HIV/AIDS

Terms Used in this Section:

**AIDS:** Acquired immunodeficiency syndrome. AIDS is the most advanced stage of HIV infection. AIDS is diagnosed when a person infected with HIV has a CD4 count of less than 200 cells/mm³ or has an AIDS-defining condition.

**AIDS-defining condition:** Any one of several illnesses that can lead to a diagnosis of AIDS in a person infected with HIV. AIDS is the most advanced stage of HIV infection.

**Antiretroviral therapy (ART):** The recommended treatment for HIV. ART involves taking a combination of three or more anti-HIV medications from at least two different drug classes every day to control the virus.

**CD4 cells:** Also called T cells or CD4+ T cells. Infection-fighting white blood cells of the immune system. HIV destroys CD4 cells, making it harder for the body to fight infections.

**CD4 count:** The number of CD4 cells in a sample of blood. A CD4 count measures how well the immune system is working.

**HIV:** Human immunodeficiency virus. HIV is a virus that attacks the immune system, putting people infected with HIV at risk for life-threatening infections and cancer. AIDS is the most advanced stage of HIV infection.

**Opportunistic infection:** An infection that occurs more frequently or is more severe in people with weakened immune systems (such as people with HIV or people receiving chemotherapy) than in people with healthy immune systems.

**Regimen:** A combination of three or more anti-HIV medications from at least two different drug classes.

**Transmission of HIV:** The spread of HIV from a person infected with HIV to another person through the infected person’s blood, semen, genital fluids, or breast milk.
THE BASICS:

What is HIV/AIDS?

The human immunodeficiency virus, or HIV, is the virus that causes HIV infection. During HIV infection, the virus attacks and destroys the infection-fighting CD4 cells of the body's immune system. Loss of CD4 cells makes it difficult for the immune system to fight infections.

Acquired immunodeficiency syndrome, or AIDS, is the most advanced stage of HIV infection.

How is HIV transmitted?

HIV is transmitted (spread) through the blood, semen, genital fluids, or breast milk of a person infected with HIV. Having unprotected sex or sharing drug injection equipment (such as needles and syringes) with a person infected with HIV are the most common ways HIV is transmitted.

You can’t get HIV by shaking hands, hugging, or closed-mouth kissing with a person who is infected with HIV. And you can’t get HIV from contact with objects such as toilet seats, doorknobs, dishes, or drinking glasses used by a person infected with HIV.

Even though it takes many years for symptoms of HIV to develop, a person infected with HIV can spread the virus at any stage of HIV infection. Detecting HIV early after infection and starting treatment with anti-HIV medications before symptoms of HIV develop can help people with HIV live longer, healthier lives. Treatment can also reduce the risk of transmission of HIV.

What is the treatment for HIV?

Antiretroviral therapy (ART) is the recommended treatment for HIV infection. ART involves taking a combination (regimen) of three or more anti-HIV medications daily. ART prevents HIV from multiplying and destroying infection-fighting CD4 cells. This helps the body fight off life-threatening infections and cancer.

ART can’t cure HIV, but anti-HIV medications help people infected with HIV live longer, healthier lives.

Can treatment prevent HIV from advancing to AIDS?

Yes. Treatment with anti-HIV medications prevents HIV from multiplying and destroying the immune system. This helps the body fight off life-threatening infections and cancers and prevents HIV from advancing to AIDS.

It takes many years, but without treatment, HIV infection can advance to AIDS. A diagnosis of AIDS requires that a person infected with HIV have either:

- A CD4 count of less than 200 cells/mm$^3$. (The CD4 count of a healthy person ranges from 500 to 1,200 cells/mm$^3$.)

OR

- An AIDS-defining condition. (AIDS-defining conditions include opportunistic infections and cancers that are life-threatening in person with HIV. Having an AIDS-defining condition signals that a person’s HIV infection has advanced to AIDS.)
What illnesses are considered AIDS-defining conditions?

