

# HATiP

HIV & AIDS Treatment in Practice

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## Monitoring ARV treatment

By Julian Meldrum, with help from Gerard van Osch (St Maarten, Dutch West Indies), Vijay Anthony Prabhu (India), Christopher Lee (Malaysia), Francesca Conradie, Paul Roux, Doug Wilson (South Africa), Henry Barigye, Molly Tumusiime (Uganda), Brian Gazzard, Anton Pozniak (UK) and Norman Nyazema (Zimbabwe).

The WHO guidelines referred to in this article are published as: 'Scaling up antiretroviral therapy in resource-limited settings: Guidelines for a public health approach', Geneva: WHO, June 2002, available [here](#).

### Summary

It is well known that ARV treatment needs careful monitoring, but what does this 'monitoring' amount to in practice? The aim of all monitoring is to enable the patient to get the maximum benefit from treatment while managing the risks that go with it.

Clinical monitoring is the most important part of the process and its most valuable function may be to give continuing encouragement and support to patients in taking their treatment. It rests on effective communication between doctors and patients.

Issues raised in previous issues of HATIP, such as discussion of side effects and monitoring for active TB, are integral to clinical monitoring. Sexual and reproductive health, too, should not be overlooked.

Laboratory monitoring involves a range of options, most of which are based on blood tests. Some of these are currently expensive and inaccessible. WHO and other guidelines therefore grade tests in order of importance and stress that the lack of access to particular tests should not be allowed to block access to treatment.

Where resources are limited, there is much that can be done by following strategies for reducing the cost of tests, exploring the use of cheaper alternatives, and limiting the use of tests to where they can be of most value.

Even expensive tests like viral resistance tests may eventually be justified if they lead to cessation of ineffective or damaging treatment, or can be used to monitor what is happening at a population level.

While blood tests are useful, there may be risks in 'treating the test' rather than treating the patient. When tests do become more widely available, patients may need help to understand their limitations as well as their value in guiding treatment.

Most of the emphasis in treatment guidelines has so far been on short term monitoring for drug safety and efficacy. Longer-term problems have emerged in settings where ARV treatment is established. These may point to the need for monitoring of a wider range of potential problems as new populations gain access to treatment.

### Clinical monitoring

Clinical monitoring requires that the patient is examined regularly, and is asked to report on any possible signs or symptoms that may relate either to an illness or to its treatment.

WHO guidelines stress that monitoring begins before a patient starts on a course of treatment and should continue, probably with monthly routine clinic visits, for as long as treatment continues. It includes a discussion with the patient of their medical history, their present condition and how it may be changing.

Later, it includes asking if the patient is actually taking any treatment that has been prescribed for them, and if they are having any problems in taking it. And it includes a full and careful physical examination and recording basic information such as the patient's weight.

Paediatric HIV clinicians with patients on ARVs benefit from being able to plot the weight of the child against a growth reference standard. Monitoring growth is a useful index of response to therapy as faltering growth can be an early warning of treatment failure. An equally important reason to monitor children's weight is to ensure they receive the correct doses of any medicine they are prescribed!

Four questions that are always in the doctor's mind are:

- Does the patient have a condition, or a change in condition, that may require further investigation?
- Is the treatment causing unwanted effects that should be explained to the patient and may require a change in the treatment offered?
- Does this patient have another condition (such as an opportunistic infection) that may require additional treatment?
- Is this the right treatment and is it working for this patient?

The first way to answer these questions is through asking the patient. This may also give valuable clues to whether the patient will continue taking the treatment they have been prescribed. As discussed in HATIP #5 [here](#), if the patient is having problems and blames the treatment for them, they may be tempted to stop treatment. If they feel their health is declining, despite the treatment, they may lose confidence in it. Another point made in that issue was the need for discussion of complementary therapies, especially where these may interact with medical treatment.

Monitoring for the development of active TB signalled by weight loss, coughing, fever/night sweats may be an important element in clinical monitoring in many settings. Nonetheless, it is always necessary to keep a balance between suspecting TB and remembering that these symptoms may have other causes.

