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A Service of the U.S. Department of Health and Human Services

HIV and Its Treatment: What You Should Know

Health Information for Patients

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Fact Sheets

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HIV and Its Treatment: What You Should Know

These fact sheets are intended for use by people recently diagnosed with HIV infection or those who are considering starting HIV treatment. The fact sheets are designed as a series, but can also be used as stand-alone documents. Information in these fact sheets is based on *Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents*, developed by the U.S. Department of Health and Human Services (HHS) Panel on Antiretroviral Guidelines for Adults and Adolescents, which is convened by the HHS in conjunction with the Henry J. Kaiser Family Foundation.

The *Guidelines*, which is a "living document," provides updates on new advances in the treatment of HIV. The current version of the document is available on the AIDS*info* Web site: **http://aidsinfo.nih.gov/guidelines/**.

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Testing HIV Positive – Do I Have AIDS?

I tested HIV positive. What does this mean? Does it mean I have AIDS?

A positive HIV test result means that you are infected with HIV (Human Immunodeficiency Virus), the virus that causes AIDS (Acquired Immune Deficiency Syndrome). Being infected with HIV does not mean that you have AIDS right now. However, if left untreated, HIV infection damages a person's immune system and can progress to AIDS.

What is AIDS?

AIDS is the most serious stage of HIV infection. It results from the destruction of the infected person's immune system.

Your immune system is your body's defense system. Cells of your immune system fight off infection and other diseases. If your immune system does not work well, you are at risk for serious and life-threatening infections and cancers. HIV attacks and destroys the disease-fighting cells of the immune system, leaving the body with a weakened defense against infections and cancer.

Which disease-fighting cells does HIV attack?

CD4 cells are a type of white blood cell that fights infections. They are also called $CD4^+$ T cells or CD4 T lymphocytes. A CD4 count is the number of CD4 cells in a sample of blood.

When HIV enters a person's CD4 cells, it uses the cells to make copies of itself. This process destroys the CD4 cells, and the CD4 count goes down. As you lose CD4 cells, your immune system becomes weak. A weakened immune system makes it harder for your body to fight infections and cancer.

How will I know if I have AIDS?

AIDS is not a diagnosis you can make yourself; it is diagnosed when the immune system is severely weakened. If you are infected with HIV and your CD4 count drops below 200 cells/mm^3, or if you develop an AIDS-defining condition (an illness that is very unusual in someone who is not infected with HIV), you have AIDS.

What are the AIDS-defining conditions?

In December 1992, the Centers for Disease Control and Prevention (CDC) published the most current list of AIDS-defining conditions*. The AIDS-defining conditions are:

- Candidiasis
- Cervical cancer (invasive)
- Coccidioidomycosis, Cryptococcosis, Cryptosporidiosis
- Cytomegalovirus disease
- Encephalopathy (HIV-related)
- Herpes simplex (severe infection)
- Histoplasmosis
- Isosporiasis
- Kaposi's sarcoma
- Lymphoma (certain types)
- Mycobacterium avium complex
- Pneumocystis carinii/jiroveci pneumonia
- Pneumonia (recurrent)
- Progressive multifocal leukoencephalopathy
- Salmonella septicemia (recurrent)
- Toxoplasmosis of the brain
- Tuberculosis
- Wasting syndrome

People who are not infected with HIV may also develop these diseases; this does not mean they have AIDS. To be diagnosed with AIDS, a person must first be infected with HIV.

What is HIV treatment?

HIV treatment is the use of anti-HIV medications to keep an HIV infected person healthy. Treatment can help people at all stages of HIV disease. Although anti-HIV medications can treat HIV infection, they cannot cure HIV infection. HIV treatment is complicated and must be tailored to you and your needs.

The fact sheets in this series provide information about HIV treatment, including when to start medication, which medications are used, how to know if treatment is working, and what can be done if your treatment is not working.

For more information:

Contact your doctor or an AIDS*info* Health Information Specialist at 1–800–448–0440 or **http://aidsinfo.nih.gov**.

* CDC. 1993 Revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. MMWR 1992;41(no. RR-17).

Seeing an HIV Doctor

I am HIV positive. What kind of doctor do I need?

Your doctor (or other health care provider) should be experienced in treating HIV and AIDS. You may want to see an infectious disease specialist. You will need to work closely with your doctor to make informed decisions about your treatment, so it is important to find a doctor with whom you are comfortable.

What can I expect at the doctor's office?

Your doctor will ask you questions about your health, life style, conduct a physical exam, and order blood tests. This is a good time to ask your doctor questions. Write down any questions you have and take them with you to your appointment.

Women should have a pregnancy test (see **HIV During Pregnancy, Labor and Delivery, and After Birth Fact Sheet series**) and a gynecologic examination with Pap smear.