The Centers for Disease Control and Prevention (CDC) considers several illnesses AIDS-defining conditions. *Pneumocystis jiroveci* pneumonia, tuberculosis, and toxoplasmosis are examples of AIDS-defining conditions.

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

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### Terms Used in This Section:

**HIV antibody test:** An HIV test that checks for HIV antibodies in a person’s blood, urine, or fluids from the mouth. HIV antibodies are a type of protein the body produces in response to HIV infection.

Mother-to-child transmission of HIV: The passing of HIV from a woman infected with HIV to her baby during pregnancy, during labor and delivery, or by breastfeeding.

**Plasma HIV RNA test (viral load test):** A test that measures the amount of HIV in the blood. This test is used to detect recent HIV infection or to measure viral load at any stage of HIV infection.

**Rapid HIV antibody test:** An HIV antibody test that can detect HIV antibodies in blood or oral fluids in less than 30 minutes.

**Transmission of HIV:** The spread of HIV from a person infected with HIV to another person through the infected person's blood, semen, genital fluids, or breast milk.

**Unprotected sex:** Sex without using a condom.

**Viral load:** The amount of HIV in the blood. One of the goals of antiretroviral therapy is to reduce viral load.

**Western blot:** A type of antibody test used to confirm a positive HIV antibody or plasma HIV RNA test.

**Window period:** The time period between a person's infection with HIV and the appearance of detectable HIV antibodies.

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What is the most common HIV test?

The most common HIV test is the HIV antibody test. HIV antibodies are a type of protein the body produces in response to HIV infection. The HIV antibody test checks for HIV antibodies in a person’s blood, urine, or fluids from the mouth.

Generally it takes the body about 3 months from the time of infection to produce enough antibodies to be detected by an HIV antibody test. (For some people, it can take up to 6 months.) The time period between infection and the appearance of detectable HIV antibodies is called the window period. Because HIV antibodies are not detectable yet, the HIV antibody test isn’t useful during the window period.

What HIV test is used during the window period?

The plasma HIV RNA test (also called a viral load test) can detect HIV in a person’s blood within 9 days of infection, before the body develops detectable HIV antibodies. The plasma HIV RNA test is recommended when recent infection is very likely—for example, soon after a person has had unprotected sex with a partner infected with HIV.

Detecting HIV at the earliest stage of infection lets people take steps right away to prevent transmission of HIV. (See the Preventing Transmission of HIV fact sheet.) This is important because immediately after infection the amount of HIV in the body is very high, increasing the risk of transmission of HIV. Starting treatment at this earliest stage of infection also can be considered.

What does it mean to test HIV positive?

A diagnosis of HIV is made on the basis of positive results from two HIV tests. The first test can be either an HIV antibody test (using blood, urine, or fluids from the mouth) or a plasma HIV RNA test (using blood). The second test (always using blood) is a different type of antibody test called a Western blot test. A positive Western blot test confirms that a person has HIV.

How long does it take to get HIV test results?

Results of the first antibody test are generally available within a few days. (Rapid HIV antibody tests can produce results within an hour.) Results of the plasma HIV RNA test and Western blot are available in a few days to a few weeks.

If I test HIV positive now, will I always test HIV positive?

Yes. There’s no cure for HIV at this time. Because you will always be infected with the virus, you will always test HIV positive. But treatment with anti-HIV medications can help you live a longer, healthier life.

If a pregnant woman tests positive for HIV, will her baby be born with HIV?

In the United States and Europe, fewer than 2 babies in 100 born to mothers infected with HIV are infected with the virus. This is because anti-HIV medications given to women infected with HIV during pregnancy and delivery and to their babies after birth help prevent mother-to-child transmission of HIV. Another reason is
that, in the United States and Europe, mothers infected with HIV do not breastfeed their babies. (For more information, see the HIV and Pregnancy fact sheet series.)

Where can I find information on HIV testing in my state?