Any diseases that are overlooked when they ought to be treated can undermine the patient's confidence in the treatment they are receiving. Oral examination for candida is an example of a simple action to check for a treatable condition.

VAN OSCH: Apart from listening to the concerns of the patient, it's important to clearly explain why something is happening and whether it is HIV related or caused by the medications. Patients are always scared that symptoms are indicating a worsening of their HIV condition, whereas many complaints are the result of minor/normal diseases. Once it is clear that a complication is not HIV/drug related it is important to re-assure, explain if it will go away or not, and what they can do to speed up this process. Patients need to feel that they have power over their own treatment and body functioning for as long as possible.

### Monitoring sexual and reproductive health

Where people with HIV are sexually active, whether with one partner or with multiple partners, asking them about their sexual behaviour and any symptoms that may indicate sexually transmitted infections may be important for their own health and for their partners'.

Treatment should be offered promptly in accordance with nationally or locally agreed guidelines, e.g. for syndromic management of STIs.

If women are seeking to become pregnant, or to avoid becoming pregnant, this may also influence the treatment advice that should be given to them. For example, efavirenz is not considered safe in pregnancy. There is limited evidence on the effect of ARVs on

hormonal contraceptives, which may need to be reviewed if a woman is relying on implants or oral contraceptives to avoid pregnancy.

## Blood tests

A number of blood tests are strongly recommended in WHO and other guidelines to check whether treatment is working and give early warning of major health problems, some of which may be due to drug toxicity.

Where resources are limited, one of the most important questions is: how far can clinical monitoring take the place of expensive and hard-to-access laboratory tests?

Supporting the patient in taking their treatment consistently, and making sure the patient understands and is able to act on the advice they have been given, is more important than any blood tests in ensuring that the treatment is effective.

If the patient feels they have to choose between paying for tests and paying for treatments, then it may be better to take the treatment consistently and go without the tests for longer periods of time.

Tests which are used routinely in some settings may be better reserved to check on clinical impressions in other settings, i.e. used when something appears to be wrong.

## Safety tests for side-effects

WHO recommends as an absolute minimum a test for anaemia and a confirmatory HIV antibody test, before starting HIV treatment. However, if possible, tests should go beyond this, to cover:

- Haemoglobin or haematocrit tests, to check for anaemia. Anaemia is not infrequent when AZT (zidovudine) is used as a first-line treatment in people with advanced HIV disease. If anaemia develops, this may require further investigation, treatment and a switch to another ARV drug combination. However, mild anaemia which may exist before ARV treatment begins can improve on ARVs, even on combinations that include AZT.
- A white blood cell count and differential (to provide a total lymphocyte and neutrophil count). This too has particular relevance to AZT, which can suppress white blood cell counts.
- Liver function tests such as ALT - which look for early signs of damage to the liver, through the presence in the blood of enzymes released by the liver. Whatever the cause of abnormal values - drug toxicity or an infection such as hepatitis B this may increase the risk of antiviral drug toxicity and require closer monitoring and/or a change of treatment. Protease inhibitors, nevirapine and to a lesser extent efavirenz all carry risks of hepatotoxicity.

In the case of nevirapine it is advisable that liver function tests are carried out at baseline and weekly for the first two weeks on this drug - which clearly goes beyond WHO's suggestion that a first clinic visit should be set for a month after starting on ARVs.

- Renal function; creatinine. These tests may be particularly important if drugs that are known to have a possible effect on the kidneys, such as the protease inhibitor indinavir or the nucleotide analogue drug tenofovir, are to be used.
- Amylase. This is an enzyme produced in the pancreas and released into the bloodstream when pancreatitis occurs; it can help diagnose this very serious condition, which has been linked to ddI (didanosine), d4T (stavudine) and, especially in children, 3TC (lamivudine).