What questions should I ask my doctor?

You should ask your doctor about:

- Risks and benefits of HIV treatment
- Other diseases you may be at risk for
- How your lifestyle will change with HIV infection
- How you can avoid transmitting HIV to others
- How you can achieve and maintain a healthier lifestyle

What tests will my doctor order?

It is very important to have a CD4 count and a viral load test done at your first doctor's visit. You should also have drug resistance testing. The results will provide a **baseline** measurement for future tests.

- *CD4 count* – CD4 cells, also called CD4$^+$ T cells or CD4 lymphocytes, are a type of white blood cell that fights infection. HIV destroys CD4 cells, weakening your body's immune system. A CD4 count is the number of CD4 cells in a sample of blood.

Terms Used in This Fact Sheet:

Baseline: *an initial measurement (such as CD4 count or viral load) made before starting therapy and used as a reference point to monitor your HIV infection.*

Kidney function tests: *blood and urine tests that determine if your kidneys are working properly.*

Liver function tests (LFTs): *tests that measure the blood levels of liver enzymes (proteins made and used by the liver) to determine if your liver is working properly.*

- *Viral load test* – A viral load test measures the amount of HIV in a sample of blood. This test shows how well your immune system is controlling the virus.

  The two viral load tests commonly used for HIV are:
  - HIV RNA amplification (RT-PCR) test
  - Branched chain DNA (bDNA) test

- *Drug resistance testing* – Drug resistance testing determines if an individual's HIV strain is resistant to any anti-HIV medications. HIV can mutate (change form), resulting in HIV that cannot be controlled with certain medications.

To ensure accurate results, viral load testing should be done at two different times, by the same laboratory, using the same type of test. The results of different types of tests may differ.

Your doctor may also order:

- Complete blood count
- Blood chemistry profile (including **liver** and **kidney function tests**)
- Tests for other sexually transmitted diseases (STDs)
- Tests for other infections, such as hepatitis, tuberculosis, or toxoplasmosis

This information is based on the U.S. Department of Health and Human Services' *Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents* (available at **http://aidsinfo.nih.gov**).

Seeing an HIV Doctor

Am I ready to begin HIV treatment?

Once you begin taking anti-HIV medications, you may need to continue taking them for the rest of your life. Deciding when or if to begin treatment depends on your health (see **Starting Anti-HIV Medications Fact Sheet**) and your readiness to follow a treatment regimen that may be complicated. You and your doctor should discuss your readiness to begin treatment as well as strategies to help you follow your treatment regimen (see **What is Treatment Adherence** and **Adhering to a Regimen Fact Sheets**).

If my doctor and I decide to delay treatment, will I need to have my CD4 count and viral load tested again?

Yes. HIV infected people who have not started anti-HIV medications should have a viral load test every 3 to 4 months and a CD4 count every 3 to 6 months. You and your doctor will use the test results to monitor your infection and to decide when to start treatment.

For more information:

Contact your doctor or an AIDS*info* Health Information Specialist at 1–800–448–0440 or **http://aidsinfo.nih.gov**.

Starting Anti-HIV Medications

I am HIV positive. Do I need to take anti-HIV medications?

You do not necessarily need to take anti-HIV (also called **antiretroviral**) medications just because you are HIV positive. You and your doctor will determine the best time to start treatment. When to take anti-HIV medications depends on your overall health, the amount of virus in your blood (**viral load**), and how well your immune system is working.

How will I know when to start anti-HIV medications?

You should start treatment if:

- you are experiencing severe symptoms of HIV infection or have been diagnosed with **AIDS**
- your **CD4 count** is 350 cells/mm^3 or less (especially if 200 cells/mm^3 or less)
- you are pregnant
- you have HIV-related kidney disease
- you are being treated for hepatitis B

If anti-HIV medications can help me stay healthy, why wait to start treatment?

Once you begin treatment, you may need to continue taking anti-HIV medications for the rest of your life. Although newer anti-HIV medications are easier to take, starting treatment usually means a significant adjustment in your lifestyle. Some anti-HIV medications need to be taken several times a day at specific times and may require a change in the foods you eat, when you eat meals, and when you take other medications.

In addition to their desired effects, anti-HIV medications may have negative side effects, some of which are serious. If the virus is not suppressed completely, drug resistance can develop. Side effects and drug resistance may limit your future treatment options.

