

## Aids and HIV

Acquired immunodeficiency syndrome, or AIDS, is a chronic and potentially fatal disease caused by the human immunodeficiency virus (HIV), which attacks a specific type of white blood cells known as T-lymphocytes. It is measured in the blood as the CD4 count. The lower the CD4 count, the weaker the immune system. As the immune system grows weaker, people with HIV and AIDS are susceptible to infections and cancers that the immune system would ordinarily fight off. About 39 million people throughout the world are infected with HIV. A massive research effort has produced better treatments, resulting in longer survival and improved quality of life for those with access to the treatments. But there is still no vaccine or cure.

## Signs and Symptoms

Symptoms of infection with HIV can vary. Often a flu-like syndrome occurs in 50 to 80% of those who contract HIV within the first 2 - 6 weeks, including a combination of the following symptoms:

- Fever
- Sore throat
- Swollen lymph nodes
- Joint pain
- Muscle aches
- Rash
- Mouth ulcers
- Nausea
- Diarrhea
- Headache

After you are infected with HIV, you may remain relatively symptom-free for years or the disease may progress more rapidly. In this stage, the CD4 count is below 500/microliter. You may develop infections or chronic symptoms including:

- Swollen lymph nodes
- Diarrhea
- Weight loss
- Fever
- Cough and shortness of breath
- Low platelet count, which may manifest as easy bruising, bleeding gums, or nose bleeds

During the last stage of the disease, HIV infection may meet the official criteria for AIDS, which is the presence of an opportunistic infection (such as *Pneumocystis carinii*)

pneumonia, or PCP) or a CD4 count below 200/microliter. At this stage, symptoms may include

- Pneumonia, including PCP
- Tuberculosis
- Night sweats
- Persistent fatigue
- Extreme weight loss and wasting, exacerbated by diarrhea. Up to 90% of HIV patients worldwide experience diarrhea
- Meningitis and other brain infections
- Fungal infections
- Syphilis
- Malignancies such as lymphoma, cervical cancer, and Kaposi's sarcoma (KS) (affects the skin and oral mucosa and may spread to the lungs. KS can actually occur in earlier stages of HIV as well)

## What Causes It?

Infection by the human immunodeficiency virus (HIV) causes AIDS. HIV is spread primarily through sexual contact, and also through blood-to-blood contact, needle sharing among intravenous drug users, and in pregnant women, from mother to child. Seventy percent of HIV transmission occurs through sexual contact. Blood transfusions and blood products caused many infections in the early years of the epidemic, but screening procedures have nearly eliminated this risk in the United States and other developed countries. A mother can spread the virus to a newborn during delivery and through breast feeding, although drug therapy available in the developed world can greatly reduce the risk to infants.

Risk factors include:

- Having unprotected sex (without using a condom) and having more than one partner, whether you are heterosexual or homosexual
- Having another sexually transmitted disease
- Using intravenous drugs and sharing needles

## What to Expect at Your Provider's Office

If your health care provider suspects HIV infection, you may receive a "rapid test," which can give a result in 20 minutes. If the test is positive, he or she will order a blood test to detect antibodies against the virus. If this test is positive, the doctor will order a CD4 count (see above) and a viral load (an indication of the amount of virus present). This information, along with your symptoms, helps see what stage the disease is in and assists your doctor in determining the best course of treatment for you, including the appropriate

tests and medications. For example, if you are experiencing shortness of breath, a chest x-ray will likely be ordered, particularly if your CD4 count is low. Some symptoms and tests may require evaluation in the hospital.

HIV tests may not be accurate immediately after you are infected, because it can take up to 12 weeks for your body to develop antibodies against the virus. If you suspect you have been infected and your test is negative, you may need to be retested after a short time to confirm the result.

If you do test positive for HIV, you will be asked to tell your sexual partners immediately so they can also be tested.

## Treatment Options

There are valuable medications that slow the progression of HIV infection to full-blown AIDS. Generally, a combination of these medicines, including a type called protease inhibitors, is used. In addition, antibiotics and other therapies are used to prevent or treat specific complications. It is important to have your care directed by a doctor who specializes in HIV. Your health care provider will know the most effective treatment for you, including the most current medical regimen, what alternative treatments are safe, and which combinations may be harmful. If you are using any alternative therapies to complement your medical regimen, be sure to share this information with your doctor.

## Drug Therapies

A combination of drugs is used in an effort to treat HIV very aggressively, with the aim of reducing the amount of virus in your blood to very low or undetectable levels, and to suppress symptoms for as long as possible.