- Blood lipids and glucose levels. Monitoring levels of cholesterol and triglycerides may be especially important when protease inhibitors, d4T or efavirenz are to be used. High glucose levels may indicate diabetes. The potential significance of these metabolic problems is discussed later on in this article.
- Lactate levels. There is no value in measuring blood lactates at baseline or on routine visits, but rapid access to the test may be vital in identifying lactic acidosis. This life-threatening condition is most likely to occur when d4T is combined with ddI, especially in pregnant women, less frequently when d4T is used in other combinations. It is often associated with hepatomegaly (liver enlargement) and steatosis.

CONRADIE: Access to blood lactate is very important. In South Africa unfortunately the cheapest nucleoside analogue combination is d4T and ddI. When finances are a problem then they are co-prescribed. I know also that they are given together in the Botswana programme. We have a saying in our unit: "beware the vomiting patient on ARVs!" We have had about 25 cases of lactic acidosis or symptomatic hyperlactataemia, most with ddI and d4T together but all with d4T, and have a very low threshold for doing a lactate.

In patients with limited resources I do an FBC, AST, ALT and a CD4+ count only. I do not use nevirapine if I cannot get two weekly AST and ALT [liver function tests]. If I am using AZT then I bring the patient back to check their haemoglobin and to exclude immune reconstitution syndromes at 6 weeks and then do a full review at 4 months.

WILSON: Haemoglobin with white cell count and differential are the only monitoring tests I do long-term for patients on AZT, and I check the ALT 3-4 times during the first eight weeks of nevirapine treatment. Steatosis (usually d4T-related) can be screened for clinically by checking for hepatomegaly. I do a urine dipstick to check for diabetes developing in patients on a PI, with lipids and triglyceride once yearly. Luckily all these tests can be done through the state hospitals in KwaZulu. Probably the most essential test to have urgent access to is the lactate level for suspected lactic acidosis. Many hospitals can do this test as part of the blood gas analysis.

## Blood tests to monitor the immune system

CD4 counts are still expensive and hard to access in most settings but are valuable in targeting treatment among people with HIV (OI prophylaxis as well as ARVs).

They can show if treatment is working, as CD4 counts rise during successful treatment, typically by about 100 during the course of the first 6-12 months, and continue to rise for as long as viral load is suppressed.

It is equally important that CD4 counts can show if treatment is not working, although this may be evident clinically through a loss of body weight.

WHO suggests that treatment failure could be recognised as a return of the CD4 count to the baseline value on starting treatment, or a 30% decline from the peak value reached while on treatment.

CD4 counts vary during the course of the day morning values are lower than afternoon ones. It therefore is best to have blood taken at the same time of day and tested in the same lab with the same test system every time.

## Reducing the cost of CD4 counts

A cheaper but much less accurate indication of CD4 counts can be obtained using total lymphocyte counts, although most of the

literature on this so far is limited to using it to decide when to start ARV treatment, rather than to judge the success or failure of that treatment. Others have explored options such as reducing sample sizes to spread the cost of the reagents.

The French ANRS has worked with researchers in several west African countries to evaluate DynaBeads. This microscopy-based system can give accurate CD4 counts with low equipment costs, though its labour-intensive nature is problematic. Staff have to be trained (which ANRS finds to be manageable) and then motivated to undertake very tedious work without loss of accuracy (which many who have used the system say is a serious problem). Reagent costs are only in the region of US \$5 per test.

A flow-cytometry based system called pan-leucogating has the potential to reduce the number and range of reagents used and at the same time improve the accuracy of testing. Potentially, the cost per test could be under US \$2 a time. A key patent on this technology has recently been granted to the South African National Health Laboratory Services and a licensing agreement has been reached with the US-based diagnostics firm Beckman Coulter International. This agreement aims to provide training and technical support to users in South Africa and many other countries which could benefit from this technology.

## Perspectives on CD4

**WILSON:** The only time I really want a CD4 count for patients on ART is when it's necessary to decide if prophylaxis for OIs can be stopped; the rest of the time I can live without the numbers and prefer to see how my patients are doing clinically.

**VAN OSCH:** Depending on clinical parameters however means a slow response to a deteriorating immune system, because symptoms might appear only when CD4 counts have reached alarmingly low levels.

