

What is AIDS? What causes AIDS?

AIDS stands for **A**cquired **I**mmune **D**eficiency **S**ndrome.

An HIV-positive person receives an AIDS diagnosis after developing one of the CDC-defined AIDS indicator illnesses. An HIV-positive person can also receive an AIDS diagnosis on the basis of certain blood tests (CD4 counts) and may not have experienced any serious illnesses. A positive HIV test does not mean that a person has AIDS. A diagnosis of AIDS is made by a physician according to the CDC AIDS Case Definition.

Over time, infection with HIV (Human Immunodeficiency Virus) can weaken the immune system to the point that the system has difficulty fighting off certain infections. These types of infections are known as opportunistic infections. Many of the infections that cause problems or that can be life-threatening for people with AIDS are usually controlled by a healthy immune system. The immune system of a person with AIDS has weakened to the point that medical intervention may be necessary to prevent or treat serious illness.

What is the Difference Between HIV and AIDS?

HIV is the virus that causes **AIDS**.

H - Human: because this virus can only infect human beings.

I - Immuno-deficiency: because the effect of the virus is to create a deficiency, a failure to work properly, within the body's immune system.

V - Virus: because this organism is a virus, which means one of its characteristics is that it is incapable of reproducing by itself. It reproduces by taking over the machinery of the human cell.

A - Acquired: because it's a condition one must acquire or get infected with; not something transmitted through the genes

I - Immune: because it affects the body's immune system, the part of the body which usually works to fight off germs such as bacteria and viruses

D - Deficiency: because it makes the immune system deficient (makes it not work properly)

S - Syndrome: because someone with AIDS may experience a wide range of different diseases and opportunistic infections.

How long does it take for HIV to cause AIDS?

Currently, the average time between HIV infection and the appearance of signs that could lead to an AIDS diagnosis is 8-11 years. This time varies greatly from person to person and can depend on many factors including a person's health status and behaviors. Today there are medical treatments that can slow down the rate at which HIV weakens the immune system. There are other treatments that can prevent or cure some of the illnesses associated with AIDS. As with other diseases, early detection offers more options for treatment and preventative health care.

Where did HIV come from?

The most recent presentation on the origin of HIV was presented at the 6th Conference on Retroviruses and Opportunistic Infections (Chicago, January 1999). At that conference, research was presented that suggested that HIV had "crossed over" into the human population from a particular species of chimpanzee, probably through blood contact that occurred during hunting and field dressing of the animals. The CDC states that the findings presented at this conference provide the strongest evidence to date that HIV-1 originated in non-human primates. The research findings were featured in the February 4, 1999 issue of the journal, Nature.

We know that the virus has existed in the United States, Haiti and Africa since at least 1977-1978. In 1979, rare types of pneumonia, cancer and other illnesses were being reported by doctors in Los Angeles and New York. The common thread was that these conditions were not usually found in persons with healthy immune systems.

In 1982 the Centers for Disease Control and Prevention (CDC) officially named the condition AIDS (Acquired Immune Deficiency Syndrome). In 1984 the virus responsible for weakening the immune system was identified as HIV (Human Immunodeficiency Virus).

How many people have HIV and AIDS?

Statistics for the end of 2006 indicate that around 39.5 million people are living with HIV (Worldwide), the virus that causes AIDS. Each year around 3.8 million more people become infected with HIV and despite recent improvements in access to antiretroviral treatment, 4.3 million die of AIDS.

Although HIV and AIDS are found in all parts of the world, some areas are more afflicted than others. The worst affected region is sub-Saharan Africa, where in a few countries more than one in five adults is infected with HIV. The epidemic is spreading most rapidly in Eastern Europe and Central Asia, where the rate of new infections increased by 70% between 2004 and 2006.

In North America, approximately 1.4 million people are living with HIV/AIDS and in 2006, 18,000 people died of an AIDS related illness. The diagram to the right illustrates the percentage of people living with HIV/AIDS in the U.S. according to race/ethnicity. It is interesting to note that, *half of all new HIV/AIDS infections are among Black Americans*, though blacks only represent 13% of the population.