Many hospitals, medical clinics, and community organizations offer HIV testing. To find an HIV testing site near you, contact AIDSinfo for the number of your state AIDS hotline or visit http://www.hivtest.org. You can also find information on testing locations on your state health department website.

This information is based on the U.S. Department of Health and Human Services’ Guidelines for the Use of Reviewed Antiretroviral Agents in HIV-1-Infected Adults and Adolescents (available at http://aidsinfo.nih.gov/guidelines). August 2012

HIV in the United States: An Overview

The number of people living with HIV infection in the United States (HIV prevalence) is higher than ever before. CDC has estimated that approximately 1.2 million (1,178,350) adults and adolescents were living with HIV infection in the United States at the end of 2008, the most recent year for which national prevalence estimates are available. This represents an increase of approximately 7% from the previous estimate in 2006 [1]. The increase is due to a higher number of people becoming infected with HIV than the number of people who die each year with HIV or AIDS.

Despite increases in the total number of people living with HIV infection, the annual number of new HIV infections (HIV incidence) has remained relatively stable in recent years. According to the most recent incidence estimates, approximately 48,100 persons were infected with HIV in 2009 [2]. The estimated HIV incidence has been relatively stable since the late 1990s despite more people living with HIV infection every year and, thus, increased opportunities for transmission to occur.

The great majority of persons with HIV infection do not transmit HIV to others. CDC estimates that there were 5 transmissions per 100 persons living with HIV infection in the United States in 2006 [3]. This means that at least 95% of those living with HIV infection did not transmit the virus to others that year—an 89% decline in the estimated rate of HIV transmission since the peak level of new infections in the mid-1980s. The decline in transmission is likely due to effective prevention efforts and the availability of improved testing and treatments for HIV. The lower transmission rate is what has enabled HIV incidence to remain stable despite increasing prevalence [1].

Subpopulations representing 2% or less of the overall US epidemic are not reflected in this chart.

More people in the United States with HIV know of their HIV infection. The estimated proportion of persons in the United States with HIV who know they are infected increased from 75% in 2003 to 80% in 2008 [1]. This is a sign of progress for HIV prevention because research shows that most individuals reduce behaviors that could transmit HIV when they know they are infected [4].

Diagnoses of HIV infection reported to CDC have remained stable in recent years. In 2010, an estimated 47,129 persons were diagnosed with HIV infection [3] in the 46 states with long term, confidential, name-based HIV infection reporting [5]. Diagnoses of HIV infection remained stable in the 46 states from 2007–2010.

The HIV diagnosis rate has also remained stable in recent years. From 2007–2010, the annual estimated rate of diagnoses of HIV infection (the number of HIV diagnoses per 100,000 persons) remained relatively stable in the 46 states with long term, confidential, name-based HIV reporting. In 2010 the estimated rate of HIV diagnoses was 16.1 per 100,000 persons [5]. Estimated numbers and rates of diagnoses of HIV infection increased in some subgroups and decreased in others. Variations in trends between groups may be due to differences in testing behaviors, targeted HIV testing initiatives, more streamlined surveillance practices in some jurisdictions, and possibly changes in the numbers of new HIV infections (HIV incidence) in some subgroups.
HIV disproportionately affects certain populations. Men who have sex with men (MSM), blacks/African Americans, and Hispanic/Latinos are the groups most affected by HIV infection.

**MSM** represent approximately 2% of the U.S. population, but accounted for more than 50% of all new HIV infections annually during 2006–2009 [6,b,2]. In 2010 MSM accounted for 61% of HIV diagnoses [5].

- From 2006–2009, over 25,000 MSM were newly infected with HIV annually [2]. Among MSM aged 13-29, HIV incidence among black/African American MSM increased significantly (48%) from 2006 through 2009 with a statistically significant 12.2% estimated annual percentage increase [2].
- From 2007–2010, the estimated number of HIV diagnoses among MSM increased by approximately 9% [5]. This increase may be due differences in testing behaviors, targeted HIV testing initiatives, more streamlined surveillance practices in some jurisdictions, and possibly changes in the numbers of new HIV infections (HIV incidence) in some subgroups [7,c]. These increases may also be affected by the degree of uncertainty inherent in statistical estimates.

