HIV Overview

HIV/AIDS: The Basics

Key Points

- HIV is the virus that causes HIV infection. AIDS is the most advanced stage of HIV infection.
- HIV is spread through contact with the blood, semen, pre-seminal fluid, rectal fluids, vaginal fluids, or breast milk of a person with HIV. In the United States, HIV is spread mainly by having anal or vaginal sex or sharing drug injection equipment with a person who has HIV.
- Antiretroviral therapy (ART) is the use of HIV medicines to treat HIV infection. People on ART take a combination of HIV medicines (called an HIV regimen) every day.
- ART can’t cure HIV infection, but it can help people with HIV live longer, healthier lives. HIV medicines can also reduce the risk of transmission of HIV.

What is HIV/AIDS?

HIV stands for human immunodeficiency virus, which is the virus that causes HIV infection. The abbreviation “HIV” can refer to the virus or to HIV infection.

AIDS stands for acquired immunodeficiency syndrome. AIDS is the most advanced stage of HIV infection.

HIV attacks and destroys the infection-fighting CD4 cells of the immune system. The loss of CD4 cells makes it difficult for the body to fight infections and certain cancers. Without treatment, HIV can gradually destroy the immune system and advance to AIDS.
How is HIV spread?

HIV is spread through contact with certain body fluids from a person with HIV. These body fluids include:

- Blood
- Semen
• Pre-seminal fluid
• Vaginal fluids
• Rectal fluids
• Breast milk

The spread of HIV from person to person is called HIV transmission. The spread of HIV from a woman with HIV to her child during pregnancy, childbirth, or breastfeeding is called mother-to-child transmission of HIV.

In the United States, HIV is spread mainly by having sex with or sharing drug injection equipment with someone who has HIV. To reduce your risk of HIV infection, use condoms correctly and consistently during sex, limit your number of sexual partners, and never share drug injection equipment.

Mother-to-child transmission is the most common way that children become infected with HIV. HIV medicines, given to women with HIV during pregnancy and childbirth and to their babies after birth, reduce the risk of mother-to-child transmission of HIV.

You can’t get HIV by shaking hands or hugging a person who has HIV. You also can’t get HIV from contact with objects such as dishes, toilet seats, or doorknobs used by a person with HIV. HIV does not spread through the air or through mosquito, tick, or other insect bites.

What is the treatment for HIV?

Antiretroviral therapy (ART) is the use of HIV medicines to treat HIV infection. People on ART take a combination of HIV medicines (called an HIV regimen) every day. (HIV medicines are often called antiretrovirals or ARVs.)

ART prevents HIV from multiplying and reduces the amount of HIV in the body. Having less HIV in the body protects the immune system and prevents HIV infection from advancing to AIDS.

ART can’t cure HIV, but it can help people with HIV live longer, healthier lives. ART also reduces the risk of HIV transmission.
What are the symptoms of HIV/AIDS?

Within 2 to 4 weeks after a person becomes infected with HIV, they may have flu-like symptoms, such as fever, chills, or rash. The symptoms may last for a few weeks after they become infected.

After this earliest stage of HIV infection, HIV continues to multiply but at very low levels. More severe symptoms of HIV infection, such as signs of opportunistic infections, generally don’t appear for many years. (Opportunistic infections are infections and infection-related cancers that occur more frequently or are more severe in people with weakened immune systems than in people with healthy immune systems.)

Without treatment with HIV medicines, HIV infection usually advances to AIDS in 10 years or longer, though it may take less time for some people.

**HIV transmission is possible at any stage of HIV infection—even if a person with HIV has no symptoms of HIV.**

How is AIDS diagnosed?

The following criteria are used to determine if a person with HIV has AIDS:

- The person’s immune system is severely damaged, as indicated by a CD4 count of less than 200 cells/mm$^3$. A CD4 count measures the number of CD4 cells in a sample of blood. The CD4 count of a healthy person ranges from 500 to 1,600 cells/mm$^3$.
  AND/OR
- The person has developed certain opportunistic infections.

Where can I learn more about HIV/AIDS?

- **How Is HIV Transmitted?** from HIV.gov
- **HIV 101** from the Centers for Disease Control and Prevention (CDC)
- This fact sheet is based on information from the following sources:
- From CDC:
  - HIV Basics
From the National Institute of Allergy and Infectious Diseases (NIAID): HIV/AIDS

The HIV Life Cycle

**Key Points**

- HIV gradually destroys the immune system by attacking and killing a type of white blood cell called a CD4 cell. CD4 cells play a major role in protecting the body from infection.
- HIV uses the machinery of the CD4 cells to multiply (make copies of itself) and spread throughout the body. This process, which is carried out in seven steps or stages, is called the HIV life cycle. HIV medicines protect the immune system by blocking HIV at different stages of the HIV life cycle.
- Antiretroviral therapy or ART is the use of HIV medicines to treat HIV infection. People on ART take a combination of HIV medicines from at least two different HIV drug classes every day. Because each class of drugs is designed to target a specific step in the HIV life cycle, ART is very effective at preventing HIV from multiplying. ART also reduces the risk of HIV drug resistance.
- ART can’t cure HIV, but HIV medicines help people with HIV live longer, healthier lives. ART also reduces the risk of HIV transmission (the spread of HIV to others).

HIV attacks and destroys the CD4 cells of the immune system. CD4 cells are a type of white blood cell that play a major role in protecting the body from infection. HIV uses the machinery of the CD4 cells to multiply (make copies of itself) and spread throughout the body. This process, which is carried out in seven steps or stages, is called the HIV life cycle.

What is the connection between the HIV life cycle and HIV medicines?

Antiretroviral therapy (ART) is the use of HIV medicines to treat HIV infection. HIV medicines protect the immune system by blocking HIV at different stages of the HIV life cycle.

HIV medicines are grouped into different drug classes according to how they fight HIV. Each class of drugs is designed to target a specific step in the HIV life cycle.
ART combines HIV medicines from at least two different HIV drug classes, making it very effective at preventing HIV from multiplying. Having less HIV in the body protects the immune system and prevents HIV from advancing to AIDS. ART also reduces the risk of HIV drug resistance.

ART can’t cure HIV, but HIV medicines help people with HIV live longer, healthier lives. HIV medicines also reduce the risk of HIV transmission (the spread of HIV to others).

What are the seven stages of the HIV life cycle?

The seven stages of the HIV life cycle are: 1) binding, 2) fusion, 3) reverse transcription, 4) integration, 5) replication, 6) assembly, and 7) budding. To understand each stage in the HIV life cycle, it helps to first imagine what HIV looks like.
Now follow each stage in the HIV life cycle, as HIV attacks a CD4 cell and uses the machinery of the cell to multiply.
The HIV Life Cycle

HIV medicines in six drug classes stop HIV at different stages in the HIV life cycle.

1. **Binding (also called Attachment):** HIV binds (attaches itself) to receptors on the surface of a CD4 cell.
   - **CCRS Antagonists**

2. **Fusion:** The HIV envelope and the CD4 cell membrane fuse (join together), which allows HIV to enter the CD4 cell.
   - **Fusion inhibitors**

3. **Reverse Transcription:** Inside the CD4 cell, HIV releases and uses reverse transcriptase (an HIV enzyme) to convert its genetic material—HIV RNA—into HIV DNA. The conversion of HIV RNA to HIV DNA allows HIV to enter the CD4 cell nucleus and combine with the cell's genetic material—cell DNA.
   - **Non-nucleoside reverse transcriptase inhibitors (NNRTIs)**
   - **Nucleoside reverse transcriptase inhibitors (NRTIs)**

4. **Integration:** Inside the CD4 cell nucleus, HIV releases integrase (an HIV enzyme). HIV uses integrase to insert (integrate) its viral DNA into the DNA of the CD4 cell.
   - **Integrase inhibitors**

5. **Replication:** Once integrated into the CD4 cell DNA, HIV begins to use the machinery of the CD4 cell to make long chains of HIV proteins. The protein chains are the building blocks for more HIV.

6. **Assembly:** New HIV proteins and HIV RNA move to the surface of the cell and assemble into immature (noninfectious) HIV.

7. **Budding:** Newly formed immature (noninfectious) HIV pushes itself out of the host CD4 cell. The new HIV releases protease (an HIV enzyme). Protease acts to break up the long protein chains that form the immature virus. The smaller HIV proteins combine to form mature (infectious) HIV.
   - **Protease Inhibitors (PIs)**
Where can I learn more about the HIV life cycle?

Visit these webpages from the National Institute of Allergy and Infectious Diseases (NIAID) to learn more about the HIV life cycle and the development of antiretroviral drugs to treat HIV.

- HIV Replication Cycle
- Antiretroviral Drug Discovery and Development

The Stages of HIV Infection

**Key Points**

- Without treatment with HIV medicines, HIV infection advances in stages, getting worse over time.
- The three stages of HIV infection are (1) acute HIV infection, (2) chronic HIV infection, and (3) acquired immunodeficiency syndrome (AIDS).
- There is no cure for HIV infection, but HIV medicines (called antiretrovirals or ARVs) can prevent HIV from advancing to AIDS. HIV medicines help people with HIV live longer, healthier lives. HIV medicines also reduce the risk of HIV transmission.

Without treatment, HIV infection advances in stages, getting worse over time. HIV gradually destroys the immune system and eventually causes acquired immunodeficiency syndrome (AIDS).

There is no cure for HIV infection, but HIV medicines (called antiretrovirals or ARVs) can prevent HIV from advancing to AIDS. HIV medicines help people with HIV live longer, healthier lives. HIV medicines also reduce the risk of HIV transmission (the spread of HIV to others).
There are three stages of HIV infection:

1. **Acute HIV Infection**
   Acute HIV infection is the earliest stage of HIV infection, and it generally develops within 2 to 4 weeks after a person is infected with HIV. During this time, some people have flu-like symptoms, such as fever, headache, and rash. In the acute stage of infection, HIV multiplies rapidly and spreads throughout the body. The virus attacks and destroys the infection-fighting CD4 cells of the immune system. During the acute HIV infection stage, the level of HIV in the blood is very high, which greatly increases the risk of HIV transmission.
2. **Chronic HIV Infection**
   The second stage of HIV infection is chronic HIV infection (also called asymptomatic HIV infection or clinical latency). During this stage of the disease, HIV continues to multiply in the body but at very low levels. People with chronic HIV infection may not have any HIV-related symptoms, but they can still spread HIV to others. Without treatment with HIV medicines, chronic HIV infection usually advances to AIDS in 10 years or longer, though it may take less time for some people.

3. **AIDS**
   AIDS is the final, most severe stage of HIV infection. Because HIV has severely damaged the immune system, the body can’t fight off **opportunistic infections**. (Opportunistic infections are infections and infection-related cancers that occur more frequently or are more severe in people with weakened immune systems than in people with healthy immune systems.) People with HIV are diagnosed with AIDS if they have a CD4 count of less than 200 cells/mm³ or if they have certain opportunistic infections. Without treatment, people with AIDS typically survive about 3 years.

This fact sheet is based on information from the following sources:

- From HIV.gov: What Are HIV and AIDS?
- From the Centers for Disease Control and Prevention (CDC): HIV/AIDS Basics

**What is a Latent HIV Reservoir?**

**Key Points**

- HIV infects immune system cells in the body and uses the cells’ machinery to make copies of itself. These infected cells can go into a resting state and stop producing HIV. A group of infected cells that are not actively producing HIV is called a **latent HIV reservoir**.
- Latent HIV reservoirs can wake up and start making more HIV. If someone with HIV is not taking HIV medicines when this happens, the level of HIV in their body (called the **viral load**) will start to increase.
- Latent HIV reservoirs can be found in many places throughout the body, and HIV can hide out for years inside reservoirs.
A latent HIV reservoir is a group of immune cells in the body that are infected with HIV but are not actively producing new HIV.

HIV attacks immune system cells in the body and uses the cells’ machinery to make copies of itself. After entering the body, HIV inserts its genetic blueprint into the DNA of an immune system cell, such as a CD4 cell. The infected cell starts producing HIV proteins that act as the building blocks for new HIV. To find out more about how HIV attacks cells, read the AIDSinfo HIV Life Cycle fact sheet.

Some HIV-infected cells, however, go into a resting (or latent) state. While in this resting state, the infected cells don’t produce new HIV.

When HIV infects cells in this way, it can hide out inside these cells for years, forming a latent HIV reservoir. At any time, cells in the latent reservoir can become active again and start making more HIV.

Where are latent HIV reservoirs found in the body?

Latent HIV reservoirs can be found throughout the body, including in the brain, lymph nodes, blood, and digestive tract.

Do HIV medicines work against latent HIV reservoirs?

HIV medicines reduce the amount of HIV in the body (called the viral load) by preventing the virus from multiplying. Because the HIV-infected cells in a latent reservoir aren’t producing new copies of the virus, HIV medicines have no effect on them.

People with HIV must take a daily combination of HIV medicines (called an HIV regimen) to keep their viral loads low. If someone is not taking HIV medicines when the infected cells of the latent reservoir begin making HIV again, the viral load in the body will start to increase. That’s why it’s important to continue taking HIV medicines every day as prescribed, even when viral load levels are low.

How are researchers targeting latent HIV reservoirs?

Finding ways to target and destroy latent reservoirs is one of the major challenges facing HIV researchers. New studies are exploring different strategies for clearing out reservoirs, including:
- Using gene therapy (which means manipulating genes to treat or prevent disease) to cut out certain HIV genes and inactivate the virus in HIV-infected immune cells.
- Developing drugs or other methods that reactivate latent HIV reservoirs so that the immune system or new therapies can effectively eliminate them.
- Developing approaches that enhance the immune system’s ability to recognize and clear reactivated latent HIV reservoirs.

This fact sheet is based on information from the following sources:

From the National Institute of Allergy and Infectious Diseases (NIAID):

- HIV Viral Eradication
- Sustained HIV Viral Remission

### HIV Testing

**Key Points**

- HIV testing shows whether a person is infected with HIV. HIV stands for human immunodeficiency virus. HIV is the virus that causes AIDS (acquired immunodeficiency syndrome). AIDS is the most advanced stage of HIV infection.
- The Centers for Disease Control and Prevention (CDC) recommends that everyone 13 to 64 years old get tested for HIV at least once and that people at high risk of infection get tested more often.
- Risk factors for HIV infection include having unprotected sex (sex without a condom) with someone who is HIV positive or whose HIV status you don’t know; having sex with many partners; and injecting drugs and sharing needles, syringes, or other drug equipment with others.
- CDC recommends that all pregnant women get tested for HIV as early as possible during each pregnancy.

What is HIV testing?

HIV testing shows whether a person is infected with HIV. HIV stands for human immunodeficiency virus. HIV is the virus that causes AIDS (acquired immunodeficiency syndrome). AIDS is the most advanced stage of HIV infection.
HIV testing can detect HIV infection, but it can’t tell how long a person has been infected with HIV or if the person has AIDS.

Why is HIV testing important?

Knowing your HIV status can help keep you—and others—safe.

If you are HIV negative:
Testing shows that you don’t have HIV. Continue taking steps to avoid getting HIV, such as using condoms during sex and, if you are at high risk of becoming infected, taking medicines to prevent HIV (called pre-exposure prophylaxis or PrEP). For more information, read the AIDSinfo fact sheet on HIV prevention.

If you are HIV positive:
Testing shows that you are infected with HIV, but you can still take steps to protect your health. Begin by talking to your health care provider about antiretroviral therapy (ART). ART is the use of HIV medicines to treat HIV infection. People on ART take a combination of HIV medicines every day. ART helps people with HIV live longer, healthier lives. ART also reduces the risk of transmission of HIV. People infected with HIV should start ART as soon as possible. Your health care provider will help you decide what HIV medicines to take.

Who should get tested for HIV?

The Centers for Disease Control and Prevention (CDC) recommends that everyone 13 to 64 years old get tested for HIV at least once. As a general rule, people at high risk for HIV infection should get tested each year. Sexually active gay and bisexual men may benefit from getting tested more often, such as every 3 to 6 months.

Factors that increase the risk of HIV infection include:

- Having vaginal or anal sex with someone who is HIV positive or whose HIV status you don’t know
- Injecting drugs and sharing needles, syringes, or other drug equipment with others
- Exchanging sex for money or drugs
- Having a sexually transmitted disease (STD), such as syphilis
- Having hepatitis or tuberculosis (TB)
- Having sex with anyone who has any of the HIV risk factors listed above

Talk to your health care provider about your risk of HIV infection and how often you should get tested for HIV.

If a person has been sexually assaulted, they should get tested for HIV as soon as possible after the assault. Post-exposure prophylaxis (PEP) can also be considered. PEP involves taking antiretroviral (ARV) medicines very soon after a possible exposure to HIV to prevent becoming infected with HIV. To learn more, read the AIDSinfo fact sheet on PEP.

Should pregnant women get tested for HIV?

CDC recommends that all pregnant women get tested for HIV as early as possible during each pregnancy. Women who are planning to get pregnant should also get tested.

Women with HIV take HIV medicines during pregnancy and childbirth to reduce the risk of mother-to-child transmission of HIV. HIV medicines used as recommended during pregnancy can reduce the risk of mother-to-child transmission of HIV to less than 1%. For more information, read the AIDSinfo fact sheet on Preventing Mother-to-Child Transmission of HIV.

What are the types of HIV tests?

There are three main types of HIV tests: antibody tests, combination tests (antibody/antigen tests), and nucleic acid tests (NATs). How soon each test can detect HIV infection differs because each test has a different window period. The window period is the time between when a person gets HIV and when a test can accurately detect HIV infection.

- **Antibody tests** check for HIV antibodies in blood or fluids from the mouth. HIV antibodies are disease-fighting proteins that the body produces in response to HIV infection. It can take 3 to 12 weeks for a person’s body to make enough antibodies for an antibody test to detect HIV infection. (In other words, the window period for antibody tests in most people is somewhere between 3 to 12 weeks from the time of infection.)
Combination tests (antibody/antigen tests) can detect both HIV antibodies and HIV antigens (a part of the virus) in blood. A combination test can detect HIV infection before an HIV antibody test. It can take 2 to 6 weeks for a person’s body to make enough antigens and antibodies for a combination test to detect HIV infection. Combination tests are now recommended for HIV testing that’s done in labs, and they are becoming more common in the United States.

NATs look for HIV in the blood. NATs can detect HIV infection about 7 to 28 days after a person has been infected with HIV. NATs are very expensive and not routinely used for HIV screening unless the person had a high-risk exposure or a possible exposure with early symptoms of HIV infection.

A person’s initial HIV test will usually be either an antibody test or a combination test. If the initial test result is positive for HIV infection, then follow-up testing will be done to make sure that the diagnosis is correct. If the initial test result is negative and the test was done during the window period, re-testing should be done 3 months after the possible exposure to HIV.

How long does it take to get the results of an HIV test?
It usually takes a few days to a few weeks to get results of an HIV test. Some rapid HIV tests can produce results within 30 minutes.

Is there an HIV test for home use?

There are two HIV tests approved by the U.S. Food and Drug Administration (FDA) for home use. Both are HIV antibody tests.

The **Home Access HIV-1 Test System** is a home collection kit, which involves pricking the finger for a blood sample, sending the sample to a lab for testing, and then calling the lab for results as early as the next business day. If the result is positive for HIV, the lab will do a follow-up test on the same blood sample to confirm the initial HIV-positive test result.

The **OraQuick In-Home HIV Test** comes with a test stick and a tube with a testing solution. The test stick is used to swab the gums to get a sample of oral fluids. To get results, the test stick is inserted into the test tube. Test results are ready in 20 minutes. **A positive result on this home HIV test must always be confirmed by additional HIV testing performed in a health care setting.**

Is HIV testing confidential?

HIV testing can be confidential or anonymous.

**Confidential testing** means that your HIV test results will include your name and other identifying information, but only people allowed to see your medical records will see your test results. HIV-positive test results will be reported to local or state health departments to be counted in statistical reports. Health departments remove all personal information (including names and addresses) from HIV test results before sharing the information with CDC. CDC uses this information for reporting purposes and does not share this information with any other organizations.

**Anonymous testing** means you don’t have to give your name when you take an HIV test. When you take the test, you receive a number. To get your HIV test results, you give the number instead of your name.
Where can I get tested for HIV?

Your health care provider can give you an HIV test. HIV testing is also available at many hospitals, medical clinics, community health centers, and AIDS service organizations. Use this CDC testing locator to find an HIV testing location near you.

You can also buy a home testing kit at a pharmacy or online.

This fact sheet is based on information from the following sources:

- From CDC: HIV Basics: Testing
- From CDC: HIV Testing

**FDA-Approved HIV Medicines**

Last Reviewed: August 17, 2017

Treatment with HIV medicines is called antiretroviral therapy (ART). ART is recommended for everyone with HIV. People on ART take a combination of HIV medicines (called an HIV regimen) every day. A person's initial HIV regimen generally includes three HIV medicines from at least two different drug classes.

ART can’t cure HIV, but HIV medicines help people with HIV live longer, healthier lives. HIV medicines also reduce the risk of HIV transmission.

The following table lists HIV medicines approved by the U.S. Food and Drug Administration (FDA) for the treatment of HIV infection in the United States. The HIV medicines are listed according to drug class and identified by generic and brand names. Click on a drug name to
view information on the drug from the AIDSinfo Drug Database. Or download the AIDSinfo Drug Database app to view the information on your Apple or Android devices.

To see a timeline of all FDA approval dates for HIV medicines, view the AIDSinfo FDA Approval of HIV Medicines infographic.

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>FDA-Approved HIV Medicines</th>
<th>Generic Name (Other names and acronyms)</th>
<th>Brand Name</th>
<th>FDA Approval Date</th>
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<tbody>
<tr>
<td><strong>Nucleoside Reverse Transcriptase Inhibitors (NRTIs)</strong></td>
<td></td>
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<tr>
<td>NRTIs block reverse transcriptase, an enzyme HIV needs to make copies of itself.</td>
<td>abacavir (abacavir sulfate, ABC)</td>
<td>Ziagen</td>
<td>December 17, 1998</td>
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<tr>
<td></td>
<td>didanosine (delayed-release didanosine, dideoxyinosine, enteric-coated didanosine, ddI, ddI EC)</td>
<td>Videx</td>
<td>October 9, 1991</td>
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<td></td>
<td></td>
<td>Videx EC (enteric-coated)</td>
<td>October 31, 2000</td>
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<td></td>
<td>emtricitabine (FTC)</td>
<td>Emtriva</td>
<td>July 2, 2003</td>
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<td></td>
<td>lamivudine (3TC)</td>
<td>Epivir</td>
<td>November 17, 1995</td>
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<td></td>
<td>stavudine (d4T)</td>
<td>Zerit</td>
<td>June 24, 1994</td>
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<td>Drug Class</td>
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<td></td>
<td>tenofovir disoproxil fumarate (tenofovir DF, TDF)</td>
<td>Viread</td>
<td>October 26, 2001</td>
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<tr>
<td></td>
<td>zidovudine (azidothymidine, AZT, ZDV)</td>
<td>Retrovir</td>
<td>March 19, 1987</td>
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<tr>
<td>Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs)</td>
<td>efavirenz (EFV)</td>
<td>Sustiva</td>
<td>September 17, 1998</td>
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<td></td>
<td>etravirine (ETR)</td>
<td>Intelence</td>
<td>January 18, 2008</td>
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<td></td>
<td>nevirapine (extended-release nevirapine, NVP)</td>
<td>Viramune</td>
<td>June 21, 1996</td>
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<td></td>
<td></td>
<td>Viramune XR (extended release)</td>
<td>March 25, 2011</td>
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<td></td>
<td>rilpivirine (rilpivirine hydrochloride, RPV)</td>
<td>Edurant</td>
<td>May 20, 2011</td>
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<td>Protease Inhibitors (PIs)</td>
<td>atazanavir (atazanavir sulfate, ATV)</td>
<td>Reyataz</td>
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<td>Drug Class</td>
<td>FDA-Approved HIV Medicines</td>
<td>Generic Name (Other names and acronyms)</td>
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<td>darunavir (darunavir ethanolate, DRV)</td>
<td>Prezista</td>
<td>June 23, 2006</td>
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<td></td>
<td>fosamprenavir (fosamprenavir calcium, FOS-APV, FPV)</td>
<td>Lexiva</td>
<td>October 20, 2003</td>
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<td>indinavir (indinavir sulfate, IDV)</td>
<td>Crixivan</td>
<td>March 13, 1996</td>
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<td></td>
<td>nelfinavir (nelfinavir mesylate, NFV)</td>
<td>Viracept</td>
<td>March 14, 1997</td>
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<td></td>
<td>ritonavir (RTV)</td>
<td>Norvir</td>
<td>March 1, 1996</td>
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<tr>
<td></td>
<td><em>Although ritonavir is a PI, it is generally used as a pharmacokinetic enhancer as recommended in the Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents and the Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection.</em></td>
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<td>saquinavir (saquinavir mesylate, SQV)</td>
<td>Invirase</td>
<td>December 6, 1995</td>
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<td>tipranavir (TPV)</td>
<td>Aptivus</td>
<td>June 22, 2005</td>
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<td></td>
<td><strong>Fusion Inhibitors</strong></td>
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<td>Drug Class</td>
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<tr>
<td>Fusion inhibitors block HIV from entering the <strong>CD4 cells</strong> of the immune system.</td>
<td>enfuvirtide (T-20)</td>
<td>Fuzeon</td>
<td>March 13, 2003</td>
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<td><strong>Entry Inhibitors</strong></td>
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<tr>
<td>Entry inhibitors block proteins on the CD4 cells that HIV needs to enter the cells.</td>
<td>maraviroc (MVC)</td>
<td>Selzentry</td>
<td>August 6, 2007</td>
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<tr>
<td><strong>Integrase Inhibitors</strong></td>
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<tr>
<td>Integrase inhibitors block HIV integrase, an enzyme HIV needs to make copies of itself.</td>
<td>dolutegravir (DTG, dolutegravir sodium)</td>
<td>Tivicay</td>
<td>August 13, 2013</td>
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<tr>
<td></td>
<td>elvitegravir (EVG)</td>
<td>Vitekta</td>
<td>September 24, 2014</td>
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<td>raltegravir (raltegravir potassium, RAL)</td>
<td>Isentress</td>
<td>October 12, 2007</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Isentress HD</td>
<td>May 26, 2017</td>
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<tr>
<td><strong>Pharmacokinetic Enhancers</strong></td>
<td></td>
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<tr>
<td>Pharmacokinetic enhancers are used in HIV treatment to increase the effectiveness of an HIV</td>
<td>cobicistat (COBI)</td>
<td>Tybost</td>
<td>September 24, 2014</td>
<td></td>
</tr>
</tbody>
</table>

Fusion inhibitors block HIV from entering the **CD4 cells** of the immune system.