Terms Used in This Fact Sheet:

AIDS: *Acquired Immune Deficiency Syndrome. AIDS is the most severe form of HIV infection. HIV infected patients are diagnosed with AIDS when their CD4 count falls below 200 cells/mm3 or if they develop an AIDS-defining illness (an illness that is very unusual in someone who is not HIV positive).*

Antiretroviral: *a medication that interferes with replication of retroviruses. HIV is a retrovirus.*

CD4 count: *CD4 cells, also called T cells or CD4$^+$ T cells, are white blood cells that fight infection. HIV destroys CD4 cells, making it harder for your body to fight infections. A CD4 count is the number of CD4 cells in a sample of blood.*

Drug resistance testing: *A laboratory test to determine if an individual's HIV strain is resistant to any anti-HIV medications. HIV can mutate (change form), resulting in HIV that cannot be controlled with certain medications.*

Viral load: *the amount of HIV in a sample of blood.*

What treatment is right for me?

The U.S. Department of Health and Human Services (HHS) provides HIV treatment guidelines to doctors and patients. These guidelines recommend that you take a combination of three or more medications from different classes (see **Approved Medications to Treat HIV Infection Fact Sheet**) in a regimen called **H**ighly **A**ctive **A**nti**r**etroviral **T**herapy (HAART). The guidelines list "preferred" HAART regimens. However, your regimen should be tailored to your needs. Factors to consider in selecting a treatment regimen include:

- your **drug resistance testing** results
- number of pills
- how often the pills must be taken
- if pills can be taken with or without food
- how the medications interact with one another
- other medications you take
- other diseases or conditions
- pregnancy

For more information:

Contact your doctor or an AIDS*info* Health Information Specialist at 1–800–448–0440 or **http://aidsinfo.nih.gov**.

This information is based on the U.S. Department of Health and Human Services' *Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents* (available at **http://aidsinfo.nih.gov**).

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Recommended HIV Treatment Regimens

When I start treatment, what kinds of medications will I need to take?

Anti-HIV medications are used to control the reproduction of the virus and to slow the progression of HIV disease. They are also called **antiretroviral** medications. There are six classes of FDA-approved antiretroviral medications: NRTIs, NNRTIs, PIs, entry inhibitors, fusion inhibitors, and integrase inhibitors. The **Approved Medications to Treat HIV Infection Fact Sheet** lists the FDA-approved antiretroviral medications by class. It also gives other names for the medications and the date they were approved by the FDA.

How many medications will I need to take?

The recommended treatment for HIV is a combination of three or more medications from different classes in a regimen called **H**ighly **A**ctive **A**nti**r**etroviral **T**herapy (HAART). How many pills you will need to take and how often you will take them will depend on what medications you and your doctor choose. Some of the medications are combinations of two or more different anti-HIV medications from one or more classes.

Which medications should I take?

Each HAART regimen is tailored to the individual patient – there is no one "best" regimen. You and your doctor will decide which medications are right for you. For people taking HAART for the first time, the recommended regimens (in alphabetical order) are:

Atripla
Kaletra + Epzicom*
Kaletra + Truvada
Lexiva + Norvir + Epzicom*
Lexiva + Norvir + Truvada
Reyataz + Norvir + Epzicom*
Reyataz + Norvir + Truvada
Sustiva + Epzicom*
Sustiva + Truvada

* For patients who test negative for HLA B*5701.

Are there any other treatment regimens?

Yes, there are several other regimens. Some people may benefit from a regimen other than those listed above. You and your doctor will select a regimen based on your particular needs (see **Starting Anti-HIV Medications Fact Sheet**). In general, taking medications from only one class is not recommended because any decrease in **viral load** is almost always temporary.

Terms Used in This Fact Sheet:

Antiretroviral: *a medication that interferes with replication of retroviruses. HIV is a retrovirus.*

Drug toxicity: *the harm a medication can do to your body.*

Viral load: *the amount of HIV in a sample of blood.*

If you are pregnant or considering becoming pregnant, there are additional treatment considerations. The **HIV During Pregnancy, Labor and Delivery, and After Birth Fact Sheet Series** has more information on HIV treatment and pregnancy.

What are some of the negative side effects of HAART?

You may experience negative side effects when you take anti-HIV medications. Some of these side effects and/or drug toxicities are serious, even life-threatening; you may have to change medications due to intolerable side effects (see **Side Effects of Anti-HIV Medications Fact Sheet Series**). You and your doctor or pharmacist should discuss the side effects of each medication.

Possible side effects of HAART include:

- liver problems – see **Hepatotoxicity Fact Sheet**
- diabetes – see **Hyperglycemia Fact Sheet**
- high cholesterol – see **Hyperlipidemia Fact Sheet**
- high levels of lactate in the blood – see **Lactic Acidosis Fact Sheet**
- abnormal fat distribution (lipodystrophy syndrome) – see **Lipodystrophy Fact Sheet**
- decreased bone density – see **Osteonecrosis, Osteopenia, and Osteoporosis Fact Sheet**
- skin rash – see **Skin Rash Fact Sheet**
- pancreatitis (inflammation of the pancreas)
- nerve problems
- increased bleeding in patients with hemophilia

Side effects that may seem minor, such as fever, nausea, and fatigue, can mean there are serious problems. Always discuss any side effects you are having with your doctor.

