

Definition of HIV and AIDS

Definition

HIV stands for: **H**uman **I**mmunodeficiency **V**irus

The Human Immunodeficiency Virus (HIV) attacks the immune system, causing deficiency or damage in the immune system. HIV damages the body's ability to fight diseases and infections. HIV infection leads to Acquired Immunodeficiency Syndrome (AIDS).

Without a healthy, functioning immune system, a person may become vulnerable to infections by bacteria, other viruses and disease-causing organisms. These infections may cause life-threatening illnesses.

Definition of AIDS

AIDS stands for: **A**cquired **I**mmuno**D**eficiency (sometimes Immune Deficiency) **S**ndrome.

ACQUIRED: This disease is not hereditary. It is not passed casually from one person to another. HIV must enter the bloodstream in order to infect someone.

IMMUNODEFICIENCY: The immune system is the body's defense against infection and disease. When the immune system becomes damaged in its ability to fight off infectious diseases, it is called 'deficient'. Over time, a person with a deficient immune system may become vulnerable to infections by disease-causing organisms such as bacteria or viruses. These infections may cause life-threatening illnesses.

SYNDROME: HIV infection causes a combination of symptoms, diseases and infections. This condition is known as a syndrome.

AIDS is a complex condition caused by the human immunodeficiency virus (HIV), which kills or impairs cells of the immune system and progressively destroys the body's ability to fight infection and disease. People with damaged immune systems are vulnerable to diseases that do not threaten people with healthy immune systems.

The term AIDS applies to the most advanced stages of an HIV infection. Medical treatment can delay the onset of AIDS.

Diagnosis

The diagnosis of AIDS requires a positive HIV antibody test or evidence of HIV infection and the appearance of some very specific

Diagnosis

conditions/diseases. Only a licensed medical provider can make an AIDS diagnosis. HIV infection is not necessarily the same thing as AIDS. All people diagnosed with AIDS have HIV, but not all people with HIV have reached an AIDS diagnosis.

How HIV Works in the Body

T-Helper lymphocyte

HIV enters the bloodstream and seeks out "T-Helper lymphocyte", white blood cells (lymphocytes) essential to the functioning of the immune system. One of the functions of these cells is to regulate the immune response in the event of attack from disease-causing organisms such as bacteria or viruses. When the virus infects the T-Helper Lymphocyte, the cell sends signals to other cells which produce antibodies. This T-Helper lymphocyte cell may also be called the T4 or the CD4 cell.

HIV antibodies

Antibodies are produced by the immune system to help get rid of specific foreign invaders that can cause disease. Producing antibodies is an essential function of our immune systems. The body makes a specific antibody for each disease. For example, if we are exposed to measles virus, the immune system will develop antibodies specifically designed to attack the measles virus. Polio antibodies fight polio virus. When our immune system is working correctly, it protects against these foreign invaders.

HIV infects and destroys the T-Helper Lymphocytes and damages their ability to signal for antibody production. This results in the eventual decline of the immune system.

Primary or Acute HIV Infection

Primary/acute HIV infection is the first stage of HIV disease, typically lasting only a week or two, when the virus first establishes itself in the body. Some researchers use the term acute HIV infection to describe the period of time between when a person is first infected with HIV and when antibodies (proteins made by the immune system in response to infection) against the virus are produced by the body (usually 6 to 12 weeks) and can be detected by an HIV test.

"Window period"

This is the period of time between when the body first becomes infected with HIV and when the body is able to produce

"Window period"

antibodies to HIV. It may take between two weeks to three months for antibodies to develop. Most people develop antibodies by 6-12 weeks. During this time, the person is "infectious," meaning s/he can pass the virus to someone else, and will remain infectious throughout life.

The window period is the time when a person may not produce sufficient antibodies to be detectable on an HIV antibody test. This means they might get a negative result on an antibody test, while actually having HIV. This is why a newly infected person can infect a partner before antibodies develop, when high amounts of virus in the blood are present, and the newly infected person does not yet know they have HIV.

Asymptomatic Stage

After the acute stage of HIV infection, people infected with HIV continue to look and feel completely well for long periods, usually for many years. During this time, the virus is replicating and slowly destroying T4 cells and the immune system.

This means that although you look and feel healthy, you can infect other people through unprotected anal, vaginal or oral sex or through needle sharing--especially if you have not been tested and do not know that you are infected. The virus can also be passed from an infected woman to her baby during pregnancy, the birth, or through breast-feeding. Without antiretroviral therapy, there is an average of ten years between the time a person is infected with HIV and the start of persistent symptoms of "AIDS."