Entry inhibitors block proteins on the CD4 cells that HIV needs to enter the cells.

Integrase inhibitors block HIV integrase, an enzyme HIV needs to make copies of itself.

Pharmacokinetic enhancers are used in HIV treatment to increase the effectiveness of an HIV.
<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Generic Name (Other names and acronyms)</th>
<th>Brand Name</th>
<th>FDA Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>medicine included in an HIV regimen.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Combination HIV Medicines</strong></td>
<td></td>
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</tr>
<tr>
<td>Combination HIV medicines contain two or more HIV medicines from one or more drug classes.</td>
<td>abacavir and lamivudine (abacavir sulfate / lamivudine, ABC / 3TC)</td>
<td>Epzicom</td>
<td>August 2, 2004</td>
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<tr>
<td></td>
<td>abacavir, dolutegravir, and lamivudine (abacavir sulfate / dolutegravir sodium / lamivudine, ABC / DTG / 3TC)</td>
<td>Triumeq</td>
<td>August 22, 2014</td>
</tr>
<tr>
<td></td>
<td>abacavir, lamivudine, and zidovudine (abacavir sulfate / lamivudine / zidovudine, ABC / 3TC / ZDV)</td>
<td>Trizivir</td>
<td>November 14, 2000</td>
</tr>
<tr>
<td></td>
<td>atazanavir and cobicistat (atazanavir sulfate / cobicistat, ATV / COBI)</td>
<td>Evotaz</td>
<td>January 29, 2015</td>
</tr>
<tr>
<td></td>
<td>darunavir and cobicistat (darunavir ethanolate / cobicistat, DRV / COBI)</td>
<td>Prezcobix</td>
<td>January 29, 2015</td>
</tr>
<tr>
<td></td>
<td>efavirenz, emtricitabine, and tenofovir disoproxil fumarate (efavirenz / emtricitabine / tenofovir DF, EFV / FTC / TDF)</td>
<td>Atripla</td>
<td>July 12, 2006</td>
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<td></td>
<td>elvitegravir, cobicistat, emtricitabine, and tenofovir alafenamide fumarate (elvitegravir / cobicistat / emtricitabine / tenofovir alafenamide, EVG / COBI / FTC / TAF)</td>
<td>Genvoya</td>
<td>November 5, 2015</td>
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### FDA-Approved HIV Medicines

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Generic Name (Other names and acronyms)</th>
<th>Brand Name</th>
<th>FDA Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>elvitegravir, cobicistat, emtricitabine, and tenofovir disoproxil fumarate (QUAD, EVG / COBI / FTC / TDF)</td>
<td>Stribild</td>
<td>August 27, 2012</td>
</tr>
<tr>
<td></td>
<td>emtricitabine, rilpivirine, and tenofovir alafenamide (emtricitabine / rilpivirine / tenofovir AF, emtricitabine / rilpivirine / tenofovir alafenamide fumarate, emtricitabine / rilpivirine hydrochloride / tenofovir AF, emtricitabine / rilpivirine hydrochloride / tenofovir alafenamide, emtricitabine / rilpivirine hydrochloride / tenofovir alafenamide fumarate, FTC / RPV / TAF)</td>
<td>Odefsey</td>
<td>March 1, 2016</td>
</tr>
<tr>
<td></td>
<td>emtricitabine, rilpivirine, and tenofovir disoproxil fumarate (emtricitabine / rilpivirine hydrochloride / tenofovir disoproxil fumarate, emtricitabine / rilpivirine / tenofovir, FTC / RPV / TDF)</td>
<td>Complera</td>
<td>August 10, 2011</td>
</tr>
<tr>
<td></td>
<td>emtricitabine and tenofovir alafenamide (emtricitabine / tenofovir AF, emtricitabine / tenofovir alafenamide fumarate, FTC / TAF)</td>
<td>Descovy</td>
<td>April 4, 2016</td>
</tr>
<tr>
<td></td>
<td>emtricitabine and tenofovir disoproxil fumarate (emtricitabine / tenofovir DF, FTC / TDF)</td>
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<td>August 2, 2004</td>
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<td>lamivudine and zidovudine (3TC / ZDV)</td>
<td>Combivir</td>
<td>September 27, 1997</td>
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<td></td>
<td>lopinavir and ritonavir (ritonavir-boosted lopinavir, LPV/r, LPV / RTV)</td>
<td>Kaletra</td>
<td>September 15, 2000</td>
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</table>
What is an Investigational HIV Drug?

**Key Points**

- An investigational HIV drug is a drug that is being tested and is not approved by the U.S. Food and Drug Administration (FDA) for general use or sale in the United States.
- Medical research studies—also called clinical trials—are done to evaluate the safety and effectiveness of an investigational HIV drug.
- Investigational HIV drugs include drugs to treat or prevent HIV and vaccines to treat or prevent HIV.
- Investigational HIV drugs can only be accessed through clinical trials and expanded access programs.

What is an investigational HIV drug?

An investigational HIV drug is a drug that is being tested to treat or prevent HIV infection and is not approved by the U.S. Food and Drug Administration (FDA) for general use or sale in the United States. Medical research studies—also called clinical trials—are done to evaluate the safety and effectiveness of an investigational HIV drug.

What types of investigational HIV drugs are being studied?

Currently, there are investigational drugs for treating HIV and preventing HIV. There are also investigational drugs for treating HIV-related opportunistic infections. (Opportunistic infections are infections and infection-related cancers that occur more frequently or are more severe in people with weakened immune systems than in people with healthy immune systems.)
Although no HIV vaccines exist yet, researchers are studying investigational preventive vaccines and treatment vaccines. The goal of a preventive HIV vaccine is to prevent HIV in people who don’t have HIV but who may be exposed to the virus. The goal of an HIV treatment vaccine, also called a therapeutic vaccine, is to slow the progression of HIV infection or delay the onset of AIDS in people with HIV. To learn more, read the AIDSinfo What is a Preventive HIV Vaccine? and What is a Therapeutic HIV Vaccine? fact sheets.

How are clinical trials of investigational drugs conducted?

Clinical trials, which are medical research studies, are conducted in phases. Each phase has a different purpose and helps researchers answer different questions about the investigational drug.

- **Phase 1 trials**: Researchers test the investigational drug in a small group of people (20–80) for the first time. The purpose is to evaluate its safety and identify side effects.

- **Phase 2 trials**: The investigational drug is administered to a larger group of people (100–300) to determine its effectiveness and to further evaluate its safety.

- **Phase 3 trials**: The investigational drug is administered to large groups of people (1,000–3,000) to confirm its effectiveness, monitor side effects, compare it with standard or equivalent treatments, and collect information that will allow the investigational drug to be used safely.

In most cases, an investigational drug must be proven effective and must show continued safety in a Phase 3 clinical trial to be considered for approval by FDA for sale in the United States. (Some drugs go through FDA’s accelerated approval process and are approved before a Phase 3 clinical trial is complete.) After a drug is approved by FDA and made available to the public, researchers track its safety in **Phase 4 trials** to seek more information about the drug’s risks, benefits, and optimal use. For more information, read the AIDSinfo HIV/AIDS Clinical Trials fact sheet.
How can I get access to an investigational HIV drug?

One way to get access to an investigational HIV drug is by enrolling in a clinical trial that is studying the drug. Another way is through an expanded access program. Expanded access involves using an investigational drug outside of a clinical trial to treat a person who has a serious or immediately life-threatening disease and who has no FDA-approved treatment options. Drug companies must have permission from FDA to make an investigational drug available for expanded access. Talk to your health care provider to see if you may qualify to take part in an expanded access program.

How can I find a clinical trial on an investigational HIV drug?

To find an HIV/AIDS clinical trial on an investigational HIV drug, use the AIDSinfo clinical trial search. For help with your search, call an AIDSinfo health information specialist at 1-800-448-0440 or email ContactUs@aidsinfo.nih.gov.
You can also join ResearchMatch, which is a free, secure online tool that makes it easier for the public to become involved in clinical trials.

Is it safe to use an investigational HIV drug?

One goal of HIV research is to identify new drugs that are less toxic and have fewer side effects. Researchers also try to make HIV/AIDS clinical trials as safe as possible. But investigational HIV drugs may have side effects that are not well known yet. Although this risk of poorly understood side effects is explained to you before you start taking the investigational drug, this makes it hard to know your actual risk. As testing of an investigational HIV drug continues, additional information on possible side effects is collected.

How can I find more information on investigational HIV drugs?

To find more information on investigational HIV drugs, use the AIDSinfo Drug Database, which includes up-to-date information on many investigational HIV drugs.

This fact sheet is based on information from the following sources:

- From the National Institutes of Health (NIH):
  - NIH Clinical Research Trials and You: The Basics
  - NIH Clinical Research Trials and You: Finding a Clinical Trial
- From the National Institute of Allergy and Infectious Diseases (NIAID):
  - HIV/AIDS Overview
- From the U.S. Food and Drug Administration (FDA):
  - Expanded Access: Information for Patients
What is a Therapeutic HIV Vaccine?

**Key Points**

- A therapeutic HIV vaccine is a vaccine that’s designed to improve the body’s immune response to HIV in a person who already has HIV.
- There are currently no therapeutic HIV vaccines approved by the Food and Drug Administration (FDA), but research is under way.
- Researchers are exploring therapeutic HIV vaccines (1) to slow down the progression of HIV infection, (2) to eliminate the need for antiretroviral therapy (ART) while still keeping undetectable levels of HIV, and (3) as part of a larger strategy to eliminate all HIV from the body.

What is a therapeutic HIV vaccine?

A therapeutic HIV vaccine is a vaccine that’s designed to improve the body’s immune response to HIV in a person who already has HIV.

Researchers are developing and testing therapeutic HIV vaccines to slow down the progression of HIV infection and ideally result in undetectable levels of HIV without the need for regular antiretroviral therapy (ART). (ART is the recommended treatment for HIV infection and involves using a combination of different HIV medicines to prevent HIV from replicating. Currently, a person with HIV must remain on ART to keep HIV at undetectable levels.)

A therapeutic HIV vaccine may also slow a person’s progression to AIDS and may make it less likely that a person could transmit HIV to others.

Researchers are also evaluating therapeutic HIV vaccines as part of a larger strategy to eliminate all HIV from the body and cure people of HIV. This kind of strategy may involve using other drugs and therapies in addition to a therapeutic HIV vaccine. HIV cure research is still in early exploratory stages, and it is not known what strategies may or may not work.
How is a therapeutic HIV vaccine different from a preventive HIV vaccine?

A preventive HIV vaccine is given to people who do not have HIV, with the goal of preventing HIV infection in the future. The vaccine would teach the person’s immune system to recognize and effectively fight HIV in case the virus ever enters the person’s body.

A therapeutic HIV vaccine is given to people who already have HIV. The goal of a therapeutic HIV vaccine is to strengthen a person’s immune response to the HIV that is already in the person’s body.
Are there any FDA-approved therapeutic HIV vaccines?

There are currently no Food and Drug Administration (FDA)-approved therapeutic HIV vaccines, but research is under way.

Where can I get more information about clinical trials studying therapeutic HIV vaccines?

A list of clinical trials on therapeutic HIV vaccines is available from the AIDSinfo database of ClinicalTrials.gov study summaries. Click on the title of any trial in the list to see more information about the study.

Where can I learn more about therapeutic HIV vaccine research?

Visit the websites below to learn more about therapeutic HIV vaccine research. This fact sheet is based on information from these sources:

- From the National Institute of Allergy and Infectious Diseases (NIAID):
  - HIV Vaccine Development
  - HIV Viral Eradication
  - Sustained HIV Viral Remission
- From the HIV Vaccine Trials Network (HVTN):
  - How Vaccines Work

What is a Preventive HIV Vaccine?

**Key Points**

- A preventive HIV vaccine is given to people who do not have HIV, with the goal of preventing HIV infection in the future.
- There are currently no preventive HIV vaccines approved by the Food and Drug Administration (FDA), but research is under way. You must be enrolled in a clinical trial to receive a preventive HIV vaccine.
What is a preventive HIV vaccine?

A preventive HIV vaccine is given to people who do not have HIV, with the goal of preventing HIV infection in the future. The vaccine would teach the person’s immune system to recognize and effectively fight HIV in case the person is ever exposed to HIV.

Are there any FDA-approved preventive HIV vaccines?

There are currently no preventive HIV vaccines approved by the Food and Drug Administration (FDA), but research is under way. You must be enrolled in a clinical trial to receive a preventive HIV vaccine.

How is a preventive HIV vaccine different from a therapeutic HIV vaccine?

While a **preventive HIV vaccine** is given to people who do not have HIV, a **therapeutic HIV vaccine** is given to people who already have HIV. The goal of a therapeutic HIV vaccine is to strengthen a person’s immune response to the HIV that is already in the person’s body. Researchers are exploring therapeutic HIV vaccines:

- To slow down the progression of HIV infection
- To eliminate the need for **antiretroviral therapy (ART)** while still keeping undetectable levels of HIV
- As part of a larger strategy to eliminate all HIV from the body

To learn more, read the AIDSinfo **What is a Therapeutic HIV Vaccine?** fact sheet.

Can I get HIV from a preventive HIV vaccine?

No, you cannot get HIV from a preventive HIV vaccine. The preventive HIV vaccines being studied in clinical trials do not contain HIV. Of the approximately 30,000 people who have participated in HIV vaccine studies around the world in the last 25 years, no one has gotten HIV from any of the vaccines tested.
Why is a preventive HIV vaccine important?

Treatment options for HIV infection have improved a lot over the last 30 years. But HIV medicines can have side effects, can be expensive, and can be hard to access in some countries. Also, some people may develop drug resistance to certain HIV medicines and then must change medicines.

Current prevention tools for HIV, such as using condoms correctly and pre-exposure prophylaxis (PrEP), work well. But researchers believe a preventive HIV vaccine will be the most effective way to completely end new HIV infections.

What research is being done on preventive HIV vaccines?

Some of the areas of interest being studied in clinical trials include:

- The safety of preventive vaccines.
- Whether a preventive vaccine protects against HIV infection.
- Whether a preventive vaccine controls HIV if a person gets HIV while enrolled in a study. (Some people in a clinical trial may get HIV by having sex with or sharing drug injection equipment with someone who has HIV, while they are participating in the study. But you cannot get HIV from the vaccine being tested.)
- The immune responses that occur in people who receive a preventive vaccine.
- Different ways of giving preventive vaccines, such as using a needle and syringe versus a needle-free device.

Where can I get more information about clinical trials studying preventive HIV vaccines?

A list of clinical trials on preventive HIV vaccines is available from the AIDSinfo database of ClinicalTrials.gov study summaries. Click on the title of any trial in the list to see more information about the study.

If you are interested in participating in a vaccine study, you can also contact the National Institutes of Health (NIH) Vaccine Research Center by calling 866-833-LIFE (5433) or by emailing vaccines@nih.gov.
Where can I learn more about preventive HIV vaccine research?

Visit the websites below to learn more about preventive HIV vaccine research. This fact sheet is based on information from these sources:

- From the National Institute of Allergy and Infectious Diseases (NIAID):
  - Vaccine Research Studies Frequently Asked Questions
  - HIV Vaccine Development
- From the HIV Vaccine Trials Network (HVTN):
  - How Vaccines Work
  - HIV Vaccine Myths and Facts
  - HVTN Studies

**HIV/AIDS Clinical Trials**

**Key Points**

- HIV/AIDS clinical trials are research studies that look at new ways to prevent, detect, or treat HIV/AIDS. Clinical trials are the fastest way to determine if new medical approaches to HIV/AIDS are safe and effective in people.
- Examples of HIV/AIDS clinical trials under way include studies of new HIV medicines, studies of vaccines to prevent or treat HIV, and studies of medicines to treat infections related to HIV.
- The benefits and possible risks of participating in an HIV/AIDS clinical trial are explained to study volunteers before they decide whether to participate in a study.
- Use the AIDSinfo clinical trial search to find HIV/AIDS studies looking for volunteer participants. Some HIV/AIDS clinical trials enroll only people who have HIV. Other studies enroll people who don’t have HIV.

What is a clinical trial?

A clinical trial is a research study done to evaluate new medical approaches in people. New approaches can include:

- new medicines or new combinations of medicines
Clinical trials are the fastest way to determine whether new medical approaches are safe and effective in people.

What is an HIV/AIDS clinical trial?

HIV/AIDS clinical trials help researchers find better ways to prevent, detect, or treat HIV/AIDS. All the medicines used to treat HIV/AIDS in the United States were first studied in clinical trials.

Examples of HIV/AIDS clinical trials under way include:

- studies of new medicines to treat HIV
- studies of vaccines to prevent or treat HIV
- studies of medicines to treat infections related to HIV
Can anyone participate in an HIV/AIDS clinical trial?

It depends on the study. Some HIV/AIDS clinical trials enroll only people who have HIV. Other studies include people who don’t have HIV.
Other factors such as age, gender, HIV treatment history, or other medical conditions may also restrict who can participate in an HIV/AIDS clinical trial.

What are the benefits of participating in an HIV/AIDS clinical trial?

Participating in an HIV/AIDS clinical trial can provide benefits. For example, many people participate in HIV/AIDS clinical trials because they want to contribute to HIV/AIDS research. They may have HIV or know someone who has HIV.

People with HIV who participate in an HIV/AIDS clinical trial may benefit from new HIV medicines before they are widely available. HIV medicines being studied in clinical trials are called investigational drugs. To learn more, read the AIDSinfo What is an Investigational HIV Drug? fact sheet.

Participants in clinical trials can receive regular and careful medical care from a research team that includes doctors and other health professionals. Often the medicines and medical care are free of charge.

Sometimes people get paid for participating in a clinical trial. For example, they may receive money or a gift card. They may be reimbursed for the cost of meals or transportation.

Are HIV/AIDS clinical trials safe?

Researchers try to make HIV/AIDS clinical trials as safe as possible. However, volunteering to participate in a study that is testing an experimental treatment for HIV can involve risks of varying degrees. Risks can include unpleasant, serious, or even life-threatening side effects from the treatment being studied.

In a process called informed consent, study volunteers are informed of the possible risks and benefits of a clinical trial. Understanding the risks and benefits helps volunteers decide whether to participate in the study.

If I decide to participate in an HIV/AIDS clinical trial, will my personal information be shared?
The privacy of study volunteers is important to everyone involved in an HIV/AIDS clinical trial. The informed consent process includes an explanation of how a study volunteer’s personal information is protected.

How can I find an HIV/AIDS trial in which to participate?

To find an HIV/AIDS clinical trial looking for volunteers, use the AIDSinfo clinical trial search. For help with your search, call an AIDSinfo health information specialist at 1-800-448-0440 or email ContactUs@aidsinfo.nih.gov.

This fact sheet is based on information from the following sources:

- From the National Institutes of Health (NIH):
- Learn About Clinical Studies
HIV Prevention

The Basics of HIV Prevention

Key Points

- HIV is spread only in certain body fluids from a person infected with HIV. These fluids are blood, semen, pre-seminal fluids, rectal fluids, vaginal fluids, and breast milk.
- In the United States, HIV is spread mainly by having sex or sharing injection drug equipment, such as needles, with someone who has HIV.
- To reduce your risk of HIV infection, use condoms correctly every time you have vaginal, oral, or anal sex. Don’t inject drugs. If you do, use only sterile injection equipment and water and never share your equipment with others.
- If you don’t have HIV but are at high risk of becoming infected with HIV, talk to your health care provider about pre-exposure prophylaxis (PrEP). PrEP involves taking a specific HIV medicine every day to reduce the risk of HIV infection.

How is HIV spread?

The person-to-person spread of HIV is called HIV transmission. HIV is transmitted (spread) only in certain body fluids from a person infected with HIV:

- Blood
HIV transmission is only possible if these fluids come in contact with a mucous membrane or damaged tissue or are directly injected into the bloodstream (from a needle or syringe). Mucous membranes are found inside the rectum, the vagina, the opening of the penis, and the mouth.

In the United States, HIV is spread mainly by:

- Having anal or vaginal sex with someone who has HIV without using a condom or taking medicines to prevent or treat HIV
- Sharing injection drug equipment ("works"), such as needles, with someone who has HIV

HIV can also spread from an HIV-infected woman to her child during pregnancy, childbirth (also called labor and delivery), or breastfeeding. This spread of HIV is called mother-to-child transmission of HIV.

In the past, some people were infected with HIV after receiving a blood transfusion or organ or tissue transplant from an HIV-infected donor. Today, this risk is very low because donated blood, organs, and tissues are carefully tested in the United States.

You can’t get HIV from casual contact with a person infected with HIV, for example from a handshake, a hug, or a closed-mouth kiss. And you can’t get HIV from contact with objects such as toilet seats, doorknobs, or dishes used by a person infected with HIV. Use the AIDSinfo You Can Safely Share… With Someone With HIV infographic to spread this message.

How can I reduce my risk of getting HIV?

Anyone can get HIV, but you can take steps to protect yourself from HIV infection.
• **Get tested and know your partner’s HIV status.** Talk to your partner about HIV testing and get tested before you have sex. Use this testing locator from the Centers for Disease Control and Prevention (CDC) to find an HIV testing location near you.

• **Have less risky sex.** HIV is mainly spread by having anal or vaginal sex without a condom or without taking medicines to prevent or treat HIV.

• **Use condoms.** Use a condom correctly every time you have vaginal, anal, or oral sex. Read this fact sheet from CDC on how to use condoms correctly.

• **Limit your number of sexual partners.** The more partners you have, the more likely you are to have a partner with HIV whose HIV is not well controlled or to have a partner with a sexually transmitted disease (STD). Both of these factors can increase the risk of HIV transmission. If you have more than one sexual partner, get tested for HIV regularly.