Antiretroviral drugs help slow the progression of HIV by inhibiting the reproduction of the virus in your blood. It's important to keep a steady dose of antiretroviral drugs in your body to prevent the virus from developing resistance to the drugs. Antiretroviral medications include:

- Protease inhibitors (PIs) stop an HIV enzyme from replicating. This class of drugs includes saquinavir (Invirase), nelfinavir (Viracept), ritonavir (Norvir), tipranavir (Aptivus), indinavir (Crixivan), amprenavir (Agenerase), and atazanavir (Reyataz). Newly approved is darunavir (Prezista), which is used in combination with other drugs for people who have not responded to treatment. A combination of ritonavir and lopinavir (Kaletra) is among the most prescribed protease inhibitors. Protease inhibitors are considered the most powerful of HIV drugs and often interact with other medications, so they must be monitored carefully.

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- Nucleoside analogue reverse transcriptase inhibitors (NRTIs) also stop a particular HIV enzyme from replicating. These drugs were among the first to be developed and include zidovudine or azidodeoxythymidine (Retrovir or AZT), lamivudine (Epivir), didanosine (Videx), abacavir (Ziagen), stavudine (Zerit), and zalcitabine (Hivid). Emtricitabine (Emtriva) is a newer drug in this class and is taken with at least two other HIV medications. Combinations of several other drugs are also available. All have side effects that must be monitored by your doctor.
- Nucleotide reverse transcriptase inhibitors (NtRTIs) work similarly to NRTIs but act more quickly. So far there is only one drug in this class, tenofovir (Viread), which seems to be effective in people who develop resistance to NRTIs.
- Non-nucleoside reverse transcriptase inhibitors (NNRTIs) stop the virus from making DNA, so that it can't replicate itself. There are three drugs in this class: nevirapine (Viramune), efavirenz (Sustiva), and delavirdine (Rescriptor). They are often used if people cannot tolerate the side effects of protease inhibitors, want to delay protease inhibitor therapy, or if they have taken protease inhibitors but did not experience a drop in levels of the virus. Many of these drugs are cross-resistant, meaning that if you develop resistance to one drug in this class it's likely you will be resistant to all.
- Fusion inhibitors prevent the HIV membrane from fusing with the membrane of healthy cells in your body. Enfuvirtide (Fuzeon) is often used in combination with other drugs in people who have become resistant to other medications. It must be administered by injection.

In addition, any opportunistic infections are treated with the appropriate medications, or in some cases medications are given to prevent the infections from occurring (prophylaxis).

## **Complementary and Alternative Therapies**

Many people with HIV turn to complementary and alternative therapies to reduce symptoms of the virus, lessen side effects from medications, improve overall health and well-being, and for a sense of empowerment by being actively involved in their own care.

Different therapies are used to:

- Inhibit the virus
- Treat symptoms of the virus or side effects of medication
- Treat or prevent opportunistic infections

Since the major impact of HIV is that it leaves patients vulnerable to opportunistic infections, making adjustments to ensure your overall health through improving stress reduction, exercise, and building a social support network can significantly boost immune function. In fact, these actions are some of the most powerful tools a person has to impact

the course of the disease. Other changes, such as improving oral and general hygiene and limiting exposure to environmental pollutants, can also bolster your health and vitality. These small steps can add up to a longer and healthier life for many people.

However, HIV should never be treated with alternative therapies alone. It is extremely important that you share information on your use of complementary and alternative therapies with your doctor, so that your doctor can help you determine what is safe and appropriate.

## **Nutrition and Supplements**

Vitamin C can inhibit the virus in test tubes, although it has not shown the same effect in the human body. It can help boost the immune system, however. Very high doses of vitamin C are sometimes used as supportive therapy. The dose must be determined and monitored by your doctor.

N-acetyl cysteine or NAC (800 mg per day), an amino acid, may also slow the growth of the virus in test tubes, though study results have been mixed on whether it reduces the level of virus in the body. It does help the body synthesize glutathione, an antioxidant found in the body that is often low in people with HIV or AIDS. NAC may also help with AZT side effects.