**Blacks/African Americans** are the racial/ethnic group most affected by HIV. Blacks/African Americans represented approximately 14% of the U.S. population, but accounted for an estimated 44% of new HIV infections in 2009 [2].

- At some point in their life, 1 in 16 black/African American men will receive a diagnosis of HIV, as will one in 32 black women [8].
- In 2009 the estimated rate of new HIV infection for black/African American men was more than six times as high as that of white men, nearly two and a half times that of Hispanic/Latino men, and more than twice that of black/African American women [2].
In 2009 the estimated rate of new HIV infection for black/African American women was 15 times the rate for white women, and over three times that of Hispanic women [2]. From 2007–2010, the estimated number and rate of HIV diagnoses among blacks/African Americans remained stable. In 2010, blacks/African Americans had an HIV diagnosis rate of 62.0 per 100,000 persons [5].

Hispanics/Latinos represented 16% of the population, but accounted for an estimated 20% of new infections in 2009 [2].

- In 2009 the estimated rate of new HIV infection among Hispanic/Latino men was two and a half times that of white men [2].
- In 2009 the estimated rate of new HIV infection among Hispanic/Latino women was four and a half times that of white women [2].
- From 2007–2010, the estimated number of HIV diagnoses remained stable among Hispanics/Latinos [5].
- The rate of HIV diagnoses among Hispanic/Latinos decreased by 7%, from 22.0 to 20.4 per 100,000 population, possibly reflecting the growing population of Hispanics/Latinos in the United States [5].

Despite many prevention and treatment successes, people are still dying from HIV disease. HIV remains a significant cause of death for some populations. For example, in 2007, HIV was the third leading cause of death for black males and black females aged 35-44 and the fourth leading cause of death for Hispanic/Latino females in the same age range [9,d]. Further, MSM are strongly affected by HIV and represent the majority of persons with an HIV diagnosis who have died in the United States.

Overall, nearly 619,400 persons with an AIDS diagnosis in the United States have died since the beginning of the epidemic through 2009 (the most recent year that death data are available) [5]. From 2007 through 2009, the annual estimated rate (per 100,000) of deaths of persons with an AIDS diagnosis remained stable.

Interpreting data regarding deaths of persons with a diagnosis of HIV or AIDS can be difficult because many factors can affect the data. For example:

- changes may be influenced by significant efforts that have been made to improve death reporting by state and local HIV surveillance programs in recent years;
- the changes may be related to the availability of more effective treatments for persons with HIV infection or AIDS;
- the group of persons living with HIV infection is aging, which may result in an increased number of deaths from any cause, including those unrelated to HIV infection;
- there are uncertainties inherent in statistical estimates.
Too many people are diagnosed with HIV late in the course of infection. Despite an increase in persons getting diagnosed with HIV earlier in the course of their infection [7], far too many continue to be diagnosed late. Among persons initially diagnosed with HIV infection during 2009, one-third (32%) received an AIDS diagnosis within 12 months [5]. These late diagnoses represent missed opportunities for treatment and prevention.

AIDS disproportionately affects different parts of the country. HIV and AIDS have had a severe impact on all regions of the country. It remains mostly an urban disease, with the majority of individuals diagnosed with AIDS in 2009 residing in areas with 500,000 or more people. Areas hardest hit (by ranking of AIDS cases per 100,000 people) include Baton Rouge and New Orleans, Louisiana; Miami, Florida; Jackson, Mississippi; and Baltimore, Maryland [5].

Key References that Explain the HIV Epidemic in the United States

Following are some of the key indicators of HIV disease in the United States and the references that best explain them.