• **Get tested and treated for STDs.** Insist that your partners get tested and treated too. Having an STD can increase your risk of becoming infected with HIV or spreading it to others.

• **Talk to your health care provider about pre-exposure prophylaxis (PrEP).** PrEP is an HIV prevention option for people who don’t have HIV but who are at high risk of becoming infected with HIV. PrEP involves taking a specific HIV medicine every day. For more information, read the AIDSinfo fact sheet on Pre-Exposure Prophylaxis (PrEP).

• **Don’t inject drugs.** But if you do, use only sterile drug injection equipment and water and never share your equipment with others.

I am HIV positive but my partner is HIV negative. How can I protect my partner from HIV?

Take HIV medicines daily. Treatment with HIV medicines (called antiretroviral therapy or ART) helps people with HIV live longer, healthier lives. ART can’t cure HIV infection, but it can reduce the amount of HIV in the body. Having less HIV in your body will reduce your risk of passing HIV to your partner during sex. You can also talk to your partner about taking PrEP.

To protect your partner, use condoms correctly every time you have sex. Even someone who is taking HIV medicines and has an undetectable viral load can still potentially transmit HIV to a partner. So even if you are taking HIV medicines, it’s still important to use condoms.

If you inject drugs, don’t share your needles, syringes, or other drug equipment with your partner.

To learn more, read this webpage from AIDS.gov on Mixed-Status Couples.
Are HIV medicines used in other situations to prevent HIV infection?

Yes, HIV medicines are also used for post-exposure prophylaxis (PEP) and to prevent mother-to-child transmission of HIV.

- **Post-exposure prophylaxis (PEP)**
  PEP is the use of HIV medicines to reduce the risk of HIV infection soon after a possible exposure to HIV. PEP may be used, for example, after a person has sex without a condom with a person who is infected with HIV or after a health care worker is accidentally exposed to HIV in the workplace. To be effective, PEP must be started within 3 days after the possible exposure to HIV. PEP involves taking HIV medicines each day for 28 days. For more information, read the AIDSinfo fact sheet on Post-Exposure Prophylaxis (PEP).

- **Prevention of mother-to-child transmission of HIV**
  Women with HIV take HIV medicines during pregnancy and childbirth to reduce the risk of passing HIV to their babies. Their newborn babies also receive HIV medicine for 4 to 6 weeks after birth. The HIV medicine reduces the risk of infection from any HIV that may have entered a baby’s body during childbirth. For more information, read the AIDSinfo fact sheet on Preventing Mother-to-Child Transmission of HIV.

How can I learn more about preventing HIV?

Browse through the following information. This fact sheet is based on this information.

From CDC:

- HIV Transmission
- HIV Prevention
- PrEP
- PEP

From the Department of Health and Human Services:

- Recommendations for Use of Antiretroviral Drugs in Pregnant HIV-1-Infected Women for Maternal Health and Interventions to Reduce Perinatal HIV Transmission in the United States:
- General Principles Regarding Use of Antiretroviral Drugs During Pregnancy: Overview
Preventing Mother-to-Child Transmission of HIV

**Key Points**

- Mother-to-child transmission of HIV is the spread of HIV from an HIV-infected woman to her child during pregnancy, childbirth (also called labor and delivery), or breastfeeding (through breast milk). Mother-to-child transmission is the most common way that children become infected with HIV.
- Pregnant women with HIV receive HIV medicines during pregnancy and childbirth to prevent mother-to-child transmission of HIV. In some situations, a woman with HIV may have a scheduled cesarean delivery (sometimes called a C-section) to prevent mother-to-child transmission of HIV during delivery.
- Babies born to women with HIV receive HIV medicine for 4 to 6 weeks after birth. The HIV medicine reduces the risk of infection from any HIV that may have entered a baby’s body during childbirth.
- Because HIV can be transmitted in breast milk, women with HIV living in the United States should not breastfeed their babies. In the United States, baby formula is a safe and healthy alternative to breast milk.
- If a woman takes HIV medicines during pregnancy and childbirth and her baby receives HIV medicine for 4 to 6 weeks after birth, the risk of transmitting HIV can be lowered to 1% or less.

What is mother-to-child transmission of HIV?

Mother-to-child transmission of HIV is the spread of HIV from an HIV-infected woman to her child during pregnancy, childbirth (also called labor and delivery), or breastfeeding (through breast milk). Mother-to-child transmission of HIV is also called perinatal transmission of HIV.

Mother-to-child transmission is the most common way that children become infected with HIV.
Can mother-to-child transmission of HIV be prevented?

Yes. Because of the use of HIV medicines and other strategies, the risk of mother-to-child transmission can be lowered to 1% or less. The risk of mother-to-child transmission of HIV is low when:

- HIV is detected as early as possible during pregnancy (or before a woman gets pregnant).
- Women with HIV receive HIV medicine during pregnancy and childbirth and, in certain situations, have a scheduled cesarean delivery (sometimes called a C-section).
- Babies born to women with HIV receive HIV medicines for 4 to 6 weeks after birth and are not breastfed.

Is HIV testing recommended for pregnant women?

The Centers for Disease Control and Prevention (CDC) recommends that all women who are pregnant or planning to become pregnant get tested for HIV as early as possible—before, if possible, and during every pregnancy.

Pregnant women with HIV receive HIV medicines to reduce the risk of mother-to-child transmission of HIV and to protect their own health. HIV medicines are recommended for everyone infected with HIV. HIV medicines help people with HIV live longer, healthier lives and reduce the risk of transmission of HIV.

How do HIV medicines prevent mother-to-child transmission of HIV?

HIV medicines work by preventing HIV from multiplying, which reduces the amount of HIV in the body. Having less HIV in the body reduces a woman's risk of passing HIV to her child during pregnancy and childbirth. Having less HIV in the body also protects the woman's health.

Some of the HIV medicine passes from the pregnant woman to her unborn baby across the placenta (also called the afterbirth). This transfer of HIV medicine protects the baby from HIV infection, especially during a vaginal delivery when the baby passes through the birth canal.
and is exposed to any HIV in the mother’s blood or other fluids. In some situations, a woman with HIV may have a cesarean delivery (sometimes called a C-section) to reduce the risk of mother-to-child transmission of HIV during delivery.

Babies born to women with HIV receive HIV medicine for 4 to 6 weeks after birth. The HIV medicine reduces the risk of infection from any HIV that may have entered a baby’s body during childbirth.

Are HIV medicines safe to use during pregnancy?

Most HIV medicines are safe to use during pregnancy. In general, HIV medicines don’t increase the risk of birth defects. Health care providers talk with HIV-infected women about the benefits and risks of specific HIV medicines to help the women decide which HIV medicines to use during pregnancy.

Are there other ways to prevent mother-to-child transmission of HIV?

Because HIV can be transmitted in breast milk, HIV-infected women in the United States should not breastfeed their babies. In the United States, baby formula is a safe and healthy alternative to breast milk.

There are reports of children becoming infected with HIV by eating food that was previously chewed by a person infected with HIV. To be safe, babies should not be fed pre-chewed food.

How can I learn more about preventing mother-to-child transmission of HIV?

Read the following AIDSinfo fact sheets:

- HIV Medicines During Pregnancy and Childbirth
- Preventing Mother-to-Child Transmission of HIV After Birth

This fact sheet is based on information from the following sources:
Post-Exposure Prophylaxis (PEP)

**Key Points**

- Post-exposure prophylaxis (PEP) involves taking antiretroviral (ARV) medicines very soon after a possible exposure to HIV to prevent becoming infected with HIV.
- PEP should be started as soon as possible to be effective and always within 72 hours (3 days) after a possible exposure to HIV.
- If your health care provider thinks PEP is right for you, you’ll take 3 or more ARV medicines every day for 28 days.

What is PEP?

PEP stands for “post-exposure prophylaxis.” The word “prophylaxis” means to prevent or protect from an infection or disease. PEP involves taking antiretroviral (ARV) medicines very soon after a possible exposure to HIV to prevent becoming infected with HIV.

There are 2 types of PEP: oPEP and nPEP. oPEP stands for “occupational post-exposure prophylaxis.” It’s when a health care worker takes PEP because of a possible on-the-job exposure to HIV, such as during a needlestick injury.
The other type of PEP is called nPEP, and it stands for “non-occupational post-exposure prophylaxis.” It’s when someone takes PEP because of a possible HIV exposure that happened outside of the person’s work, such as during sex or injection drug use.

Who should consider taking PEP?

PEP might be prescribed for you if you are HIV negative or don’t know your HIV status, and in the last 72 hours you:

- Think you were exposed to HIV during your work, for example from a needlestick injury
- Think you were exposed to HIV during sex
- Shared needles or drug preparation equipment (“works”)
- Were sexually assaulted

Your health care provider will help to determine whether you should receive PEP.

PEP is intended for emergency situations. It is not meant for regular use by people who may be exposed to HIV frequently. Another HIV prevention method, called pre-exposure prophylaxis or PrEP, is when people at high risk for HIV take a specific HIV medicine daily to prevent getting HIV. For more information on PrEP, see the AIDSinfo fact sheet on Pre-Exposure Prophylaxis (PrEP).

What should I do if I think I was recently exposed to HIV?

If you think you were exposed to HIV, immediately contact your health care provider or go to an emergency room, urgent care clinic, or local HIV clinic right away. You will have an HIV test and other tests done. Your health care provider or emergency room doctor will help to decide whether you should receive PEP.

When should PEP be taken?

PEP should be started as soon as possible to be effective and always within 72 hours (3 days) after a possible exposure to HIV. According to research, PEP will most likely not prevent HIV infection if it is taken 72 hours after a person is exposed to HIV.
How long is PEP taken for?

PEP involves taking 3 or more ARV medicines every day for 28 days. You will need to return to your health care provider at certain times while taking PEP and after you finish taking PEP for HIV testing and other tests.

What HIV medicines are used for PEP?

The Centers for Disease Control and Prevention (CDC) provides information on recommended ARV medicines for PEP. CDC also provides PEP recommendations for specific groups of people, including children, pregnant women, and people with kidney problems. The most recent PEP recommendations can be found on CDC’s PEP Guidelines webpage. Your health care provider or emergency room doctor will determine which medicines you should take as part of PEP.

Does PEP work?

PEP is effective in preventing HIV infection when it’s taken correctly, but it’s not 100% effective. The sooner you start PEP after a possible HIV exposure, the better. While taking PEP, it’s important to keep using condoms with sex partners and to continue safe drug injection practices. Read this fact sheet from CDC for information on how to use condoms correctly.

Does PEP cause side effects?

The ARV medicines in PEP may cause side effects. The side effects can be treated and aren’t life threatening. Talk to your health care provider if you have any side effect that bothers you or that does not go away.

PEP medicines may also interact with other medicines that people are taking (known as a drug interaction). Because of potential drug interactions, it’s important to tell your health care provider about any other medicines that you take.

How can I learn more about PEP?
Visit the websites below from CDC to learn more about PEP. This fact sheet is based on information from these sources:

- HIV Basics: PEP
- PEP Resources

**Pre-Exposure Prophylaxis (PrEP)**

**Key Points**

- Pre-exposure prophylaxis (PrEP) can help prevent HIV infection in people who don’t have HIV but who are at high risk of becoming infected with HIV.
- PrEP involves taking a specific HIV medicine every day. PrEP is most effective when taken consistently each day.
- According to the Centers for Disease Control and Prevention (CDC), by taking PrEP every day, a person can lower their risk of getting HIV from sex by more than 90% and from injection drug use by more than 70%.

What is PrEP?

PrEP stands for “pre-exposure prophylaxis.” The word “prophylaxis” means to prevent or protect from an infection or disease.

PrEP can help prevent HIV infection in people who don’t have HIV but who are at high risk of becoming infected with HIV. PrEP involves taking a specific HIV medicine every day. If a person is exposed to HIV, having the HIV PrEP medicine in the person’s bloodstream can help stop HIV from setting up a permanent infection in the body.

What HIV medicine is used for PrEP?

The HIV medicine currently prescribed for PrEP is a combination pill called Truvada. Truvada is made up of two HIV medicines: tenofovir disoproxil fumarate (brand name: Viread) and emtricitabine (brand name: Emtriva). Truvada was approved by the U.S. Food and Drug Administration (FDA) to treat HIV in 2004, and it was approved by FDA for use as PrEP in July 2012.
Other medicines are being studied for possible use as PrEP. These medicines are called investigational drugs, and none of them have been approved by FDA yet. To find out more about investigational HIV drugs, read the AIDSinfo What is an Investigational HIV Drug? fact sheet.

Who should consider taking PrEP?

PrEP is for people who don’t have HIV but who are at high risk of becoming infected with HIV through sex or injection drug use.

You may want to consider PrEP if you are not infected with HIV and you are in an ongoing sexual relationship with an HIV-positive partner.

Other people who may want to consider PrEP include:

- Gay or bisexual men who are not in a monogamous relationship with a recently tested, HIV-negative partner, who have either 1) had anal sex without a condom in the past 6 months, or 2) been diagnosed with a sexually transmitted disease (STD) in the past 6 months.
- Heterosexual men or women who are not in a monogamous relationship with a recently tested, HIV-negative partner, and who do not always use condoms during sex with partners whose HIV status is unknown and who are at high risk of HIV infection (for example, people who inject drugs or have bisexual male partners).
- People who, in the last 6 months, have injected drugs and have either 1) shared needles or injection equipment, or 2) been in a drug treatment program.

The above are some examples of people who may benefit from PrEP. If you think PrEP may be right for you, talk to your health care provider.

Does PrEP work?

PrEP is most effective when taken consistently each day. According to the Centers for Disease Control and Prevention (CDC), by using PrEP every day, you can lower your risk of getting HIV from sex by more than 90% and from injection drug use by more than 70%. Adding other strategies, such as condom use, along with PrEP can reduce a person’s risk even further.
Does PrEP cause side effects?

Most people taking PrEP do not have any serious side effects from the medicine. Some people taking PrEP may have nausea, but this usually goes away over time. Talk to your health care provider if you have any side effect that bothers you or that does not go away.

What should I do if I think PrEP could help me?

If you think you may be at high risk for HIV and that you might benefit from PrEP, talk to your health care provider. If you and your health care provider agree that PrEP might reduce your risk of getting HIV, the next step is a physical examination, an HIV test, and other blood tests. If the tests show that PrEP is likely to be safe for you and that you might benefit from PrEP, your health care provider can give you a prescription.

Many health insurance plans cover the cost of PrEP. A commercial medication assistance program can help eligible people pay for PrEP.

What happens once I start PrEP?

Once you start PrEP, you will need to take PrEP every day. If you don’t take PrEP every day, there may not be enough medicine in your bloodstream to block HIV. Studies have shown that PrEP is much less effective if it is not taken every day.

You should keep using condoms while taking PrEP. Taking PrEP daily can protect you against HIV infection, but it is not 100% effective. Continued use of condoms can help reduce your risk of HIV infection even further. PrEP also does not reduce the risk of getting any other STDs. Read this fact sheet from CDC for information on how to use condoms correctly.

If you are having trouble taking PrEP every day or if you want to stop taking PrEP, talk to your health care provider.

How can I learn more about PrEP?

Visit the websites below from CDC to learn more about PrEP. This fact sheet is based on information from these sources:
HIV Treatment

HIV Treatment: The Basics

**Key Points**

- Antiretroviral therapy (ART) is the use of HIV medicines to treat HIV infection. People on ART take a combination of HIV medicines (called an **HIV regimen**) every day.
- ART is recommended for everyone infected with HIV. People infected with HIV should start ART as soon as possible. ART can’t cure HIV, but HIV medicines help people infected with HIV live longer, healthier lives. ART also reduces the risk of **HIV transmission**.
- Potential risks of ART include unwanted side effects from HIV medicines and **drug interactions** between HIV medicines or between HIV medicines and other medicines a person is taking. Poor adherence—not taking HIV medicines every day and exactly as prescribed—can lead to **drug resistance** and treatment failure.

What is antiretroviral therapy?

Antiretroviral therapy (ART) is the use of HIV medicines to treat HIV infection. People on ART take a combination of HIV medicines (called an **HIV regimen**) every day.

ART is recommended for everyone infected with HIV. ART can’t cure HIV, but HIV medicines help people with HIV live longer, healthier lives. ART also reduces the risk of **HIV transmission**.
How do HIV medicines work?

HIV attacks and destroys the infection-fighting CD4 cells of the immune system. Loss of CD4 cells makes it hard for the body to fight off infections and certain HIV-related cancers.

HIV medicines prevent HIV from multiplying (making copies of itself), which reduces the amount of HIV in the body. Having less HIV in the body gives the immune system a chance to recover. Even though there is still some HIV in the body, the immune system is strong enough to fight off infections and certain HIV-related cancers.

By reducing the amount of HIV in the body, HIV medicines also reduce the risk of HIV transmission.

When is it time to start taking HIV medicine?

People infected with HIV should start ART as soon as possible. In people with the following conditions, it’s especially important to start ART right away: pregnancy, AIDS, certain HIV-related illnesses and coinfections, and early HIV infection. (Early HIV infection is the period up to 6 months after infection with HIV.)

Read the AIDSinfo When to Start Antiretroviral Therapy fact sheet to learn more about why it’s important for people with these conditions to start ART as soon as possible.

What HIV medicines are included in an HIV regimen?

There are many HIV medicines available for HIV regimens. The HIV medicines are grouped into six drug classes according to how they fight HIV. A person’s initial HIV regimen usually includes three HIV medicines from at least two different HIV drug classes.

Selection of an HIV regimen depends on several factors, including possible side effects of HIV medicines and potential drug interactions between medicines. Because the needs of people with HIV vary, there are several HIV regimens to choose from.
What are risks of taking HIV medicines?

Potential risks of ART include side effects from HIV medicines and drug interactions between HIV medicines or between HIV medicines and other medicines a person is taking. Poor adherence—not taking HIV medicines every day and exactly as prescribed—increases the risk of drug resistance and treatment failure.
Side effects
Side effects from HIV medicines can vary depending on the medicine and the person taking the medicine. People taking the same HIV medicine can have very different side effects. Some side effects, like headaches or occasional dizziness, may not be serious. Other side effects, such as swelling of the throat and tongue or liver damage, can be life-threatening.

Drug interactions
HIV medicines can interact with other HIV medicines in an HIV regimen. They can also interact with other medicines, vitamins, nutritional supplements, and herbal products. A drug interaction can reduce or increase a medicine's effect on the body. Drug interactions can also cause unwanted side effects.

Drug resistance
When HIV multiplies in the body, the virus sometimes mutates (changes form) and makes variations of itself. Variations of HIV that develop while a person is taking HIV medicines can lead to drug-resistant strains of HIV. HIV medicines that previously controlled a person’s HIV are not effective against the new, drug-resistant HIV. In other words, the person’s HIV continues to multiply.

Poor adherence to an HIV regimen increases the risk of drug resistance and treatment failure.

Where can I learn more about ART?

Read the other fact sheets in the AIDSinfo HIV Treatment series to learn more about ART. Topics covered in this series include:

- When to Start Antiretroviral Therapy
- What to Start: Choosing an HIV Regimen
- HIV Medication Adherence
- Drug Resistance
- What is a Drug Interaction?

This fact sheet is based on information from the following sources:
Just Diagnosed: Next Steps After Testing Positive for HIV

**Key Points**

- Testing positive for HIV often leaves a person overwhelmed with questions and concerns. It’s important to remember that HIV is a manageable disease that can be treated with HIV medicines. HIV medicines can’t cure HIV, but they help people with HIV live longer, healthier lives.
- The first step after testing HIV positive is to see a health care provider, even if you don’t feel sick. Prompt medical care and treatment with HIV medicines as soon as possible is the best way to stay healthy.
- It is recommended that people with HIV start taking HIV medicines as soon as possible. Deciding when to start HIV medicines and what medicines to take begins with an HIV baseline evaluation.
- An HIV baseline evaluation includes a review of the person’s health and medical history, a physical exam, and lab tests.

What is the next step after testing positive for HIV?

Testing positive for HIV often leaves a person overwhelmed with questions and concerns. It’s important to remember that HIV is a manageable disease that can be treated with HIV medicines.

The first step after testing positive is to see a health care provider, even if you don’t feel sick. People with HIV work closely with their health care providers to decide when to start HIV medicines and what HIV medicines to take.

The use of HIV medicines to treat HIV infection is called antiretroviral therapy (ART). ART involves taking a combination of HIV medicines (called an HIV regimen) every day. ART can’t cure HIV, but it helps people with HIV live longer, healthier lives and reduces the risk of HIV transmission.
It is recommended that people with HIV start ART as soon as possible. Deciding when to start ART and what HIV medicines to take begins with an HIV baseline evaluation.

What is an HIV baseline evaluation?

An HIV baseline evaluation includes all the information collected during a person’s initial visits with a health care provider. The HIV baseline evaluation includes a review of the person’s health and medical history, a physical exam, and lab tests.

The purpose of an HIV baseline evaluation is to:

- Determine how far a person’s HIV infection has progressed. Treatment with HIV medicines can prevent HIV from advancing to AIDS. AIDS is the final stage of HIV infection.
- Evaluate whether the person is ready to start lifelong treatment with HIV medicines.
- Collect information to decide what medicines to start.

During an HIV baseline evaluation, the health care provider explains the benefits and risks of HIV treatment and discusses ways to reduce the risk of passing HIV to others. The health care provider also takes time to answer any questions.

What are some questions people typically ask during their first visits with an HIV health care provider?

People newly diagnosed with HIV infection have many questions. If you’ve just tested HIV positive you may have some of the following questions:

- Because I have HIV, will I eventually get AIDS?
- What can I do to stay healthy and avoid getting other infections?
- How can I prevent passing HIV to others?
- How will HIV treatment affect my lifestyle?
- How should I tell my partner that I have HIV?
- Is there any reason to tell my employer and those I work with that I have HIV?
- Are there support groups for people with HIV?
Many people find it helpful to write down questions before a medical appointment. Some people bring a family member or friend to their HIV appointments to remind them of questions to ask and to write down the answers.

What lab tests are included in an HIV baseline evaluation?

The following lab tests are included in an HIV baseline evaluation.

**CD4 count**
A CD4 count measures the number of CD4 cells in a sample of blood. CD4 cells are infection-fighting cells of the immune system. HIV destroys CD4 cells, which damages the immune system. A damaged immune system makes it hard for the body to fight off infections. Treatment with HIV medicines prevents HIV from destroying CD4 cells. The higher a person’s CD4 count is, the better.

ART is recommended as soon as possible for everyone with HIV, no matter how high or low their CD4 count is. However, a low CD4 count (below 200 cells/mm$^3$) increases the urgency to start ART.

The CD4 count is also used to monitor the effectiveness of HIV medicines once ART is started.

**Viral load**
A viral load test measures how much virus is in the blood (HIV viral load). A goal of HIV treatment is to keep a person’s viral load so low that the virus can’t be detected by a viral load test.

**Drug-resistance testing**
Drug-resistance testing identifies which, if any, HIV medicines will not be effective against a person’s strain of HIV. Health care providers consider a person’s drug resistance test results when recommending an HIV regimen.

**Testing for sexually transmitted infections (STIs)**
Coinfection with another STI can cause HIV infection to advance faster and increase the risk of HIV transmission to a sexual partner. STI testing makes it possible to detect and treat any STIs promptly.
An HIV baseline evaluation also includes other tests, such as a blood cell count, kidney and liver function tests, blood glucose and blood fat level tests, and tests for hepatitis.

To learn more, view the AIDSinfo infographic: What do my lab results mean?

How does an HIV baseline evaluation help determine if a person is ready to start HIV treatment?

Before starting treatment, people with HIV must be prepared to take HIV medicines every day for the rest of their lives. A baseline evaluation can help to identify any issues that can make it difficult to take HIV medicines every day and exactly as prescribed (called medication adherence).

Issues, such as lack of health insurance or alcohol or drug abuse, can make medication adherence difficult. Health care providers can recommend resources to help people deal with any issues before they start taking HIV medicines.

How can I find more resources for a person who has just tested HIV positive?

