HIV/AIDS Overview for Health Care

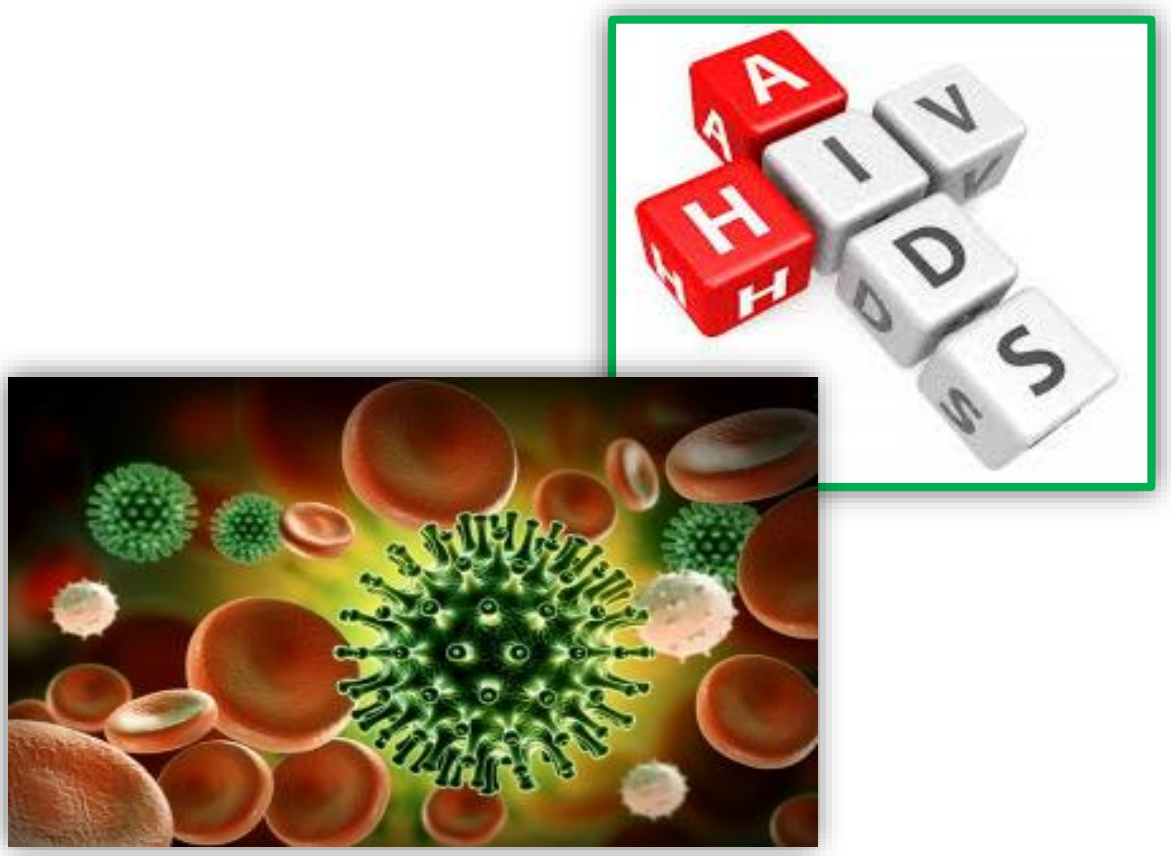
Developed by Clinical Learning Baptist Health South Florida

Description

This 1-hour course informs health care professionals about Human Immunodeficiency Virus (HIV) infection and end stage Acquired Immunodeficiency Syndrome (AIDS). This course outlines HIV/AIDS transmission, treatment, and care as well as the rights and resources afforded patients residing in Florida. This course meets the license initial renewal requirements for the Board of Nursing.

Objectives

1. Describe the modes of transmission and various strategies to prevent the spread of HIV.
2. Review the pathophysiology and progression of HIV as an infection, including signs and symptoms.
3. Identify the civil rights and social issues relevant to the HIV/AIDS patient and their family/friends.
4. Summarize the medication and testing protocols prescribed for the HIV infected patient.



Introduction

Since surfacing in 1980, Human Immunodeficiency Virus (HIV) has evolved from an acute and fatal illness to a chronic and often debilitating condition. The infection known as HIV has brought devastation and debilitation to individuals and nations since its world debut in the 1980s. HIV is a fatal infection whose final terminal stage is referred to as Acquired Immunodeficiency Syndrome (AIDS). Individuals, countries and cultures, particularly in central and southern Africa, have suffered tremendously due to the devastation that accompanies HIV, rightly referred to as the "Scourge of Our Time". In the past few years, new treatments have been developed which have extended by decades the lifespan of those infected, effectively shifting HIV from an acute terminal illness to a chronic debilitating condition requiring a different perspective on care and monitoring. As healthcare professionals, it is imperative that we keep current on new information regarding HIV as it is continuously being discovered. Information concerning the spread (i.e., modes of transmission), treatment and care of the HIV infected individual, as well as those individuals who progress into the final stage of AIDS is crucial as we strive to help those infected live healthier more satisfying lives.

HIV/AIDS IN FLORIDA

According to Mario Stevenson, Ph.D., Professor, University of Miami Health System; Chief, Division of Infectious Diseases; Director, Institute of AIDS and Emerging Infectious Diseases, "Miami is the epicenter of the epicenter of HIV/AIDS in the United States". Beginning in 2016, the Center for Disease Control (CDC) reports that the rate of new infections in Miami was the highest new infection rate per capita of any U.S. city: 47 per 100,000 people. That's more than twice as many as San Francisco, New York City, or Los Angeles.

HIV spreads across our Sunshine State mainly because of our tremendous influx of tourists and immigrants from countries where HIV is prevalent, such as Latin America or the Caribbean. Besides our amusement parks, water activities, and other attractions, Florida is known for the party atmosphere of Miami, Key West, Ft. Lauderdale, and other beach towns. This has resulted in almost half of the million people living in the United States with HIV to live here in Florida.

http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/index.html

The Florida Department of Health reports the number of persons diagnosed and living with HIV in Florida in 2018 as 119,661. Modeling estimates however attribute an additional 15% of infected persons to that number because of those who do not know their HIV status. That means that as of 2018, the state contains an estimated 137,610 HIV-infected people. Florida's high transmission rate for new infections come from people who don't know they have HIV and infect others. Encouraging individuals to get tested is an important strategy for reducing the spread.