For more information:

Contact your doctor or an AIDS*info* Health Information Specialist at 1–800–448–0440 or **http://aidsinfo.nih.gov**.

This information is based on the U.S. Department of Health and Human Services' *Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents* (available at **http://aidsinfo.nih.gov**).

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Approved Medications to Treat HIV Infection

Anti-HIV (also called antiretroviral) medications are used to control the reproduction of the virus and to slow the progression of HIV-related disease. **H**ighly **A**ctive **A**nti**r**etroviral **T**herapy (HAART) is the recommended treatment for HIV infection. HAART combines three or more anti-HIV medications in a daily regimen. Anti-HIV medications do not cure HIV infection, and individuals taking these medications can still transmit HIV to others. Anti-HIV medications approved by the U.S. Food and Drug Administration (FDA) fall into five classes:

Class	Generic Name	Brand & Other Names	Manufacturer	FDA Approval Date
Non-nucleoside Reverse Transcriptase Inhibitors (NNRTIs)				
NNRTIs bind to and disable reverse transcriptase, a protein that HIV needs to make more copies of itself.	**Delavirdine**	**Rescriptor, DLV**	Pfizer	April 4, 1997
	Efavirenz	**Sustiva, EFV**	Bristol-Myers Squibb	Sept. 17, 1998
	Etravirine	**Intelence, Celsentri, TMC125, ETR**	Tibotec	Jan. 18, 2008
	Nevirapine	**Viramune, NVP**	Boehringer Ingelheim	June 21, 1996
Nucleoside Reverse Transcriptase Inhibitors (NRTIs)				
NRTIs are faulty versions of building blocks that HIV needs to make more copies of itself. When HIV uses an NRTI instead of a normal building block, reproduction of the virus is stalled.	**Abacavir**	**Ziagen, ABC**	GlaxoSmithKline	Dec. 17, 1998
	Abacavir, Lamivudine	**Epzicom**	GlaxoSmithKline	Aug. 2, 2004
	Abacavir, Lamivudine, Zidovudine	**Trizivir**	GlaxoSmithKline	Nov. 14, 2000
	Didanosine	**Videx, ddI, Videx EC**	Bristol-Myers Squibb	Oct. 9, 1991 Oct. 31, 2000 (EC)
	Emtricitabine	**Emtriva, FTC, Coviracil**	Gilead Sciences	July 2, 2003
	Emtricitabine, Tenofovir DF	**Truvada**	Gilead Sciences	Aug. 2, 2004
	Lamivudine	**Epivir, 3TC**	GlaxoSmithKline	Nov. 17, 1995
	Lamivudine, Zidovudine	**Combivir**	GlaxoSmithKline	Sept. 27, 1997
	Stavudine	**Zerit, d4T**	Bristol-Myers Squibb	June 24, 1994
	Tenofovir DF	**Viread, TDF**	Gilead Sciences	Oct. 26, 2001
	Zidovudine	**Retrovir, AZT, ZDV**	GlaxoSmithKline	March 19, 1987

This information is based on the U.S. Food and Drug Administration's Drugs Used in the Treatment of HIV Infection (available at **http://www.fda.gov/oashi/aids/virals.html**).