The following are resources to share with someone newly diagnosed with HIV:

- **How to Find HIV Treatment Services**, a fact sheet listing HIV-related resources including resources to help find a health care provider and get help paying for HIV medicines, from AIDSinfo.
- **Question Builder**, a tool to use to create a list of questions to ask a health care provider, from the Agency for Healthcare Research and Quality.
- **Do You Have to Tell?** A webpage with tips on how to share an HIV diagnosis with others, from AIDS.gov.

This fact sheet is based on information from these sources:

- From the Department of Veterans Affairs: Just Diagnosed
- From the Health Resources and Services Administration: Guide for HIV/AIDS Clinical Care/Testing and Assessment
- From the Department of Health and Human Services: Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents: Baseline Evaluation and Initiation of Antiretroviral Therapy
When to Start Antiretroviral Therapy

**Key Points**

- **Antiretroviral therapy (ART)** is the use of HIV medicines to treat HIV infection. ART is recommended for everyone infected with HIV. ART helps people with HIV live longer, healthier lives.
- People with HIV should start ART as soon as possible. In HIV-infected people with the following conditions, it’s especially important to start ART right away: pregnancy, **AIDS**, certain HIV-related illnesses and coinfections, and early HIV infection. (Early HIV infection is the period up to 6 months after infection with HIV.)
- Before starting ART, people with HIV discuss the benefits and risks of ART with their health care providers. They also discuss the importance of medication adherence—taking HIV medicines every day and exactly as prescribed.

When is it time to start taking HIV medicine?

Treatment with HIV medicines (called antiretroviral therapy or ART for short) is recommended for everyone infected with HIV. ART helps people with HIV live longer, healthier lives and reduces the risk of **HIV transmission**.

The **Department of Health and Human Services (HHS) guidelines on the use of HIV medicines in adults and adolescents** recommend that people with HIV start ART as soon as possible. In HIV-infected people with certain conditions, it’s especially important to start ART right away.

What conditions increase the urgency to start ART?

The following conditions increase the urgency to start ART:

- Pregnancy
- AIDS
- Certain HIV-related illnesses and coinfections
- Early HIV infection
Pregnancy
All pregnant women with HIV should take HIV medicines to prevent mother-to-child transmission of HIV. The HIV medicines will also protect the health of the pregnant woman.

All pregnant women with HIV should start taking HIV medicines as soon as possible during pregnancy. In general, women who are already taking HIV medicines when they become pregnant should continue taking HIV medicines throughout their pregnancies. When HIV infection is diagnosed during pregnancy, ART should be started right away.

AIDS
Acquired immunodeficiency syndrome (AIDS) is the most advanced stage of HIV infection. People with AIDS should start ART immediately.

A diagnosis of AIDS is based on the following criteria:

- A CD4 count less than 200 cells/mm$^3$. A low CD4 count is a sign that HIV has severely damaged the immune system.

OR

- Illness with an AIDS-defining condition. AIDS-defining conditions are infections and cancers that are life-threatening in people with HIV. Certain forms of cervical cancer and tuberculosis are examples of AIDS-defining conditions.

HIV-related illnesses and coinfections
Some illnesses that develop in people infected with HIV increase the urgency to start ART. These illnesses include HIV-related kidney disease and certain opportunistic infections (OIs). OIs are infections that develop more often or are more severe in people with weakened immune systems, such as people with HIV.

Coinfection is when a person has two or more infections at the same time. Coinfection with HIV and certain other infections, such as hepatitis B or hepatitis C virus infection, increases the urgency to start ART.
Early HIV infection

Early HIV infection is the period up to 6 months after infection with HIV. During early HIV infection, the level of HIV in the body (called viral load) is very high. A high viral load damages the immune system and increases the risk of HIV transmission.

ART helps people with HIV live longer, healthier lives. Studies suggest that these benefits begin even when ART is started in early HIV infection. In addition, starting ART during early HIV infection reduces the risk of HIV transmission.

Once a person starts ART, why is medication adherence important?

ART is a life-long treatment that helps people with HIV live longer, healthier lives. Before starting ART, people with HIV discuss the benefits and risks of ART with their health care providers. They also discuss the importance of medication adherence—taking HIV medicines every day and exactly as prescribed. Adherence to an HIV regimen prevents HIV from multiplying and destroying the immune system. Taking HIV medicines every day also reduces the risk of HIV transmission.

Before starting ART, it’s important to address issues that can make adherence difficult. For example, a busy schedule or lack of health insurance to cover the cost of HIV medicines can make it hard to take HIV medicines consistently. Health care providers can recommend resources to help people deal with any issues that may interfere with adherence.

Read the following AIDSinfo fact sheets to learn more about medication adherence:

- HIV Medication Adherence
- Following an HIV Regimen: Steps to Take Before and After Starting HIV Medicines

This fact sheet is based on information from the following sources:

From the U.S. Department of Health and Human Services:
What to Start: Choosing an HIV Regimen

Key Points

- The use of HIV medicines to treat HIV infection is called antiretroviral therapy (ART). People on ART take a combination of HIV medicines (called an HIV regimen) every day.
- HIV medicines are grouped into six drug classes according to how they fight HIV. The six drug classes include more than 25 HIV medicines.
- In general, a person’s first HIV regimen includes three HIV medicines from at least two different drug classes.
- The choice of HIV medicines to include in an HIV regimen depends on a person’s individual needs. When choosing an HIV regimen, people with HIV and their health care providers consider many factors, including possible side effects of HIV medicines and potential drug interactions.

What is an HIV regimen?

An HIV regimen is a combination of HIV medicines used to treat HIV infection. HIV treatment (also called antiretroviral therapy or ART) begins with choosing an HIV regimen. People on ART take the HIV medicines in their HIV regimens every day. ART helps people with HIV live longer, healthier lives and reduces the risk of HIV transmission.

There are more than 25 HIV medicines approved by the U.S. Food and Drug Administration (FDA) to treat HIV infection. Some HIV medicines are available in combination (in other words, two or more different HIV medicines combined in one pill).
The U.S. Department of Health and Human Services (HHS) provides guidelines on the use of HIV medicines. In general, the guidelines recommend starting ART with a regimen that includes three HIV medicines from at least two different drug classes.

What are the HIV drug classes?

HIV medicines are grouped into six drug classes according to how they fight HIV. The six drug classes are:

- Non-nucleoside reverse transcriptase inhibitors (NNRTIs)
- Nucleoside reverse transcriptase inhibitors (NRTIs)
- Protease inhibitors (PIs)
- Fusion inhibitors
- CCR5 antagonists (CCR5s) (also called entry inhibitors)
- Integrase strand transfer inhibitors (INSTIs)

In general, a person's first HIV regimen includes two NRTIs plus an INSTI, an NNRTI, or a PI boosted with cobicistat (brand name: Tybost) or ritonavir (brand name: Norvir). Cobicistat or ritonavir increase (boost) the effectiveness of the PI.

Click here to see the AIDSinfo fact sheet that lists the FDA-approved HIV medicines by drug class.

What factors are considered when choosing an HIV regimen?

The choice of HIV medicines to include in an HIV regimen depends on a person’s individual needs. When choosing an HIV regimen, people with HIV and their health care providers consider the following factors:

- Other diseases or conditions that the person with HIV may have, for example heart disease or pregnancy.
- Possible side effects of HIV medicines.
- Potential interactions between HIV medicines or between HIV medicines and other medicines the person with HIV is taking.
- Results of drug-resistance testing (and other tests). Drug-resistance testing identifies which, if any, HIV medicines won’t be effective against a person’s HIV.
- Convenience of the regimen. For example, a regimen that includes two or more HIV medicines combined in one pill is convenient to follow.
- Any issues that can make it difficult to follow an HIV regimen. For example, a busy schedule can make it hard to take HIV medicines consistently every day.
- Cost of HIV medicines.

The HHS guidelines on the use of HIV medicines in adults and adolescents recommend several regimens for people starting ART. The best regimen for a person depends on their individual needs.

How long does it take for ART to work?

Viral load is the amount of HIV in a person’s blood. A main goal of ART is to reduce a person’s viral load to an undetectable level. An undetectable viral load means that the level of HIV in the blood is too low to be detected by a viral load test.

Once effective ART is started, it usually takes 3 to 6 months for a person’s viral load to reach an undetectable level. Having an undetectable viral load doesn’t mean a person’s HIV is cured. But although there is still some HIV in the person’s body, an undetectable viral load shows that ART is working effectively. Effective ART helps people with HIV live longer, healthier lives and reduces the risk of HIV transmission.

This fact sheet is based on information from the following sources:

- From the Department of Health and Human Services: Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents: Treatment Goals and What to Start: Initial Combination Regimens for the Antiretroviral-Naive Patient
- From the Department of Veterans Affairs: Treatment Decisions
FDA-Approved HIV Medicines

Treatment with HIV medicines is called antiretroviral therapy (ART). ART is recommended for everyone with HIV. People on ART take a combination of HIV medicines (called an HIV regimen) every day. A person's initial HIV regimen generally includes three HIV medicines from at least two different drug classes.

ART can’t cure HIV, but HIV medicines help people with HIV live longer, healthier lives. HIV medicines also reduce the risk of HIV transmission.

The following table lists HIV medicines approved by the U.S. Food and Drug Administration (FDA) for the treatment of HIV infection in the United States. The HIV medicines are listed according to drug class and identified by generic and brand names. Click on a drug name to view information on the drug from the AIDSinfo Drug Database. Or download the AIDSinfo Drug Database app to view the information on your Apple or Android devices.

To see a timeline of all FDA approval dates for HIV medicines, view the AIDSinfo FDA Approval of HIV Medicines infographic.

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<td>abacavir (abacavir sulfate, ABC)</td>
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<td>didanosine (delayed-release didanosine, dideoxyinosine, enteric-coated didanosine, ddI, ddI EC)</td>
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<td>zidovudine (azidothymidine, AZT, ZDV)</td>
<td>Retrovir</td>
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**Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs)**

NNRTIs bind to and later alter reverse transcriptase, an enzyme HIV needs to make copies of itself.

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<tr>
<th></th>
<th><strong>Generic Name</strong> (EFV)</th>
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<tr>
<td></td>
<td>efavirenz</td>
<td>Sustiva</td>
<td>September 17, 1998</td>
</tr>
<tr>
<td></td>
<td>etravirine (ETR)</td>
<td>Intelence</td>
<td>January 18, 2008</td>
</tr>
<tr>
<td></td>
<td>nevirapine (extended-release nevirapine, NVP)</td>
<td>Viramune</td>
<td>June 21, 1996</td>
</tr>
<tr>
<td>Drug Class</td>
<td>Generic Name</td>
<td>Brand Name</td>
<td>FDA Approval Date</td>
</tr>
<tr>
<td>-----------------------------</td>
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</tr>
<tr>
<td>Viramune XR (extended release)</td>
<td>rilpivirine (rilpivirine hydrochloride, RPV)</td>
<td>Edurant</td>
<td>May 20, 2011</td>
</tr>
<tr>
<td>Protease Inhibitors (PIs)</td>
<td>atazanavir (atazanavir sulfate, ATV)</td>
<td>Reyataz</td>
<td>June 20, 2003</td>
</tr>
<tr>
<td></td>
<td>darunavir (darunavir ethanolate, DRV)</td>
<td>Prezista</td>
<td>June 23, 2006</td>
</tr>
<tr>
<td></td>
<td>fosamprenavir (fosamprenavir calcium, FOS-APV, FPV)</td>
<td>Lexiva</td>
<td>October 20, 2003</td>
</tr>
<tr>
<td></td>
<td>indinavir (indinavir sulfate, IDV)</td>
<td>Crixivan</td>
<td>March 13, 1996</td>
</tr>
<tr>
<td></td>
<td>nelfinavir (nelfinavir mesylate, NFV)</td>
<td>Viracept</td>
<td>March 14, 1997</td>
</tr>
<tr>
<td></td>
<td>ritonavir (RTV)</td>
<td>Norvir</td>
<td>March 1, 1996</td>
</tr>
</tbody>
</table>
### FDA-Approved HIV Medicines

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Generic Name</th>
<th>Brand Name</th>
<th>FDA Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>*Although ritonavir is a PI, it is generally used as a pharmacokinetic enhancer as recommended in the <em>Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents</em> and the <em>Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection.</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fusion Inhibitors</strong></td>
<td><strong>saquinavir</strong> (saquinavir mesylate, SQV)</td>
<td>Invirase</td>
<td>December 6, 1995</td>
</tr>
<tr>
<td><strong>Entry Inhibitors</strong></td>
<td><strong>tipranavir</strong> (TPV)</td>
<td>Aptivus</td>
<td>June 22, 2005</td>
</tr>
<tr>
<td><strong>Integrase Inhibitors</strong></td>
<td><strong>enfuvirtide</strong> (T-20)</td>
<td>Fuzeon</td>
<td>March 13, 2003</td>
</tr>
<tr>
<td></td>
<td><strong>maraviroc</strong> (MVC)</td>
<td>Selzentry</td>
<td>August 6, 2007</td>
</tr>
</tbody>
</table>

**Fusion Inhibitors**

Fusion inhibitors block HIV from entering the CD4 cells of the immune system.

**Entry Inhibitors**

Entry inhibitors block proteins on the CD4 cells that HIV needs to enter the cells.
### FDA-Approved HIV Medicines

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Generic Name (Other names and acronyms)</th>
<th>Brand Name</th>
<th>FDA Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrase inhibitors block HIV integrase, an enzyme HIV needs to make copies of itself.</td>
<td>dolutegravir (DTG, dolutegravir sodium)</td>
<td>Tivicay</td>
<td>August 13, 2013</td>
</tr>
<tr>
<td></td>
<td>elvitegravir (EVG)</td>
<td>Vitekta</td>
<td>September 24, 2014</td>
</tr>
<tr>
<td></td>
<td>raltegravir (raltegravir potassium, RAL)</td>
<td>Isentress</td>
<td>October 12, 2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Isentress HD</td>
<td>May 26, 2017</td>
</tr>
</tbody>
</table>

### Pharmacokinetic Enhancers

Pharmacokinetic enhancers are used in HIV treatment to increase the effectiveness of an HIV medicine included in an HIV regimen.

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Generic Name (Other names and acronyms)</th>
<th>Brand Name</th>
<th>FDA Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cobicistat (COBI)</td>
<td>Tybost</td>
<td>September 24, 2014</td>
</tr>
</tbody>
</table>

### Combination HIV Medicines

Combination HIV medicines contain two or more HIV medicines from one or more drug classes.

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Generic Name (Other names and acronyms)</th>
<th>Brand Name</th>
<th>FDA Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>abacavir and lamivudine</td>
<td>Epzicom</td>
<td>August 2, 2004</td>
</tr>
<tr>
<td></td>
<td>(abacavir sulfate / lamivudine, ABC / 3TC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>abacavir, dolutegravir, and lamivudine</td>
<td>Trumeq</td>
<td>August 22, 2014</td>
</tr>
<tr>
<td></td>
<td>(abacavir sulfate / dolutegravir sodium / lamivudine, ABC / DTG / 3TC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug Class</td>
<td>Generic Name (Other names and acronyms)</td>
<td>Brand Name</td>
<td>FDA Approval Date</td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------------------</td>
<td>------------</td>
<td>------------------</td>
</tr>
<tr>
<td>abacavir, lamivudine, and zidovudine (abacavir sulfate / lamivudine / zidovudine, ABC / 3TC / ZDV)</td>
<td>Trizivir</td>
<td>November 14, 2000</td>
<td></td>
</tr>
<tr>
<td>atazanavir and cobicistat (atazanavir sulfate / cobicistat, ATV / COBI)</td>
<td>Evotaz</td>
<td>January 29, 2015</td>
<td></td>
</tr>
<tr>
<td>darunavir and cobicistat (darunavir ethanolate / cobicistat, DRV / COBI)</td>
<td>Prezcobix</td>
<td>January 29, 2015</td>
<td></td>
</tr>
<tr>
<td>efavirenz, emtricitabine, and tenofovir disoproxil fumarate (efavirenz / emtricitabine / tenofovir DF, EFV / FTC / TDF)</td>
<td>Atripla</td>
<td>July 12, 2006</td>
<td></td>
</tr>
<tr>
<td>elvitegravir, cobicistat, emtricitabine, and tenofovir alafenamide fumarate (elvitegravir / cobicistat / emtricitabine / tenofovir alafenamide, EVG / COBI / FTC / TAF)</td>
<td>Genvoya</td>
<td>November 5, 2015</td>
<td></td>
</tr>
<tr>
<td>elvitegravir, cobicistat, emtricitabine, and tenofovir disoproxil fumarate (QUAD, EVG / COBI / FTC / TDF)</td>
<td>Stribild</td>
<td>August 27, 2012</td>
<td></td>
</tr>
<tr>
<td>emtricitabine, rilpivirine, and tenofovir alafenamide (emtricitabine / rilpivirine / tenofovir AF, emtricitabine / rilpivirine / tenofovir alafenamide fumarate, emtricitabine / rilpivirine hydrochloride / tenofovir AF, emtricitabine / rilpivirine hydrochloride / tenofovir alafenamide, emtricitabine / rilpivirine hydrochloride / tenofovir alafenamide fumarate, FTC / RPV / TAF)</td>
<td>Odefsey</td>
<td>March 1, 2016</td>
<td></td>
</tr>
</tbody>
</table>
## FDA-Approved HIV Medicines

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Generic Name (Other names and acronyms)</th>
<th>Brand Name</th>
<th>FDA Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>emtricitabine, rilpivirine, and tenofovir disoproxil fumarate</td>
<td>(emtricitabine / rilpivirine hydrochloride / tenofovir disoproxil fumarate, emtricitabine / rilpivirine / tenofovir, FTC / RPV / TDF)</td>
<td>Complera</td>
<td>August 10, 2011</td>
</tr>
<tr>
<td>emtricitabine and tenofovir alafenamide</td>
<td>(emtricitabine / tenofovir AF, emtricitabine / tenofovir alafenamide fumarate, FTC / TAF)</td>
<td>Descovy</td>
<td>April 4, 2016</td>
</tr>
<tr>
<td>emtricitabine and tenofovir disoproxil fumarate</td>
<td>(emtricitabine / tenofovir DF, FTC / TDF)</td>
<td>Truvada</td>
<td>August 2, 2004</td>
</tr>
<tr>
<td>lamivudine and zidovudine</td>
<td>(3TC / ZDV)</td>
<td>Combivir</td>
<td>September 27, 1997</td>
</tr>
<tr>
<td>lopinavir and ritonavir</td>
<td>(ritonavir-boosted lopinavir, LPV/r, LPV / RTV)</td>
<td>Kaletra</td>
<td>September 15, 2000</td>
</tr>
</tbody>
</table>

This fact sheet is based on information from the following sources:

- From FDA: [Antiretroviral Drugs Used in the Treatment of HIV Infection](https://www.fda.gov/Drugs/DevelopmentApprovalProcess/DrugApplications/HowDrugsAreApproved/ucm135537.htm)
- From the National Institute of Allergy and Infectious Diseases: [Drugs That Fight HIV-1](https://www.niaid.nih.gov/topics/hiv/AIDS-drugs)
- From the National Library of Medicine: Drug information from the [DailyMed website](https://dailymed.nlm.nih.gov/dailymed)
Drug Resistance

**Key Points**

- As HIV multiplies in the body, the virus sometimes mutates (changes form) and produces variations of itself. Variations of HIV that develop while a person is taking HIV medicines can lead to drug-resistant strains of HIV.
- With drug resistance, HIV medicines that previously controlled a person’s HIV are not effective against new, drug-resistant HIV. In other words, the HIV medicines can’t prevent the drug-resistant HIV from multiplying. Drug resistance can cause HIV treatment to fail.
- A person can initially be infected with drug-resistant HIV or develop drug-resistant HIV after starting HIV medicines.
- **Drug-resistance testing** identifies which, if any, HIV medicines won’t be effective against a person’s HIV. Drug-resistance testing results help determine which HIV medicines to include in an HIV treatment regimen.
- Medication adherence—taking HIV medicines every day and exactly as prescribed—reduces the risk of drug resistance.

What is HIV drug resistance?

Once a person becomes infected with HIV, the virus begins to multiply (make copies of itself) in the body. As HIV multiplies, it sometimes mutates (changes form) and produces variations of itself. Variations of HIV that develop while a person is taking HIV medicines can lead to drug-resistant strains of HIV.

With drug resistance, HIV medicines that previously controlled the person’s HIV are not effective against the new, drug-resistant HIV. In other words, the HIV medicines can’t prevent the drug-resistant HIV from multiplying. Drug resistance can cause HIV treatment to fail.

Drug-resistant HIV can spread from person to person. People initially infected with drug-resistant HIV have drug resistance to one or more HIV medicines even before they start taking HIV medicines.

How does poor medication adherence increase the risk of drug resistance?
Medication adherence means taking HIV medicines every day and exactly as prescribed. HIV medicines prevent HIV from multiplying. Skipping HIV medicines allows HIV to multiply, which increases the risk that the virus will mutate and produce drug-resistant HIV.

As a result of drug resistance, one or more HIV medicines in a person’s HIV regimen may no longer be effective.

What is cross resistance?

Cross resistance is when resistance to one HIV medicine causes resistance to other medicines in the same HIV drug class. (HIV medicines are grouped into drug classes according to how they fight HIV.) As a result of cross resistance, a person’s HIV may be resistant even to HIV medicines that the person has never taken. Cross resistance limits the number of HIV medicines available to include in an HIV regimen.

What is drug-resistance testing?

Drug-resistance testing is done to identify which, if any, HIV medicines won’t be effective against a person’s strain of HIV. Drug-resistance testing is done using a sample of blood.

Drug-resistance testing is done when a person first begins receiving care for HIV infection. Resistance testing should be done whether the person decides to start taking HIV medicines immediately or to delay treatment. If treatment is delayed, resistance testing may be repeated when HIV medicines are started.

Drug-resistance testing done before a person starts HIV medicines for the first time can show whether the person was initially infected with a drug-resistant strain of HIV. Drug-resistance testing results are used to decide which HIV medicines to include in a person’s first HIV regimen.
After treatment is started, drug-resistance testing is repeated if viral load testing indicates that a person’s HIV regimen isn’t controlling the virus. If drug-resistance testing shows that the HIV regimen isn’t effective because of drug resistance, the test results can be used to select a new HIV regimen.

Drug-resistance testing is also recommended for all HIV-infected pregnant women before starting HIV medicines and also in some pregnant women already taking HIV medicines. Pregnant women will work with their health care providers to decide if drug-resistance testing is needed.

How can a person taking HIV medicines reduce the risk of drug resistance?

Adherence to an effective HIV treatment regimen reduces the risk of drug resistance.

Here are some tips on medication adherence for people living with HIV:

- Once you decide to start treatment, work closely with your health care provider to choose an HIV regimen that suits your needs. A regimen that meets your needs will make adherence easier. Tell your health care provider about any issues that can make adherence difficult. For example, tell your health care provider if you have a busy schedule that makes it hard to take medicines on time or lack health insurance to cover the cost of HIV medicines. Your health care provider can recommend resources to help you address any issues before you start taking HIV medicines.
- When you start treatment, closely follow your HIV regimen. Take your HIV medicines every day and exactly as prescribed. Use medication aids such as a 7-day pill box or pill diary to stay on track. Download the AIDSinfo Drug Database app to set daily pill reminders.
- Keep your medical appointments so that your health care provider can monitor your HIV treatment. Appointments are a good time to ask questions and ask for help to manage problems that make it hard to follow an HIV regimen.

How can I learn more about drug resistance?

- Read about HIV resistance testing.
- Get more tips on HIV medication adherence.
- View the AIDSinfo drug resistance infographic.
This fact sheet is based on information from the following sources:

- From the Department of Health and Human Services: Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents/Drug-Resistance Testing
- From the Health Resources and Services Administration: Guide for HIV/AIDS Clinical Care/Resistance Testing
- From the National Institute of Allergy and Infectious Diseases: HIV/AIDS Treatment

HIV Medication Adherence

**Key Points**

- Medication adherence means sticking firmly to an HIV regimen—taking HIV medicines every day and exactly as prescribed.
- HIV medicines prevent HIV from multiplying, which protects the immune system and reduces the risk of both drug resistance and HIV treatment failure. Medication adherence lets HIV medicines do their job!
- Adherence can be difficult for many reasons. For example, side effects from some HIV medicines can make it hard to stick to an HIV regimen, or a medication dosing schedule might not fit well into a person’s routine.
- Strategies to help maintain adherence include using a 7-day pill box and setting daily pill reminders on a smartphone. For more tips on medication adherence, read the AIDSinfo fact sheet: Following an HIV Regimen: Steps to Take Before and After Starting HIV Medicines.