Small reductions in CD4 counts could be the result of a myriad of reasons, like recent minor infections, stress, poor diet, bad adherence, and can often be improved again with proper counselling and advice. When testing frequently for the purpose of monitoring, it also means every time we as doctors think we should make a treatment decision, whereas in most cases a less frequent testing policy prevents us from taking overzealous decisions and so provide comparable (if not, in the long term, better) overall treatment for our patients.

**GAZZARD:** The main advantage of monitoring is in fact the positive reinforcement of adherence. There is no doubt about [the value of] monitoring according to western guidelines but it would be impossible for many communities in developing countries. The DART study is looking at no monitoring at all but I think one could well argue in a really resource poor setting, that monitoring the weight and twice a year CD4 counts would be enough [to check that treatment is continuing to benefit the patients].

**PRABHU:** The costs of CD4 counts are borne by the patients, unless they are part of certain research studies conducted by a few central government organisations. The vast majority of patients do not get funded. There is nobody to pay for these tests other than the patient - there is no winning argument. Economics and financial viability of the patients is largely the deciding factor!

## HIV viral load tests

Although, as WHO stresses, it is prudent to check that a patient is actually HIV positive, before starting on treatment, the HIV antibody test does not give useful information for monitoring treatment.

Viral load tests are even more expensive than CD4 counts, although prototypes of cheaper versions of these tests have been developed. These are of greatest value in showing whether ARV treatments are working, as the goal of ARV treatment is to suppress the production of the virus in the body to 'undetectable' levels. However, low but detectable virus levels do not always need ARV treatment adjustments. Extra attention to adherence and other possible causes for elevated virus levels should be looked at first, to arrive at proper treatment decisions for the long term.

The form of viral load test used in Western medical practice depends on looking for viral genetic information (RNA or DNA). It depends on equipment that requires specialised technical support, highly trained personnel and regular maintenance, which takes a lot of lab space and must be operated under strictly controlled conditions. The system is highly vulnerable to contamination between specimens.

The guidelines of the Southern African HIV Clinicians' Society nonetheless recommend using viral load tests to monitor patients. They highlight four laboratory methods for determining viral load: Amplicor PCR, Branched DNA, NucliSens, and LCx. Comparable results are obtained with the first three methods; experience is currently more limited with the LCx assay. It is recommended that the same method be used for sequential testing in an individual patient.

Treatment failure is defined with reference to viral load, as:

- A sustained increase in VL >5 000 copies/mL.
- A decline in VL of less than 1 log within 6-8 weeks after commencing antiretroviral therapy.
- A sustained increase in VL of > 0.6 log from its lowest point or a return to 50% of pre-treatment value.

Several factors can influence the measurement of HIV viral load. It is strongly recommended that the decision to alter therapy should be based on the results of at least two consecutive viral load measurements performed at least one week apart.

(This is a reference to 'blips' temporary small rises in viral load above 'detectable' levels, which may have no clinical significance. Viral load can also rise temporarily due to vaccination or an infection, without long term consequences.)

Properly prepared samples can be shipped to regional (or international) reference centres. This reduces the cost, but has little impact on dependability. This may require cooled shipment, but in most settings there is already a cold-chain system in place for transporting vaccines.

An alternative that some have been using is to test dried blood spots, collected on filter paper, which are even easier to transport.

**VAN OSCH:** Testing 6 - 8 weeks after initiation of treatment is often not financially feasible, but should not be postponed much later than 3 months. The first 2 or 3 tests post initiation should be done every 3 - 4 months but once adherence is good, and results stable, can be spread to 6 - 9 month intervals, without negative consequences for most patients.

Clinical parameters should of course be evaluated at regular (monthly) intervals.

A 0.5 log or 3 fold change in viral load still seems very useful in monitoring.

A one week interval is often not possible because of financial restraints.

And by testing after 2 or 3 months likewise one reduces the measurement of blips and it gives a chance to evaluate renewed attention to adherence.