How is HIV Transmitted?

HIV can be transmitted from an infected person to another through:

- Blood (including menstrual blood)
- Semen
- Vaginal secretions
- Breast milk

Blood contains the highest concentration of the virus, followed by semen, followed by vaginal fluids, followed by breast milk.

*** Activities That Allow HIV Transmission**

- Unprotected sexual contact
- Direct blood contact, including injection drug needles, blood transfusions, accidents in health care settings or certain blood products
- Mother to baby (before or during birth, or through breast milk)

Sexual intercourse (vaginal and anal): In the genitals and the rectum, HIV may infect the mucous membranes directly or enter through cuts and sores caused during intercourse (many of which would be unnoticed). *Vaginal and anal intercourse is a high-risk practice.*

Oral sex (mouth-penis, mouth-vagina): The mouth is an inhospitable environment for HIV (in semen, vaginal fluid or blood), meaning the risk of HIV transmission through the throat, gums, and oral membranes is lower than through vaginal or anal membranes. There are however, documented cases where HIV was transmitted orally, so we can't say that getting HIV-infected semen, vaginal fluid or blood in the mouth is without risk. *However, oral sex is considered a low risk practice.*

Sharing injection needles: An injection needle can pass blood directly from one person's bloodstream to another. It is a very efficient way to transmit a blood-borne virus. *Sharing needles is considered a high-risk practice.*

Mother to Child: It is possible for an HIV-infected mother to pass the virus directly before or during birth, or through breast milk. Breast milk contains HIV, and while small amounts of breast milk do not pose significant threat of infection to adults, it is a viable means of transmission to infants.

The following "bodily fluids" are NOT infectious:

- Saliva
- Tears
- Sweat
- Feces

DEMENTIA and NERVOUS SYSTEM PROBLEMS

WHAT ARE NERVOUS SYSTEM PROBLEMS?

The nervous system has two parts. The brain and spinal cord are the central nervous system (CNS). The nerves and muscles are the peripheral nervous system. Peripheral means around the outside.

People with HIV disease can have several nerve problems. A common problem is [peripheral neuropathy](#). This causes nerve and muscle pain, especially in the feet, legs, and hands. CNS problems include depression and problems with sleeping, balance, walking, thinking and memory.

At first, these were all called "AIDS Dementia Complex". However, there is a wide range of AIDS-related nerve troubles. AIDS Dementia means ongoing major problems with thinking, memory, and usually also with controlling the legs and arms.

Before combination antiviral therapy was available, about 20% of people with AIDS developed dementia. Strong antiviral medications have cut the rate of dementia by about 2/3. However, milder cases of dementia are increasing as people with HIV live longer.

Infection with hepatitis C and dependence on methamphetamines increase the risk of mental problems in people with HIV.

HOW ARE NEUROLOGIC PROBLEMS DIAGNOSED?

It can be difficult to know what's causing neurologic problems. They can be caused by vitamin deficiencies (opportunistic infections), or by antiviral medications. Others are caused when HIV infects the brain or spinal cord.

Most mental problems don't show up until the late stages of HIV disease. If someone with a high [T-cell count](#) develops a neurologic problem, their doctor will look for other causes. These might include depression or the aging process. However, HIV infection can affect verbal memory, even in patients with no other symptoms of HIV disease. One study also found brain damage in people with HIV. This was true even when their viral load was controlled to undetectable levels.

Signs of neurologic problems include:

- Balance problems
- Vision problems
- Difficulty remembering
- Difficulty concentrating or completing a task
- Getting lost in places that you know
- Forgetting telephone numbers that you use a lot
- Having trouble with simple math like making change at the store

HOW ARE NERVE PROBLEMS TREATED?

CNS problems can be caused by medications, swelling, or direct HIV infection of the brain and spinal cord.

If the problems are caused by medications, they usually go away if you stop taking the drugs.