There are many reasons why individuals are reluctant to seek HIV testing, despite the availability of treatment. They include fears about:

- Being ostracized if infected
- Homophobic attitudes
- Employment discrimination
- Healthcare disparities
- Religious intolerance
- Shame regarding sexual orientation

HIV/AIDS Patient Rights

Becoming diagnosed with HIV can invoke a sense of fear, dread and sometimes embarrassment. This insecurity is understandable given the history related to HIV/AIDS in the United States and globally. HIV infection is not the deadly disorder it once was decades ago, but it remains a serious infectious disease. Having HIV can generate fear of repercussions from having an unwanted health status. Patients newly diagnosed with HIV are often unaware that federal laws exist to protect them from discrimination and ensure that they can apply for social and medical benefits.

As healthcare professionals, it is vital to share with those in high-risk groups that legislation offers protection from discrimination. It is important for patients to know what their individual rights are in order to get the best care for themselves. We, as healthcare professionals, can help increase patient participation in his/her own care by educating them to:

- □ Keep informed of changes in HIV treatment and care
- □ Use measures to protect others and stop HIV transmission
- □ Avoid high-risk behaviors for self and others
- □ Have routine partner screening for HIV infection, if necessary
- □ Actively participate in their treatment

People living with HIV or AIDS are protected against discrimination because of HIV status under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 (ADA). Title II of the ADA forbids discrimination by state and local government organizations, even for those not receiving federal funding. For those afraid of how those close to them might be treated should they acquire HIV, Title II of the ADA also protects an HIV positive individual's friends and family against discrimination or denial of services that might come from being related to someone with HIV.

Information privacy regarding an individual's HIV status is guaranteed by the 1996 Health Insurance Portability and Accountability Act (HIPAA), whose Privacy Rule is enforced by the Office for Civil Rights (OCR). HIPAA protects the privacy of health information while allowing each individual access to their records so that they can see what is written about them and even ask to make corrections to what is documented.

If you are living with HIV or AIDS, you are protected against discrimination because of your HIV under **Section 504** of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 (**ADA**). Under these laws, discrimination means that you are not allowed to participate in a service that is offered to others, or you are denied a benefit, because of your HIV disease.

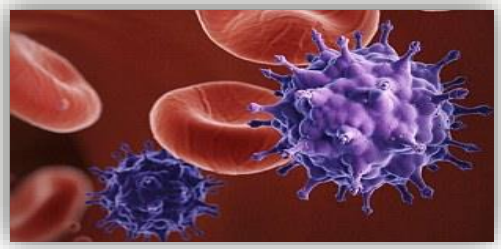
https://www.hiv.gov/hiv-basics/living-well-with-hiv/your-legal-rights/civil-rights

Keeping HIV under control imposes a burden requiring much time and resources. Each newly diagnosed patient is faced with the sudden overwhelming burden that comes with managing the chronic and ultimately terminal condition of HIV/AIDS. Florida resources available to eligible patients include:

- The AIDS Drug Assistance Program (ADAP), providing medication assistance
- Ryan White Part B, providing health care assistance
- The Housing Opportunities for Persons With AIDS (HOPWA) program, providing housing assistance

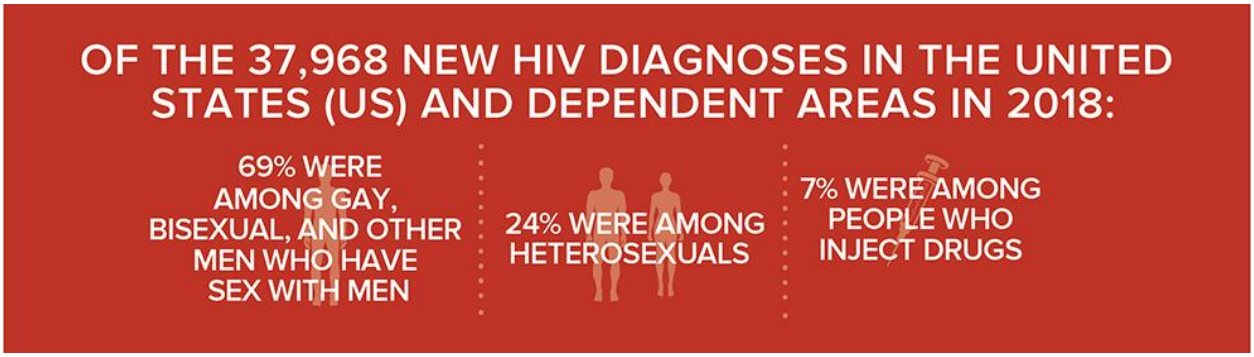
The Florida Ryan White Part B Program provides services though Lead Agencies to eligible clients residing in Florida. Services are fully funded through the Ryan White HIV/AIDS Treatment Extension Act of 2009, administered by the Health Resources Services Administration (HRSA), HIV/AIDS Bureau (HAB). For people diagnosed or living with HIV/AIDS and do not have enough health care coverage or financial resources for coping with the disease, Ryan White helps fill gaps in care.

Ryan Wayne White was an American teenager from Kokomo, Indiana, who became a national poster child for HIV/AIDS in the United States after failing to be re-admitted to school following a diagnosis of AIDS. As a hemophiliac, he became infected with HIV from a contaminated factor VIII blood treatment and, when diagnosed in December 1984, was given six months to live. Doctors said he posed no risk to other students, as AIDS is not an airborne disease and spreads solely through body fluids, but AIDS was poorly understood by the general public at the time. When White tried to return to school, many parents and teachers in Howard County rallied against his attendance due to concerns of the disease spreading through bodily fluid transfer. A lengthy administrative appeal process ensued, and news of the conflict turned Ryan into a popular celebrity and advocate for AIDS research and public education. Surprising his doctors, Ryan White lived five years longer than predicted. He died on April 8, 1990, one month before his high school graduation.