Approved Medications to Treat HIV Infection

Class	Generic Name	Brand & Other Names	Manufacturer	FDA Approval Date
Protease Inhibitors (PIs)				
PIs disable protease, a protein that HIV needs to make more copies of itself.	**Amprenavir**	**Agenerase, APV**	GlaxoSmithKline, Vertex Pharmaceuticals	April 15, 1999
	Atazanavir	**Reyataz, ATV**	Bristol-Myers Squibb	June 20, 2003
	Darunavir	**Prezista, TMC114, DRV**	Tibotec	June 23, 2006
	Fosamprenavir	**Lexiva, FPV**	GlaxoSmithKline, Vertex Pharmaceuticals	Oct. 20, 2003
	Indinavir	**Crixivan, IDV**	Merck	March 13, 1996
	Lopinavir, Ritonavir	**Kaletra, LPV/r**	Abbott Laboratories	Sept. 15, 2000
	Nelfinavir	**Viracept, NFV**	Agouron Pharmaceuticals	March 14, 1997
	Ritonavir	**Norvir, RTV**	Abbott Laboratories	March 1, 1996
	Saquinavir	**Invirase, SQV**	Hoffmann-La Roche	Dec. 6, 1995
	Tipranavir	**Aptivus, TPV**	Boehringer Ingelheim	June 22, 2005
Entry/Fusion Inhibitors				
Entry/Fusion inhibitors work by blocking HIV entry into cells.	**Enfuvirtide**	**Fuzeon, T-20**	Hoffmann-La Roche, Trimeris	March 13, 2003
	Maraviroc	**Selzentry, MVC**	Pfizer	Aug. 6, 2007
Integrase Inhibitors				
Integrase inhibitors disable integrase, a protein that HIV uses to insert its viral genetic material into the genetic material of an infected cell.	**Raltegravir**	**Isentress**	Merck	Oct. 12, 2007
Fixed Dose Combination				
Fixed dose combination tablets contain 2 or more anti-HIV medications that can be from 1 or more drug classes.	**Abacavir, Lamivudine**	**Epzicom**	GlaxoSmithKline	Aug. 2, 2004
	Abacavir, Lamivudine, Zidovudine	**Trizivir**	GlaxoSmithKline	Nov. 14, 2000
	Efavirenz, Emtricitabine, Tenofovir DF	**Atripla**	Bristol-Myers Squibb, Gilead Sciences	July 12, 2006
	Emtricitabine, Tenofovir DF	**Truvada**	Gilead Sciences	Aug. 2, 2004
	Lamivudine, Zidovudine	**Combivir**	GlaxoSmithKline	Sept. 27, 1997

This information is based on the U.S. Food and Drug Administration's Drugs Used in the Treatment of HIV Infection (available at **http://www.fda.gov/oashi/aids/virals.html**).

Is My Treatment Regimen Working?

How will I know if my HIV treatment regimen is working?

In general, **viral load** is the most important indicator of how well your regimen is working. Your viral load should decrease if your anti-HIV medications are effective. Other factors that can tell you and your doctor how well your regimen is working are:

- Your **CD4 count**. This should remain stable or go up if your medications are working.
- Your recent health and results of physical examinations. Your treatment regimen should help keep you healthy.

How often should I have a viral load test?

Your viral load should be tested 2 to 8 weeks after you start treatment, then every 3 to 4 months throughout treatment to make sure your anti-HIV medications are still working. HIV treatment should reduce your viral load to the point at which it is undetectable. An undetectable viral load does not mean that your HIV infection is gone; it simply means that the test is not sensitive enough to detect the small amount of HIV left in your blood.

If your viral load is still detectable within 4 to 6 months after starting treatment, you and your doctor should discuss how well you have **adhered** to your regimen (see **What Is Treatment Adherence** and **Adhering to My HIV Treatment Regimen Fact Sheets**). Missing medication doses is the most common reason for treatment failure and development of **drug resistance**. Your doctor should do a drug resistance test, which will determine if the HIV in your body has mutated into a strain that your current treatment regimen can't control.

How fast or how much your viral load decreases depends on factors other than your treatment regimen. These factors include your **baseline** viral load and CD4 count, whether you have taken anti-HIV medications before, whether you have HIV-related medical conditions, and how closely you have followed (adhered to) your treatment. Talk with your doctor if you are concerned about the results of your viral load tests.

How often should I have a CD4 count?

CD4 counts also indicate how well your treatment regimen is working. Your CD4 count should be tested every 3 to 6 months throughout your treatment. HIV treatment should increase your CD4 count or at least keep it from going down. Talk to your doctor if you are concerned about your CD4 counts.

Terms Used in This Fact Sheet:

Adherence: *how closely you follow, or adhere to, your treatment regimen. This includes taking the correct dose at the correct time as prescribed by your doctor.*

Baseline: *an initial measurement (such as CD4 count or viral load) made before starting therapy and used as a reference point to monitor your HIV infection.*

CD4 count: *CD4 cells, also called T cells or CD4$^+$ T cells, are white blood cells that fight infection. HIV destroys CD4 cells, making it harder for your body to fight infections. A CD4 count is the number of CD4 cells in a sample of blood.*

Drug resistance: *HIV can mutate (change form), resulting in HIV that cannot be controlled with certain medications.*

Viral load: *the amount of HIV in a sample of blood.*

My doctor wants to change my treatment regimen. Why?

There are several reasons why you may need to change your treatment regimen. Two of the most important reasons are *drug toxicity* and *regimen failure*.

Drug toxicity means that your treatment regimen causes side effects that make it difficult for you to take your medications.

Regimen failure means that the medications are not working well enough (see **HIV Treatment Regimen Failure Fact Sheet**).

