

A.D.A.M. Medical Encyclopedia.

AIDS

Acquired immune deficiency syndrome

Last reviewed: June 9, 2011.

AIDS (acquired immune deficiency syndrome) is the final stage of [HIV disease](#), which causes severe damage to the immune system.

Causes, incidence, and risk factors

Important facts about the spread of AIDS include:

- AIDS is the sixth leading cause of death among people ages 25 - 44 in the United States, down from number one in 1995.
- The World Health Organization estimates that more than 25 million people worldwide have died from this infection since the start of the epidemic.
- In 2008, there were approximately 33.4 million people around the world living with HIV/AIDS, including 2.1 million children under age 15.

Human immunodeficiency virus (HIV) causes AIDS. The virus attacks the immune system and leaves the body vulnerable to a variety of life-threatening infections and cancers.

Common bacteria, yeast, parasites, and viruses that usually do not cause serious disease in people with healthy immune systems can cause fatal illnesses in people with AIDS.

HIV has been found in saliva, tears, nervous system tissue and spinal fluid, blood, semen (including pre-seminal fluid, which is the liquid that comes out before ejaculation), vaginal fluid, and breast milk. However, only blood, semen, vaginal secretions, and breast milk have been shown to transmit infection to others.

The virus can be spread (transmitted):

- Through sexual contact -- including oral, vaginal, and anal sex
- Through blood -- via blood transfusions (now extremely rare in the U.S.) or needle sharing
- From mother to child -- a pregnant woman can transmit the virus to her fetus through their shared blood circulation, or a nursing mother can transmit it to her baby in her breast milk

Other methods of spreading the virus are rare and include accidental needle injury, artificial insemination with infected donated semen, and organ transplantation with infected organs.

HIV infection is NOT spread by:

- Casual contact such as hugging
- Mosquitoes

What works?

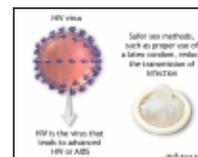
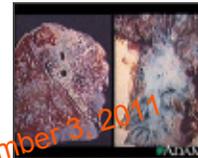


Training, experience and volumes on outcomes for persons living with HIV/AIDS: A systematic review

The training and qualifications of providers treating patients with HIV/AIDS is very important. But equally important is an understanding of the impact of numbers of patients treated by providers on key

[See all \(110\)...](#)

Figures



Boyer v. Belleque, No. 10-38574 archived on November 3, 2011

Participation in sports

- Touching items that were touched by a person infected with the virus

AIDS and blood or organ donation:

- AIDS is NOT transmitted to a person who DONATES blood or organs. People who donate organs are never in direct contact with people who receive them. Likewise, a person who donates blood is never in contact with the person receiving it. In all these procedures, sterile needles and instruments are used.
- However, HIV can be transmitted to a person RECEIVING blood or organs from an infected donor. To reduce this risk, blood banks and organ donor programs screen donors, blood, and tissues thoroughly.

People at highest risk for getting HIV include:

- Injection drug users who share needles
- Infants born to mothers with HIV who didn't receive HIV therapy during pregnancy
- People engaging in unprotected sex, especially with people who have other high-risk behaviors, are HIV-positive, or have AIDS
- People who received blood transfusions or clotting products between 1977 and 1985 (before screening for the virus became standard practice)
- Sexual partners of those who participate in high-risk activities (such as injection drug use or anal sex)

Symptoms

AIDS begins with HIV infection. People who are infected with HIV may have no symptoms for 10 years or longer, but they can still transmit the infection to others during this symptom-free period. If the infection is not detected and treated, the immune system gradually weakens and AIDS develops.

Acute HIV infection progresses over time (usually a few weeks to months) to [asymptomatic HIV infection](#) (no symptoms) and then to early symptomatic HIV infection. Later, it progresses to AIDS (advanced HIV infection with CD4 T-cell count below 200 cells/mm³).

Almost all people infected with HIV, if they are not treated, will develop AIDS. There is a small group of patients who develop AIDS very slowly, or never at all. These patients are called nonprogressors, and many seem to have a genetic difference that prevents the virus from significantly damaging their immune system.

The symptoms of AIDS are mainly the result of infections that do not normally develop in people with a healthy immune system. These are called opportunistic infections.