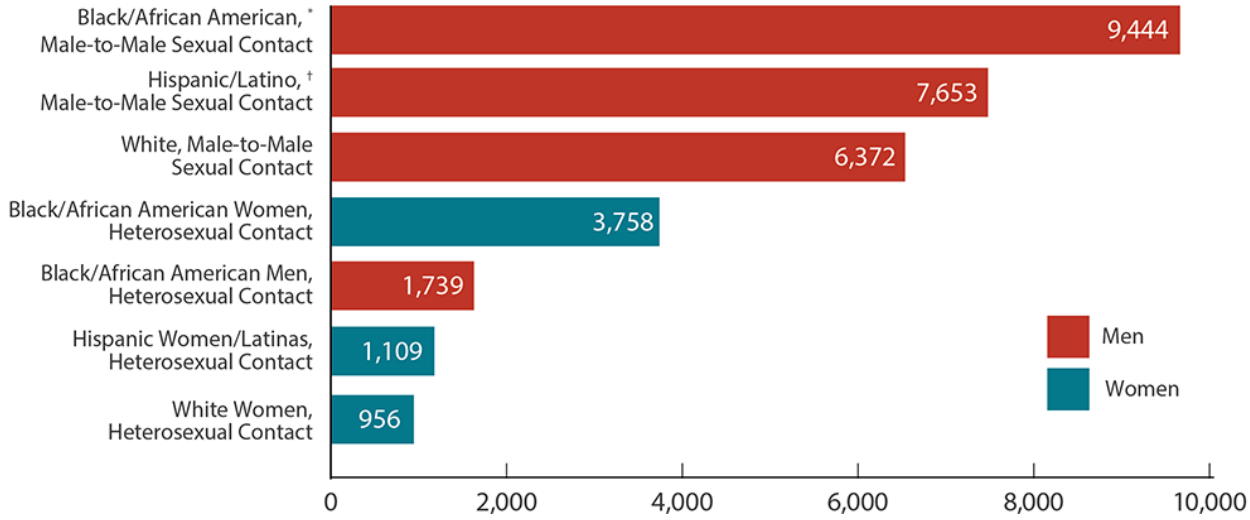


← ***HIV Overwhelming Immune Cells***

In 2018, 37,968 people received an HIV diagnosis in the United States (US) and dependent areas. From 2014 to 2018, HIV diagnoses decreased 7% among adults and adolescents, while annual diagnoses have increased among some groups.



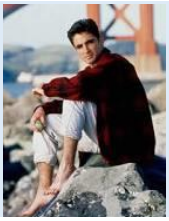
New HIV Diagnoses in the US and Dependent Areas for the Most-Affected Subpopulations, 2018



* *Black* refers to people having origins in any of the black racial groups of Africa. *African American* is a term often used for Americans of African descent with ancestry in North America.
† Hispanics/Latinos can be of any race.
Subpopulations representing 2% or less of all people who received an HIV diagnosis in 2018 are not represented in this chart.

Source: CDC. Diagnoses of HIV infection in the United States and dependent areas, 2018 (updated). *HIV Surveillance Report* 2020;31.

Gay, bisexual and other men who have sex with men (MSM) of all races and ethnicities, particularly young to middle-aged Black/African American MSM, remain the population most profoundly affected.



Pedro Zamora was a Cuban-American AIDS educator and television personality. As one of the first openly gay men with AIDS to be portrayed in popular media, Zamora brought international attention to HIV/AIDS and LGBTQ issues and prejudices through his appearance on MTV's reality television series.

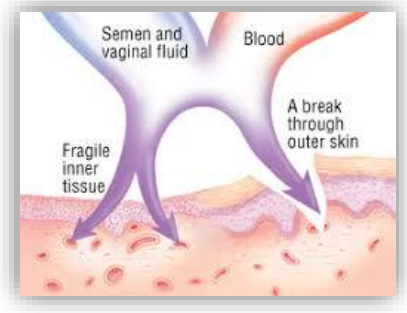
Transmission and Prevention

The prevention of HIV infection is directly related to the route of transmission. The HIV viral particle, once having attacked the body, is tough and resilient and impossible for the body's immune defenses to extinguish. Outside the body, however, HIV is delicate and does not survive for long. Misleading rumors about ease of viral spread have led the CDC to provide a list of ways HIV **cannot** be spread:

- HIV cannot be spread in air or water.
- HIV cannot be spread by insects, including bed bugs, ticks or mosquitoes.
- HIV cannot be spread in saliva, sweat or tears and no documented case exists of HIV being transmitted by spitting.
- HIV cannot be spread by casual contact, such as sharing dishes or shaking hands.
- HIV cannot be spread by closed mouth or social kissing.
- HIV cannot be spread from toilet seats.

Sexual Transmission

HIV infection, both worldwide and in the United States, is most often spread through anal or vaginal sexual activities. Male to male sexual contact, "men who have sex with men" (MSM), have 28 times the rate of infection than steadfast heterosexuals. The second most common mode of transmission is sharing needles and blood exposure as a result of drug addiction.



The transmission of HIV is significantly affected by the type of sexual exposure. Here are some of the facts:

- Receptive anal intercourse has a much greater risk of viral transmission as compared to receptive vaginal intercourse.
- The use of condoms does not always prevent transmission for several reasons. Condoms can have holes or develop tears or not fit correctly. Yet condom use does lower the chance of transmission as compared to intercourse without protection.
- The presence of other sexually transmitted diseases, such as the ulcerations of genital herpes, can increase the risk of transmission as much as four times.
- Circumcision has been shown to decrease the chance of HIV acquisition by the circumcised male, as well as decreasing the probability of transmitting HIV from the one circumcised to their partner.

HIV Blood Transmission

HIV particles can be introduced into a person's blood by sharing contaminated needles, blood-sharing rituals, and potentially improperly cleaned or sterilized surgical or cosmetic instruments. Ear piercing, tattooing, and even manicure instruments must be meticulously cleaned and disinfected between clients to avoid transmission of HIV and other bloodborne pathogens.

