known virus mutations associated with drug resistance. This test is called a 'genotypic resistance assay'. It is used to compare the genetic code of a sample of HIV against a 'wildtype' (the most common form of HIV). This test is usually only performed if you have a viral load over about 1,000 copies per millilitre of blood because the test may not be successful if viral load is below this level.

Knowing which treatments you are potentially resistant to, and which treatments are effective against, your virus is useful in determining your optimal treatment strategy. The current treatment guidelines1 recommend that this test be performed:

- for all people with HIV infection when they enter into care regardless of whether therapy will be started immediately;
- in cases of virologic failure when viral load is over 1,000 copies per millilitre;
- while taking HIV antiviral drugs, or immediately (i.e. within four weeks) after discontinuing therapy; and
- for all pregnant women prior to initiation of therapy (and for those entering pregnancy with detectable HIV RNA levels while on therapy).

Resistance testing should also be considered at the time of initiating antiretroviral therapy if therapy has been deferred.

This test is currently not covered under Medicare and the availability and cost varies. Your doctor or Treatments Officer will be able to provide more information as to the cost and availability in your area and what this test may mean for you.

ABACAVIR HYPERSENSITIVITY

This test is rapidly becoming widespread and is a genetic test used to determine the likelihood of a possibly fatal side effect of an antiretroviral drug called abacavir (3TC, Kivexa). This side effect is known as abacavir hypersensitivity reaction. Wherever possible, an abacavir hypersensitivity test should be performed by your doctor prior to commencing treatment with abacavir.

CO-RECEPTOR TROPISM ASSAY

A coreceptor tropism assay (or viral tropism assay) is a test that is used to identify whether you are likely to respond to a new class of HIV treatments called CCR5 antagonists. This test should be performed prior to initiation of a CCR5 antagonist. The only drug in this class is maraviroc (Celsentri, Selzentry) which is currently only available in Australia on a special access scheme or as part of a clinical trial.

THERAPEUTIC DRUG MONITORING (TDM)

Therapeutic drug monitoring (TDM) is used to help individualise anti-HIV therapy by measuring the amount of drug in an individual's blood (plasma) or cerebrospinal fluid. This is important because different people absorb, process, and eliminate drugs at different rates, and blood and cerebrospinal fluid levels may vary considerably among individuals taking the same doses of the same medications. Ideally, the lowest plasma drug concentration between doses (the trough level, or Cmin) should still be high enough to inhibit HIV, but the highest concentration (the peak level, or Cmax) should not cause intolerable side effects.

Some, but not all, studies have shown that using TDM to guide treatment decisions increases the chance of successful viral suppression and can assist in minimising side effects; however, drug level monitoring is not appropriate for all HIV treatments.

For more information please refer to the AFAO resource entitled *HIV Test and Treatments*, which is available from your local AIDS council or PLHIV organisation.

References:

[1] Antiretroviral Guidelines Panel, Australian Health Minister's Advisory Committee on HIV and STI. (November 3, 2008). *Guidelines for the use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents:*
Incorporating commentary to adapt the guidelines to the Australian setting.

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January 2010

COMMON TESTS

COMMON BLOOD TESTS FOR MANAGING HIV

INTRODUCTION

To better understand the impact that HIV is having on your health and body your doctor may carry out various blood tests. The information that the results of these tests provide can help you and your doctor make decisions about the way you manage HIV infection. The results can also be used to make adjustments to the type or amount of antiretroviral medications that you have been prescribed.

VIRAL LOAD

A viral load test is a simple blood test. 'Viral load' is the term used to describe the amount of HIV present in your blood. Knowing how much HIV is present is an important indicator of how much your immune system is at risk of damage, how well your treatments are working, or whether you should consider starting or changing treatments.

The amount of virus in your blood may range from a very small number of copies in your blood (below 50 copies per millilitre of blood or what is known as an 'undetectable viral load') to levels in the thousands, hundreds of thousands, or even millions. In some Australian states and territories the tests can measure down to 40 copies per millilitre of blood.

When you first have your viral load tested, you will usually have two tests several weeks apart. This is known as your 'baseline' result. This can be used to compare changes over time.

Make sure you understand the meaning of your viral load test result. Ask your doctor to explain its significance and what it means for you.

THE CD4 COUNT

The other test that is critical in managing HIV and understanding how it is affecting your body, is the CD4 (or T-cell) count.

CD4 cells are an important part of your immune system. These cells are infected and destroyed by HIV. Sometimes, they can be depleted to such low levels that they are unable to play their part in helping your immune system work properly. If this happens, you could be at risk of developing AIDS or AIDS-related illnesses.

A general guide to CD4 test results is:

- 500 to 1,350 cells/mm^3 is the 'normal' range for adults;
- more than 500 cells/mm^3 indicates little or no immune system damage;
- between 500 and 250 cells/mm^3 cells indicates some damage but it is unlikely you will be at risk of major opportunistic infections; and
- less than 250 cells/mm^3 indicates more serious immune system damage and suggests that you could be at risk of serious opportunistic illnesses.

Together with viral load, the CD4 count is another result used by your doctor to assist in determining your optimal treatment strategies.

The CD4 count is a measure of the damage already done. The viral load is a measure of the risk of future damage.

COMMON TESTS FOR MONITORING SIDE EFFECTS

Viral load and CD4 cell count results are two of the main tests used to inform decisions about starting or changing treatments. Usually when you have these blood tests several other tests are also conducted at the same time. Some of these are useful in monitoring drug side effects and potential organ damage. The results of these tests may also influence decisions to commence or change your HIV treatments.

Some of the common tests include:

GLUCOSE, TRIGLYCERIDE AND CHOLESTEROL LEVELS

The two major fats (lipids) in the blood are triglycerides and cholesterol. Glucose, triglyceride, and cholesterol levels are most reliably measured in the fasted state, that is, in the morning before eating. Certain HIV treatments can increase cholesterol, triglyceride, and glucose levels in some people, which may increase the risk of heart attack and stroke, and can be associated with lipodystrophy (the redistribution of body fat).

LIVER FUNCTION TESTS

There are a range of tests which taken together give an indication of the health of the liver. The liver can be damaged by hepatitis, alcohol and other drugs, being overweight, and by HIV treatments, so it is important to monitor your liver function.

KIDNEY FUNCTION

Kidney function is normally measured by the blood levels of 'waste' products such as urea and creatinine. Some HIV treatments can affect the levels of these waste products because they compete with them for excretion in the kidney. Some HIV treatments may also have an impact on kidney function.

PLATELET COUNT

Platelets are important in helping your blood clot in response to a cut or wound. Some HIV treatments—particularly nucleoside analogues (e.g. AZT, d4T)—can decrease the platelet count.

HAEMOGLOBIN AND HAEMATOCRIT

Haemoglobin measures the levels of the key protein which transports oxygen around the body. Haematocrit is a measure of the proportion of blood that is red blood cells. Low haemoglobin levels or a low haemotocrit can be an indicator of anaemia, a known side effect of some HIV treatments.