Ask your doctor to explain why you need to change your treatment. If the reason is drug toxicity, your doctor may change one or more of the anti-HIV medications in your regimen. If the reason is regimen failure, your doctor should change all of your medications to ones that you have never taken before. If you have been taking three medications and all three cannot be changed, at least two medications should be changed. Using new medications will reduce the risk of drug resistance. See **Changing My HIV Treatment Regimens Fact Sheet** for more information about changing treatment regimens.

For more information:

Contact your doctor or an AIDS*info* Health Information Specialist at 1–800–448–0440 or **http://aidsinfo.nih.gov**.

This information is based on the U.S. Department of Health and Human Services' *Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents* (available at **http://aidsinfo.nih.gov**).

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HIV Treatment Regimen Failure

What is regimen failure?

Regimen failure occurs when the anti-HIV medications you are taking do not adequately control the infection. Factors that may cause regimen failure include:

- Poor health before starting the treatment regimen
- Poor adherence to the regimen (not taking medications exactly as instructed by your doctor, missing doses)
- Previous HIV treatment and/or **drug resistance**
- Alcohol or drug abuse
- Side effects of medications, drug **toxicity**, or interactions with other medications
- Medication poorly absorbed by the body
- Medical conditions or illnesses other than HIV infection

What are the three types of regimen failure?

1. *Virologic failure:* Regimens should lower the amount of HIV in your blood to undetectable levels. Virologic failure has occurred if HIV can still be detected in your blood 48 weeks after starting treatment, or if it is detected again after treatment had previously lowered your **viral load** to undetectable.
2. *Immunologic failure:* An effective regimen should increase the number of CD4 cells in your blood or at least prevent the number from going down. Immunologic failure can occur even if your viral load remains undetectable.
3. *Clinical progression:* Clinical progression has occurred if you experience an HIV-related condition or a decline in physical health despite at least 3 months of HIV treatment.

Virologic failure is the most common kind of regimen failure. People with virologic failure who do not switch to a more effective treatment regimen usually progress to immunologic failure within about 3 years. Immunologic failure may be followed by clinical progression.

Terms Used in This Fact Sheet:

Drug resistance: *HIV can mutate (change form), resulting in HIV that cannot be controlled with certain medications.*

Toxicity: *the harm a medication can do to your body.*

Viral load: *the amount of HIV in a sample blood.*

What happens if my regimen fails?

If your treatment regimen fails, your doctor will evaluate your treatment history, medication side effects, problems you may have had with taking the medications as directed, your physical condition, and results of drug resistance testing to determine why your regimen is failing. You and your doctor may then select a new treatment regimen to better control your infection. See **Changing My HIV Treatment Regimen Fact Sheet** for more information about changing treatment regimens.

For more information:

Contact your doctor or an AIDS*info* Health Information Specialist at 1–800–448–0440 or **http://aidsinfo.nih.gov**.

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Changing My HIV Treatment Regimen

How will my doctor and I know what medications to use next?

Before changing your treatment regimen, your doctor will try to find out why your current regimen is not working (see **HIV Treatment Regimen Failure Fact Sheet** for causes of regimen failure). Your doctor will evaluate your *adherence* to the regimen, the regimen's *tolerability*, and *drug interactions*. Whether you and your doctor decide to change your regimen and what new medications you will take will depend on why your current regimen is failing.

What is adherence?

Adherence refers to how closely you follow (adhere to) your treatment regimen. If your regimen is failing because you cannot adhere to it, you and your doctor should discuss why you are having difficulty taking your medication and what you can do to improve your adherence. Your doctor may change your regimen to reduce the number of pills you take or how often you take them. For more information about adherence, see **What is Treatment Adherence?** and **Adhering to My HIV Treatment Regimen Fact Sheets**.

What is tolerability?

Tolerability refers to how many and what types of negative side effects you experience while taking your medications. If the side effects are severe, you may need to change your regimen. Your doctor will ask you what side effects you have and how long you have had them. You and your doctor will decide whether to treat the side effects or to change your anti-HIV medications.

What are drug interactions?

Anti-HIV medications may interact with other medications you are taking. This may reduce the effectiveness of the medications or increase the risk of negative side effects. You and your doctor should review all of your medications, including over-the-counter medications and herbal remedies. You should also review whether your medications should be taken with food or on an empty stomach.