Pre-Exposure Prophylaxis (PrEP)

Pre-exposure prophylaxis (PrEP) medication is a way for individuals who do not have HIV, but who are at substantial risk of contracting it. One PrEP currently being prescribed is the combination TDF-FTC (tenofovir disoproxil fumarate- emtricitabine), sold under the brand name Truvada. When an individual is exposed to HIV through sexual intercourse, these medicines can help to keep the virus from starting a permanent infection. It must be taken consistently, and is only for individuals who are at real ongoing risk of HIV infection, such as:

- □ Anyone who is in an ongoing relationship with an HIV-positive partner
- □ Anyone who is not in a mutually monogamous relationship who recently tested HIV-negative
- □ A gay or bisexual man who has had anal sex without a condom or been diagnosed with an STD in the past 6 months
- □ A heterosexual man or woman who does not regularly use condoms during sex with partners of unknown HIV status and are at substantial risk of HIV infection.

Post-Exposure Prophylaxis (PEP)

For individuals who need to prevent HIV after a single high-risk event of HIV exposure such as rape, unprotected sex, needle-sharing during drug use, or a health care *accidental needlestick injury*, there is post-exposure prophylaxis (PEP) medications. Antiretroviral medications as taken soon as possible, but no more than 72 hours (3 days) after exposure to HIV to try to reduce the chance of becoming HIV positive. It takes about three days for HIV to make copies of itself once it enters the body and for it to spread throughout the body. When HIV is only in a few cells where it entered the body, it can sometimes be halted by PEP, but when it is in many cells in many places of the body, PEP will not work.

Center for Disease Control Recommendations

Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5011a1.htm

Recommendations for HIV PEP include a basic 4-week regimen of two drugs (zidovudine [ZDV] and lamivudine [3TC]; 3TC and stavudine [d4T]; or didanosine [ddI] and d4T) for most HIV exposures (accessed 07-05-20)

Emergency Sharps Information Workers Please Note
If you experienced a needle-stick or sharps injury or were exposed to the blood or other body fluid of a patient during the course of your work, **immediately follow these steps**:

- Wash needlesticks and cuts with soap and water
- Flush splashes to the nose, mouth, or skin with water
- Irrigate eyes with clean water, saline, or sterile irrigants
- Report the incident to your supervisor
- Immediately seek medical treatment for Post-Exposure Prophylaxis (PEP) if indicated

HIV Viral Characteristics

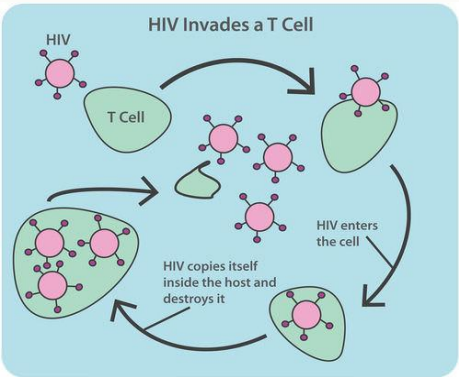
The Human Immunodeficiency Virus belongs to a viral family known as *retro*viruses. These viruses are known as retro, or backward, due to an ability to copy their genetic code from RNA into the DNA of a host cell (as opposed to the more common DNA to RNA method of transcription). Like other viruses, HIV cannot reproduce or grow independently. HIV requires a living human host in order to replicate, which ultimately destroys the host cells hijacked to be production factories. For most viruses, human bodies respond by quickly destroying the invader virus by means of the immune system. Unfortunately, it is the immune system itself that the HIV infection invades and replicates in. This creates a process where the source of protection against viruses become cellular assassins destroying the body's defenses and releasing masses of new viral particles.

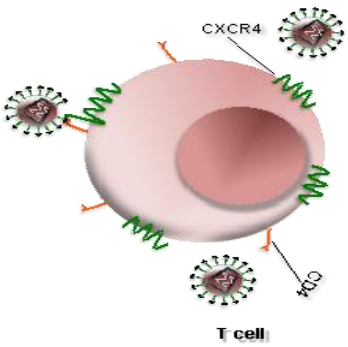
HIV viral particles like to attack our CD4 T-cells, macrophages and dendritic cells. The virus finds one of these cells and locks onto it, quickly spewing its core to the inside of the doomed host allowing viral RNA to begin the process of copying into the host cell's DNA using an enzyme called reverse transcriptase. The newly rewritten DNA integrates into the human genome of the body's cell. HIV may remain a quiet passenger in the genome of its human host cell for months, or it may immediately force the captive human genome into making more copies of viral particles. It then becomes a mass producer of new viruses ready to continue the spread and take over more of the infected human body.

Even if HIV is not actively making new virus particles, its genetic information is being copied every time infected cells replicate. This is one of the reasons why it is so difficult to get rid of an HIV infection - the virus can hide in these so-called reservoirs when the environment is not good for making new viruses. Once the environment has improved, it can re-activate and make more viruses again.

RNA = ribonucleic acid, a nucleic acid present in all living cells. Its principal role is to act as a messenger carrying instructions from DNA for controlling the synthesis of proteins, although in some viruses' RNA rather than DNA carries the genetic information.

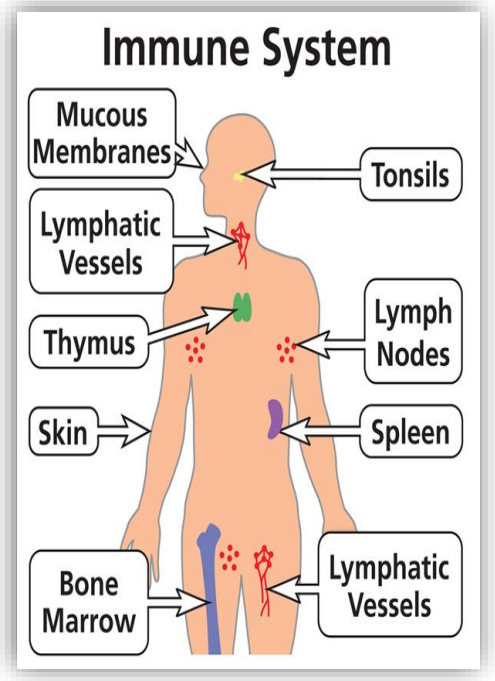
DNA = deoxyribonucleic acid, a self-replicating material which is present in nearly all living organisms as the main constituent of chromosomes. It is the carrier of genetic information.





