



AIDS

Acquired Immune Deficiency Syndrome

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What is HIV/AIDS

- **HIV** stands for human immunodeficiency virus, which is the virus that causes HIV infection.
- **AIDS** stands for acquired immunodeficiency syndrome. AIDS is the most advanced stage of HIV infection.
- HIV attacks and destroys the infection-fighting **CD4 cells** of the **immune system**. The loss of CD4 cells makes it difficult for the body to fight off infections and certain cancers. Without treatment, HIV can gradually destroy the immune system and advance to AIDS.

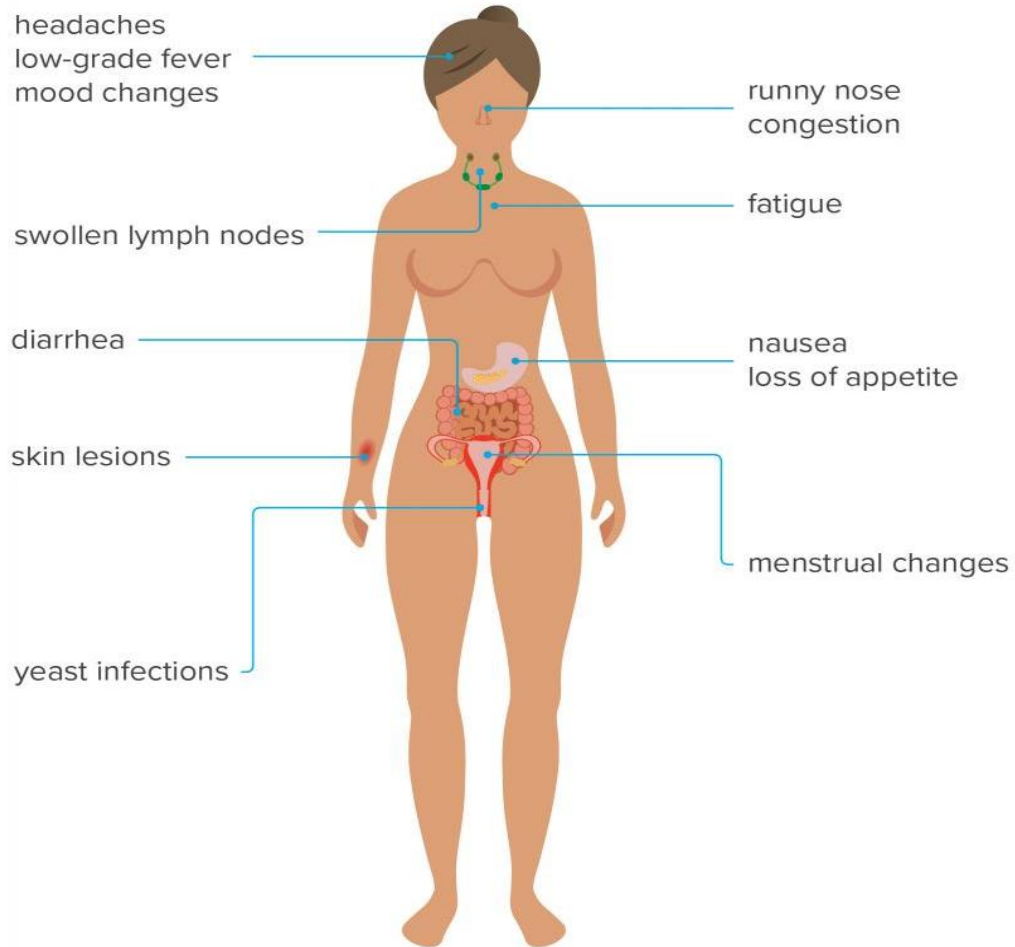
Epidemiology of HIV/AIDS in India

- **In India in 2017** (Source-unaids.org)
 - 2 100 000 people were living with HIV out of which (41.9%) were women
 - HIV incidence per 1000 uninfected—the number of new HIV infections among the uninfected population over one year—among all people of all ages was 0.1.
 - HIV prevalence—the percentage of people living with HIV—among adults (15–49 years) was 0.2%.
 - 88 000 people were newly infected with HIV.
 - 69 000 people died from an AIDS-related illness.