Because of the loss of appetite, people with HIV have low levels of some essential vitamins and nutrients, including:

- Vitamin A and beta-carotene -- these are often deficient in people with HIV, and low levels of vitamin A may be associated with lower CD4 counts. A high supplemental dose may be beneficial, but very high doses have been associated with higher death rates from AIDS. Your doctor must determine the proper dose for you, and, since high doses can damage the liver, monitor your liver function.
- B-complex vitamins (75 - 100 mg per day). Low levels of vitamin B12 and B1 (thiamine) in people with HIV have been linked to lower CD4 counts and neurological problems. B6 deficiency has been associated with poor immune function. A type of B3 (niacinamide) seemed to slow the progression of HIV.
- Vitamin E (400 IU two times per day) may help reduce side effects of AZT while improving the drug's effectiveness, although evidence is slight.
- Selenium (100 - 400 mcg per day) needed for the immune system to function properly, and higher levels of selenium in the body may help boost CD4 counts. Some studies have shown results with 400 mcg per day. At this dose, however, you must be monitored by your doctor.
- Zinc (45 mg per day) may boost the immune system and help prevent opportunistic infections, but there is also some evidence that zinc can be harmful for HIV infection. Talk to your doctor to see if you are deficient in zinc before taking it.

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- Iron is often deficient in people with HIV. Your doctor must determine and monitor the proper dose because too much iron can increase bacterial infections.

Weight loss can be a serious problem for people with HIV. This symptom may begin early in the course of the disease and can increase the risk for developing opportunistic infections. Weight loss is exacerbated by other common symptoms of HIV and AIDS, including lesions in the mouth and esophagus, diarrhea, and poor appetite. Over the last several years, weight loss has become less of a problem due to the new protease inhibitors used for treating HIV. Reduction of muscle mass, though, remains a significant concern. Working with a registered dietitian to develop a meal plan to prevent weight loss and muscle breakdown is extremely helpful. Resistance training (lifting weights) can also protect against muscle breakdown and increase lean body mass.

Preventing diarrhea and ensuring that the body absorbs enough protein to maintain muscle strength has become a major goal of HIV/AIDS preventative care. One program for combating diarrhea includes using soluble fiber (not insoluble fiber, such as Metamucil and psyllium husks). For some people, soluble fiber can help food stay in the digestive tract for longer periods of time, increasing the amount of nutrients that are absorbed, and lessening bowel frequency. Good sources of soluble fiber include apple pectin, oat bran, and flax seed. Because diarrhea can be a potentially life-threatening situation, soluble fiber therapy should be used under the strict supervision of a trained professional.

Using certain supplements may help in maintaining body weight. A well-designed study compared the use of a daily supplement regimen that included enormous amounts of the amino acid glutamine (40 g per day), along with vitamin C (800 mg), vitamin E (500 IU), beta-carotene (27,000 IU), selenium (280 mcg), and N-acetyl cysteine (2,400 mg) to placebo. People who took the supplements gained significantly more weight after 12 weeks than those who took the placebo.

Another study found that a combination of glutamine (7 g per day), arginine (7 g), and an amino acid derivative called hydroxymethylbutyrate or HMB (1.5 g) helped people gain lean body weight during 8 weeks of treatment compared to placebo. High doses of arginine however, may be linked to an increase in herpes viral outbreaks. To find the right dose that offers benefits without dangerous side effects, consult with a trained nutritionally oriented physician.

Other supplements sometimes used for supportive treatment include:

- Dehydroepiandrosterone or DHEA (200 - 500 mg per day) is a hormone that is often low in people with HIV. One study found that DHEA supplements improved minor depression with no serious side effects. Because DHEA is a hormone, you should not take it without your doctor's supervision.
- Coenzyme Q10 (200 mg per day) appears to help improve immune system function and slow progression of the disease.

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- SAME or S-adenosyl-L-methionine (intravenous dose of 800 mg per day) is used to treat AIDS-related myelopathy (diseases that affect the spinal cord).
- Injections of vitamin B6 and B12 can dramatically improve neuropathies (damage to peripheral nerves) associated with some HIV medications such as Zerit.

## Herbs

You may use herbs as supportive therapies, but you should never use them alone to treat HIV or AIDS. It is important that you keep all of your health care providers informed of any treatments, conventional or alternative, that you are taking so they can monitor interactions and side effects, and provide the best care.

A few herbs have antiretroviral effects, though none are as effective at reducing the level of virus in your blood as conventional drugs. Herbs that have antiretroviral effects include:

- Boxwood (*Buxus sempervirens*) was studied before many conventional drugs were developed to treat HIV. A special extract of stems and leaves given in the amount of 990 mg per day slowed the progression of the disease and decreased levels of virus in the blood. No side effects were reported, although high doses of a substance found in boxwood can cause muscle spasms and paralysis. For that reason, and because only the extract of boxwood has been evaluated for HIV, you should only take boxwood under your doctor's supervision.
- Licorice (*Glycyrrhiza glabra*) -- Two studies used an extract of licorice, which appeared to slow growth of the virus. Because the amounts used are high and large doses can have serious side effects including high blood pressure, you should only take licorice under your doctor's supervision. Do not take licorice if you have high blood pressure, kidney disease, or heart failure.
- Turmeric (*Curcuma longa*, 1.5 - 3 g per day) -- Some test-tube studies suggest turmeric and its active ingredient curcumin can slow replication of the virus. In a human study, turmeric appeared to increase CD4 counts.