HIV Virus Spreading through System

HIV is a prolific replicator, able to create trillions of copies of itself quickly. In fact, during times when the virus is actively reproducing, a single milliliter of blood can have a million copies of the virus. As characteristic of all viruses, a small percentage of these trillions of copies will vary slightly from the original, thus making them resistant to medications that would have effectively treated the original virus.



There are two varieties of the HIV virus: type 1 (HIV-1) and type 2 (HIV-2). HIV-1 is more virulent, and the main cause of infection globally. When HIV is referred to without designation type, it usually is HIV-1. HIV-2 shows up predominantly in West Africa, is far less common, and is less easily transmitted. Both types of HIV have AIDS as their end stage, and both are transmitted through blood, sexual contact and body fluids. Testing is available to detect both HIV-1 and HIV-2. Be alert, as HIV changes and mutates readily, a single infected individual may have several different strains of HIV inside their body. We can expect more significant and documented subtypes of HIV in the future.

Three Stages of HIV Infection

There is no cure for HIV infection. The Centers for Disease Control outlines HIV infection in three distinct stages: HIV Primary or Acute infection, HIV Chronic or Asymptomatic infection, and HIV as AIDS, or Acquired Immune.

HIV Primary or Acute Infection

The earliest stage of HIV infection is the primary or acute stage. Acute HIV infection generally develops around two to four weeks after an individual has been infected by a significant amount of the virus, known as the viral load. Many newly infected individuals report having symptoms such as generalized aches, headache, fever and perhaps even a rash. During this stage, the virus begins invading CD4 Helper-T cells, destroying them in the process of replicating.

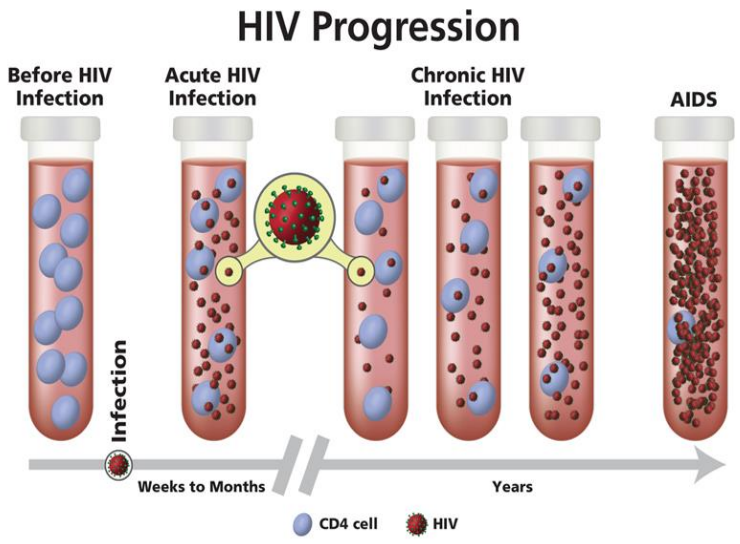
After a person contracts HIV, their immune system begins to develop HIV antibodies. Seroconversion is the period during which these antibodies first become detectable by testing. These few weeks or months are called the “window” of acute HIV infection. During this window of time a person who has been infected will not register as positive with the HIV screening tests available in 2020. Newly infected persons have enough of the virus to infect others through high risk sexual activities and sharing contaminated needles. The window can be as little as two weeks or long as six months, making lifestyle screening an important tool during HIV pre-test counseling sessions.

Around 70% of those with acute HIV infection develop noticeable symptoms during the acute stage of infection. Seroconversion illness has a flu-like symptoms with fever and swollen lymph glands in neck, armpits, or groin. Fatigue, sore throat, and rash, as well as headache, diarrhea, and/or ulcerations of the esophagus are also common.

Due to the high viral count during the initial infection, the acute stage of HIV infection holds the greatest risk of disease transmission to others, although HIV can be transmitted during any of its stages.

Our human immune system is able to mount a major defense against even a massive invasion of new viral particles. The immune response rallies and fights to bring the viral load down to a stable level.

The Second Stage: Chronic HIV or Asymptomatic Infection



During this stage, the infected person usually looks and feels healthy. After the initial flu-like symptoms and the swift surge of viral levels in the acute stage of HIV infection, comes a chronic or latency stage. The length of this asymptomatic stage differs from person to person and may last ten years. During this chronic stage HIV is still active, although it is replicating at a much slower rate than it did in the acute stage. Individuals who are infected and have started on antiretroviral therapy (ART) may be able to extend this asymptomatic HIV period for up to twenty plus years.

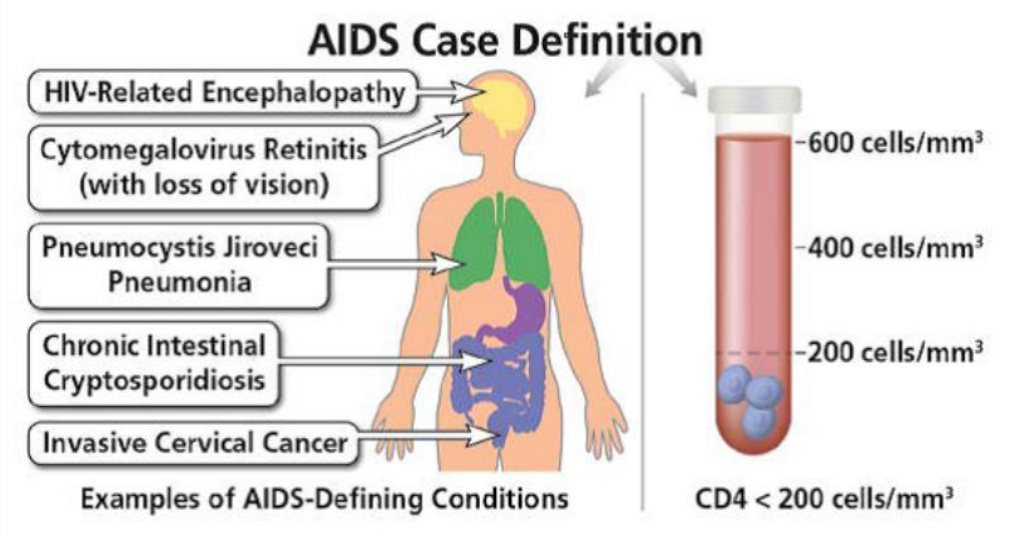
Individuals in the chronic HIV stage are still able to infect others. The chronically infected and asymptomatic individual may not feel sick, but the risky lifestyle behaviors that brought them initially into contact with HIV must be addressed. HIV carriers know they are infected and can help stop the continued spread of this deadly infection. Lifestyle changes are important, and the initiation of antiviral medication can reduce the chance of transmitting the infection by as much as 90%.