People with AIDS have had their immune system damaged by HIV and are very susceptible to these opportunistic infections. Common symptoms are:

- Chills
- Fever
- Sweats (particularly at night)
- Swollen lymph glands
- Weakness
- Weight loss

Note: At first, infection with HIV may produce no symptoms. Some people, however, do



Drugs of interest

- [Filgrastim Injection](#)
- [Eprex Alfa Injection](#)
- [Zidovudine Oral](#)
- [Zidovudine Injection](#)
- [Nevirapine](#)

[See all...](#)

Read More

- [HIV infection](#)
- [Asymptomatic HIV infection](#)



HIV/AIDS

MedlinePlus.gov links to free, reliable, up-to-date health information from the National Institutes of Health (NIH) and other trusted health organizations.

Recent activity

[Turn Off](#) [Clear](#)

AIDS

PubMed Health

Review: Belledune No. 10-35574 archived on November 2, 2011

experience flu-like symptoms with fever, rash, sore throat, and swollen lymph nodes, usually 2 - 4 weeks after contracting the virus. Some people with HIV infection stay symptom-free for years between the time when they are exposed to the virus and when they develop AIDS.

Signs and tests

CD4 cells are a type of T cell. T cells are cells of the immune system. They are also called "helper cells."

The following is a list of AIDS-related infections and cancers that people with AIDS may get as their CD4 count decreases. In the past, having AIDS was defined as having HIV infection and getting one of these other diseases. Today, according to the Centers for Disease Control and Prevention, a person may also be diagnosed with AIDS if they are HIV-positive and have a CD4 cell count below 200 cells/mm³, even if they don't have an opportunistic infection.

AIDS may also be diagnosed if a person develops one of the opportunistic infections and cancers that occur more commonly in people with HIV infection. These infections are unusual in people with a healthy immune system.

Many other illnesses and their symptoms may develop, in addition to those listed here.

The following illnesses are common with a CD4 count below 350 cells/mm³:

- [Herpes simplex virus](#) -- causes ulcers/small blisters in the mouth or genitals, happens more often and usually much more severely in an HIV-infected person than in someone without HIV infection
- [Herpes zoster](#) (shingles) -- ulcers/small blisters over a patch of skin, caused by reactivation of the varicella zoster virus, the same virus that causes chickenpox
- [Kaposi's sarcoma](#) -- cancer of the skin, lungs, and bowel due to a herpes virus (HHV-8). It can happen at any CD4 count, but is more likely to happen at lower CD4 counts, and is more common in men than in women.
- [Non-Hodgkin's lymphoma](#) -- cancer of the lymph nodes
- Oral or vaginal thrush -- yeast (typically *Candida albicans*) infection of the mouth or vagina
- Tuberculosis -- infection by tuberculosis bacteria mostly affects the lungs, but can also affect other organs such as the bowel, lining of the heart or lungs, brain, or lining of the central nervous system (brain and spinal cord)

Common with CD4 count below 200 cells/mm³:

- Bacillary angiomatosis -- skin sores caused by a bacteria called *Bartonella*, which may be caused by cat scratches
- Candida esophagitis -- painful yeast infection of the esophagus
- [Pneumocystis jiroveci pneumonia](#), "PCP pneumonia," previously called *Pneumocystis carinii* pneumonia, caused by a fungus

Common with CD4 count below 100 cells/mm³:

- AIDS dementia -- worsening and slowing of mental function, caused by HIV
- [Cryptococcal meningitis](#) -- fungal infection of the lining of the brain
- Cryptosporidium diarrhea -- Extreme diarrhea caused by a parasite that affects the gastrointestinal tract
- [Progressive multifocal leukoencephalopathy](#) -- a disease of the brain caused by a virus (called the JC virus) that results in a severe decline in mental and physical functions
- Toxoplasma encephalitis -- infection of the brain by a parasite, called

Boyer v. Belknap, No. 10-35574, archived on November 3, 2011

Toxoplasma gondii, which is often found in cat feces; causes lesions (sores) in the brain

- Wasting syndrome -- extreme weight loss and loss of appetite, caused by HIV itself

Common with CD4 count below 50/mm³:

- [Cytomegalovirus](#) infection -- a viral infection that can affect almost any organ system, especially the large bowel and the eyes
- *Mycobacterium avium* -- a blood infection by a bacterium related to tuberculosis

In addition to the CD4 count, a test called HIV RNA level (or viral load) may be used to monitor patients. Basic screening lab tests and regular cervical Pap smears are important to monitor in HIV infection, due to the increased risk of cervical cancer in women with a compromised immune system. Anal Pap smears to detect potential cancers may also be important in both HIV-infected men and women.