What is medication adherence?

Adherence means “to stick firmly.” So for people with HIV, medication adherence means sticking firmly to an HIV regimen—taking HIV medicines every day and exactly as prescribed.

Why is adherence to an HIV regimen important?

Adherence to an HIV regimen gives HIV medicines the chance to do their job: to prevent HIV from multiplying and destroying the immune system. HIV medicines help people with HIV live longer, healthier lives. HIV medicines also reduce the risk of HIV transmission.
Poor adherence to an HIV regimen allows HIV to destroy the immune system. A damaged immune system makes it hard for the body to fight off infections and certain cancers. Poor adherence also increases the risk of drug resistance and HIV treatment failure.

What is drug resistance?

Drug resistance can develop as HIV multiplies in the body. When HIV multiplies, the virus sometimes mutates (changes form) and makes variations of itself. Variations of HIV that develop while a person is taking HIV medicines can lead to new, drug-resistant strains of HIV. With drug resistance, HIV medicines that used to suppress the person’s HIV are not effective against the new drug-resistant HIV. In other words, the person’s HIV continues to multiply.

Once drug-resistant HIV develops, it remains in the body. Drug resistance limits the number of HIV medicines available to include in a current or future HIV regimen.

What is the connection between medication adherence and drug resistance?

Taking HIV medicines every day prevents HIV from multiplying, which reduces the risk that HIV will mutate and produce drug-resistant HIV. Skipping HIV medicines allows HIV to multiply, which increases the risk of drug-resistant HIV developing.

Research shows that a person’s first HIV regimen offers the best chance for long-term treatment success. So adherence is important from the start—when a person first begins taking HIV medicines.

Why is medication adherence sometimes difficult?

Adherence to an HIV regimen can be difficult for several reasons. For example, side effects from some HIV medicines, such as nausea or diarrhea, can make it hard to follow an HIV regimen. When an HIV regimen includes several HIV medicines, it’s easy to forget how many pills to take and when to take them.

The following factors can also make medication adherence difficult:
- Side effects from interactions between HIV medicines and other medicines a person may take
- Trouble swallowing pills or other difficulty taking medicines
- A busy schedule, shift work, or travel away from home that makes it hard to take medicines on time
- Having an unstable living or housing situation
- Illness or depression
- Alcohol or drug use that interferes with the activities of daily life
- Fear of disclosing one’s HIV-positive status to others
- Lack of health insurance to cover the cost of HIV medicines

Before starting HIV medicines, it helps to have strategies in place to maintain adherence. Strategies may include using a 7-day pill box or using an app, such as the AIDSinfo Drug Database app, to set daily pill reminders. Also, health care providers can provide helpful referrals and resources for anticipated adherence challenges. People can work with their health care providers to select an HIV regimen that works best for their needs and lifestyle.

To get more tips on adherence, read the AIDSinfo fact sheet: Following an HIV Regimen: Steps to Take Before and After Starting HIV Medicines.

This fact sheet is based on information from the following sources.

- From the Department of Health and Human Services: Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents/Adherence to Antiretroviral Therapy
- From the Health Resources and Services Administration: Guide for HIV/AIDS Clinical Care: HIV Treatment/Adherence
Following an HIV Regimen: Steps to Take Before and After Starting HIV Medicines

Key Points

- An essential part of following an HIV regimen is medication adherence. Medication adherence means sticking firmly to an **HIV regimen**—taking HIV medicines every day and exactly as prescribed.
- Medication adherence reduces the risk of **drug resistance** and treatment failure.
- Before starting an HIV regimen, tell your health care provider about any issues that can make adherence difficult, such as lack of health insurance or alcohol or drug abuse.
- After starting an HIV regimen, medication aids such as pill boxes, pill reminders, and medication diaries can help to maintain long-term medication adherence.
Before starting an HIV regimen, talk to your health care provider about medication adherence.

Talking with your health care provider will help you understand why you’re starting HIV treatment and why medication adherence is important. Medication adherence means sticking firmly to an HIV regimen—taking HIV medicines every day and exactly as prescribed.

Your health care provider will explain that taking HIV medicines every day can protect your health and prevent your HIV infection from advancing to AIDS. The HIV medicines will also reduce your risk of passing HIV to another person during sex. Your health care provider will emphasize that adherence to an HIV regimen reduces the risk of drug resistance and treatment failure.

Information that you share with your health care provider will make it easier to select an HIV regimen that suits your needs. The information will also help you and your health care provider plan ahead for any issues that may make adherence difficult.

What should I tell my health care provider before starting an HIV regimen?

Tell your health care provider about other prescription and nonprescription medicines, vitamins, nutritional supplements, and herbal products you are taking or plan to take. Other medicines you take may interact with the HIV medicines in your HIV regimen. A drug interaction can reduce or increase the effect of a medicine or cause side effects.

Tell your health care provider about any issues that can make adherence difficult. Issues such as lack of health insurance or alcohol or drug use can make it hard to follow an HIV regimen. If needed, your health care provider can recommend resources to help you address any issues before you start treatment.

Describe your schedule at home and at work to your health care provider. Working together, you can arrange your HIV medication schedule to match your day-to-day routine.

Ask your health care provider for written instructions on how to follow your HIV regimen. The instructions should include the following details:
• Each HIV medicine included in your regimen
• How much of each medicine to take
• When to take each medicine
• How to take each medicine (for example, with or without food)
• Possible side effects from each medicine, including serious side effects
• How to store each medicine

Use small candies to practice following the instructions. The practice will help you identify and address problems with adherence before you start your HIV regimen.

After you start an HIV regimen, use a variety of strategies to maintain adherence.

To maintain adherence over the long term, try some of the following strategies:

• Use a 7-day pill box. Once a week, fill the pill box with your HIV medicines for the entire week.
• Take your HIV medicines at the same time every day.
• Set the alarm on your cell phone to remind you to take your medicines. (An alarm clock or timer works too.) Or download the AIDSinfo Drug App to bookmark your HIV medicines, make notes, and set daily pill reminders.
• Ask your family members, friends, or coworkers to remind you to take your medicines.
• Keep your medicines nearby. Keep a back-up supply of medicines at work or in your purse or briefcase.
• Plan ahead for changes in your daily routine, including weekends and holidays. If you’re going away, pack enough medicine to last the entire trip.
• Use an app or an online or paper medicine diary to stay on track. Enter the name of each medicine; include the dose, number of pills to take, and when to take them. Record each medicine as you take it. Reviewing your diary will help you identify the times that you’re most likely to forget to take your medicines.
• Keep all of your medical appointments. Use a calendar to keep track of your appointments. If you run low on medicines before your next appointment, call your health care provider to renew your prescriptions.
• Get additional tips on adherence by joining a support group for people living with HIV.

What should I do if I forget to take my HIV medicines?
Unless your health care provider tells you otherwise, take the medicine you missed as soon as you realize you skipped it. But if it’s almost time for the next dose of the medicine, don’t take the missed dose and instead just continue on your regular medication schedule. Don’t take a double dose of a medicine to make up for a missed dose.

Discuss medication adherence at each appointment with your health care provider.

Tell your health care provider if you’re having difficulty following your regimen. Don’t forget to mention any side effects you’re having. Side effects from HIV medicines are a major reason why medication adherence can be difficult.

Let your health care provider know if your regimen is too complicated to follow. Your health care provider may simplify your regimen by including fewer HIV medicines or by reducing the number of times a day you need to take your HIV medicines.

Discuss any issues that are causing you to skip medicines. Your health care provider can recommend resources to help you deal with the issues.

Learn more about adherence.

- Read this fact sheet on adherence.
- Get tools and resources to help with medication adherence.

This fact sheet is based on information from the following sources:

- From the Department of Health and Human Services: Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents: Adherence to Antiretroviral Therapy
- From the Health Resources and Services Administration: Guide for HIV/AIDS Clinical Care: HIV Treatment/Adherence
HIV and Immunizations

**Key Points**

- Vaccines protect people from diseases such as chicken pox, flu, and polio. Vaccines are given by needle injection (a shot), by mouth, or sprayed into the nose. The process of getting a vaccine is called vaccination or immunization.

- There are no vaccines to prevent or cure HIV, but people with HIV can benefit from vaccines against other diseases. The following vaccines are recommended for all people with HIV: hepatitis B; influenza (flu); human papillomavirus (HPV) (for those up to age 26); pneumococcal (pneumonia); and tetanus, diphtheria, and pertussis (a single vaccine that protects against the three diseases). Every 10 years, a repeat vaccine against tetanus and diphtheria is also recommended. Other vaccines may be recommended for some people with HIV.

- In general, people with HIV should not get live, attenuated vaccines unless the benefit outweighs the risk.

- Because HIV medicines strengthen the immune system and reduce HIV viral load, whenever possible people with HIV may want to start taking HIV medicines before getting immunizations.

What are vaccines?

Vaccines protect people from diseases such as chicken pox, flu, and polio. Vaccines are given by needle injection (a shot), by mouth, or sprayed into the nose. The process of getting a vaccine is called vaccination or immunization.

Most vaccines are designed to prevent a person from ever having a particular disease or to result in a person having only a mild case of the disease. When a person gets a vaccine, the body responds by mounting an immune response against the particular disease. An immune response includes all the actions of the immune system to defend the body against the infection.

Vaccines not only protect individuals from disease, they protect communities as well. When most people in a community get immunized against a disease, there is little chance of a disease outbreak.

Is there a vaccine against HIV?
Testing is underway on experimental vaccines to prevent and treat HIV/AIDS, but no HIV vaccines are approved for use outside of clinical trials. For more information about these vaccines, read the AIDSinfo fact sheets What is a Preventive HIV Vaccine? and What is a Therapeutic HIV Vaccine?

Even though there are no vaccines to prevent or cure HIV, people with HIV can benefit from vaccines against other diseases.

Can HIV infection affect the safety and effectiveness of vaccines?

Yes. Damage to the immune system due to HIV can reduce the body’s immune response to a vaccine. A weakened immune response makes a vaccine less effective. In general, vaccines work best when an HIV-infected person’s CD4 count is above 200 copies/mm³.

By stimulating the immune system, vaccines may also cause a person’s HIV viral load to increase temporarily.

Because HIV medicines strengthen the immune system and reduce HIV viral load, people with HIV may want to start antiretroviral therapy (ART) before getting vaccinated whenever possible. In some situations, however, immunizations should be given even if ART has not been started. For example, it’s important for people with HIV to get vaccinated against the flu at the time of year when the risk of flu is greatest.

Are all types of vaccines safe for people with HIV?

The design of a vaccine depends on several factors, such as how a microbe infects the body and how the immune system responds. For this reason, there are several types of vaccines, including live, attenuated vaccines and inactivated vaccines.

**Live, attenuated vaccines:**
A live, attenuated vaccine contains a weakened but live form of a disease-causing microbe. Although the attenuated (weakened) microbe cannot cause the disease (or can cause only mild disease), the vaccine can still trigger an immune response.
**Inactivated vaccines:**

Inactivated vaccines are made from microbes that have been killed with chemicals, heat, or radiation. There is no chance that an inactivated vaccine can cause the disease it was designed to prevent.

In general, to be safe, people with HIV should get inactivated vaccines to avoid even the remote chance of getting a disease from a live, attenuated vaccine. However, for some diseases, only live, attenuated vaccines are available. In this case, the protection offered by the live vaccine may outweigh the risks. Vaccines against chicken pox and shingles are examples of live, attenuated vaccines that, in certain situations, may be recommended for people with HIV.

Do vaccines cause side effects?

Side effects from vaccines are generally minor (for example, soreness at the location of an injection or a low-grade fever) and go away within a few days. Severe reactions to vaccines are rare. Before getting a vaccine, talk to your health care provider about the benefits and risks of the vaccine and possible side effects.

Which vaccines are recommended for people with HIV?

The following vaccines are recommended for people with HIV:

- Hepatitis B
- Influenza (flu)
- Pneumococcal (pneumonia)
- Tetanus, diphtheria, and pertussis (whooping cough). A single vaccine called Tdap protects adolescents and adults against the three diseases. Every 10 years, a repeat vaccine against tetanus and diphtheria (called Td) is recommended.
- Human papillomavirus (HPV) (for those up to age 26)

Additional vaccines may be recommended based on an HIV-infected person’s age, previous vaccinations, risk factors for a particular disease, or certain HIV-related factors. For more details, read this information from the Centers for Disease Control and Prevention (CDC): [HIV Infection and Adult Vaccination](https://www.cdc.gov/hiv/AIDSinfo/vaccines.html).
What about travel and immunizations?

Regardless of destination, all travelers should be up to date on routine vaccinations. Those traveling to destinations outside the United States may need immunizations against diseases present in other parts of the world, such as cholera or yellow fever.

If you have HIV, talk to your health care provider about any vaccines you may need before you travel.

- If a required immunization is available only as a live, attenuated vaccine, your health care provider can give you a letter that excuses you from getting the vaccine.
- If your CD4 count is less than 200 copies/mm$^3$, your health care provider may recommend that you delay travel to give your HIV medicines time to strengthen your immune system.
- To prepare for your trip, read information from CDC on Travelers with Weakened Immune Systems.

This fact sheet is based on information from the following sources:
- From CDC, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America: Guidelines for the Prevention and Treatment of Opportunistic Infections in HIV-Infected Adults and Adolescents
- From the Health Resources and Services Administration: Guide for HIV/AIDS Clinical Care/Immunizations for HIV-Infected Adults and Adolescents
- From the National Institute of Allergy and Infectious Diseases: Vaccines

What is a Drug Interaction?

**Key Points**

- A drug interaction is a reaction between two (or more) drugs or between a drug and a food or beverage.
- A drug interaction can decrease or increase the action of a drug or cause unwanted side effects.
- Having an existing medical condition can also cause a drug interaction. For example, taking a nasal decongestant if you have high blood pressure may cause an unwanted reaction.
- Treatment with HIV medicines (called antiretroviral therapy or ART) helps people with HIV live longer, healthier lives. But drug interactions can complicate HIV treatment.
To avoid drug interactions, tell your health care provider about all prescription and nonprescription medicines, vitamins, nutritional supplements, and herbal products you are taking or plan to take.

What is a drug interaction?

A drug interaction is a reaction between two (or more) drugs (called a drug-drug interaction) or between a drug and a food or beverage (called a drug-food interaction). An existing medical condition can make certain drugs potentially harmful (called a drug-condition interaction). For example, taking a nasal decongestant if you have high blood pressure may cause an unwanted reaction.

Medicines help us feel better and stay healthy. But drug interactions can cause problems by reducing or increasing the action of a medicine or causing adverse (unwanted) side effects.
Are drug interactions a problem for people with HIV?

Treatment with HIV medicines (called antiretroviral therapy or ART) helps people with HIV live longer, healthier lives. But drug interactions, especially drug-drug interactions, can complicate HIV treatment.

Drug-drug interactions between HIV medicines are common. Interactions between HIV medicines may reduce or increase the concentration of an HIV medicine in the blood. The change in concentration can make the affected HIV medicine less effective, more effective, or so strong that it causes dangerous side effects.

Drug-drug interactions between HIV medicines and other medicines are also common. For example, some HIV medicines may make hormonal birth control less effective. Women using hormonal contraceptives may need to use an additional or different method of birth control to prevent pregnancy. For more information about using birth control and HIV medicines at the same time, view the AIDSinfo HIV and Birth Control infographic.

Can drug-food interactions and drug-condition interactions affect people with HIV?

Yes, the use of HIV medicines can lead to both drug-food interactions and drug-condition interactions.

Food or beverages can affect the absorption of some HIV medicines and increase or reduce the concentration of the medicine in the blood. Depending on the HIV medicine, the change in concentration may be helpful or harmful. Instructions for HIV medicines affected by food specify whether to take the medicine with or without food. (HIV medicines not affected by food can be taken with or without food.)

Pregnancy is a condition that can affect how the body processes HIV medicines. Because of these pregnancy-related changes, dosing of an HIV medicine may change during different stages of pregnancy. But pregnant women should always consult with their health care providers before making any changes to their HIV regimens.

How can I avoid drug interactions?
You can take the following steps to avoid drug interactions:

- **Tell your health care provider about all prescription and nonprescription medicines you are taking or plan to take. Also tell your health care provider about any vitamins, nutritional supplements, and herbal products you take.**
- Before taking a medicine, ask your health care provider or pharmacist the following questions:
  - What is the medicine used for?
  - How should I take the medicine?
  - While taking the medicine, should I avoid any other medicines or certain foods or beverages?
  - Can I take this medicine safely with the other medicines that I am taking? Are there any possible drug interactions I should know about? What are the signs of those drug interactions?
  - In the case of a drug interaction, what should I do?
  - Take medicines according to your health care provider’s instructions. Always read the information and directions that come with a medicine. Drug labels and package inserts include important information about possible drug interactions.
  - Tell your health care provider if you have any side effect that bothers you or that does not go away.

Learn more about drug interactions. Read the *Food and Drug Administration’s (FDA’s) Drug Interactions: What You Should Know* webpage.

Browse the *AIDSinfo Drug Database* to find information on FDA-approved and investigational HIV/AIDS-related drugs, including information on drug interactions.

This fact sheet is based on information from the following sources:

- From the U.S. Department of Health and Human Services: Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents:
- Considerations for Antiretroviral Use in Special Patient Populations: [HIV-Infected Women](#)
- Considerations for Antiretroviral Use in Special Patient Populations: [HIV and the Older Patient](#)
- Drug Interactions: [Overview](#)
- From FDA: [Avoiding Drug Interactions](#)
- From the National Institutes of Health (NIH) SeniorHealth.gov: [Taking Medicines](#)

*Last Reviewed: August 22, 2017*
HIV continues to be a serious threat to the health of the Hispanic/Latino community. In 2015, Hispanics/Latinos accounted for about one quarter of all new diagnoses of HIV in the United States, despite representing about 18% of the total US population.

### The Numbers

#### New HIV Infections

From 2010 to 2014, estimated annual HIV infections increased 14% (from 6,400 to 7,300) among Hispanic/Latino gay, bisexual, and other men who have sex with men.

#### HIV and AIDS Diagnoses

- In 2015, Hispanics/Latinos accounted for 24% (9,798) of the 40,040 new diagnoses of HIV infection in the United States and 6 dependent areas. Of those, 87% (8,563) were in men, and 12% (1,223) were in women.
- Gay and bisexual men accounted for 85% (7,271) of the HIV diagnoses among Hispanic/Latino men in 2015.
- Among Hispanic women/Latinas, 90% (1,096) of the diagnosed HIV infections were attributed to heterosexual contact.
- From 2010 to 2014, HIV diagnoses increased 2% among all Hispanics/Latinos, but trends varied among subgroups.
  - Diagnoses among Hispanic women/Latinas declined steadily (16%).
  - Diagnoses among all Hispanic/Latino gay and bisexual men increased (13%).
  - Diagnoses among young Hispanic/Latino gay and bisexual men (aged 13 to 24) increased 16%, a slower increase than in previous years.

#### Living With HIV and Deaths

- At the end of 2014, an estimated 235,600 Hispanics/Latinos were living with HIV in the United States. Of these, an estimated 17% were living with undiagnosed HIV.
- Among all Hispanics/Latinos living with HIV in 2014, 83% had received a diagnosis, 58% received HIV medical care in 2014, 48% were retained in HIV care, and 48% had a suppressed viral load.

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*Hispanics/Latinos can be of any race.

*The term male-to-male sexual contact is used in CDC surveillance systems. It indicates a behavior that transmits HIV infection, not how individuals self-identify in terms of their sexuality. This fact sheet uses the term gay and bisexual men.

*Heterosexual contact with a person known to have, or be at high risk for, HIV infection.

*People are considered retained in care if they get two viral load or CD4 tests at least 3 months apart in a year. (CD4 cells are the cells in the body’s immune system that are destroyed by HIV.) Viral suppression is based on the most recent viral load test.
• In 2014, 916 deaths among Hispanics/Latinos were attributed directly to HIV.

**Prevention Challenges**

**Why are Hispanics/Latinos at higher risk?**

In all communities, lack of awareness of HIV status contributes to HIV transmission. People who do not know they have HIV cannot take advantage of HIV care and treatment and may unknowingly pass HIV to others.

• A number of challenges contribute to the higher rates of HIV infection among Hispanics/Latinos:
  • More Hispanics/Latinos are living with HIV than some other races/ethnicities.
  • Hispanics/Latinos have higher rates of some STDs than some other races/ethnicities. Having another STD can increase a person’s chance of getting or transmitting HIV.
  • Though not unique to Hispanics/Latinos, stigma, fear, discrimination, and homophobia impact Hispanic/Latino lives. These issues may put many Hispanics/Latinos at higher risk for HIV infection.
  • Poverty, migration patterns, lower educational level, and language barriers may make it harder for Hispanics/Latinos to get HIV testing and care.
  • Undocumented Hispanics/Latinos may be less likely to use HIV prevention services, get an HIV test, or get treatment if HIV-positive because of concerns about being arrested and deported.

**What CDC Is Doing**

CDC and its partners are pursuing a high-impact prevention approach to advance national HIV prevention goals and maximize the effectiveness of current HIV prevention methods. Activities include

• Support and technical assistance to health departments and community-based organizations (CBOs) to deliver effective prevention interventions for Hispanics/Latinos:
  ° Starting in 2012, CDC has **awarded at least $330 million each year** under the current funding opportunity (https://www.cdc.gov/hiv/funding/announcements/ps12-1201/index.html) for health departments to direct resources to the populations and geographic areas of greatest need and prioritize the HIV prevention strategies that will have the greatest impact.
  ° In 2017, CDC awarded nearly $11 million per year for 5 years to 30 CBOs to provide HIV testing to young gay and bisexual men of color and transgender youth of color, with the goals of identifying undiagnosed HIV infections and linking those who have HIV to care and prevention services.

• The **Act Against AIDS** (https://www.cdc.gov/actagainstaids/) initiative, which raises awareness about HIV through multiple campaigns and partnerships such as
  ° **Doing It** (https://www.cdc.gov/actagainstaids/campaigns/doingit/) (La Estoy Haciendo / La Prueba del VIH (https://www.cdc.gov/actagainstaids/spanish/campaigns/doingit/index.html)), which motivates individuals to get tested for HIV and know their status.
  ° **Partnering and Communicating Together (PACT)** (https://www.cdc.gov/actagainstaids/partnerships/pact.html), a 5-year partnership with organizations such as the National Hispanic Medical Association to raise awareness about testing, prevention, and retention in care among populations disproportionately affected by HIV, including Hispanics/Latinos.
**Fast Facts**

- African Americans are the racial/ethnic group most affected by HIV in the United States.
- Gay and bisexual men account for a majority of new HIV diagnoses among African Americans.
- There are promising signs of progress, especially among women and those who inject drugs.

Blacks/African Americans³ account for a higher proportion of new HIV diagnoses, those living with HIV, and those ever diagnosed with AIDS, compared to other races/ethnicities. In 2015, African Americans accounted for 45% of HIV diagnoses, though they comprise 12% of the US population.

**The Numbers**

**HIV and AIDS Diagnoses**

In 2015:

- 17,670 African Americans were diagnosed with HIV in the United States (13,070 men and 4,524 women).
- More than half (58%, 10,315) of African Americans diagnosed with HIV were gay or bisexual men.
- Among African American gay and bisexual men diagnosed with HIV, 38% (3,888) were young men aged 13 to 24.
- 48% (8,702) of those diagnosed with AIDS in the United States were African Americans.

From 2005 to 2014:

- The number of HIV diagnoses among African American women fell 42%, though it is still high compared to women of other races/ethnicities. In 2015, 4,524 African American women were diagnosed with HIV, compared with 1,131 Hispanic/Latino women and 1,431 white women.
- HIV diagnoses among African American gay and bisexual men increased 22%. But diagnoses stabilized in recent years, increasing less than 1% since 2010.
- HIV diagnoses among young African American gay and bisexual men (aged 13 to 24) increased 87%. But that trend has leveled off recently, with diagnoses declining 2% since 2010.

