

HIV / AIDS

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What is HIV

- The Human Immunodeficiency Virus or HIV virus as it is commonly known is a unique type of virus (a retrovirus). The human immunodeficiency virus is a lentivirus that causes the acquired immunodeficiency syndrome, a condition in humans in which progressive failure of the immune system allows life-threatening opportunistic infections and cancers to thrive.

HIV infection

- **The HIV Virus:**
 - Invades the helper T cells (CD4 cells) in the body of the host (defense mechanism of a person).
 - Is threatening a global epidemic.
 - Is preventable & manageable but is NOT curable.

Other names for HIV

- **Former names of the virus include:**
 - Human T cell lymphotropic virus (HTLV-III)
 - Lymphadenopathy associated virus (LAV)
 - AIDS associated retrovirus (ARV)

What is AIDS?

- AIDS (acquired immune deficiency syndrome) is the final stage of HIV disease, which causes severe damage to the immune system.
 - HIV is the virus that causes AIDS.
 - Disease limits the body's ability to fight infection due to markedly reduced helper T cells.
 - Patients have a very weak immune system (defense mechanism).
 - Patients predisposed to multiple opportunistic infections leading to death.

AIDS Predisposes our body to other opportunistic infections. Opportunistic infections and malignancies that rarely occur in the absence of severe immunodeficiency (e.g. *Pneumocystis* pneumonia, central nervous system lymphoma). Persons with positive HIV serology who have ever had a CD4 lymphocyte count below 200 cells/mcL or a CD4 lymphocyte percentage below 14% are considered to have AIDS.

The viral genome

- Icosahedral (20 sided), enveloped virus of the lentivirus subfamily of ***retroviruses***.
Retroviruses transcribe RNA to DNA.
Two viral strands of RNA found in core surrounded by protein outer coat.

- Two viral strands of RNA found in core surrounded by protein outer coat. Outer envelope contains a lipid matrix within which specific viral glycoproteins are imbedded. These knob-like structures responsible for binding to target cell

Modes of HIV transmission

- 1- Blood products
- 2- Sex: Semen- Vaginal fluids
- 3- Intravenous drug abuse
- 4- Mother to baby: Before birth- During birth

Natural course of AIDS

- Stage 1 Primary stage:
 - * Short, flu-like illness -occurs one to six weeks after infection
 - * Mild symptoms
 - * Infected person can infect other people

Stage 2 Asymptomatic

- Lasts for an average of ten years
- This stage is free from symptoms
- There may be swollen glands
- The level of HIV in the blood drops to low levels
- HIV antibodies are detectable in blood

Stage 3 Symptomatic

- The immune system deteriorates
- Opportunistic infections and cancers start to appear

Stage 4 HIV (AIDS)

- The immune system weakens too much as CD4 cells decrease in number.

1- AIDS opportunistic infections:

- **If your CD4 < 500:**
 - Bacterial infections
 - Tuberculosis (TB)
 - Herpes Simplex
 - Herpes Zoster
 - Vaginal candidiasis
 - Hairy leukoplakia
 - Kaposi's sarcoma

2- If your CD4 < 200:

- Pneumocystic carinii
- Toxoplasmosis
- Cryptococcosis
- Coccidioidomycosis
- Cryptosporiosis
- Non hodgkin's lymphoma

3- If your CD4 < 50:

- ❑ Disseminated mycobacterium avium complex (MAC) infection
- ❑ Histoplasmosis
- ❑ CMV retinitis
- ❑ CNS lymphoma
- ❑ Progressive multifocal leukoencephalopathy
- ❑ HIV dementia

The Most Common Opportunistic Infection:

- For HIV-infected individuals with CD4 < 200 cells/mcL: *Pneumocystis jiroveci* prophylaxis
- For HIV-infected individuals with CD4 < 75 cells/mcL: *Mycobacterium avium* complex prophylaxis
- For HIV-infected individuals with CD4 < 50 cells/mcL: CMV prophylaxis

Diagnosis of HIV

- 1- ELISA test
- 2- Western blot
- 3- HIV rapid antibody test
- 4- CD4 count

Treatment

1- Anti-retroviral drugs:

- Nucleoside Reverse Transcriptase inhibitors
AZT (Zidovudine)
- Non-Nucleoside Transcriptase inhibitors
Viramune (Nevirapine)
- Protease inhibitors Norvir (Ritonavir)
- Fusion inhibitors

Healthcare follow up

- **For all HIV-infected individuals:**
 - CD4 counts every 3–6 months
 - Viral load tests every 3–6 months and 1 month following a change in therapy
 - PPD = Tuberculosis skin test
 - INH (Isoniazid) for those with positive PPD and normal chest radiograph
 - RPR (rapid plasma reagin test) or VDRL (venereal disease research lab test) for syphilis

Healthcare follow up

- Toxoplasma IgG serology
- CMV IgG serology
- Pneumococcal (pneumonia) vaccine
- Influenza vaccine in season
- Hepatitis B vaccine for those who are HBsAbnegative
- *Haemophilus influenzae* type b vaccination
- Papanicolaou smears every 6 months for women.

CDC recommendations

- The CDC recommends that health care providers test everyone between the ages of 13 and 64 at least once as part of routine health care. One in six people in the United States who have HIV do not know they are infected.

HIV is spread through unprotected sex and drug injecting behaviors (plus mother to child), so people who engage in these behaviors should get tested more often.

THANK YOU