Treatment

There is no cure for AIDS at this time. However, a variety of treatments are available that can help keep symptoms at bay and improve the quality of life for those who have already developed symptoms.

Antiretroviral therapy suppresses the replication of the HIV virus in the body. A combination of several antiretroviral drugs, called highly active antiretroviral therapy (HAART), has been very effective in reducing the number of HIV particles in the bloodstream. This is measured by the viral load (how much free virus is found in the blood). Preventing the virus from replicating can improve T-cell counts and help the immune system recover from the HIV infection.

HAART is not a cure for HIV, but it has been very effective for the past 12 years. People on HAART with suppressed levels of HIV can still transmit the virus to others through sex or by sharing needles. There is good evidence that if the levels of HIV remain suppressed and the CD4 count remains high (above 200 cells/mm³), life can be significantly prolonged and improved.

However, HIV may become resistant to one combination of HAART, especially in patients who do not take their medications on schedule every day. Genetic tests are now available to determine whether an HIV strain is resistant to a particular drug. This information may be useful in determining the best drug combination for each person, and adjusting the drug regimen if it starts to fail. These tests should be performed any time a treatment strategy begins to fail, and before starting therapy.

When HIV becomes resistant to HAART, other drug combinations must be used to try to suppress the resistant strain of HIV. There are a variety of new drugs on the market for treating drug-resistant HIV.

Treatment with HAART has complications. HAART is a collection of different medications, each with its own side effects. Some common side effects are:

- Collection of fat on the back ("buffalo hump") and abdomen
- General sick feeling (malaise)
- Headache
- Nausea
- Weakness

When used for a long time, these medications increase the risk of heart attack, perhaps by increasing the levels of cholesterol and glucose (sugar) in the blood.

Any doctor prescribing HAART should carefully watch the patient for possible side effects. In addition, blood tests measuring CD4 counts and HIV viral load should be taken every 3 months. The goal is to get the CD4 count as close to normal as possible,

Boyer v. Belleque, No. 10-35574 archived on November 3, 2011

and to suppress the amount of HIV virus in the blood to a level where it cannot be detected.

Other antiviral medications are being investigated. In addition, growth factors that stimulate cell growth, such as erythropoietin (Epogen, Procrit, and Recomon) and filgrastim (G-CSF or Neupogen) are sometimes used to treat AIDS-associated [anemia](#) and low white blood cell counts.

Medications are also used to prevent opportunistic infections (such as [Pneumocystis jiroveci pneumonia](#)) if the CD4 count is low enough. This keeps AIDS patients healthier for longer periods of time. Opportunistic infections are treated when they happen.

Support Groups

Joining support groups where members share common experiences and problems can often help the emotional stress of devastating illnesses. See [AIDS - support group](#).

Expectations (prognosis)

Right now, there is no cure for AIDS. It is always fatal without treatment. In the U.S., most patients survive many years after diagnosis because of the availability of HAART. HAART has dramatically increased the amount of time people with HIV remain alive.

Research on drug treatments and vaccine development continues. However, HIV medications are not always available in the developing world, where most of the epidemic is raging.

Complications

When a person is infected with HIV, the virus slowly begins to destroy that person's immune system. How fast this occurs differs in each individual. Treatment with HAART can help slow or halt the destruction of the immune system.

Once the immune system is severely damaged, that person has AIDS, and is now susceptible to infections and cancers that most healthy adults would not get. However, antiretroviral treatment can still be very effective, even at that stage of illness.

Calling your health care provider

Call for an appointment with your health care provider if you have any of the risk factors for HIV infection, or if you develop symptoms of AIDS. By law, the results of HIV testing must be kept confidential. Your health care provider will review results of your testing with you.

Prevention

1. See the article on [safe sex](#) to learn how to reduce the chance of catching or spreading HIV, and other sexually transmitted diseases.
2. Do not use illicit drugs and do not share needles or syringes. Many communities now have needle exchange programs, where you can get rid of used syringes and get new, sterile ones. These programs can also provide referrals for addiction treatment.
3. Avoid contact with another person's blood. You may need to wear protective clothing, masks, and goggles when caring for people who are injured.
4. Anyone who tests positive for HIV can pass the disease to others and should not donate blood, plasma, body organs, or sperm. Infected people should tell any sexual partner about their HIV-positive status. They should not exchange body fluids during sexual activity, and should use preventive measures (such as [condoms](#)) to reduce the rate of transmission.
5. HIV-positive women who wish to become pregnant should seek counseling about the risk to their unborn child, and methods to help prevent their baby from

Boyer v. Bellevue, No. 10-35574 archived on November 3, 2011

becoming infected. The use of certain medications dramatically reduces the chances that the baby will become infected during pregnancy.