**Living With HIV and Deaths**

- At the end of 2013, 498,400 African Americans were living with HIV (40% of everyone living with HIV in the US), and 1 in 8 did not know they were infected.
- Of African Americans diagnosed with HIV in 2014, 72% were linked to HIV medical care within 1 month.
- Of African Americans diagnosed with HIV in 2012 or earlier, 54% were retained in continuous HIV care and 49% had a suppressed viral load (virus at low enough levels to stay healthy and reduce transmission risk).
- In 2014, 3,591 African Americans died of HIV or AIDS, accounting for 53% of total deaths attributed to the disease that year.

**Prevention Challenges**

In all communities, lack of awareness of HIV status contributes to HIV risk. People who do not know they have HIV cannot take advantage of HIV care and treatment and may unknowingly pass HIV to others.
A number of challenges contribute to the higher rates of HIV infection among African Americans. The greater number of people living with HIV (prevalence) in African American communities and the fact that African Americans tend to have sex with partners of the same race/ethnicity mean that African Americans face a greater risk of HIV infection with each new sexual encounter.

Some African American communities continue to experience higher rates of other sexually transmitted diseases (STDs) than other racial/ethnic communities in the United States. Having another STD can significantly increase a person's chance of getting or transmitting HIV.

The poverty rate is higher among African Americans than other racial/ethnic groups. The socioeconomic issues associated with poverty—including limited access to high-quality health care, housing, and HIV prevention education—directly and indirectly increase the risk for HIV infection and affect the health of people living with and at risk for HIV. These factors may explain why African Americans have worse outcomes on the HIV continuum of care, including lower rates of linkage to care and viral suppression. Stigma, fear, discrimination, and homophobia may also place many African Americans at higher risk for HIV.

**What CDC Is Doing**

CDC and its partners are pursuing a high-impact prevention approach to advance the goals of the National HIV/AIDS Strategy: Updated to 2020 (https://www.aids.gov/federal-resources/national-hiv-aids-strategy/overview/) and maximize the effectiveness of current HIV prevention methods. Some of CDC’s activities include:

- Support for health departments and community-based organizations to deliver effective prevention interventions for African Americans and other populations.
  - Comprehensive HIV Prevention Programs for Health Departments (https://www.cdc.gov/hiv/funding/announcements/ps12-1201/index.html), an HIV prevention initiative for health departments in states, territories, and select cities, including those serving African American clients. Starting in 2012, CDC has awarded at least $330 million each year ($343.7 million in 2015) under this funding opportunity.
  - Support (http://www.cdc.gov/hiv/funding/announcements/ps15-1509/index.html) for health departments to develop comprehensive models of prevention, care, and social services for gay and bisexual men of color living with or at risk for HIV, as well as training and technical assistance (https://www.cdc.gov/hiv/funding/announcements/ps15-1510/index.html) to implement and sustain those models.
  - Two new projects to help health departments reduce HIV infections and improve HIV medical care among gay and bisexual men of color. These funding opportunity announcements (FOAs) will increase gay and bisexual men's access to pre-exposure prophylaxis (PrEP) (http://www.cdc.gov/hiv/risk/prep/index.html), increase health departments' surveillance capacity, and support effective models of prevention and care for gay and bisexual men of color.
  - The Act Against AIDS (http://www.cdc.gov/actagainstaids/) campaigns, including
    - Let's Stop HIV Together (http://www.cdc.gov/actagainstaids/campaigns/lsht/index.html), which raises HIV awareness and fights stigma among all Americans and provides many stories about people living with HIV;
    - Doing It (http://www.cdc.gov/actagainstaids/campaigns/doingit/index.html), a national HIV testing and prevention campaign that encourages all adults to know their HIV status and protect themselves and their community by making HIV testing a part of their regular health routine;
    - HIV Treatment Works (http://www.cdc.gov/actagainstaids/campaigns/hivtreatmentworks/index.html), which shows how people living with HIV have overcome barriers to stay in care and provides resources on how to live well with HIV; and
    - Partnering and Communicating Together (PACT) to Act Against AIDS (http://www.cdc.gov/actagainstaids/partnerships/pact.html), a 5-year partnership with organizations such as the National Black Justice Coalition, the National Urban League, and the Black Men's Xchange to raise awareness about testing, prevention, and retention in care among populations disproportionately affected by HIV, including African Americans.

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*Refers to as African Americans in this fact sheet.
1 Does not include African Americans who are Hispanic/Latino.
2 HIV and AIDS diagnoses indicate when a person is diagnosed with HIV infection or AIDS, not when the person was infected.
3 The term male-to-male sexual contact is used in CDC surveillance systems. It indicates a behavior that transmits HIV infection, not how individuals self-identify in terms of their sexuality. This fact sheet uses the term gay and bisexual men.
4 In 32 states and the District of Columbia (the areas with complete lab reporting by December 2015).
Fast Facts

- The number of HIV diagnoses among Asians in the United States increased in recent years.
- Among Asians, gay and bisexual men are most affected by HIV.
- Around 1 in 5 Asians living with HIV in the United States do not know they have it.

Between 2010 and 2014, the Asian population in the United States grew around 11%, more than three times as fast as the total U.S. population. During the same period, the number of Asians receiving an HIV diagnosis increased by 36%, driven primarily by an increase in HIV diagnoses among Asian gay and bisexual men. Asians, who make up 6% of the population, continue to account for only a small percentage of new HIV diagnoses in the United States and 6 dependent areas.

The Numbers

HIV and AIDS Diagnoses

- Asians accounted for 2% (959) of the 40,040 new HIV diagnoses in the United States and 6 dependent areas in 2015.
- Of Asians diagnosed with HIV infection in 2015, 86% (820) were men and 14% (132) were women.
- Gay and bisexual men accounted for 89% (729) of all HIV diagnoses among Asian men in 2015. Among Asian women, 95% (125) of HIV diagnoses were attributed to heterosexual contact.
- From 2010 to 2014, HIV diagnoses increased by 47% among Asian gay and bisexual men in the United States.
- In 2015, 326 Asians were diagnosed with AIDS, representing 2% of the 18,538 AIDS diagnoses in the United States and 6 dependent areas.

Living With HIV

- Of the 16,200 Asians estimated to be living with HIV in the United States in 2013, 22% (3,500) were undiagnosed, the highest rate of undiagnosed HIV among any race/ethnicity. By comparison, 13% of all persons living with HIV in the United States were undiagnosed.
- Of Asians diagnosed with HIV in 2014, 80% were linked to HIV medical care within 1 month of diagnosis, compared to 75% of all persons diagnosed with HIV that year.
- Of Asians who had been living with diagnosed HIV for at least a year at the end of 2013, 56% were retained in care (receiving continuous HIV medical care), and 60% had achieved viral suppression, slightly higher than the overall rate (55%) of viral suppression among all races/ethnicities.
Prevention Challenges

There are some behaviors that put everyone at risk for HIV. These include having vaginal or anal sex without a condom or without being on medicines that prevent HIV, or sharing injection drug equipment with someone who has HIV. Other factors that affect Asians particularly include:

• **Undiagnosed HIV.** People living with undiagnosed HIV cannot obtain the care they need to stay healthy and may unknowingly transmit HIV to others.

• **Cultural factors.** Some Asians may avoid seeking testing, counseling, or treatment because of language barriers or fear of discrimination, the stigma of homosexuality, immigration issues, or fear of bringing shame to their families.

• **Limited research.** Limited research about Asian health and HIV infection has resulted in few targeted prevention programs and behavioral interventions in this population.

• **Data limitations.** The reported number of HIV cases among Asians may not reflect the true HIV diagnoses in this population because of race/ethnicity misidentification. This could lead to the underestimation of HIV infection in this population.

What CDC Is Doing

CDC and its partners are pursuing a high-impact prevention (https://www.cdc.gov/hiv/policies/hip/hip.html) approach to maximize the effectiveness of current HIV prevention methods, and improve surveillance among Asians. Funding state, territorial, and local health departments is CDC’s largest investment in HIV prevention.

• CDC provides support and technical assistance to health departments and community-based organizations to deliver prevention programs for Asians, such as The Banyan Tree Project (http://banyantreeproject.org/wp2014/).

• Capacity Building Assistance for High-Impact HIV Prevention (https://www.cdc.gov/hiv/funding/announcements/ps14-1403/index.html) provides technical assistance in capacity building to the Asian and Pacific Islander American Health Forum (http://www.apiahf.org) and the Asian and Pacific Islander Wellness Center (http://apiwellness.org/site/).

• The CDC publication Effective HIV Surveillance Among Asian Americans and Native Hawaiians and Other Pacific Islanders (https://www.cdc.gov/hiv/pdf/policies_13_238558_HIVSurveillance_NHAS_v6_508.pdf) outlines successful HIV surveillance activities for health departments in states with high concentrations of Asians.

• CDC is raising awareness through the Act Against AIDS campaigns (https://www.cdc.gov/actagainstaids/index.html), including
  - Doing It (https://www.cdc.gov/actagainstaids/campaigns/doingit/index.html), a new national HIV testing and prevention campaign that encourages all adults to know their HIV status and protect themselves and their community by making HIV testing a part of their regular health routine;
  - Let’s Stop HIV Together (https://www.cdc.gov/actagainstaids/campaigns/lsht/index.html), which raises HIV awareness and fights stigma among all Americans and provides many stories about people living with HIV; and
  - HIV Treatment Works (https://www.cdc.gov/actagainstaids/campaigns/hivtreatmentworks/index.html), which highlights how men and women who are living with HIV have overcome barriers.

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* A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
* The term male-to-male sexual contact is used in CDC surveillance systems. It indicates a behavior that transmits HIV infection, not how individuals self-identify in terms of their sexuality. This fact sheet uses the term gay and bisexual men.
* Dependent areas include American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, the Republic of Palau, and the US Virgin Islands.
* HIV and AIDS diagnoses indicate when a person was diagnosed with HIV infection or AIDS, not when the person was infected.
* Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.
* Data for medical care and viral suppression are from 32 states and the District of Columbia (the areas with complete lab reporting by December 2015).
* A person who has a suppressed viral load has a very low level of the virus. That person can stay healthy and has a dramatically reduced risk of transmitting the virus to others.
HIV Among American Indians and Alaska Natives

Fast Facts

- HIV affects AIs/ANs in ways that are not always obvious because of their small population sizes.
- Over the last decade, annual diagnoses increased 63% among AI/AN gay and bisexual men.
- AIs/ANs face HIV prevention challenges, including poverty, high rates of STIs, and stigma.

HIV is a public health issue among American Indians and Alaska Natives (AIs/ANs), who represent about 1.2% of the U.S. population. Overall, diagnosed HIV infections among AIs/ANs are proportional to their population size. Compared with other racial/ethnic groups, AIs/ANs ranked fifth in rates of HIV diagnoses in 2015, with a lower rate than blacks/African Americans, Hispanics/Latinos, Native Hawaiians/Other Pacific Islanders, and people reporting multiple races, but a higher rate than Asians and whites.

The Numbers

HIV and AIDS Diagnoses

- Of the 39,513 HIV diagnoses in the United States in 2015, 1% (209) were among AIs/ANs. Of those, 73% (152) were men and 26% (55) were women.
- Of the 152 HIV diagnoses among AI/AN men in 2015, most (79%; 120) were among gay and bisexual men.
- Most of the 55 HIV diagnoses among AI/AN women in 2015 were attributed to heterosexual contact (73%; 40).
- From 2005 to 2014, the annual number of HIV diagnoses increased 19% (from 172 to 205) among AIs/ANs overall and 63% among AI/AN gay and bisexual men (from 81 to 132).
- In 2015, 96 AIs/ANs were diagnosed with AIDS. Of them, 59% (57) were men and 41% (39) were women.

Living With HIV and Deaths

- Of the 3,600 AIs/ANs estimated to be living with HIV in 2013, 18% (630) were undiagnosed. By comparison, 13% of everyone living with HIV were undiagnosed.
- Of AIs/ANs diagnosed with HIV in 2014, 78% were linked to medical care within 1 month.
- At the end of 2013, 53% of AIs/ANs who had been living with diagnosed HIV for at least a year were retained in care (receiving continuous HIV medical care), and 52% had achieved viral suppression.
- During 2014, 51 AIs/ANs died from HIV or AIDS.

HIV Diagnoses Among American Indians/Alaska Natives in the US by Transmission Category and Sex, 2015

- Injection drug use


*Percentage of AIs/ANs reporting only one race.
**Hispanics/Latinos can be of any race.
†HIV and AIDS diagnoses indicate when a person is diagnosed with HIV infection or AIDS, but do not indicate when the person was infected.
‡The term gay and bisexual men, referred to as men who have sex with men in CDC surveillance systems, indicates how individuals self-identify in terms of their sexuality, not a behavior that transmits HIV infection.
§In 32 states and the District of Columbia (the areas with complete lab reporting by December 2015).
Prevention Challenges

- **Sexually transmitted diseases (STDs).** From 2011 to 2015, AIs/ANs had the second highest rates of chlamydia and gonorrhea among all racial/ethnic groups. Having another STD increases a person’s risk for getting or transmitting HIV.

- **Lack of awareness of HIV status.** Almost 1 in 5 AIs/ANs who were living with HIV at the end of 2013 were unaware of their status. People who do not know they have HIV cannot take advantage of HIV care and treatment and may unknowingly pass HIV to others.

- **Stigma.** AI/AN gay and bisexual men may face culturally based stigma and confidentiality concerns that could limit opportunities for education and HIV testing, especially among those who live in rural communities or on reservations.

- **Cultural diversity.** There are over 560 federally recognized AI/AN tribes, whose members speak over 170 languages. Because each tribe has its own culture, beliefs, and practices, creating culturally appropriate prevention programs for each group can be challenging.

- **Socioeconomic issues.** Poverty, including limited access to high-quality housing, directly and indirectly increases the risk for HIV infection and affects the health of people living with and at risk for HIV infection. Compared with other racial/ethnic groups, AIs/ANs have higher poverty rates, have completed fewer years of education, are younger, are less likely to be employed, and have lower rates of health insurance coverage.

- **Alcohol and illicit drug use.** Alcohol and substance use can impair judgment and lead to behaviors that increase the risk of HIV. Injection drug use can directly increase the risk of HIV through sharing contaminated needles, syringes, and other equipment. Compared with other racial/ethnic groups, AIs/ANs tend to use alcohol and drugs at a younger age and use them more often and in higher quantities.

- **Data limitations.** Racial misidentification of AIs/ANs may lead to the undercounting of this population in HIV surveillance systems and may contribute to the underfunding of targeted services for AI/AN.

What CDC Is Doing

CDC and its partners are pursuing a **high-impact prevention** approach to advance the goals of the National HIV/AIDS Strategy, maximize the effectiveness of current HIV prevention methods, and **improve surveillance among AI/AN.** Activities include:

- Working with the Indian Health Service (IHS) and tribal leaders of the CDC Tribal Consultation Advisory Committee to discuss methods for developing and implementing scalable, effective prevention approaches that reach those at greatest risk for HIV, including young gay and bisexual AI/AN men.

- Providing support and technical assistance to health departments and community-based organizations to deliver effective prevention interventions (https://effectiveinterventions.cdc.gov/en/Home.aspx).

- Ensuring that capacity-building assistance providers incorporate cultural competency, linguistics, and educational appropriateness into all services delivered.

- Providing capacity building assistance directly to the IHS so it can strengthen its support for HIV activities, including HIV testing capacity; We R Native, a comprehensive health resource for Native youth; and the Red Talon Project, which works to achieve a more coordinated national and Northwest tribal response to STDs/HIV.


- Raising awareness through the Act Against AIDS campaigns (http://www.cdc.gov/actagainstaids/index.html), including
  - **Doing It** (http://www.cdc.gov/actagainstaids/campaigns/doingit/index.html), a national HIV testing and prevention campaign that encourages all adults to get tested for HIV and know their status;
  - **Let’s Stop HIV Together** (http://www.cdc.gov/actagainstaids/campaigns/lsht/index.html), which raises HIV awareness and fights stigma among all Americans and provides many stories about people living with HIV; and
  - **HIV Treatment Works** (http://www.cdc.gov/actagainstaids/campaigns/hivtreatmentworks/index.html), which highlights how men and women who are living with HIV have overcome barriers. The campaign provides resources and encourages people living with HIV to Get In Care (http://www.cdc.gov/actagainstaids/campaigns/hivtreatmentworks/getincare/index.html), Stay In Care (http://www.cdc.gov/actagainstaids/campaigns/hivtreatmentworks/stayincare/index.html), and Live Well (http://www.cdc.gov/actagainstaids/campaigns/hivtreatmentworks/livewell/index.html).

In addition, the Office for State, Tribal, Local, and Territorial Support (OSTLTS) serves as the primary link between CDC, the Agency for Toxic Substance and Disease Registry, and tribal governments. OSTLTS’s tribal support activities are focused on fulfilling CDC’s supportive role in ensuring that AI/AN communities receive public health services that keep them safe and healthy.
HIV Among Native Hawaiians and Other Pacific Islanders in the United States

May 2017

Fast Facts

- NHOPi represented less than 1% of new HIV diagnoses in the United States in 2015.
- From 2010 to 2014, the annual number of HIV diagnoses declined 22% among NHOPi.
- Nearly 20% of adult and adolescent NHOPi living with HIV do not know it.

Although Native Hawaiians and Other Pacific Islanders (NHOPi) account for a very small percentage of new HIV diagnoses, HIV affects NHOPi in ways that are not always apparent because of their small population sizes.

The Numbers

HIV and AIDS Diagnoses

- In 2015, 79 NHOPi were diagnosed with HIV, representing less than 1% of new HIV diagnoses in the United States. NHOPi make up 0.2% of the population.
- NHOPi had the third-highest rate of HIV diagnoses (14.1 per 100,000 people) by race/ethnicity in 2015, behind blacks/African Americans and Hispanics/Latinos.
- Gay and bisexual men accounted for 78% (62) of HIV diagnoses among NHOPi in 2015.
- The annual number of HIV diagnoses among NHOPi declined 22% from 2010 to 2014.
- In 2015, 22 NHOPi were diagnosed with AIDS in the United States.

Living With HIV

- In 2013, an estimated 1,200 NHOPi were living with HIV in the United States. Of those, nearly 20% had not been diagnosed. By comparison, 13% of all Americans living with HIV are undiagnosed.
- Among NHOPi who were diagnosed with HIV in 2014, 84% were linked to care within 1 month.
- Among NHOPi diagnosed with HIV in 2012 or earlier and alive at the end of 2013, 47% were retained in HIV care, and 55% had a suppressed viral load.

Prevention Challenges

Some behaviors put everyone at risk for HIV, including NHOPi. These behaviors include having vaginal or anal sex without a condom or without medicines to prevent or treat HIV, or sharing injection drug equipment with someone who has HIV. Other factors particularly affect NHOPi:

- Lack of awareness of HIV status can affect HIV rates in communities. People who do not know they have HIV cannot take advantage of HIV care and treatment and may unknowingly pass HIV to others.
- Socioeconomic factors such as poverty, inadequate or no health care coverage, language barriers, and lower educational attainment among NHOPi may contribute to lack of awareness about HIV risk and higher-risk behaviors.
- Cultural factors may affect the risk of HIV infection. NHOPi

Diagnoses of HIV Infection among Adult and Adolescent Native Hawaiians/Other Pacific Islanders, by Transmission Category, 2015 – United States

cultural customs, such as not talking about sex across generations, may stigmatize sexuality in general, and homosexuality specifically, as well as interfere with HIV risk-reduction strategies, such as condom use.

- Limited research about NHOPI health and HIV infection and small population numbers have resulted in a lack of targeted prevention programs and behavioral interventions for this population.
- The low reported number of HIV cases among NHOPI may not reflect the true burden of HIV in this population because of race/ethnicity misidentification that could lead to an underestimation of HIV infection.

**What CDC Is Doing**


- CDC provides support and technical assistance to health departments and community-based organizations to deliver prevention programs for NHOPI, such as The Banyan Tree Project (http://banyantreeproject.org/wp2014/).
- HIV Prevention Projects for Community-Based Organizations funds The Asian Pacific AIDS Intervention Team (http://apaitonline.org) and the Asian and Pacific Islander Wellness Center (http://apiwellness.org/site/), which provide an array of culturally sensitive services, including HIV care and testing, HIV education, counseling, behavioral health, substance abuse, and social support services.
- The CDC publication *Effective HIV Surveillance Among Asian Americans and Native Hawaiians and Other Pacific Islanders* (https://www.cdc.gov/hiv/pdf/policies_13_238558_HIVSurveillance_NHAS_v6_508.pdf) outlines successful HIV data collection activities for health departments in states with high concentrations of NHOPI.
- Through its *Act Against AIDS* (https://www.cdc.gov/actagainstaids/) campaigns, CDC provides messages about HIV treatment and prevention. For example,
  - *Doing It* (https://www.cdc.gov/actagainstaids/campaigns/doingit/index.html) encourages all adults to get tested for HIV and know their status.

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* HIV and AIDS diagnoses indicate when a person received an HIV or AIDS diagnosis, not when the person was infected.
* Hispanics/Latinos can be of any race.
* The term *male-to-male sexual contact* is used in CDC surveillance systems. It indicates a behavior that transmits HIV infection, not how individuals self-identify in terms of their sexuality. This fact sheet uses the term *gay and bisexual men*.
* In 32 states and the District of Columbia (the areas with complete lab reporting by December 2015).
* A person with a suppressed viral load has a very low level of the virus. That person can stay healthy and has a dramatically reduced risk of transmitting the virus to others.
Estimated annual HIV infections in the U.S. declined 18% from 2008-2014

HIV infections are declining in the U.S.

After remaining stable since the mid-1990s, the estimated number of annual HIV infections in the U.S. fell nearly 20% between 2008-2014 (from 45,700 to 37,600). A new analysis of trends in infections by transmission route demonstrates particular progress in several groups:

- Some gay and bisexual men
  - 13- to 24-year-old gay and bisexual men (9,400 to 7,700)
  - 35- to 44-year-old gay and bisexual men (5,800 to 4,300)
  - White gay and bisexual men (9,000 to 7,400)
- Heterosexuals (from 13,400 to 8,600)
- People who inject drugs (from 3,900 to 1,700)

Progress remains uneven

HIV remains a serious health problem in the U.S., with gay and bisexual men bearing the greatest burden by risk group. Gay and bisexual men were the only group that did not experience an overall decline in annual HIV infections from 2008 to 2014: annual infections remained stable at about 26,000 per year.

Infections were also stable among black gay and bisexual men, at about 10,000 per year.

This stabilization is an encouraging sign after more than a decade of increases in these populations, but progress must be accelerated.

Gay and bisexual men remain most affected

- 26% decline among gay and bisexual men aged 35-44 years
- 36% decline among heterosexuals
- 56% decline among people who inject drugs
- 18% decline among gay and bisexual men aged 13-24 years

37,600 New HIV Infections in 2014

- 70% 23%
- 5%
- 3%

Heterosexuals 8,600 infections
People who inject drugs 1,700 infections
Gay and bisexual men who inject drugs 1,100 infections
Gay and bisexual men 26,200 infections
Additionally, concerning trends have emerged among gay and bisexual males by age and ethnicity. While annual infections have declined among white men, they remain high and stable among black men, and are now increasing among Latino men.

- Stable among black gay and bisexual men (from 10,100 to 10,100)
- 20% increase among Latino gay and bisexual men (from 6,100 to 7,300)

And, by age, as infections have declined among young men ages 13-24 and men ages 35-44, they have increased among men ages 25-34.

Annual HIV infections are falling among gay and bisexual men aged 13-24, but rising among those aged 25-34 years

Current burden and trends by state

Another new analysis examines current burden and trends in infections by state. The study reveals:

- Southern states bear the greatest burden of HIV, accounting for 50% of new infections in 2014
- In the jurisdictions where they could be estimated,* annual infections in all states decreased or remained stable from 2008-2014

*35 states and Washington, D.C.