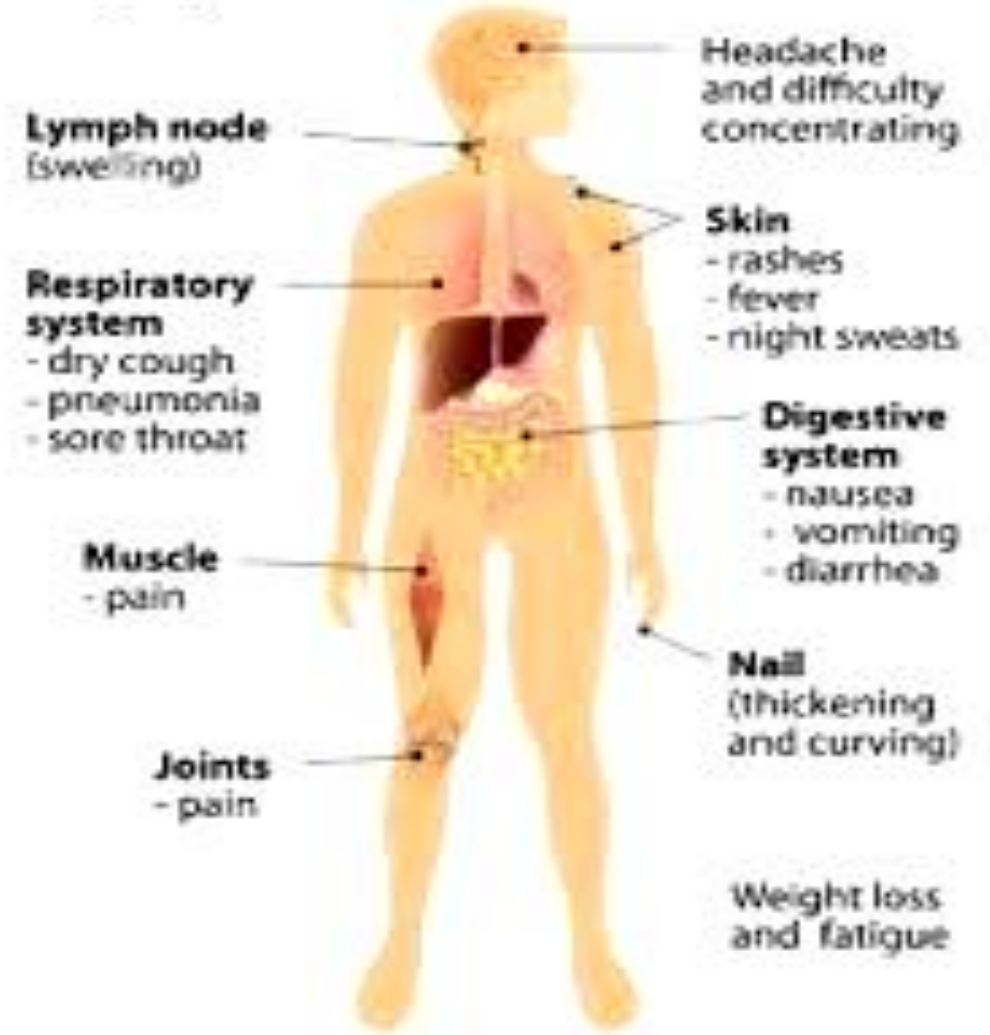
What are the symptoms of HIV/AIDS?

- Within 2 to 4 weeks after infection with HIV, some people may have **flu-like** symptoms, such as fever, chills, or rash, swollen glands, chills, weakness, and weight loss.
- The symptoms may last for a few days to several weeks.
- During this earliest stage of HIV infection, the virus multiplies rapidly.
- **Opportunistic infections** occur more frequently or are more severe in people with weakened immune systems than in people with healthy immune systems.
- HIV destroys vital cells required for the functioning of the immune system.

Effects on the Body HIV in Women



Symptoms of HIV infection



HIV progress through three stages:

Stage 1: Acute stage, the first few weeks after transmission

- Early symptoms are flu-like.

