VI.A. UNDERSTANDING YOUR LAB RESULTS

When physicians want to know how a patient is doing clinically they often ask “what are the numbers”? These “numbers” are lab results, usually from tests done on blood. For people with AIDS and their care givers the “numbers” are quite important and are often used in deciding key issues of care. Of course lab results are no substitute for a complete evaluation, and no one lab test is ever an answer, yet we know enough about AIDS now to tell a good deal from these tests. The lab tests used to examine PLWH/A’s are not difficult to understand, but they are often explained in medical jargon, a language closer to old church Latin than to plain English or Spanish. Here, then, is an explanation of what some of the “numbers” mean.

The first test many of us encounter is the HIV test. This is sometimes mistakenly called the “AIDS Test” but it is nothing of the kind. AIDS is a syndrome, which means it is diagnosed on the overall picture of the patient. There is no one test for AIDS. The HIV test looks for antibodies to the HIV virus. Antibodies are proteins the body makes in response to an infection or to an exposure, or to a vaccine. So the HIV test tells us if a person has been exposed and made antibodies to the virus. It can take the body up to six months to make these antibodies after exposure to HIV, so a negative test can still occur when the virus has been in the body only a short time.

The second important test is the Complete Blood Count (CBC). The CBC counts the cells in the blood (the red cells, white cells and platelets). Blood is made up of these various cells and the clear fluid is plasma which is examined by blood chemistries. The majority of cells are red cells, the cells that carry oxygen. There are too many to count, so the Percentage (%) of whole blood which is red cells is used. Typically, the blood is 38-54% red cells in men and about 36-47% in women. This percentage is called the Hematocrit. A low Hematocrit is seen in anemia, a common problem in PLWH/A’s and a common complication of therapy with AZT. Hemoglobin (Hgb),

the iron containing protein in red cells, is measured along with the hematocrit to evaluate the red cells.

After the red cells, we look at the white cells (the cells involved in immunity). The total number of white cells is measured by the White Blood Count (WBC) and is normally between 5,000 - 9,000 (doctors often drop these zeros and say the WBC's are 5 or 9). A low WBC is often a sign of low immune resistance. In healthy people, a high WBC is a sign of an acute infection. Very low WBC's (below 3,000) are often seen in AIDS and can be a complication of numerous drugs including antiviral drugs like Gancyclovir.

The white cells are actually a family of cells which includes, among others, the lymphocytes. Lymphocyte means simply the lymph cells and are also the cells in lymph nodes. Lymphocytes again are a family (or cell line) and are of central importance in AIDS (the "L" in HTLV-III, an older name for HIV, was for lymphocytes). Two key members of this family of cells are the T-helpers and T-suppressors, the "T" here stands for Thymus (the immune gland in the neck where the cells develop). The names get hairy here, but all the following mean the same thing: T4=CD4=T-helper. A healthy person has about 1,100-1,400 T-helpers and about 700-900 T-suppressors. This means a ratio, or proportion, of 1400 to 700 or 2 to 1. This number is called the helper to suppressor ratio and has been used to measure the severity of disease with HIV. When you have only 700-900 T-helpers and the same number of T-suppressors, the ratio becomes one to one and the virus is then considered to be actively affecting the immune system. When the T-helpers (remember your doctor may say T4's, CD4's) fall below 400-500, the risk of developing "full-blown" AIDS is high. Many physicians begin preventive treatment for HIV when the T4's reach this level. When T4's fall to below 200, the patient usually has signs and symptoms of severe immune deficiency and is at risk for many infection. T4 cells below 100 make physicians nervous--and they should, at this level of immunity a PLWH/A needs careful

management to avoid infections. So “the numbers” here are watched very closely.

The CBC also looks at the last cell type, the platelets. Platelets are tiny cell fragments that play an essential part in blood clotting. There are usually between 200,000 to 500,000 in a blood sample. Low platelets are often seen in early HIV disease (especially in children) and very low platelets are sometimes seen in advanced disease. This can lead to easy bruising and easy bleeding.

There are, of course, many other kinds of tests important to PLWH/A’s and they are usually geared to each person’s particular problem. The ones described here are likely to be given to every PLWH/A.

We need to stress again that no one test tells the story of a disease. There are, for example, people with very low T4 cells who somehow avoid infections and others with much higher levels who do not do as well (explain this and you may get a Nobel prize!). Yet, these numbers do have value and need to be understood by PLWH/A’s if we are to understand and, therefore, participate in our medical care.

VI.B. WHAT IS VIRAL LOAD?

Viral load refers to the amount of HIV present in the blood. From the start of infection, HIV reproduces continuously and rapidly. An average of 10 billion new copies of the virus are produced by your body every day from the first day of infection. At the same time, your immune system - the body’s natural source of protection from all types of infection - produces about 2 billion CD4 cells to fight the virus. HIV attacks, infects, and kills your CD4 cells.

Although you may continue to feel fine for months or even years, new copies of the virus continue to be produced and continue to infect your CD4 cells. Because HIV continues to copy at such a rapid rate, the body is unable to continue to fight off the infection. As a result, the signs and symptoms of AIDS begin to develop. It is also easier for you to get sick from other infections that the body can usually fight off.

What is the significance of viral load?

Disease stage

Viral load may predict the rate of disease progression even before symptoms begin. Studies have shown a direct relationship between viral load and disease stage. In fact, results of recent studies show that viral load may be a better predictor of progression to AIDS than the number of CD4 cells alone.

Treatment of HIV

Many healthcare professionals now believe that viral load should be used (in conjunction with your CD4 count) to determine when to start treatment and the best medications to use to treat HIV. A higher or rapidly increasing viral load, for example, may indicate that your infection is advancing, which may prompt your physician to talk to you about starting or changing your treatment.

An important treatment goal is to reduce viral load to as low a level as possible, for as long as possible.

How is viral load measured?

A viral load test is a simple blood test that measures the amount of HIV in the blood. Results can range from 50 to well over a million copies.

How often should viral load be measured?

Many healthcare providers now believe that viral load should be used in conjunction with CD4 counts as the signal to begin or change therapy.

Guidelines for viral load testing

- For initial determination, or baseline levels, two tests (2 - 4 weeks apart);

- Regularly, along with CD4 counts (every 3 - 4 months); 3 - 4 weeds after beginning or changing antiretroviral treatments to measure response to therapy.