## Lower cost alternatives?

A possible cheaper alternative to these tests is to measure the viral protein p24. For these tests to be reliable, it is necessary to heat the blood so that antibodies which mask the p24 from most test systems are cleared out of the way. The equipment for such tests is compact and no more complex than ELISA antibody tests. However, these tests are not precisely equivalent to RNA tests and may not be as sensitive to low levels of active virus in the body.

Another alternative is to use a test designed to measure levels of the viral enzyme reverse transcriptase. This test may be closely equivalent to RNA viral load, as it corresponds quite closely to the number of virus particles circulating in the blood. However, it is not as sensitive to low levels of the virus as the established tests.

Viral resistance tests are generally even more expensive than viral load tests. They may either test the ability of the virus or a viral enzyme to work in the presence of a drug or look for particular mutations known to enable the virus to avoid particular ARV drugs. WHO suggests these may have a place in central laboratories, used to monitor levels of drug resistance in communities.. In due course, however, there will be cheaper viral resistance tests and their use will spread.

## Perspectives on viral loads

CONRADIE: In terms of viral loads, I only do a viral load at 4-6 months. If this is not detectable then the patient is being adherent and is on the correct regimen. Initial viral loads are only of value to say that the patient's virus is detectable at the outset. A patient with a CD4+ count of less than 200 or symptomatic disease will need therapy anyway. Most patients, including children, will reach <50 copies at 4-6 months.

WILSON: Viral load is "nice to have", but immune failure due to viral rebound can be picked up clinically. I worry about the time lag between viral rebound and clinical immune deterioration, and also about the sexual transmission of resistant virus. Ongoing education about safer sex seems to be the best way to tackle this problem.

ROUX: Where viral load assays are available but too expensive for routine use, freezing serial samples (at start of therapy and every 4 months, for example) or storing serial 'blood spot' specimens may be a cheaper option. The lab is only called upon to perform viral load assays when clinical monitoring or CD4+ counts suggest virological failure.

LEE: In Malaysia where viral load assays are available free only in two government hospitals, we have to depend heavily on CD4 and clinical parameters e.g. weight gain, clinical signs, sense of well being, etc. for treatment monitoring. I normally suggest to my local colleagues to AT LEAST check the viral loads twice in the first 6 months and if viral suppression is indeed achieved (VL < 50 copies/ml), I subsequently monitor mainly using the CD4 count with viral loads done only when there is uncertainty with progress (a drop in CD4 or if the patient is unwell).

Ensuring good adherence/compliance is crucial to ensure that every patient on HAART obtains maximal benefit. There is good data to show that if adherence is good/excellent eg. > 95%, a substantial majority of patients will actually achieve VL below levels of detection. In these cases we may minimise VL testing to either 6 monthly or even yearly. In this way, we can conserve the patient's finances to purchase ARVs rather than for the expensive blood tests.

## Metabolic changes

As treatment programmes become more widespread and individuals are on treatment for longer periods, it is likely that metabolic problems will become more prominent in HIV medicine. Despite several years of studies, there is still no simple and agreed definition of what is often called 'lipodystrophy' and no simple consensus about the metabolic changes which are linked to it. This is a complex issue, which will be covered at greater length in future issues of HATIP. How important it will be in the populations that are most heavily affected by HIV, especially in Africa, remains to be seen.

In particular, there are concerns about:

- Loss of subcutaneous fat on the face and limbs ('lipoatrophy'). This has been shown to occur more rapidly with d4T (stavudine) although it can occur with ARV combinations that do not include d4T. It generally appears after the first 24-48 weeks on treatment. In itself, it may not be a medical problem, but if it makes someone look 'unwell' it can be a serious social problem. The extent to which it is or will be a problem among African populations of people with HIV may still be unclear, but it has certainly occurred among European, North American and South East Asian people on treatment. In Europe and North America, cosmetic treatments for facial wasting are becoming available, but these are likely to be unaffordable in most settings.
- Accumulation of central fat, which has been associated with protease-inhibitor-based combinations, but has also been reported in cases of people treated sometimes for short periods with combinations that do not include protease inhibitors. Among women, this may mean breast enlargement, which can be uncomfortable and cause anxiety. There may be cultural differences in the acceptability of weight gain, but in every setting, individuals will attach different levels of importance to physical changes, and some will be much more aware of and concerned about such changes than others.
- Insulin resistance a precursor of diabetes which may lead to increased risk of more serious forms of diabetes and associated illnesses. Urine tests and/or a test for serum glucose levels can be used to detect this, and should be done at least every 6 - 9 months.
- Raised blood levels of cholesterol, associated with an increased long term risk of heart disease. It remains unclear, whether this will translate into an actual problem with heart disease. Some argue that if other risk factors (family history, smoking) are absent or, where possible, controlled, then the risk may be small.
- Raised blood levels of triglycerides, which increase the risk of pancreatitis, especially where ddI (didanosine) is being used.