- **HIV transmission rates**: Holtgrave DR, Hall HI, Rhodes PH, et al. Updated annual HIV transmission rates in the United States,


The following indicators can be found in the CDC’s HIV Surveillance Report (CDC. HIV Surveillance Report, 2010; vol 22.)

- Diagnoses of HIV infection in the United States (46 states and 5 U.S. dependent areas)
- Persons living with a diagnosis of HIV infection (46 states and 5 U.S. dependent areas)
- AIDS diagnoses in the United States and 6 U.S. dependent areas
- Persons living with an AIDS diagnosis in the United States and 6 U.S. dependent areas
- Deaths of persons with a diagnosis of HIV infection or AIDS
- Time to AIDS diagnosis after a diagnosis of HIV infection (late HIV diagnoses)
- Survival time after diagnosis of HIV infection or AIDS
- Geographic (United States) distribution of diagnoses of HIV infection or AIDS

**References**

   a. New diagnoses are not the same as new infections (incidence). A person can be infected with HIV for years before being diagnosed.
Occupational HIV Transmission and Prevention among Health Care Workers

Through December 2001, there were 57 documented cases of occupational HIV transmission to health care workers in the United States, and no confirmed cases have been reported since 1999. Occupational transmission of HIV is reported in the Centers for Disease Control and Prevention (CDC) HIV Surveillance Report in the transmission category that includes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or not identified.

To prevent transmission of HIV to health care workers in the workplace, CDC offers the following recommendations.

Prevention Strategies

Health care workers should assume that the blood and other body fluids from all patients are potentially infectious. They should therefore follow infection control precautions at all times.

These precautions include

- routinely using barriers (such as gloves and/ or goggles) when anticipating contact with blood or body fluids,
- immediately washing hands and other skin surfaces after contact with blood or body fluids, and
• carefully handling and disposing of sharp instruments during and after use.

Safety devices have been developed to help prevent needle-stick injuries. If used properly, these types of devices may reduce the risk of exposure to HIV. Many percutaneous injuries, such as needle-sticks and cuts, are related to sharps disposal. Strategies for safer disposal, including safer design of disposal containers and placement of containers, are being developed.

Although the most important strategy for reducing the risk of occupational HIV transmission is to prevent occupational exposures, plans for post exposure management of health care personnel should be in place. CDC has issued guidelines for the management of health care worker exposures to HIV and recommendations for post exposure prophylaxis (PEP): Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HIV and Recommendations for Post exposure Prophylaxis\(^2\) (September 30, 2005).

These guidelines outline a number of considerations in determining whether health care workers should receive PEP and in choosing the type of PEP regimen. For most HIV exposures that warrant PEP, a basic 4-week, two-drug (there are several options) regimen is recommended. For HIV exposures that pose an increased risk of transmission (based on the infection status of the source and the type of exposure), a three-drug regimen may be recommended. Special circumstances, such as a delayed exposure report, unknown source person, pregnancy in the exposed person, resistance of the source virus to antiviral agents, and toxicity of PEP regimens, are also discussed in the guidelines. Occupational exposures should be considered urgent medical concerns.

Building Better Prevention Programs for Health Care Workers

Continued diligence in the following areas is needed to help reduce the risk of occupational HIV transmission to health care workers.

**Administrative efforts.** All health care organizations should train health care workers in infection control procedures and on the importance of reporting occupational exposures. They should develop a system to monitor reporting and management of occupational exposures.

**Development and promotion of safety devices.** Effective and competitively priced devices engineered to prevent sharps injuries should continue to be developed for health care workers who frequently come into contact with potentially HIV-infected blood and other body fluids. Proper and consistent use of such safety devices should be continuously evaluated.

**Monitoring the effects of PEP.** Data on the safety and acceptability of different regimens of PEP, particularly those regimens that include new antiretroviral agents, should be continuously monitored and evaluated. Furthermore, improved communication about possible side effects before starting treatment and close follow-up of health care workers receiving treatment are needed to increase compliance with the PEP.

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