Stage 2: Clinical latency or chronic stage

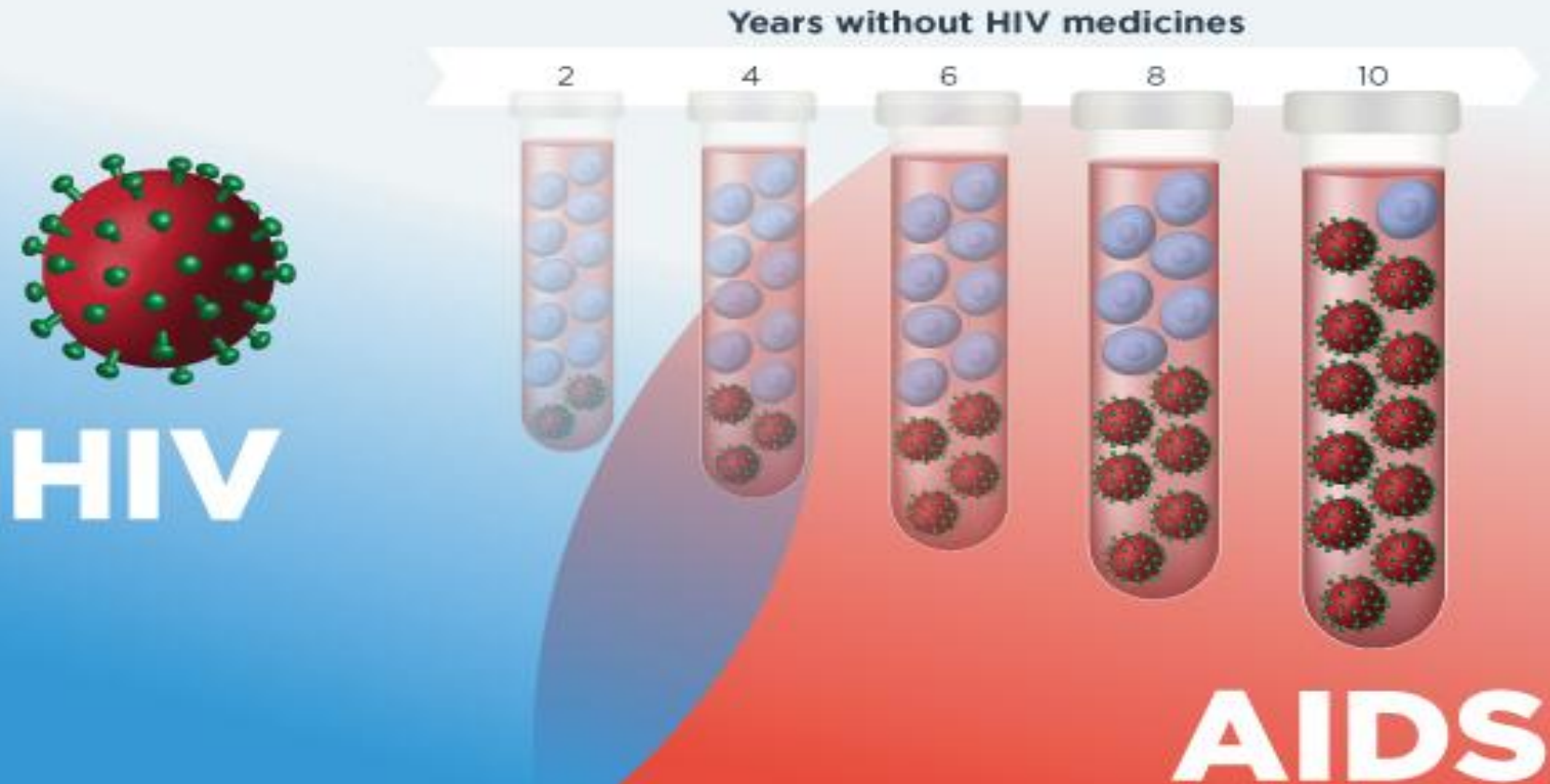
- Non-specific symptoms observed like headaches and other aches and pains, swollen lymph nodes, recurrent fevers, night sweats, fatigue, nausea, vomiting, diarrhea, weight loss

Stage 3: AIDS

- Symptoms are recurrent fever, chronic swollen lymph glands, chronic fatigue, night sweats, skin lesions, recurrent or chronic diarrhea, rapid weight loss, neurologic problems, anxiety and depression.