You may also use herbs to support the immune system. They may include:

- Andrographis (*Andrographis paniculata*) -- A pilot study found that components of andrographis increased CD4 counts and decreased the amount of virus in the blood, but caused potentially dangerous side effects. Because of that, you should not take andrographis without your doctor's supervision.
- Korean red ginseng or Asian ginseng (*Panax ginseng*) -- Several studies suggest Korean red ginseng has benefits, including raising CD4 counts and increasing the effectiveness of AZT. You may want to consult a trained practitioner in traditional Chinese medicine to assess whether ginseng will be beneficial for your individual constitution.

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- Sangre de Drago (*Croton lechleri*, 500 mg every six hours) -- One study and anecdotal evidence suggest Sangre de Drago may be helpful in combating AIDS-related diarrhea. Because very high amounts of the herb were used, it should only be taken under a doctor's supervision.
- Cat's claw (*Uncaria tomentosa*) -- In one study of 13 patients with human immunodeficiency virus (HIV) who refused to take conventional treatments, an extract of cat's claw at a dosage of 20 mg per day for up to 5 months significantly increased white blood cell counts (the infection-fighting cells in the body that HIV destroys). There is some preliminary indication that it may reduce side effects from AZT. However, there are also studies suggesting a negative result from cat's claw. You should consult a trained, botanically oriented physician before adding cat's claw to your regimen, and all other health care providers should be aware of all your treatments.

Other herbs sometime used to treat symptoms of HIV or opportunistic infections include tea tree oil (*Melaleuca alternifolia*), which has been used to treat thrush (15 ml of solution used as a mouthwash), and garlic (*Allium sativum*), which has helped treat AIDS-related diarrhea and stop weight loss. Garlic interacts negatively with several HIV medications, however, so you should never use garlic without your doctor's supervision.

Herbs you should avoid until more studies are done include St. John's wort (*Hypericum perforatum*), which has a negative effect on indinavir and could lead to developing resistance to the drug, and echinacea (*Echinacea spp.*) and astragalus (*Astragalus membranaceus*). These two substances show conflicting evidence of enhancing immune function and strengthening replication of the HIV virus in test tubes.

## **Homeopathy**

No specific scientific research supports the use of homeopathy for HIV or AIDS. A licensed, certified homeopathic doctor would evaluate you individually to assess the value of homeopathy for reduction of symptoms or side effects from medication as an adjunct to standard medical treatment.

## **Physical Medicine**

Exercise is another way to help develop a general sense of well-being, improve mental attitude, decrease depression, diminish weight loss, and increase lean body mass. Resistance or weight training is particularly useful to increase strength and enhance lean body mass.

## **Acupuncture**

People with HIV have used acupuncture to improve general well-being, alleviate symptoms such as fatigue, insomnia, and night sweats, and to minimize side effects from

medications, such as nausea. Some people also find relief from peripheral neuropathy, caused occasionally by certain medications used for HIV, reporting less pain, increased strength, and improved sensation.

As mentioned earlier, diarrhea can be a major problem for people with HIV throughout the world. In China, acupuncture and moxibustion (a heat treatment performed by the acupuncturist over points where the needles are placed) are the standard treatments for HIV-related diarrhea.

Acupuncture can also be used to treat the neuropathic (nerve) pain associated with certain HIV medications. Inserting needles bilaterally in the hand and foot points known as Baaxie and Bafeng, respectively, can lessen neuropathic pain.

## **Massage**

Massage can relieve chronic muscle tension and stress, which may help the immune system.

## **Special Considerations**

If you are HIV-positive and pregnant, taking certain antiretroviral medications will reduce the likelihood of you transmitting the virus to your baby. Your doctor will determine which medicine is best for you and safe for your baby. Depending on your own condition, you and your health care provider may decide to postpone treatment until after your first trimester to reduce the risk of birth defects. Efavirenz should be avoided throughout pregnancy. If you are HIV-positive, you should not breastfeed because of the risk of transmission to your baby.

## **Resources**

[AIDS.ORG: www.aids.org](http://www.aids.org)

## **Supporting Research**

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