VAN OSCH: Although important, changes in lipid (or even glucose) levels mostly do not cause acute danger. Monitoring every 6-9 months seems sufficient, especially because increases do not always need acute medical intervention, apart from dietary/exercise adjustments and after re-evaluation maybe changing the medication. In resource-limited settings there are often no funds for lipid lowering treatments.

When loss of facial subcutaneous fat occurs patients tend to come very quickly and indeed fast action is indicated. Changing from d4T or from a PI-based to non-nucleoside regimen has helped quite a few patients.

In the Caribbean it is healthy to look "fat", so abdominal fat deposits and even a small buffalo hump might be cosmetically

acceptable, but a "skinny" face looks sick and people respond quickly to it. Western trained doctors working in other parts of the world should adapt to locally acceptable cosmetic features, and not impose their own cultural beliefs/emotions towards issues of what is cosmetically preferred.

## Bone disorders

Bone disease may take the form of osteonecrosis (death of living bone tissue) or osteoporosis (loss of calcium from the bone, making it more vulnerable to fracture). This is relatively rare in comparison to lipid and glucose changes. The most common manifestation of bone disease in Europe and North America is as damage to the upper femur, leading in some cases to hip replacement operations an unaffordable solution in most settings. There are well-known ethnic differences in the risk of osteoporosis, with Caucasian populations being at higher risk than Black African ones, so it may be that the HIV/ARV associated risks of the disease will also vary.

Bone disease is an example of an emerging problem where it is hard to be sure if the cause is a direct effect of ARV treatment, the result of people with HIV living longer so that more subtle effects of the disease become apparent, or possibly the result of a chronic nutritional deficiency brought about by the treatment and/or the disease. There have also been suggestions of a link between bone disease and the metabolic problems previously mentioned.

Advisory panel member Vijay Anthony Prabhu reports that he is seeing an increasing number of patients on ARVs with bone problems in southern India, which indicates that clinicians should be alert to local variations in the incidence of drug side effects.

VAN OSCH: Effective testing for osteoporosis is mostly unavailable in resource-limited settings and additional treatment mostly too costly. In general it is healthy to counsel for proper diet and regular exercise regimens, which can reduce the risk for bone disease.

## Monitoring in perspective

TUMUSIIME: Tests before and during therapy are obviously the way to know for sure 'where you are going' in the course of therapy. However, the experts need to come up universally and say that another option for the developing world could be syndromic monitoring for those who can only afford ARVs but can't afford the tests. Take the example of a father of four children, who is living with the virus, who said: "I am the bread winner at home. If I don't take the drugs I may die, then what will happen to these innocent ones whose mother passed away two years ago? I have no money for the tests, but I can sacrifice for the drugs". Such people are living in a world of uncertainty.

CONRADIE: We, as Africans seem, to be hamstrung by the developed world's paradigm of antiretroviral therapy. I feel that many problems are created by the fact that if we cannot have everything, i.e. access to every type of safety monitoring, then we can have nothing at all. Most of my patients will accept that if they can have treatment with reasonable safety the risks of the treatment are worth taking. When I see a woman who has three children under the age of ten, and all she wants is to see them into late teenagerhood, and I say that she cannot have lifesaving treatment because I cannot do three-monthly viral load tests that are the same price as her monthly salary ... it becomes more than a little ridiculous.