With or without the support of antiretroviral therapy, the chronic latency period of HIV infection ends. The beginning of the end of the latency period is signaled by an increasing rise in viral levels, often referred to as the viral load, and a drop in the CD4 cell count. This mix of events allows symptomatic illness indicators of the HIV infection to once more surface as the struggling immune system grows too weak to counter and control symptoms.

The Third Stage: HIV as AIDS the Final Stage of Infection

Acquired Immunodeficiency Syndrome (AIDS) is the final stage of HIV infection. AIDS occurs when the body's immune system has been so badly compromised that the individual is defenseless to diseases, infections and even infection-related cancers. The person with AIDS is vulnerable to opportunistic illnesses and infections because of the absence of immune system defenses, allowing these opportunists to spread without challenge or check. Antibiotic prophylaxis is prescribed to help the severely impaired immune system fight off infections.

An AIDS diagnosis can only be made by a licensed healthcare provider based on the results of specific HIV blood tests and/or the patient's physical condition and disease state. It is diagnostically true that once a person is diagnosed with AIDS, the diagnosis is with them for their lifetime. Diagnostic criteria do not allow going back to stage one or stage two, even when symptoms are in remission and the individual feels good. Even when patients with AIDS are not experiencing symptoms, they remain infectious and capable of transmitting the virus to others. Additionally, they are defenseless against opportunistic diseases, especially when not receiving adequate supportive medical treatments. When untreated, the average lifespan from the onset of HIV infection to death from AIDS in the United States is just over three years. Fortunately, medication therapies and lifestyle changes have been able to lengthen the lifespan by decades.



AIDS is officially diagnosed when the patient is at 200 CD4 cells per cubic millimeter of blood or 200 cells/mm3 or below, however having one or more diagnostically recognized opportunistic illnesses is also considered enough for a diagnosis of AIDS regardless of the CD4 count.

Observable symptoms that the final stage of AIDS has been reached include:

- Persistent low-grade fever
- Extreme and unexplained fatigue
- Difficulty recovering from colds or flu
- Recurring fever or profuse night sweating
- Diarrhea lasting more than one week
- Rapid weight loss
- Sores of the mouth, anus or genitals
- Memory loss, depression or other neurologic disorders
- Respiratory difficulties including pneumonia

Diagnostic Tests for HIV

Basically, there are three types of diagnostic tests for HIV: antibody tests, antigen (Ag)/ antibody (Ab) tests and nucleic acid (RNA) tests. Antibody tests detect antibodies, which are proteins that the body makes to fight against HIV. Antigen tests and RNA tests detect HIV directly.

Antibody screening tests (immunoassays) are the most common of the HIV tests available. These are available as both laboratory and rapid testing versions using either blood or oral fluids. Antibody screening tests performed on blood detect the presence of HIV earlier in the infection process due to the levels of antibody in the blood. Antibody screening immunoassays conducted at the point of care such as the emergency department can provide preliminary results in about 20 minutes.

There have been significant advances in laboratory-based enzyme and chemiluminescent immunoassays which can identify HIV as early as three weeks after infection. These advanced testing methods are not widely available so patients should be aware of variations in testing services.

Antibody screening immunoassays have been designed to detect HIV-1 and/or HIV-2 antibodies in blood, oral fluid and even urine specimens. Reactive/positive screening test results are always considered preliminary, pending a confirmation test. When using a rapid screening tool, the confirmation test will be a laboratory follow-up test.

Blood-based HIV screening:

- Finger stick testing detects antibodies
- May be a rapid result test or a sent to the laboratory version
- Most often used in medical offices, public health clinics and community outreach centers.

Oral fluid HIV screening:

- Oral fluid containing antibodies in the oral mucosal transudate is gathered by swab from around the gums of the mouth.
- Rapid test kits are available, or the swab can be placed in a special collection container for shipment to a licensed processing center.
- Public health clinics and community outreach agencies are the primary users of this method.

Urine HIV screening:

- Urine rapid test kits or collection devices are available to be sent to appropriately licensed processing centers but are not yet widely used.

Arthur Ashe - American Tennis Player
Arthur Robert Ashe Jr. was an American professional tennis player who won three Grand Slam singles titles. Ashe was the first black player selected to the United States Davis Cup team and the only black man ever to win the singles title at Wimbledon, the US Open, and the Australian Open. In the early 1980s, Ashe is believed to have contracted HIV from a blood transfusion he received during heart bypass surgery. He publicly announced his illness in April 1992 and began working to educate others about HIV and AIDS. He founded the Arthur Ashe Foundation for the Defeat of AIDS and the Arthur Ashe Institute for Urban Health before his death from AIDS-related pneumonia at the age of 49 on February 6, 1993.

HIV Antigen/Antibody Tests

Combination antigen/antibody (Ag/Ab) immunoassays are in their fourth generation for HIV detection and are capable of detecting antibodies against HIV and fragments of the virus itself called antigens. Ag/Ab tests require blood samples (serum, plasma or whole blood) and have the capacity to detect a specific protein known as p24 viral core protein as soon as three weeks after the initial infection. The p24 particles, however, soon become imperceptible once the body accelerates its antibody production and begins to "destroy the evidence" in its war against HIV. At this point, the second part of the Ag/Ab test becomes valuable, as the antibodies hiding the antigen evidence become reactive to the test allowing accurate detection efforts to continue.