CD4 methodology

CD4 cells are a type of white blood cell that help in protecting the body from infections, but they are also targeted by HIV. CD4 cell counts can be used to determine the stage of HIV infection in a person. As HIV stays in the body longer, CD4 cells decrease. CDC used CD4 cell counts from the time of HIV diagnosis to estimate when an infection occurred and to estimate HIV incidence for 2008-2014. The CD4 model was based on data reported to the National HIV Surveillance System. The new methodology was applied first to these new analyses presented at the Conference on Retroviruses and Opportunistic Infections. Additional analyses will be available over time.

If you are a member of the news media and need more information, please visit www.cdc.gov/nchhstp/newsroom or contact the News Media Line at CDC’s National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention 404-639-8895 or NCHHSTPMediaTeam@cdc.gov.
A publication of the Hepatitis C Support Project

The information in this guide is designed to help you understand and manage HCV and is not intended as medical advice. All persons with HCV should consult a medical practitioner for diagnosis and treatment of HCV.

A GUIDE TO:
UNDERSTANDING HEPATITIS C
2017

Alan Franciscus
The Centers for Disease Control and Prevention (CDC) and the United States Preventive Services Task Force (USPSTF) recommend a one-time test for everyone born from 1945 to 1965.
When I was diagnosed in 1996 there was almost no information about hepatitis C (HCV) available and the information that was available was often incorrect. At that time, treatment consisted of standard interferon monotherapy that you would inject under the skin three times a week for six months. For the most common strain of hepatitis C—genotype 1—there was only a 9% chance of being cured of hepatitis C.

Now it’s 2017 and there is a wealth of information to help guide people with HCV. Treatments for hepatitis C have progressed to the point that more than 90% of the people who take the treatments can be cured, and, for many people, the treatment duration is usually 12 to 24 weeks. Now, we have interferon-free therapy. Importantly, the side effects of the newer treatments will be much less than the side effects of interferon-based therapies.

Today, medical providers are much more knowledgeable about diagnosis, management and treatment of hepatitis C. There is also a public campaign to raise awareness and test the largest patient population—Baby Boomers. In addition to testing Baby Boomers, we must test all people at risk for hepatitis C.

The most important steps that people can take are to learn as much as they can about hepatitis C and work with their medical provider to stay as healthy as possible—and that should include seeking HCV treatment now. This Guide is meant to help you understand hepatitis C and provide some strategies to become healthier and live longer.

I hope that you are as excited as I am about the future of hepatitis C. As I stated above, we have come a long way in our understanding of hepatitis C. Much more needs to be done to make sure that all of the people who are undiagnosed are tested and provided with care, support and have access to these life-saving medications that can cure almost everyone with hepatitis C. Remember, everyone has the right to be treated and cured.

Stay tuned to the hepatitis C Support Project and our website www.hcvadvocate.org for the latest information about every aspect of hepatitis C.

The information in this booklet is designed to help you understand and manage HCV and is not intended as medical advice. All people with HCV should consult a medical practitioner for diagnosis and treatment of HCV.

Alan Franciscus
Executive Director, Hepatitis C Support Project
Editor-in-Chief, HCV Advocate

Get Tested. Get Treated. Get Cured.
INTRODUCTION

HCV is a blood-borne virus that was previously referred to as non-A/non-B hepatitis. HCV has seven genotypes, numbered 1–7. Genotype 1 is the most common in the U.S. HCV enters the body through direct blood exposure. The virus attacks cells in the liver, where it multiplies (replicates). HCV causes liver inflammation and kills liver cells. Up to 75% of people initially infected with HCV may become chronically infected—that is, the infection does not clear up within six months. Most people with chronic HCV do not have symptoms and lead normal lives. However, in 10–25% of people with chronic HCV, the disease progresses over a period of 10–40 years, and may lead to serious liver damage, cirrhosis (scarring), and liver cancer. Today, HCV is the leading reason for liver transplants in the U.S. There is currently no vaccine for HCV; however, treatment can cure most people of HCV and stop or slow disease progression.

Your Liver and Hepatitis

The liver is the largest internal organ, located behind the ribcage on the right side of the abdomen. It weighs approximately three pounds and is about the size of a football. The liver is responsible for some 500 vital functions. It processes virtually everything you eat, breathe, or absorb through the skin. The liver converts substances you eat and drink into energy and the building blocks for muscles, hormones, clotting factors, and immune factors. It stores many vitamins, minerals, and sugars for later use. Liver cells produce bile, which helps the body digest food and absorb nutrients. The liver detoxifies substances that are harmful to the body. It can regenerate its own tissue—as much as 3/4 of the liver can regenerate within a few weeks.

Hepatitis simply means inflammation of the liver. It may be caused by viruses, toxic chemicals, drugs, or other factors. The most common forms of viral hepatitis include hepatitis A virus (HAV), hepatitis B virus (HBV), and HCV. These three viruses are related only in that they affect the liver.

HCV TRANSMISSION

Transmission

HCV is transmitted by direct blood-to-blood contact. Transmission routes include sharing drug paraphernalia for both injection and non-injection drugs (needles, cookers, tourniquets, straws, pipes, etc.). Needles used for tattooing, body piercing, and acupuncture may also spread HCV. Sharing personal items such as razors, toothbrushes, or nail files is a less likely, but still possible, transmission route.

IMPORTANT NOTE

Do not share needles or any other drug paraphernalia, razors, toothbrushes, clippers, nail files, or any items that might contain blood.

Before 1992, many people contracted HCV through blood or blood product transfusions. In 1992, a reliable blood test to identify HCV antibodies became available. Since then, the blood supply has been screened. Now the risk is considered to be less than 1 chance per 2 million units of transfused blood. A small percentage of people (estimated at 0–3% for monogamous heterosexuals) may contract HCV through unprotected sexual activity. Among people in so-called “high risk” groups (gay men, sex workers, people with multiple sex partners, people with STDs), sexual transmission appears to be somewhat more common.

Healthcare workers are at risk for HCV infection because of needlestick accidents and
unavoidable situations that may result in direct contact with blood from an infected individual.

Perinatal transmission from mothers with HCV to their infants before or during birth occurs in about 6% of births. Whether or not transmission occurs may depend on the presence of high levels of HCV in the mother’s blood; mothers co-infected with HBV or HIV are more likely to transmit HCV to their babies. Some studies have shown that HCV is present in breast milk, but breast-feeding is considered safe.

The transmission route for up to 10% of individuals infected with HCV cannot be identified. HCV is not transmitted by casual contact such as sneezing, coughing, hugging, or sharing eating utensils and drinking glasses.

HCV Prevention
Do not share needles or any other drug paraphernalia, razors, toothbrushes, clippers, nail files, or any items that may come in contact with blood. Make sure that instruments used for tattooing, body piercing, and acupuncture are properly sterilized; practitioners today should only use disposable needles. All cuts and wounds should be covered.

Although sexual transmission appears to be rare, you can reduce the risk by practicing safer sex, including the use of condoms and barriers. Many experts recommend that if you are in a stable, long-term monogamous relationship you do not need to change your current sexual practices, although partners should discuss safer sex options if either partner is concerned about transmission. If a woman has HCV, avoid sex during monthly periods. Proper dental hygiene can prevent bleeding gums, another possible transmission route.

Notify your doctor, dentist, and other healthcare professionals if you have HCV. Healthcare workers should observe standard universal precautions when dealing with blood. If you are a woman with HCV, talk to your doctor if you are thinking about becoming pregnant.

HCV Disease Progression
After exposure to HCV, the window period usually lasts 2–26 weeks. The initial phase of hepatitis C is called acute infection. Acute HCV can take up to 12 months to resolve. However, up to 75-85% of people initially infected with HCV do not clear the virus from their bodies and become chronically infected. Most people with chronic HCV do not have symptoms and lead relatively normal lives. But in 10–25% or more of people, the disease progresses over the course of 10–40 years. Chronic HCV infection can lead to liver damage, the development of fibrous tissue in the liver (fibrosis), fat deposits in the liver (steatosis), liver scarring (cirrhosis), and liver cancer. In severe cases, a person may require a liver transplant to avoid death.

Cirrhosis is a process in which liver cells are damaged or killed and replaced with scar tissue. Extensive scar tissue formation impairs the flow of blood through the liver, causing more liver cell death and a loss of liver function.

- **Compensated Cirrhosis** means that the liver is heavily scarred but can still perform most functions; some people with compensated cirrhosis exhibit few or no symptoms.
- **Decompensated Cirrhosis** means that the liver is extensively scarred and unable to function. People with decompensated cirrhosis often develop complications such
as high blood pressure in the vein that leads to the liver (portal hypertension), varices (stretched and weakened blood vessels) in the esophagus (swallowing tube) and stomach, internal bleeding, ascites (fluid accumulation), and other potentially life-threatening conditions. They may also experience encephalopathy (reversible mental confusion).

Liver Cancer usually develops at later stages of HCV infection. The type of liver cancer associated with HCV is called primary hepatocellular carcinoma (HCC).

SYMPTOMS OF HCV
People with HCV may experience mild flu-like symptoms including nausea, fatigue, fever, headaches, loss of appetite, abdominal pain, night sweats, and muscle or joint pain. Over time (often years) people with chronic HCV may develop various symptoms related to liver damage. Chronic HCV is also associated with a wide variety of related conditions.

Conditions Linked to HCV
A number of different conditions have been associated with HCV. Some of these are autoimmune conditions, in which the immune system attacks the body’s own tissues. Conditions sometimes seen in people with chronic HCV include Sjögren’s syndrome (characterized by dry eyes and dry mouth), kidney conditions such as glomerulonephritis, and skin conditions such as lichen planus (characterized by white lesions or bumps) and porphyria cutanea tarda (characterized by a sun-sensitive rash). Other related conditions include certain types of arthritis (joint inflammation), arthralgia (joint pain), thyroid disease, vasculitis (blood vessel damage), Non-Hodgkin’s Lymphoma (a form of cancer) and cryoglobulinemia (high levels of a blood protein that settles in the kidneys, skin, and nerve endings). Most serious conditions are associated with late-stage HCV disease, when the liver is damaged and not able to function properly. Many people with HCV never experience any of these conditions. Check with your doctor if you experience any unusual symptoms.

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<th>Symptoms Reported by People with HCV</th>
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<td><strong>Acute Hepatitis C</strong></td>
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<td>• Flu-like illness</td>
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<td>• Fatigue (mild to severe)</td>
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<td>• Fever</td>
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<td>• Night sweats</td>
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<td>• Loss of appetite (anorexia)</td>
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<td>• Nausea</td>
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<td>• Abdominal pain</td>
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<td>• Abdominal bloating</td>
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<td><strong>Chronic Hepatitis C</strong></td>
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<td>• Fatigue (mild to severe)</td>
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<td>• Fever</td>
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<td>• Loss of appetite (anorexia)</td>
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<td>• Jaundice</td>
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<td>• Headaches</td>
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<td>• Muscle or joint pain</td>
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<td>• Abdominal bloating</td>
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<td>• Fluid retention</td>
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<td>• Frequent urination</td>
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<td>• “Brain fog”</td>
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<tr>
<td>• Late-Stage Hepatitis C with Cirrhosis</td>
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<td>• Fatigue (mild to severe)</td>
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<td>• Loss of appetite (anorexia)</td>
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<td>• Nausea</td>
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<td>• Vomiting</td>
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<td>• Depression</td>
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<td>• Cognitive dysfunction</td>
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<td>• Mental confusion</td>
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<td>• Dizziness</td>
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<td>• Peripheral vision</td>
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<td>• Fluid retention</td>
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<td>• Frequent urination</td>
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DIAGNOSING HCV

Testing for HCV is not routinely done, so you may have to request a test from your physician. It is recommended that you use the same laboratory for all of your tests, since result ranges and accuracy can vary from lab to lab. Keep copies of your lab and liver test results for future reference. The tests below can help determine whether you are infected with HCV and the state of disease progression.

HCV Antibody Tests

HCV ELISA

The HCV ELISA or EIA is a simple blood test that can detect HCV antibodies. A positive HCV antibody test means that a person has been infected at one time. An HCV RNA or viral load test must be performed to find out whether a person is currently infected with the hepatitis C virus.

Rapid HCV Antibody Test

A point-of-care test that collects and processes a sample and gives results after 20 minutes. A fingerprick and whole blood draw has been approved and a CLIA waiver issued by the Food and Drug Administration (FDA).

HCV RNA or Viral Load Tests

Viral load tests measure the amount of HCV circulating in the blood. HCV viral load is expressed as a standard unit of measurement called International Units. There are three different types of viral load test: HCV RNA PCR, branched-chain DNA (bDNA), and transcription mediated amplification, or TMA. The bDNA assay is the least expensive, but also the least sensitive. Viral load tests are used to confirm active HCV infection and are performed before, during and after HCV treatment. An association between viral load and disease progression has not been established.

Genotype Tests

Genotype tests are used to determine what type (‘strain’) of HCV you have. This information is useful for making treatment decisions, such as how long treatment should last, what type of medicine to use, and the likelihood of responding to treatment.

Liver Biochemical/Function Tests

There are various blood tests used to assess how well your liver is working. The liver chemical tests includes measurements that may indicate liver function. The most common measurements are alanine aminotransferase (ALT) and aspartate aminotransferase (AST). ALT and AST are enzymes that are released into the blood when the liver is damaged. They are often elevated in people with HCV infection. Many people with HCV have mild to moderate elevations of these two enzymes, which are often the first indication that they are infected. Other measurements include alkaline phosphatase (ALP) and gamma-glutamyl transpeptidase (GGT). Abnormal levels may indicate cirrhosis or bile duct blockage, as well as other abnormalities.

The Centers for Disease Control and Prevention (CDC) estimates that 3.5 million Americans have chronic hepatitis C. Many experts believe the actual number is much higher.

More than 19,000 Americans die annually of complications related to HCV. This figure is expected to triple in the next 10 years.

HCV is the leading reason for liver transplants in the U.S.

Individuals with HCV should avoid drinking alcohol and using recreational drugs.

Individuals with HCV should be vaccinated against hepatitis A and hepatitis B, if not already immune.
In addition, your doctor may measure prothrombin time (an indication of blood clotting speed) and bilirubin levels. Bilirubin is a pigment that is often present in the blood of people with liver inflammation; high bilirubin levels result in jaundice. Many factors such as the use of medications and alcohol may cause abnormal lab results. Before drawing your own conclusions, check with a healthcare provider.

Liver Biopsy / Fibroscan

Biopsies are done to measure the severity of inflammation, the amount of scarring, and the general health of the liver. The Fibroscan is another diagnostic tool that is used to evaluate liver health. The Fibroscan is based on a technology using a machine that sends a vibration wave through the liver to detect and analyze any fibrosis. These and other diagnostic tests are discussed in a fact sheet from the HCV Advocate website.

HCV Treatment Options

Until 1998, interferon alone (monotherapy) was the only approved treatment for HCV infection. Today, there are interferon- and ribavirin-free medications that can cure most patients who take the medications. The newer medications also have fewer side effects than the older medications and they are taken for a shorter period of time.

There are currently three types of HCV inhibitors protease, polymerase and NS5a. They ‘inhibit’ the hepatitis C virus from replicating (making more viruses).

There are also several alternative and complementary treatments that people have used to treat symptoms of HCV infection, for example, milk thistle (silymarin) and licorice root (glycyrrhizin). Herbal and other alternative therapies are discussed in a fact sheet from the HCV Advocate website.

Approved Pharmaceutical Treatments

There are currently many medications approved to treat hepatitis C. These include direct-acting antiviral medications with and without ribavirin that inhibits the replication process of the hepatitis C virus. Ribavirin is not effective when used alone.

- A DAA is a pill that may or may not need to be taken with food.
- Ribavirin is a pill taken orally twice a day with food.

Genotype 1

People with HCV genotype 1 who have never been treated (treatment-naïve) or who have had a previous of course treatment (treatment-experienced) are treated with a combination of an HCV inhibitor(s) and for some ribavirin (pills). People who take the combinations have more than a 90% chance of curing hepatitis C.

Treatment duration is 8 to 24 weeks, but most people are treated for 12 weeks.

Genotypes 2,3,4,5, and 6

People with genotype 2,3,4,5 and 6 are treated with a combination of an HCV DAA
with or without ribavirin. The treatment duration is 12 to 24 weeks. The cure rates are 80 to 100%. However, people with genotype 3 and who have cirrhosis do not respond as well.

**Investigational Pharmaceutical Therapies**

HCV therapy has seen impressive advances, given that the virus was only identified in 1989. There are many clinical studies underway with investigational drugs and different combinations of existing drugs that have the potential to cure everyone with hepatitis C in the near future. For more information about these studies visit the HCV Advocate Drug Pipeline. [http://hcvadvocate.org/treatment/drug-pipeline-monthly-report/](http://hcvadvocate.org/treatment/drug-pipeline-monthly-report/)

**HCV Vaccines**

There is currently no vaccine for HCV, as there are for HAV and HBV. HCV vaccines will be difficult to develop due to the virus’ different genotypes and its ability to change, or mutate, during infection. Some progress is being made, but an effective HCV vaccine is not expected for many years, if ever.

**Clinical Trials**

The process of testing a new drug involves establishing its safety and tolerability (Phase I trials), measuring its effectiveness (Phase II trials), and comparing the new drug to current standard treatments (Phase III trials). After the FDA has granted approval and the new drug is marketed, ongoing studies are done to refine the treatment for maximum safety and effectiveness (Phase IV, or postmarketing trials).

Clinical trials can be an excellent way to obtain free medications; some trials may also pick up some or all of the costs of physician visits and lab tests. However, if you enroll in a clinical trial you may not be chosen to receive the new drug or the most effective dosage. You should read all clinical trial information and make sure that you fully understand the terms and conditions. It is also important to understand that the study drug(s) could potentially cause you harm. For more information about clinical trials go to our Clinical Trials Reference Guide [http://hcvclinical.hcvadvocate.org/](http://hcvclinical.hcvadvocate.org/)

**TREATMENT CONSIDERATIONS**

**Direct-Acting Antivirals**

The most common side effects of HCV inhibitors and ribavirin include mild flu-like symptoms, muscle and joint pain, nausea, headaches, fatigue, loss of appetite, dry skin, rashes, anxiety, and insomnia. Some physical symptoms may be reduced with ibuprofen or acetaminophen in low doses. High doses of acetaminophen can be toxic to the liver. High doses of non-steroidal anti-inflammatory drugs...
(NASIDs) should also be avoided. People experiencing anxiety, or irritability, may be helped with mild tranquilizers. Check with your doctor before taking any of these medications for any of the side effects listed above.

The key to managing HCV treatment-related side effects is to treat them as soon as they occur. Always report any serious side effects to your medical provider as soon as possible before they become severe.

> **Regular exercise may help alleviate some side effects, such as fatigue.**

There are many simple tips to help alleviate some of the less serious side effects of treatment including:

- Drink plenty of fluids (without caffeine or alcohol); this helps to relieve side effects. It is especially important to drink water or clear fruit juices (apple, cranberry, or grape) right before taking the medications.
- Exercise is one of the most important components of health maintenance, and this remains true during therapy. Physical activity helps you stay positive and focused and improves well-being. Moderation is the key to physical activity. Some good choices for exercise include stretching, walking, yoga, or any activity that you enjoy.

### HCV Management

HCV can be a difficult disease to manage. Lifestyle plays an integral part in HCV disease management and treatment. Proper diet, exercise, and stress management are all critical to maintaining good health. Many physicians are not fully educated about HCV, and you may have to educate both conventional and alternative practitioners. If you have a family doctor, you may want to quiz him or her about HCV. It is important to find a doctor who is both knowledgeable about and sympathetic to people with HCV. If you are not comfortable with your medical provider, look for a new one; ask family or friends for recommendations. Once your HCV diagnosis has been confirmed, your family doctor or general practitioner should send you to a specialist. Generally, you will be referred to a gastroenterologist (a digestive disease specialist) or a hepatologist (a liver disease specialist).

### Nutrition

Since the liver processes and detoxifies everything you eat and drink, a healthy, well-balanced diet is essential. A diet that follows the general guidelines for nutritional health based on [www.choosemyplate.gov](http://www.choosemyplate.gov) is generally recommended. Such a diet is low in fat and sodium, high in complex carbohydrates, and has adequate protein.

Avoiding certain foods may reduce the processing and detoxification work the liver must do, and may improve the overall health of your liver. Processed foods often contain chemical additives, so reduce your consumption of canned, frozen, and other preserved foods. Eating organic fruits and vegetables can help you avoid the pesticides and fertilizers used to grow nonorganic produce. Although these options are not available to everyone with hepatitis C, any action that will reduce the harm is beneficial. Read all labels to acquaint yourself with the ingredients.
Protein derived from poultry, fish, and vegetable sources may be most beneficial. It is recommended that people with any type of liver disease should not eat raw or undercooked shellfish (even if they are immune to hepatitis A). It is often recommended that people with HCV should avoid foods high in fat, salt, or sugar. Caffeine is a chemical that must be processed by the liver, and it is recommended that you limit your caffeine intake by reducing your over-consumption of coffee, tea, and soda. Because chocolate has a high fat (and in some types, caffeine) content, eat it in moderation. Some people with HCV cannot tolerate dairy products. If this is the case for you, you may wish to use nondairy substitutes such as soy, almond, cashew, coconut, hemp or rice milk.

A well-balanced diet should contain all the essential vitamins and minerals you need, but some people also take vitamin supplements. Taking megavitamin supplements may be harmful. Avoid taking high doses of vitamins A and D; vitamin A can be very toxic to the liver. If you need extra vitamins and/or minerals, choose a low-dose supplement without iron unless otherwise directed by a medical provider.

Most people with HCV would benefit from a consultation with a dietitian. Do not undertake any unconventional diet without consulting a medical practitioner. In addition, be sure to inform your doctor about any vitamins and minerals you are taking.

**Alcohol and Drugs**

Many studies have shown that heavy consumption of alcohol can severely accelerate HCV disease progression. It is not yet known if light or moderate alcohol consumption is harmful to the liver, but most experts recommend that people with HCV should avoid alcohol. Many drugs (whether prescription, over-the-counter, or recreational) must be processed by the liver. People with HCV should avoid recreational drugs and tobacco. Check with your doctor before taking over-the-counter or prescription medications. Certain herbal remedies have also been shown to damage the liver.

**General Wellness**

- **Stress management**
  Controlling stress is a major factor in managing HCV disease. Living with a chronic disease is stressful. Many people report “flare-ups” (periods of increased symptoms) following episodes of stress. Exercise, meditation, and time management can all help reduce stress. Try to maintain a realistic picture of your health and a positive attitude. Understanding the severity of your liver disease is an important part of having a realistic picture of your condition.

- **Managing fatigue**
  Fatigue and low energy levels are common in people with HCV. Learn your limits and do not overextend yourself. When you plan activities, allow time in between for relaxation or naps. Remember that your health is important—learn to say “no” to friends and family who have unrealistic expectations of your energy level.

- **Time management**
  Plan activities well in advance and try to make realistic work and play schedules. Use a daily planner to help with organizing and remembering activities. Consult your planner regularly when making appointments and scheduling daily tasks. Don’t forget to include restful activities.

- **Meditation**
  Meditation can be a useful tool in managing and living with HCV or any chronic illness. It is simple and easy to learn. Meditation can reduce stress and help you maintain a healthy outlook on life.
• Exercise
Moderate exercise is generally recommended for all individuals who are not in an acute or end-stage phase of HCV. Exercise can help reduce stress and is important for maintaining good health. However, too much exercise can lead to flare-ups. Select low impact types of exercise such as walking and swimming. Slowly increase your workouts until the desired level is achieved. Always check with your medical provider before starting any exercise program.

Support Groups
Many people with HCV feel isolated and find it difficult to cope with the effects of living with a chronic illness. A support group can offer a safe space to discuss the emotional issues surrounding HCV. Furthermore, the information shared by peer members can be helpful in making decisions about a wide variety of issues facing people with HCV. It is highly recommended that you join a support group while undergoing HCV treatment. Support group information can be found on our website or by contacting the organizations listed at the end of this guide.

Social Media
Social Media such as Facebook provides many groups that provide support to people with hepatitis C.

HAV AND HBV VACCINATION
It is strongly recommended that people with HCV get vaccinated against hepatitis A and B if they are not already immune. Severe HAV and HBV infections have been reported in people already infected with HCV. The hepatitis A vaccine consists of two doses within a six-month period, and the hepatitis B vaccine requires three doses within a six-month period. Both vaccines are made from killed viruses and are considered safe and effective. A combination HAV/HBV vaccine as well as an accelerated dosing schedule is FDA approved.