PRABHU: The positive effects of treatment are very evident clinically, when patients stop falling sick and doing well, in contrast to the others. CD4 counts and viral loads in this context impose an

additional burden economically to the already stretched purse. So, we perform these measurements once in 6 months to a year, more often if patients are on ARV medication and still deteriorating clinically. Otherwise, we may even defer doing these tests as long as patients continue to take their medications and improve clinically. Routine and repetitive monitoring only feeds the labs, it is much simpler to check clinical parameters.

Regular clinical monitoring as opposed to laboratory monitoring is stressed. Certain "HIV physicians" regularly make their patients do CD4 counts/viral loads as if they were taking a bus ride into town, even if the patients are asymptomatic. A fear psychosis is unduly imbibed into patient's minds as a result. "Doctor, my CD4 count dropped 50/60 compared to last year&"

Some patients on ARV expect their drugs to work miracles and feel upset that after spending so much of money on drugs and testing for viral loads and CD4 counts, they are still falling sick and not becoming all right. Add to this the battery of tests that may be needed to pick up complications of therapy or to diagnose opportunistic infections and it is a very expensive business indeed! In fact we have come across instances where the patient's relatives fight amongst themselves, as to who has to bear the expenses and very often take the patient, who is caught in the middle, to a [poorly resourced] government hospital and let the system run its natural course.

VAN OSCH: From the start, one has to emphasize open communication, where one indicates that the only way to effectively assist the patient is when they feel free to ask any question, but also tell of any problem they encounter with the medicines/treatments, and indicate whichever complementary treatments/supplements/herbs they take or intend to try. What is important at the end of the day, is that as physician you feel comfortable that the treatment you suggest is effective, but the patient should also feel comfortable and in power (not confused) with what is going on.

I have felt it of utmost importance, to "individualize" the monitoring and treatment along general guidelines, instead of treating according to strict protocols. It seems as if many doctors only feel comfortable when they can work along protocols and are scared to miss out on something. Obviously, protocols help in the beginning to set the guidelines for yourself, but once you gain some confidence and see how well people can do with simple adherence tricks, listening and support, one can safely reduce monitoring frequency with most patients without jeopardizing their success for the future.

Still, with support for their adherence strategies, many continue to do very well for extended periods of time, which means that in the beginning, and if clinical parameters indicate I would monitor their CD4 and Viral Load every 2 - 3 months, but once they are doing well tend to go to every 6 - 9 months. I do the general blood tests when clinical symptoms indicate the need but usually every 6 - 9 months.

I see all patients every month and that way we can keep a close eye on their clinical parameters and problems with adherence. Social and psychological problems have major effect on adherence and require special attention.

Obviously in resource limited settings one has to make do with what one has. Some patients have the means to do more frequent monitoring, and only feel comfortable when they do this exactly according to the protocols. Most however do just as well with less frequent expensive blood testing, once there is an open relationship with the doctor, regular (monthly) clinical monitoring, and a strong emphasis on and support for adherence issues.

It is indeed not always necessary (or in the long term may be harmful) to change a treatment when tests seem worse than before. Monitoring means evaluating the disease in a patient, not jumping to quick conclusions which will make the treatment erratic and confusing. In the long term patients might lose out on viable options thrown overboard based on quick decisions.

In the end it is important to sit and listen to your patient, plus give guiding advice, instead of doing magical blood-tests all the time, setting you and your patient up to treating lab-results instead of the person living with HIV/AIDS.

### Further resources on aidsmap

[A to Z of medical tests](#)

[Lactic acidosis/acidemia](#)

[Monitoring where resources are limited](#)

including:

[Monitoring the immune system](#)

[Monitoring drug side effects](#)

[Monitoring the virus](#)

## about HATiP

A regular electronic newsletter for health care workers and community-based organisations on HIV treatment in resource-limited settings.

The newsletter is edited by Theo Smart (Cape Town) and Keith Alcorn, NAM's Senior Editor (London).

For further information please visit the HATIP section of [aidsmap.com](http://aidsmap.com)