Terms Used in This Fact Sheet:

CD4 count: *CD4 cells, also called T cells or CD4⁺ T cells, are white blood cells that fight infection. HIV destroys CD4 cells, making it harder for your body to fight infections. A CD4 count is the number of CD4 cells in a sample of blood.*

Drug resistance: *HIV can mutate (change form), resulting in HIV that cannot be controlled with certain medications.*

Viral load: *the amount of HIV in a sample of blood.*

Changing Regimens

If your regimen is failing and you and your doctor have ruled out adherence, tolerability, and drug interactions, you should consider changing your regimen. Before changing anti-HIV medications, talk with your doctor about:

- anti-HIV medications you have taken before
- the strength of the new medications your doctor recommends
- possible side effects of the new medications
- how well you will be able to adhere to the new regimen
- the number of anti-HIV medications that you have not yet used

Your doctor will confirm that your regimen is failing with at least two **viral load** tests and three **CD4 counts**. You should also be tested for **drug resistance** *while you are taking the failing regimen.*

In general, your new treatment regimen should include three or more medications. You and your doctor will choose the medications based on your medication history, results of resistance testing, and side effects you have experienced. If you have already taken many of the FDA-approved anti-HIV medications, your doctor may recommend a new medication currently under investigation. You may be eligible to participate in a clinical trial using these medications or new treatment strategies. For more information about participating in a clinical trial, ask your doctor, or visit the "Clinical Trials" section of the AIDS*info* Web site at **http://aidsinfo.nih.gov/ClinicalTrials/**.

For more information:

Contact your doctor or an AIDS*info* Health Information Specialist at 1–800–448–0440 or **http://aidsinfo.nih.gov**.

This information is based on the U.S. Department of Health and Human Services' *Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents* (available at **http://aidsinfo.nih.gov**).

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What is Treatment Adherence?

What is adherence?

Adherence refers to how closely you follow a prescribed treatment regimen. It includes your willingness to start treatment and your ability to take medications exactly as directed.

Is adherence important for HIV treatment?

Yes! Adherence is a major issue in HIV treatment for two reasons:

- Adherence affects how well anti-HIV medications decrease your **viral load**. When you skip a medication dose, even just once, the virus has the opportunity to reproduce more rapidly. Keeping HIV replication at a minimum is essential for preventing AIDS-related conditions and death.
- Adherence to HIV treatment helps prevent **drug resistance**. When you skip doses, you may develop strains of HIV that are resistant to the medications you are taking and even to medications you have not yet taken. This may leave you with fewer treatment options should you need to change treatment regimens in the future. Because drug-resistant strains can be transmitted to others, engaging in risky behavior can have especially serious consequences.

Although there are many different anti-HIV medications and treatment regimens, studies show that *your first regimen has the best chance for long-term success*. Taking your anti-HIV medications correctly (adherence) increases your odds of success.

Why is adherence difficult for many people with HIV?

HIV treatment regimens can be complicated; most regimens involve taking multiple pills each day. Some anti-HIV medications must be taken on an empty stomach, while others must be taken with meals or before or after doses of other medications. This can be difficult for many people, especially for those who are sick or are experiencing HIV symptoms or negative side effects caused by their medications.

Other factors that can make it difficult to adhere to an HIV treatment regimen include:

- Experiencing unpleasant side effects to your medications (such as nausea)
- Sleeping through doses
- Traveling away from home
- Being too busy
- Feeling sick or depressed
- Forgetting to take medications

Terms Used in This Fact Sheet:

Drug resistance: *HIV can mutate (change form), resulting in HIV that cannot be controlled with certain medications.*

Viral load: *the amount of HIV in a sample of blood.*

What can I do to adhere to my treatment regimen?

There are many things you can do to better adhere to your treatment regimen. **Adhering to My HIV Treatment Regimen Fact Sheet** discusses what you can do to improve your adherence both before and after you start taking anti-HIV medications.

One of the most important things you can do when starting a treatment regimen is to talk with your doctor about your lifestyle. He or she will then be able to prescribe a regimen that works best for you. Topics you should address with your doctor include:

- Your work, sleep, eating, and travel schedules
- Possible side effects of medications
- Other medications you are taking and their possible interaction with anti-HIV medications
- Your level of commitment to following an HIV treatment regimen

Many people adhere well to their treatment early on but find adherence becomes more difficult over time. Talk with your doctor about adherence during every visit. Your commitment to a treatment plan is critical; studies show that *patients who take their medications correctly achieve the best results*.

For more information:

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Adhering To My HIV Treatment Regimen

What should I do before I begin treatment?

Before you begin an HIV treatment regimen, there are several steps you can take to help you with **adherence**:

- Talk with your doctor about your treatment regimen.
- Get a written copy of your treatment plan that lists each medication; when and how much to take; and if it must be taken with food, on an empty stomach, or before or after doses of other medications.
- Understand how important adherence is (see **What is Treatment Adherence Fact Sheet**).
- Be honest about personal issues that may affect your adherence. Adherence may be harder for people dealing with substance abuse or alcoholism, unstable housing, mental illness, or other life challenges.
- Consider a "dry run." Practice your treatment regimen using vitamins, jelly beans, or mints. This will help you determine ahead of time which doses might be difficult to take correctly.
- Develop a plan that works for you.