The Origin of HIV

Where did HIV originate?

Since HIV was discovered in 1983, researchers have worked to pinpoint the origin of the virus. In 1999, an international team of researchers reported that they discovered the origins of HIV-1, the predominant strain of HIV in the developed world. A subspecies of chimpanzees native to west equatorial Africa was identified as the original source of the virus. The researchers believe that HIV-1 was introduced into the human population when hunters became exposed to infected blood. HIV transmission is driven by changes in migration, housing, travel, sexual practices, drug use, war, and economics that affect both Africa and the entire world.

HIV strains and subtypes

HIV has divided into two primary strains: HIV-1 and HIV-2. Worldwide, the predominant virus is HIV-1, and generally when people refer to HIV without specifying the type of virus they are referring to HIV-1. The relatively uncommon HIV-2 type is concentrated in West Africa and is rarely found elsewhere.

HIV is a highly variable virus which mutates very readily. This means there are many different strains of HIV, even within the body of a single infected person. Based on genetic similarities, the numerous virus strains may be classified into types, groups and subtypes.

Both HIV-1 and HIV-2 have several subtypes. It is virtually certain that more undiscovered subtypes are in existence now. It is also probable that more HIV subtypes will evolve in the future. As of 2001, blood testing in the United States can detect both strains and all known subtypes of HIV.

Epidemiology of HIV and AIDS

Epidemiology is defined as "the study of how disease is distributed in populations and of the factors that influence or determine this distribution." Epidemiologists try to discover why a disease develops in some people and not in others.

AIDS cases first recognized

AIDS was first recognized in the United States in 1981. In Washington State, the first reported case of AIDS was in 1982. Since then, the number of AIDS cases has continued to increase both in the U.S. and other countries. In 1983, HIV was discovered to be the cause of AIDS.

HIV infection knows no boundaries

People who are infected with HIV come from all races, countries, sexual orientations, genders, and income levels.

Most HIV-infected people do not know their status

Globally, most of the people who are infected with HIV have not been tested, and are unaware that they are living with the virus. The U.S. Centers for Disease Control and Prevention (CDC) estimates that a quarter of people with HIV are unaware that they are living with the virus.

HIV & AIDS cases

The number of HIV-infected people worldwide has grown dramatically. HIV cases only became reportable to the

HIV & AIDS cases continued

Department of Health in the fall of 1999. AIDS cases have been reportable since 1984. Contact the State AIDS Hotline at 1-800-272-2437 for updated information on reported HIV and AIDS cases in Washington.

The CDC estimates that there are between 1,039,000 to 1,185,000 persons infected with HIV in the United States. Additionally, it is estimated that 40,000 persons in the United States become newly infected with HIV each year.

In the U.S., there are estimated to be over 17,000 people with AIDS who are dying each year in the U.S. As therapies have improved, fewer people have died of AIDS each year. However, the treatments have not reduced the number of new infections.

The United Nations AIDS Program estimates there were 38.6 million people in the world living with HIV or AIDS in 2005. An estimated 4.1 million people worldwide became infected with HIV in 2005. Half of these new infections were in people between the ages of 15-24. There were 3 million deaths worldwide from AIDS in 2000.

For current HIV and AIDS statistics, visit these websites:

<http://www.doh.wa.gov/cfh/hiv.htm> (go to Prevention & Education)

<http://hivinsite.ucsf.edu/>

<http://www.cdc.gov/>

http://www.unaids.org/en/HIV_data/2006GlobalReport

Internet access can be obtained through local libraries. If you are unable to access the internet, contact the Washington State HIV/AIDS hotline at 1-800-272-2437.

Decrease in AIDS deaths in wealthier countries

The discovery of antiviral "combination" drug therapies in 1996 resulted in a dramatic decrease in the number of deaths due to AIDS (among persons taking the drug therapies). Many people who have access to the drug therapies may not benefit from them, or may not be able to tolerate the side effects. The medications are expensive and require strict dosing schedules. In developing countries, due to lack of access to health care systems and cost, many people with HIV have no access to the newer drug therapies.

**HIV and AIDS cases
are reportable**

As previously mentioned, AIDS and symptomatic HIV infections have been reportable (meaning physicians must confidentially report any cases among their patients) to the Washington State Dept. of Health since 1984 and 1993, respectively. Please see the legal section of this curriculum starting on page 72 for more information. HIV cases have been reportable in many states for several years. Reporting of new HIV diagnoses has been required in Washington State since September, 1999.