Problems caused by swelling, which include toxoplasmosis, can be treated with antibiotics.

- HIV infection of the CNS has to be treated with antiviral drugs. Unfortunately, the "blood brain barrier" keeps many drugs out of the central nervous system. It's a tight network of blood vessels that protects the brain and spinal cord from most germs or poisons in your blood.

A special concern is that people with CNS problems may need extra help remembering to take their medications.

THE BOTTOM LINE

HIV disease can cause a range of nervous system problems, from forgetfulness and balance problems to serious dementia. These problems usually don't show up until the later stages of HIV disease. However, problems with verbal memory can show up even in people with no other symptoms.

The new combination therapies that fight HIV seem to help protect the central nervous system against damage from the virus.

Caring for someone with dementia is very difficult. Caregivers need to take care of themselves, too, to avoid burnout and depression.

IS THERE A CURE FOR AIDS?

There is no cure for AIDS. There are drugs that can slow down the HIV virus, and slow down the damage to your immune system. There is no way to "clear" the HIV out of your body.

OPPORTUNISTIC INFECTIONS (OIs)

WHAT ARE OPPORTUNISTIC INFECTIONS?

In our bodies, we carry many germs - bacteria, protozoa, fungi, and viruses. When our immune system is working, it controls these germs. But when the immune system is weakened by HIV disease or by some medications, these germs can get out of control and cause health problems.

Infections that take advantage of weakness in the immune defenses are called "opportunistic". The phrase "opportunistic infection" is often shortened to "OI".

OIs AND AIDS

People who aren't HIV-infected can develop OIs if their immune systems are damaged. For example, many drugs used to treat cancer suppress the immune system. Some people who get cancer treatments can develop OIs.

HIV weakens the immune system so that opportunistic infections can develop. If you are HIV-infected and develop opportunistic infections, you might have AIDS.

In the US, the Center for Disease Control (CDC) is responsible for deciding who has AIDS. The CDC has developed a list of about 24 opportunistic infections. If you have HIV and one or more of these "official" OIs, then you have AIDS. The list is available at <http://www.aidsmeds.com/lessons/StartHere8.htm>.

WHAT ARE THE MOST COMMON OIs?

In the early years of the AIDS epidemic, OIs caused a lot of sickness and deaths. Once people started taking strong antiretroviral therapy (ART), however, a lot fewer people got OIs. It's not clear how many people with HIV will get a specific OI.

In women, health problems in the vaginal area may be early signs of HIV. These can include pelvic inflammatory disease and bacterial vaginosis, among others.

The most common OIs are listed here, along with the disease they usually cause, and the CD4 cell count when the disease becomes active:

- [Candidiasis \(Thrush\)](#) is a fungal infection of the mouth, throat, or vagina. CD4 cell range: can occur even with fairly high CD4 cells.
- [Cytomegalovirus \(CMV\)](#) is a viral infection that causes eye disease that can lead to blindness. CD4 cell range: under 50.
- Herpes simplex viruses can cause oral herpes (cold sores) or genital herpes. These are fairly common infections, but if you have HIV, the outbreaks can

be much more frequent and more severe. They can occur at any CD4 cell count.

- **Malaria** is common in the developing world. It is more common and more severe in people with HIV infection.
- [Mycobacterium avium complex \(MAC or MAI\)](#) is a bacterial infection that can cause recurring fevers, general sick feelings, problems with digestion, and serious weight loss. CD4 cell range: under 75.
- [Pneumocystis pneumonia \(PCP\)](#) is a fungal infection that can cause a fatal pneumonia. CD4 cell range: under 200. Unfortunately this is still a fairly common OI in people who have not been tested or treated for HIV.
- [Toxoplasmosis \(Toxo\)](#) is a protozoal infection of the brain. T-cell range: under 100.
- [Tuberculosis \(TB\)](#) is a bacterial infection that attacks the lungs, and can cause meningitis. CD4 cell range: Everyone with HIV who tests positive for exposure to TB should be treated.