Many people find it helpful to identify the activities they normally do at the times they will be taking their medication. People who arrange their medication schedule around their daily routines adhere to their treatment plans better than those who do not.

How can I maintain adherence after I start treatment?

- Take your medication at the same time each day.
- Put a week's worth of medication in a pill box at the beginning of each week.
- Use timers, alarm clocks, or pagers to remind you when to take your medication.
- Keep your medication in the place where you will take it. You may want to keep backup supplies of your medication at your workplace or in your briefcase or purse.

Term Used in This Fact Sheet:

Adherence: *how closely you follow, or adhere to, your treatment regimen. This includes taking the correct dose at the correct time as prescribed by your doctor.*

- Keep a medication diary. Write the names of your medications in your daily planner, then check off each dose as you take it.
- Plan ahead for weekends, holidays, and changes in routine.
- Develop a support network of family members, friends, or coworkers who can remind you to take your medication. Some people also find it helpful to join a support group for people living with HIV infection.
- Monitor your medication supply. Contact your doctor or clinic if your supply will not last until your next visit.

What should I do if I have problems adhering to my treatment regimen?

It is important that you tell your doctor right away about any problems you are having with your treatment plan. If you are experiencing unpleasant side effects, your dose may need to be adjusted or you may need a change in your regimen (see **Changing My HIV Treatment Regimen Fact Sheet**). Missed doses may be a sign that your treatment plan is too complicated or unrealistic for you to follow. Talk with your doctor about other treatment options. Your doctor needs to stay informed to help you get the most out of your treatment regimen and to provide workable treatment options.

For more information:

Contact your doctor or an AIDS*info* Health Information Specialist at 1–800–448–0440 or **http://aidsinfo.nih.gov**.

This information is based on the U.S. Department of Health and Human Services' *Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents* (available at **http://aidsinfo.nih.gov**).

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Understanding HIV Prevention

I am HIV positive and don't want to infect others. What should I do?

Understanding how HIV is transmitted is an important step in prevention. Talk with your doctor about how HIV is transmitted and what you can do to prevent infecting others. Each time you visit your doctor, discuss your high-risk behaviors, such as unprotected sex and needle sharing.

You may feel reluctant to talk with your doctor about your high-risk behaviors. It can be difficult to change behaviors, even when you want to. However, it is important to be honest with your doctor about risky activities. You and your doctor can then discuss ways to minimize the risk of infecting others.

If you are a woman, you and your doctor should discuss ways to prevent pregnancy. If you want to become pregnant, you and your doctor can talk about what you should do to prevent transmitting HIV to your baby (see **HIV During Pregnancy, Labor and Delivery, and After Birth Fact Sheet Series**).

How can I prevent infecting someone else?

Successful HIV treatment can lower your viral load, which may reduce the risk of HIV transmission. But there are other factors that influence sexual transmission of HIV, such as:

- presence of other sexually transmitted diseases (STDs)
- genital irritation
- menstruation
- lack of circumcision in men
- taking birth control pills
- hormone imbalances
- vitamin and mineral deficiencies

Always use prevention strategies, such as condoms and safer sex practices. If you inject drugs, don't share your works with anyone else. Talk with your doctor if you have trouble sticking to these prevention strategies. You and your doctor can then find ways to make your high-risk behaviors safer.

Should I tell my partners that I am HIV infected?

Yes. It is very important that you tell your sexual partners and people with whom you have shared injected drugs that they may have been exposed to HIV and should be tested. You and your doctor can discuss the best way to notify your partners. Some health departments and HIV clinics have anonymous partner notification systems—your partners are told that they have been exposed but are not told who reported their names or when the reported exposure occurred.

It is important to use HIV prevention strategies even if your partner is also HIV positive. Your partner may have a different strain of the virus that could act differently in your body or be resistant to different anti-HIV medications.

I am taking anti-HIV medications and my viral load is undetectable. Am I cured? Can I infect others?

An undetectable viral load does not mean that you are cured. It means that the amount of HIV in your blood is so low that the viral load tests cannot detect it. You are still infected with HIV and can infect others. You should continue to use prevention strategies and should see your doctor regularly.

For more information:

The Centers for Disease Control and Prevention (CDC) National Prevention Information Network (NPIN) provides information about prevention of HIV infection, other STDs, and tuberculosis.

If you have questions about ways to prevent transmitting HIV, contact your doctor or a CDC NPIN Information Specialist at 1–800–458–5231 or visit **http://cdcnpin.org**.

This information is based on the U.S. Department of Health and Human Services' *Incorporating HIV Prevention into the Medical Care of Persons Living with HIV* (available at **http://aidsinfo.nih.gov**).

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