The Western blot (protein immunoblotting IgM/IgG) test for HIV is now the confirmatory test preferred by the CDC for double-checking the results of other HIV tests. Be aware that the Western Blot may be unreliable in new HIV infections, under two months since the time of infection.

HIV Nucleic Acid (RNA) Tests

Nucleic acid tests detect the genetic material of the HIV virus, ribonucleic acid (RNA) in the blood plasma specimen required for the test. These tests can identify the presence of HIV in an individual's blood as soon as ten days after they become infected. Only licensed laboratories are allowed to perform this test.

HIV Testing Informed Consent

The CDC has formulated specific recommendations balancing the rights of individuals with the need of the public regarding infectious disease. As of 2018, all states have enacted laws that are consistent with the following CDC recommendations:

Consent:

- A separate written consent for HIV testing is not recommended.
- A general informed consent for medical care, which notifies an individual that an HIV test will be performed unless specifically declined (opt-out screening) should be sufficient to encompass informed consent for HIV testing.

Prevention Counseling:

- Prevention counseling should not be required with HIV diagnostic testing or as part of HIV screening programs in healthcare settings.

For specific information about each state's laws regarding HIV testing informed consent and prevention counseling rules go to the CDC state HIV law information page: CDC State HIV Law Information Page

Confidential HIV testing means that results go into the individual's medical file and may be shared with other healthcare providers and insurance companies according to HIPAA regulations. Some states offer anonymous HIV testing where a unique identifier is attached to the results allowing only the individual to access the results.

Tests positive for HIV or other sexually transmitted infections (STI's) will be reported to local or state health departments. This allows state tracking of new instances for the purpose of planning public health response. State health departments take the compiled information and forward them to the CDC after stripping all personal information from them.

Anonymous testing may delay or prevent a timely initiation of treatment and may lead to some individuals failing to receive care. Thus, anonymous testing is not an ideal option. Healthcare professionals should take the time to review whether anonymous HIV testing is in the best interest of the individual and if it is even an option in the practice area.

HIV Test Results

Negative HIV Results: Having a negative HIV result indicates one of two things:

- No HIV infection is present or
- The individual has been recently infected and has not yet produced enough antibodies to be detected by the test.

If the patient's intake reveals a recent episode of high-risk behavior, it is recommended that a follow-up HIV test get done in three weeks to three months from the date of initial testing so as to work around the "window" effect that occurs during acute infection. Risk is particularly high if unprotected sex or needle-sharing behaviors have occurred. It is important to educate and warn the patient that a negative HIV test result does not mean that an individual is immune to HIV. If risky behavior continues, HIV infection is likely to occur.

Positive HIV Results: Confirmatory test results indicate the presence of HIV antibodies or HIV RNA:

- This person has an HIV infection.
- This person is infected with HIV for life.
- This person can spread the HIV virus to others (i.e. unsafe sex, sharing contaminated needles and other high-risk behaviors).
- HIV treatment and medical care should be initiated immediately.

Indeterminate HIV Results: Occasionally, an HIV test will return as inconclusive or indeterminate. Recent high-risk behaviors that will lead to HIV infection may still be in the process of developing antibodies or "seroconverting." Whenever seroconversion is suspected, RNA testing should be performed to see whether or not the virus is present. If RNA testing is not available, a second HIV test using different antibody detection from the first indeterminate test should be done. If the second test gives a positive result, HIV is present.

An indeterminate HIV test result does not automatically mean seroconversion. It is possible to have test cross-reactions with other proteins from sources such as an autoimmune disease, recent influenza vaccination or even pregnancy.

HIV Viral Load Testing

Once a positive HIV test result is confirmed, laboratory testing is ongoing to monitor both CD4 counts and viral loads when treating HIV infections. Viral load refers to the quantity of HIV viral particles present in an individual's bloodstream. When the viral load is high, more HIV is present, indicating the immune system is not functioning well. Low viral loads are desirable to reduce complications from the HIV infection and translate into an extended lifespan. The best laboratory results show a high CD4 count and low or absent viral load count.

HIV Treatment

There is no cure for HIV infection. An individual's lifespan can be extended and quality of life enhanced, yet all those diagnosed with HIV infection will eventually die from it. Prevention is the key, the goal and focus of early intervention. Once an HIV diagnosis does occur, early and aggressive therapy can add decades of life and enhance the quality of life.

A complete medical history, physical examination and general laboratory work up should be initiated as soon as possible after initial diagnosis. The results of these provide the baseline on which future results can be compared.

The current best practice for HIV treatment is early and continuing antiretroviral therapy (ART) for all HIV infected individuals, especially infected pregnant women, so as to reduce the risk of transmission to the fetus. Antiretroviral medications do not kill the HIV virus or cure the disease. ART's are intended to slow or prevent the growth and spread of the virus.

There are several antiretroviral agents in use since the HIV virus has shown itself capable of developing resistance to single-agent therapy. Highly active antiretroviral therapy (HAART) combines three or more antiretroviral agents that are given to prevent resistance to treatment from developing.

Each drug class of antiretroviral medications operate by a specific mechanism to fight HIV. There are six classes of antiretroviral medications from the Panel on Antiretroviral Guidelines for Adults and Adolescents (2018):

- Nucleoside Reverse Transcriptase Inhibitors (NRTIs) or "nukes" block reverse transcriptase, an enzyme HIV needs to create altered DNA from viral RNA to make copies of itself.
- Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs) or "non-nukes" bind to and later alter reverse transcriptase, in order to block the altered DNA creation from viral RNA though in a different fashion from the NRTIs.
- Protease Inhibitors (PIs) interfere with the process of the newly formed HIV virus using the enzyme protease to gather components it needs to mature into full function.
- Entry Inhibitors block proteins on the CD4 cells that HIV needs to enter the cells. This category includes the CCR5 antagonists, which block viral entry into CD4, and the lone-wolf Fusion Inhibitor enfuvirtide.
- Post-Attachment Inhibitor, the monoclonal antibody Ibalizumab-uiyk, is the only PAI in current use. It does not block viral attachment to CD4 cells; however, it thwarts viral core entry into the cell core, thus preventing HIV replication.
- Integrase Strand Transfer Inhibitors (INSTI) act to prevent the DNA from the virus from being inserted into the chromosome of the host cell by interfering with the HIV integrase enzyme, the tool the virus uses to unzip and then patch in its own genetics.