6. The Public Health Service recommends that HIV-infected women in the United States avoid breast-feeding to prevent transmitting HIV to their infants through breast milk.
7. Safer sex practices, such as latex condoms, are highly effective in preventing HIV transmission. HOWEVER, there is a risk of acquiring the infection even with the use of condoms. Abstinence is the only sure way to prevent sexual transmission of HIV.

The riskiest sexual behavior is receiving unprotected anal intercourse. The least risky sexual behavior is receiving oral sex. There is some risk of HIV transmission when performing oral sex on a man, but this is less risky than unprotected vaginal intercourse. Female-to-male transmission of the virus is much less likely than male-to-female transmission. Performing oral sex on a woman who does not have her period has a low risk of transmission.

HIV-positive patients who are taking antiretroviral medications are less likely to transmit the virus. For example, pregnant women who are on effective treatment at the time of delivery, and who have undetectable viral loads, give HIV to their baby less than 1% of the time, compared with 13% to 40% of the time if medications are not used.

The U.S. blood supply is among the safest in the world. Nearly all people infected with HIV through blood transfusions received those transfusions before 1985, the year HIV testing began for all donated blood.

If you believe you have been exposed to HIV, seek medical attention IMMEDIATELY. There is some evidence that an immediate course of antiviral drugs can reduce the chances that you will be infected. This is called post-exposure prophylaxis (PEP), and it has been used to prevent transmission in health care workers injured by needles or syringes.

There is less information available about how effective PEP is for people exposed to HIV through sexual activity or injection drug use, but it appears to be effective. If you believe you have been exposed, discuss the possibility with a knowledgeable specialist (check local AIDS organizations for the latest information) as soon as possible. Anyone who has been sexually assaulted should consider the potential risks and benefits of PEP.

References

1. Del Rio C, Curran JW. Epidemiology and prevention of acquired immunodeficiency syndrome and human immunodeficiency virus infection. In: Mandell GL, Bennett JE, Dolin R, eds. *Principles and Practice of Infectious Diseases*. 7th ed. Philadelphia, Pa: Elsevier Churchill Livingstone; 2009:chap 118.
2. Piot P. Human immunodeficiency virus infection and acquired immunodeficiency syndrome: A global overview. In: Goldman L, Ausiello D, eds. *Cecil Medicine*. 23rd ed. Philadelphia, Pa: Saunders Elsevier; 2007:chap 407.
3. Sterling TR, Chaisson RE. General clinical manifestations of human immunodeficiency virus infection (including the acute retroviral syndrome and oral, cutaneous, renal, ocular, metabolic, and cardiac diseases). In: Mandell GL, Bennett JE, Dolin R, eds. *Principles and Practice of Infectious Diseases*. 7th ed. Philadelphia, Pa: Elsevier Churchill Livingstone; 2009:chap 121.

Review Date: 6/9/2011.

Reviewed by: David C. Dugdale, III, MD, Professor of Medicine, Division of General Medicine, Department of Medicine, University of Washington School of Medicine; and Jatin M. Vyas, MD, PhD, Assistant Professor in Medicine, Harvard Medical School, Assistant in Medicine, Division of Infectious Disease, Department of Medicine, Massachusetts General Hospital. Also reviewed by David Zieve, MD, MHA, Medical Director, A.D.A.M., Inc.

Boyer, Belongia, No. 10-35574, archived on November 3, 2011



A.D.A.M., Disclaimer

Copyright © 2011, A.D.A.M., Inc.

[PubMed Health Home](#) | [About PubMed Health](#) | [Copyright](#) | [Disclaimer](#) | [Contact Us](#)



National Center for Biotechnology Information, U.S. National Library of Medicine
8600 Rockville Pike, Bethesda MD, 20894 USA



In partnership with:



The Cochrane Collaboration

IQWiG



content supplied by
NHS choices

NHS
National Institute for
Health Research



OREGON
HEALTH & SCIENCE
UNIVERSITY

Veterans Health
Administration
R&D
www.research.va.gov



Boyer v. Belleque, No. 10-35574 archived on November 3, 2011