ENVIRONMENTAL TOXINS
Everything you breathe or absorb through the skin must be filtered by the liver. Fumes from paint thinners, pesticides, and aerosol sprays can damage your liver and should be avoided.

The Internet
The Internet contains a wealth of information, both good and bad. Always check the sources of the information you find. Look for dates and references. Challenge any information you believe is in error. Be skeptical of websites that contain unfounded claims or other misleading information. Remember that not all the information you find on the Internet is correct. Talk to your doctor regarding any information you are concerned about. Common sense can take you a long way! Visit our website at www.hcvadvocate.org for recommended sites.

CONCLUSION
Chronic hepatitis C is a liver disease that can have serious consequences. It is important to remember that not everyone experiences every symptom or severe disease progression. Those who do eventually experience disease progression may remain symptom-free for many years. However, many people develop serious liver disease that can result in liver failure and death. There are effective treatments now and everyone with hepatitis C should talk with a medical provider about treatment. Additionally, lifestyle changes such as good nutrition, exercise, and stress management can help alleviate some side effects and may slow disease progression.

We hope this information has helped you to understand the hepatitis C virus and how it can affect your physical and emotional health. We welcome any suggestions or ideas for improving this guide.
PATIENT ASSISTANCE PROGRAMS

There are many assistance programs that can help you with the cost of the medicines including the insurance co-payments. Talk to and work closely with your medical provider to access these programs.

### Umbrella Organizations

<table>
<thead>
<tr>
<th>Organization</th>
<th>Phone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Days</td>
<td>1-877-968-7233</td>
<td><a href="http://www.mygooddays.org">www.mygooddays.org</a></td>
</tr>
<tr>
<td>Needymeds.org</td>
<td>1-800-503-6897</td>
<td><a href="http://www.needymeds.org">www.needymeds.org</a></td>
</tr>
<tr>
<td>Partnership for Prescription Assistance</td>
<td>1-888-477-2669</td>
<td><a href="http://www.pparx.org">www.pparx.org</a></td>
</tr>
<tr>
<td>Patient Advocate Foundation Co-Pay Relief</td>
<td>1-866-512-3861</td>
<td><a href="http://www.copays.org/diseases/hepatitis-c">www.copays.org/diseases/hepatitis-c</a></td>
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</tbody>
</table>

### Vaccines

<table>
<thead>
<tr>
<th>Vaccine</th>
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<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merck-VAQTA – hepatitis A vaccine; RECOMBIVAX HB – hepatitis B vaccine</td>
<td>1-800-293-3881</td>
<td><a href="http://www.merck.com/merckhelps/vaccines/home.html">www.merck.com/merckhelps/vaccines/home.html</a></td>
</tr>
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</table>

### Pharmaceutical Companies

<table>
<thead>
<tr>
<th>Company</th>
<th>Phone</th>
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</tr>
</thead>
<tbody>
<tr>
<td>AbbVie</td>
<td>1-844-2proCeed</td>
<td><a href="http://www.viekira.com/patient-support">www.viekira.com/patient-support</a></td>
</tr>
<tr>
<td>BMS</td>
<td>1-844-442-6663</td>
<td><a href="http://www.daklinza.bmscustomerconnect.com/support">www.daklinza.bmscustomerconnect.com/support</a></td>
</tr>
<tr>
<td>Gilead</td>
<td>1-855-769-7284</td>
<td><a href="http://www.mysupportpath.com/">www.mysupportpath.com/</a></td>
</tr>
<tr>
<td>Merck</td>
<td>1-800-727-5400</td>
<td><a href="http://www.merckhelps.com">www.merckhelps.com</a></td>
</tr>
<tr>
<td>Ribavirin patient assistance programs</td>
<td></td>
<td><a href="http://hepatitiscmedications.hcvadvocate.org/patient-assistance-programs/">http://hepatitiscmedications.hcvadvocate.org/patient-assistance-programs/</a></td>
</tr>
</tbody>
</table>
SUGGESTED READING

Free from Hepatitis C: Your Complete Guide to Healing Hepatitis C
By Lucinda K. Porter, RN.
Square One Publishers.

Hepatitis C Treatment One Step at a Time.
By Lucinda K. Porter, RN.
Demos Health.

RESOURCES

Visit the HCV Advocate Website for information about hepatitis C including:

- HCV Advocate Website: www.hcvadvocate.org for information about hepatitis C
- Newly Diagnosed: Information and a printable brochure to help newly diagnosed patients http://hcvadvocate.org/newly-diagnosed/
- Treatment Issues: Treatment-related information: fact sheets about approved medications, side effects, and more http://hcvadvocate.org/treatment/
- Fact Sheets: This lists all of our fact sheets including our Easy C Facts, HCSP Fact Sheets, FAQ, Guides, Coinfection Facts, Chinese Easy C’s, and Tattoos http://hcvadvocate.org/publications/fact-sheets/
- Resources: Disability Benefits, Glossaries (Medical & Herbal), Helpful links including support groups http://hcvadvocate.org/resources/
- Espanol: Fact Sheets in Spanish http://hcvadvocate.org/spanish/  
- HBV: A web page dedicated to hepatitis B http://hcvadvocate.org/hbv/  
- Newsletter: http://hcvadvocate.org/publications/newsletter/  
- Clinical Trial Reference Site: http://hcvclinical.hcvadvocate.org/  
- HCV Drug Pipeline and Conference Coverage Site: http://hcvdrugs.com/

For more information about HCV, contact the following organizations

- HIVandHepatitis.com www.hivandhepatitis.com/
- National AIDS Treatment Advocacy Project (NATAP) www.natap.org/
- National HCV Helpline 877-HELP-4-HEP (877-435-7443)
ACUTE: rapid-onset, short-term initial stage of a disease. Contrast with chronic.

ACUTE HEPATITIS: the initial stage of viral hepatitis following infection. In HCV, acute hepatitis refers to the first six months of infection.

ADVERSE REACTION (SIDE EFFECT): an undesired action or effect of a drug or other treatment.

ALT (ALANINE AMINOTRANSFERASE, formerly SGPT): an enzyme (also called alanine transaminase) produced in the liver when the membranes of liver cells break down. ALT levels are measured to help assess the degree of liver damage and determine how well HCV treatment is working. A normal level is below 48 IU/L.

ANEMIA (adjective ANEMIC): reduced number of red blood cells or reduced ability of blood to carry oxygen. There are several types of anemia, all with different causes. Symptoms may include fatigue, weakness, pale skin, and difficulty breathing.

ANTIBODY (IMMUNOGLOBULIN): a protein that the body makes to fight specific invaders. The antibody attaches itself to the invaders and targets them for destruction. The presence of antibodies indicates current infection with or past exposure to a pathogen.

ARTHRALGIA: joint pain.

AST (formerly SGOT): an enzyme (also called aspartate transaminase) produced in the liver. When liver cells are damaged, AST is released. Elevated levels may indicate liver disease, but are also seen in people with muscle damage. A normal level is below 42 IU/L.

AUTOIMMUNE RESPONSE (AUTOIMMUNITY): a condition in which a person's immune system produces antibodies that attack the body's own tissues. Several conditions associated with hepatitis C (e.g., lichen planus, Sjögren's syndrome) appear to have an autoimmune aspect.

BID: taken twice daily.

BILIRUBIN: a yellowish pigment released when red blood cells are broken down. Normally bilirubin is processed and excreted by the liver. An excess level of bilirubin in the blood (hyperbilirubinemia) may indicate liver damage, and can lead to jaundice (yellowing of the skin and whites of the eyes), pale-colored stools, and dark urine.

BIOLOGY (BX): a procedure in which a sample of cells or tissue is taken for laboratory examination. Liver biopsies are used to monitor liver disease progression in people with HCV.

BRAIN FOG: mild mental confusion, memory loss, and/or lack of concentration and alertness.

CHRONIC: a long-term or persistent disease. Contrast with acute.

CIRRHOSIS: a type of liver damage in which normal liver cells are replaced with fibrous scar tissue.

COINFECTION: concurrent infection with more than one disease-causing organism (e.g., HCV and HIV).

COMPLETE EARLY VIROLOGICAL RESPONSE (cEVR): HCV RNA negative at treatment week 12.

CYTOPENIA: low levels of blood cells.

DAA’S: see direct-acting antivirals.

EDEMA: swelling caused by accumulation of fluid in body tissues.

EFFICACY: effectiveness; the ability to achieve a desired result.

ENCEPHALOPATHY: disease of the brain.

END-OF-TREATMENT RESPONSE (EOT OR ETR): undetectable HCV RNA at the completion of treatment.

EXTRAHEPATIC: outside the liver.

FD: Food and Drug Administration.

FIBROSIS (ADJECTIVE FIBROTIC): liver damage in which fibrous tissue develops and replaces normal cells.

GENOTYPE: the genetic makeup of an organism. HCV has seven major genotypes ('strains') designated by the numbers 1 through 7. In the U.S., genotypes 1a and 1b are most prevalent.

HCV INHIBITORS: There are 3 categories of HCV inhibitors—protease inhibitors, polymerase inhibitors and NS5a. DAA's target viral enzymes that are important for replication of hepatitis C and block these enzymes from allowing the hepatitis C virus to replicate. Also known as HCV inhibitors.

HCV RNA: the genetic material of the hepatitis C virus. A detectable level of HCV RNA on a viral load test indicates that HCV is actively replicating.

HEPATIC: having to do with the liver; also, an herbal remedy used to treat liver conditions.

HEPATIC PANEL: liver function tests.

HEPATITIS: inflammation of the liver. Hepatitis may have various causes, including viruses, toxins, and heavy alcohol consumption.

HEPATOCELULAR CARCINOMA (HCC): a type of primary liver cancer seen in some people with long-term liver damage due to chronic hepatitis B or hepatitis C.

HEPATOTOXICITY (ADJECTIVE HEPATOTOXIC): toxic or poisonous to the liver.
HISTOLOGY (ADJECTIVE HISTOLGICAL): the study or examination of body tissues. In people with HCV, histological improvement refers to improved liver tissue health, including decreased inflammation and reduced fibrosis or cirrhosis.

HISTOLOGICAL RESPONSE: an improvement in liver tissue condition (e.g., reduced inflammation) in response to treatment.

JAUNDICE: (icterus, icteric) yellowing of the skin and whites of the eyes due to high bilirubin levels in the blood. Jaundice is often a sign of liver damage or gallbladder disease.

LIVER: a large organ on the upper right side of the abdomen that plays an important role in the metabolism of sugars and fats, synthesizes several proteins, and filters toxins from the blood.

MALAISE: a generalized feeling of illness and discomfort; a flu-like feeling.

MYALGIA: muscle pain.

NEUTROPENIA: an abnormally low number of neutrophils, resulting in increased susceptibility to infection.

NONRESPONDER: person who does not show improvement while undergoing treatment. In HCV, a nonresponder does not achieve normal ALT levels or an undetectable viral load.

NS5A INHIBITOR: an HCV medication that inhibits viral replication.

NULL RESPONDER: a person who does not achieve a 2 log_{10} drop of HCV RNA by treatment week 12.

ONCE-A-DAY: taken once a day.

PLATELET: see thrombocyte.

POLYMERASE INHIBITOR: an agent that inhibits viral replication by interfering with the polymerase enzyme.

PROTEASE INHIBITOR: an agent that inhibits viral replication by interfering with the virus' protease enzyme.

PRURITUS (ADJECTIVE PRURITIC): itchiness.

PSORIASIS: a skin condition characterized by scaling and red patches, due to the overproduction of skin cells.

QUALITATIVE: relating to, or expressed in terms of, quality. A qualitative viral load test measures the presence of a virus.

QUANTITATIVE: relating to, or expressed in terms of, quantity. A quantitative viral load test measures the amount of viral genetic material.

QUASISPECIES: individual genetic variants of HCV. Within a single genotype there may be multiple quasispecies.

RELAPSE: recurrence of disease symptoms following a period of improvement. In HCV, relapse can refer to an increase in viral load after it has been suppressed.

RELAPSER: a person who becomes HCV RNA negative at end of treatment, but becomes HCV detectable within 24 weeks from the end of treatment (EOT).

RIBAVIRIN (RBV)—BRAND NAME REBETOL, COPEGUS, RIBASPHERE: an antiviral medication approved for use in combination with interferon to treat chronic HCV infection.

STEATOSIS: buildup of fat tissue in the liver.

SUBCUTANEOUS (SQ): underneath the skin; usually refers to a drug injected under the skin.

SUSTAINED RESPONDER: a person who maintains a long-term response to treatment. In HCV, a sustained responder has a long-term response (e.g., normal ALT levels, undetectable HCV RNA) that persists after treatment is stopped.

SUSTAINED VIROLOGICAL RESPONSE (SVR): HCV RNA negative 12 weeks after completion of treatment (CURE).

THROMBOCYTE (PLATELET): a type of blood cell responsible for normal blood clotting.

TID: taken three times a day.

TREATMENT-NAIVE: a person who has never been treated.

VACCINE: a preparation administered to stimulate an immune response to protect a person from illness. A vaccine typically includes a small amount of a killed or inactivated microorganism, or genetically engineered pieces. A therapeutic (treatment) vaccine is given after infection and is intended to reduce or stop disease progression. A preventive (prophylactic) vaccine is intended to prevent initial infection.

VARICES (ADJECTIVE VARICEAL): an abnormally dilated or swollen vein, artery, or lymph vessel resulting from portal hypertension.

VIRAL LOAD: the amount of virus in the blood or other tissues, usually expressed in terms of copies of viral genetic material (RNA or DNA). The presence of genetic material indicates that a virus is actively replicating.

VIRAL REPLICATION: the ability of a virus to reproduce copies of itself.

VIRUS: a microscopic infectious organism that is unable to grow or replicate outside of a host cell. Viruses integrate their genetic material (DNA or RNA) into a host cell and take over the cell’s biological mechanisms to reproduce new virus particles.

WESTERN MEDICINE: allopathic medicine; the type of medical practice.

WHITE BLOOD CELL (WBC): leukocyte.

WINDOW PERIOD: the time between exposure to a microorganism and the production of sufficient antibodies to be detected on a test.
In February 2013, CDC published two analyses\(^1\)\(^2\) that provide an in-depth look at the severe human and economic burden of sexually transmitted infections (STIs) in the United States.

CDC’s new estimates show that there are about 20 million new infections in the United States each year, costing the American healthcare system nearly $16 billion in direct medical costs alone.

America’s youth shoulder a substantial burden of these infections. CDC estimates that half of all new STIs in the country occur among young men and women. In addition, CDC published an overall estimate of the number of prevalent STIs in the nation. Prevalence is the total number of new and existing infections at a given time. CDC’s new data suggest that there are more than 110 million total STIs among men and women across the nation.

CDC’s analyses included eight common STIs: chlamydia, gonorrhea, hepatitis B virus (HBV), herpes simplex virus type 2 (HSV-2), human immunodeficiency virus (HIV), human papillomavirus (HPV), syphilis, and trichomoniasis.

### How CDC developed its new estimates: CDC’s new estimates were developed using the best available data. The estimates are based on national surveys, nationally notifiable disease case reports, and data from special projects. The primary data source used to estimate the number of most prevalent infections was the National Health and Nutrition Examination Survey (NHANES), a nationally representative sample of the civilian, non-institutionalized population in the United States that includes testing for STIs. CDC used conservative assumptions in generating its estimates, so the true numbers of STIs in the United States may be even higher than estimated.

When calculating the number of prevalent and incident infections, only those infections that were sexually transmitted were counted. In general, CDC estimated the total number of infections in the calendar year, rather than the number of individuals with infection, since one person can have more than one STI at a given time (e.g., HPV and chlamydia) or more than one episode of a single STI (e.g., repeat chlamydia infection). Because 20 percent of people with HPV are infected with more than one type, HPV infections were calculated per person so that individuals infected with multiple HPV types would not be double counted. If each HPV infection was considered, the totals would show an even higher burden of infection.

CDC’s cost estimates reflect the lifetime direct medical cost per case of eight common STIs in the United States and do not include either indirect costs (e.g., loss of productivity) or intangible costs (e.g., pain and suffering) associated with many STIs. Including such costs would have resulted in a substantially higher estimated economic burden.

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Nearly 20 Million New Infections Occur Each Year – Half among the Nation’s Youth

CDC estimates that there are more than 19.7 million new STIs in the United States each year. While most of these STIs will not cause harm, some have the potential to cause serious health problems, especially if not diagnosed and treated early. Young people (ages 15-24) are particularly affected, accounting for half (50 percent) of all new STIs, although they represent just 25 percent of the sexually experienced population.

Estimated number of new sexually transmitted infections - United States, 2008

<table>
<thead>
<tr>
<th>Infection</th>
<th>Ages 15-24</th>
<th>Ages 25+</th>
<th>Total:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlamydia</td>
<td>2,860,000</td>
<td>820,000</td>
<td>3,680,000</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>55,400</td>
<td>776,000</td>
<td>831,400</td>
</tr>
<tr>
<td>HSV-2</td>
<td>1,090,000</td>
<td>1,410,000</td>
<td>2,500,000</td>
</tr>
<tr>
<td>Syphilis</td>
<td>14,100,000</td>
<td>14,100,000</td>
<td>28,200,000</td>
</tr>
<tr>
<td>Trichomoniasis</td>
<td>41,400</td>
<td>2,860,000</td>
<td>3,271,400</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>8,000</td>
<td>19,000</td>
<td>27,000</td>
</tr>
<tr>
<td>HIV*</td>
<td>4,350,000</td>
<td>41,400</td>
<td>4,391,400</td>
</tr>
<tr>
<td>Total:</td>
<td>19,738,800</td>
<td>19,738,800</td>
<td>39,477,600</td>
</tr>
</tbody>
</table>

*HIV incidence not calculated by age in this analysis

While the consequences of untreated STIs are often worse for young women, the new analysis reveals that the annual number of new infections is roughly equal among young women and young men (49 percent of incident STIs occurs among young men, vs. 51 percent among young women).

Four of the STIs included in the analysis are easily treated and cured if diagnosed early: chlamydia, gonorrhea, syphilis, and trichomoniasis. However, too many of these infections go undetected because they often have no symptoms. But even STIs that don't have symptoms can have serious health consequences. Undiagnosed and untreated chlamydia or gonorrhea, for example, can put a woman at increased risk of chronic pelvic pain and life-threatening ectopic pregnancy, and can also increase a woman's chance of infertility.

CDC estimates that HPV accounts for the majority of newly acquired STIs. While the vast majority (90 percent) of HPV infections will go away on their own within two years and cause no harm, some of these infections will take hold and potentially lead to serious disease, including cervical cancer (see HPV box, pg. 3).
New Estimates Reveal More than 110 Million STIs in the United States

CDC’s analysis suggests that there are more than 110 million STIs overall among men and women nationwide. This estimate includes both new and existing infections. Some prevalent infections – such as HSV-2 and HIV – are treatable but lifelong infections.

Estimated number of new and existing (total) sexually transmitted infections
- United States, 2008

Total: 110,197,000

<table>
<thead>
<tr>
<th>STI</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syphilis</td>
<td>117,000</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>270,000</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>422,000</td>
</tr>
<tr>
<td>HIV</td>
<td>908,000</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>1,570,000</td>
</tr>
<tr>
<td>Trichomoniasis</td>
<td>3,710,000</td>
</tr>
<tr>
<td>HSV-2</td>
<td>24,100,000</td>
</tr>
<tr>
<td>HPV</td>
<td>79,100,000</td>
</tr>
</tbody>
</table>

Gender totals do not equal overall total, due to rounding
Bars are for illustration only; not to scale, due to wide range in numbers of infections

HPV accounts for the majority of prevalent STIs in the United States. While there is no treatment for the virus itself, there are treatments for the serious diseases that HPV can cause, and vaccines are available to prevent some types of HPV infection (see HPV box below).

**Human papillomavirus (HPV) – The most common STI:** The body’s immune system clears most HPV naturally within two years (about 90 percent), though some infections persist. While there is no treatment for the virus itself, there are treatments for the serious diseases that HPV can cause, including genital warts, cervical, and other cancers.

Most sexually active men and women will get HPV at some point in their lives. This means that everyone is at risk for the potential outcomes of HPV and many may benefit from the prevention that the HPV vaccine provides. HPV vaccines are routinely recommended for 11 or 12 year old boys and girls, and protect against some of the most common types of HPV that can lead to disease and cancer, including most cervical cancers. CDC recommends that all teen girls and women through age 26 get vaccinated, as well as all teen boys and men through age 21 (and through age 26 for gay, bisexual, and other men who have sex with men). HPV vaccines are most effective if they are provided before an individual ever has sex.
HSV-2, HBV, and HIV are lifelong infections that together account for nearly one-quarter of all prevalent infections. These infections have potentially severe health consequences. For example, HSV-2 can lead to painful chronic infection, miscarriage or premature birth, and fatal infection in newborns. HBV can lead to cirrhosis, a life-threatening liver disease. And HIV damages a person’s immune system over time, increasing an infected person’s susceptibility to a number of diseases. Additionally, nearly 18,000 people in the United States die with AIDS each year.

**STIs Result in Significant Costs to the U.S. Healthcare System**

STIs place a significant economic strain on the U.S. healthcare system. CDC conservatively estimates that the lifetime cost of treating eight of the most common STIs contracted in just one year is $15.6 billion.

Because some STIs – especially HIV – require lifelong treatment and care, they are by far the costliest. In addition, HPV is particularly costly due to the expense of treating HPV-related cancers. However, the annual cost of curable STIs is also significant ($742 million). Among these, chlamydia is most common and therefore the most costly.

**Fighting STIs: Prevention, Diagnosis, and Prompt Treatment**

Because STIs are preventable, significant reductions in new infections are not only possible, they are urgently needed. Prevention can minimize the negative, long-term consequences of STIs and also reduce healthcare costs.

The high incidence and overall prevalence of STIs in the general population suggests that many Americans are at substantial risk of exposure to STIs, underscoring the need for STI prevention.

Abstaining from sex, reducing the number of sexual partners, and consistently and correctly using condoms are all effective STI prevention strategies. Safe, effective vaccines are also available to prevent HBV and some types of HPV that cause disease and cancer. And for all individuals who are sexually active – particularly young people – STI screening and prompt treatment (if infected) are critical to protect a person’s health and prevent transmission to others.

**CDC’s STI Screening Recommendations:** If you are sexually active, be sure to talk to your healthcare provider about STI testing and which tests may be right for you.

- All adults and adolescents should be tested at least once for HIV.
- Annual chlamydia screening for all sexually active women age 25 and under, as well as older women with risk factors such as new or multiple sex partners.
- Yearly gonorrhea screening for at-risk sexually active women (e.g., those with new or multiple sex partners, and women who live in communities with a high burden of disease).
- Syphilis, HIV, chlamydia, and hepatitis B screening for all pregnant women, and gonorrhea screening for at-risk pregnant women at the first prenatal visit, to protect the health of mothers and their infants.
- Trichomoniasis screening should be conducted at least annually for all HIV-infected women.
- Screening at least once a year for syphilis, chlamydia, gonorrhea, and HIV for all sexually active gay men, bisexual men, and other men who have sex with men (MSM). MSM who have multiple or anonymous partners should be screened more frequently for STIs (e.g., at 3 to 6 month intervals). In addition, MSM who have sex in conjunction with illicit drug use (particularly methamphetamine use) or whose sex partners participate in these activities should be screened more frequently.

If you are a member of the news media, please visit [www.cdc.gov/nchhstp/Newsroom](http://www.cdc.gov/nchhstp/Newsroom) or contact the News Media Line at CDC’s National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention: 404-639-8895 or [NCHHSTPMediaTeam@cdc.gov](mailto:NCHHSTPMediaTeam@cdc.gov).

Other information requests may be directed to the Division of STD Prevention ([www.cdc.gov/std](http://www.cdc.gov/std)) or the CDC-INFO Contact Center: 1-800-CDC-INFO (1-800-232-4636). Inquiries may also be submitted to [www.cdc.gov/cdc-info/requestform.html](http://www.cdc.gov/cdc-info/requestform.html).