Also important are Pharmacokinetic Enhancers and Combination HIV Medications commonly used in the ART and HAART regimens. Pharmacokinetic Enhancers are used in HIV treatment to increase the effectiveness of an HIV medication included within an individualized HIV regimen. Combination HIV Medicines are two or more HIV medications from one or more drug classes given together for greater impact.

HIV Medication Combination Therapies

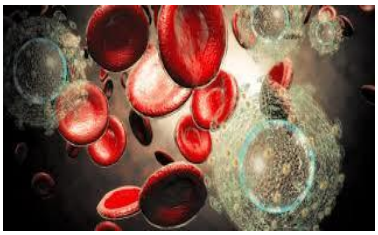
CDC guidelines recommend initiating prompt treatment following diagnosis with combination antiretroviral medications (ART's). Every patient should have these medications personalized based on drug resistance testing, epidemiologic determination of susceptibilities of the local prevalent viral strains, comorbid conditions, possible drug to drug interactions and anticipated adverse effect profiles. The CDC provides recommendations for a general starting combination therapy.

In an antiretroviral-naive individual, general guideline suggestions include a starting regimen considering the following factors:

- All new HIV positive clients should be offered ART.
- While there are more than 25 medications from six major classes of antiretroviral medications used for HIV treatment, the most commonly used are NRTIs, NNRTIs, and PIs (Nucleoside Reverse Transcriptase Inhibitors, Non-Nucleoside Reverse Transcriptase Inhibitors, and Protease Inhibitors).
- The general starting regimen should include two nucleoside/nucleotide reverse transcriptase agents (NRTIs) either tenofovir/emtricitabine (TDF/FTC) or abacavir/lamivudine (ABC/3TC), plus a drug from one of the following classes: NNRTI, PI boosted with ritonavir (RTV) or INSTI.

Summary

HIV infection is a chronic medical condition that those infected will have until they succumb to it during the final stage of AIDS or death occurs from another cause. There is no cure for HIV infection, which means that prevention is key to controlling its transmission. Education about HIV along with information about an infected person's rights and the value that their lives hold is essential in having a positive effect on individuals and high risk groups. It is important to share information concerning the transmission of HIV along with the risks of unprotected sex, sharing of needles and exposure to unsterilized blood-contaminated devices as ways the HIV retrovirus can be transmitted to still another victim.



It is estimated that approximately one in five HIV infected individuals are unaware of it and do not begin life-extending treatment. HIV testing is available both from healthcare professionals and by means of home tests. Once a positive test is confirmed, early aggressive treatment with antiretroviral medications is highly recommended. The state of HIV medications allows those infected to live decades longer than they otherwise would without medication, and with a greater quality of life, though the medication regimen can be demanding. Support for adherence to the medication regimen and behavioral changes that minimize the chance of spread of the virus are important objectives for healthcare professionals as we work toward helping the HIV infected live healthier, more satisfying lives.

REFERENCES

CDC. HIV in the United States and Dependent Areas. Centers for Disease Control and Prevention, US Department of Health and Human Services. Published May 9, 2019.

CDC. HIV PrEP. Centers for Disease Control and Prevention, US Department of Health and Human Services. Published August 6 2019. Accessed July 5, 2020.

Fletcher, CV. Overview of Antiretroviral Agents used to Treat HIV. UpToDate. Published October 7, 2018. Accessed July 2020.

Gai, Y., & Marthinsen, J. (2019). Medicaid Expansion, HIV Testing, and HIV-Related Risk Behaviors in the United States, 2010–2017. American Journal of Public Health, 109(10), 1404–1412. https://doi.org/10.2105/AJPH.2019.305220

Guilamo-Ramos, V., Thimm-Kaiser, M., Benzekri, A., Chacón, G., López, O. R., Scaccabarrozzi, L., & Rios, E. (2020). The Invisible US Hispanic/Latino HIV Crisis: Addressing Gaps in the National Response. American Journal of Public Health, 110(1), 27–31. https://doi.org/10.2105/AJPH.2019.305309

Hare CB, Coll J, Ruane P, et al. The Phase 3 DISCOVER Study: daily F/TAF or F/TDF for HIV preexposure prophylaxis. In: Program and abstracts of the 2019 Conference on Retroviruses and Opportunistic Infections; March 4-7, 2109; Seattle. Abstract 104LB.

Hartog, J.P. & Robinson, G. (2013). FLORIDA'S OMNIBUS AIDS ACT: A brief legal guide for health care professionals. Access from the Florida Department of Health. http://www.floridahealth.gov/diseases-and-conditions/aids/administration/_documents/Omnibus-booklet-update-2013.pdf

HIV.gov. Laws Protect People Living with HIV and AIDS. U.S. Department of Health & Human Services MHAF Minority HIV/AIDS Fund. Published November 0, 2017.

Mayer, KH. & Krakower, D. Administration of Pre-exposure Prophylaxis against HIV Infection. UpToDate. Published July 16, 2019. Accessed July 5, 2020.

Panel on Antiretroviral Guidelines for Adults and Adolescents. (2019). Guidelines for the Use of Antiretroviral Agents in Adults and Adolescents with HIV. Department of Health and Human Services. Published July 10, 2019. Accessed July 2020.

Recent Findings from Centers for Disease Control and Prevention Provide New Insights into HIV/AIDS (Client Perspectives and Experiences With HIV Patient Navigation in the United States: A Qualitative Meta-Synthesis). (2019, October 21). AIDS Weekly, 18.

Roland, K. B., Higa, D. H., Leighton, C. A., Mizuno, Y., DeLuca, J. B., & Koenig, L. J. (2020). Client Perspectives and Experiences With HIV Patient Navigation in the United States: A Qualitative Meta-Synthesis. Health Promotion Practice, 21(1), 25.

Sax, PE. The Natural History and Clinical Features of HIV Infection in Adults and Adolescents. UpToDate. Published July 24, 2018. Accessed July 6, 2020.