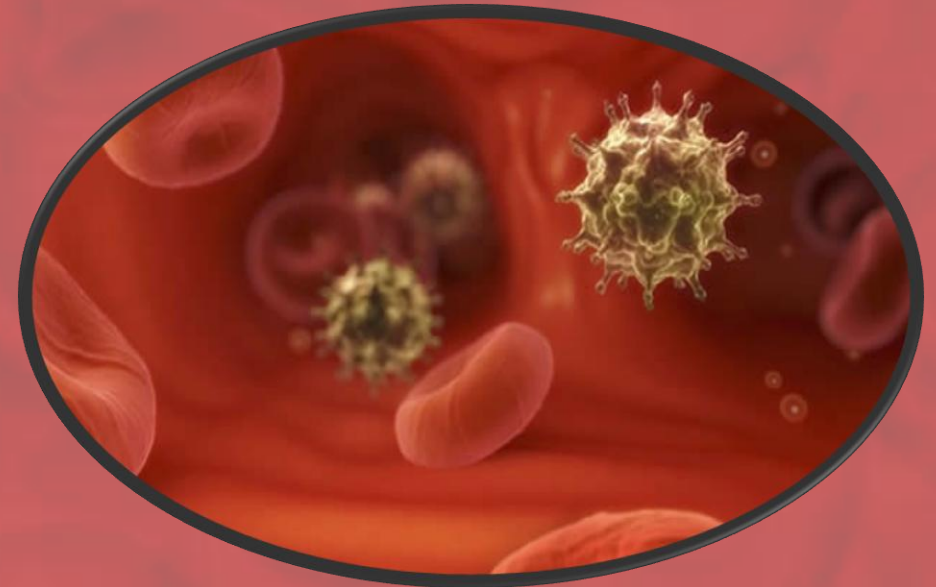
HIV Progression to AIDS

HIV and AIDS



How HIV Transmit?

- The spread of HIV from person to person is called **HIV Transmission**. HIV is spread only in certain body fluids from a person who has HIV. These body fluids include:-
 - Blood
 - Semen
 - Pre-seminal fluid
 - Vaginal fluids
 - Rectal fluids
 - Breast milk
- Unprotected sex with HIV infected person
- Sharing injection drug equipment (works), such as needles, with someone who has HIV



Transmission of HIV

The most common methods of transmission of HIV are:



Unprotected sex with an infected partner



Sharing needles with infected person

Almost eliminated as risk factors for HIV transmission are:



Transmission from infected mother to fetus



Infection from blood products

You can't get HIV by :-



- shaking hands or hugging a person who has HIV.
- from contact with objects such as dishes, toilet seats, or doorknobs used by a person with HIV.
- sharing food or drinks, including drinking fountains
- saliva, tears, or sweat (unless mixed with the blood of a person with HIV)
- HIV is not spread through the air or in water or by mosquitoes, ticks, or other blood-sucking insects.

How is AIDS diagnosed?

- Diagnosis of AIDS is based on the following criteria:-
 - A **drop in CD4** count to **less than 200 cells/mm³**. A CD4 count measures the number of CD4 cells in a sample of blood. **OR**
 - The presence of certain opportunistic infections.
- No HIV test can detect HIV immediately after infection.
- The first HIV protein (antigen) that can be measured is p24 (from 1 to 8 weeks after exposure).
- In general, nucleic acid tests (NAT) can detect HIV the soonest, followed by combination or fourth generation tests, and then antibody tests.
- ***Fourth-generation test*** looks for both HIV antibodies and antigens.

HIV Diagnostic Test

Types of HIV Diagnostic Tests

HIV Antibodies



Most Common Test for
Established Infection

HIV-1 RNA



Used for Acute HIV and
Indeterminate WB

HIV p24 Antigen



Rarely Used
Future use: 4th Generation
EIA

HIV/AIDS Tests

- **Nucleic acid test (NAT)**-it detects the amount of virus(viral load) in blood of people who have early symptoms of HIV.
- **Fourth Generation -Antibody/antigen tests**-check the blood for antibodies and antigens.
 - **ELISA** for screening &
 - **Western Blot** for confirmation

HIV-1/2 Antigen/Antibody Immunoassay

(+)

(-)

Negative for HIV-1 and HIV-2 antibodies and p24 Ag

HIV-1/HIV-2 Antibody Differentiation Immunoassay

HIV-1 (+)
HIV-2 (-)

HIV-1 antibodies detected

HIV-1 (-)
HIV-2 (+)

HIV-2 antibodies detected

HIV-1 (+)
HIV-2 (+)

HIV antibodies detected

HIV-1 (-) or Indeterminate
HIV-2 (-)

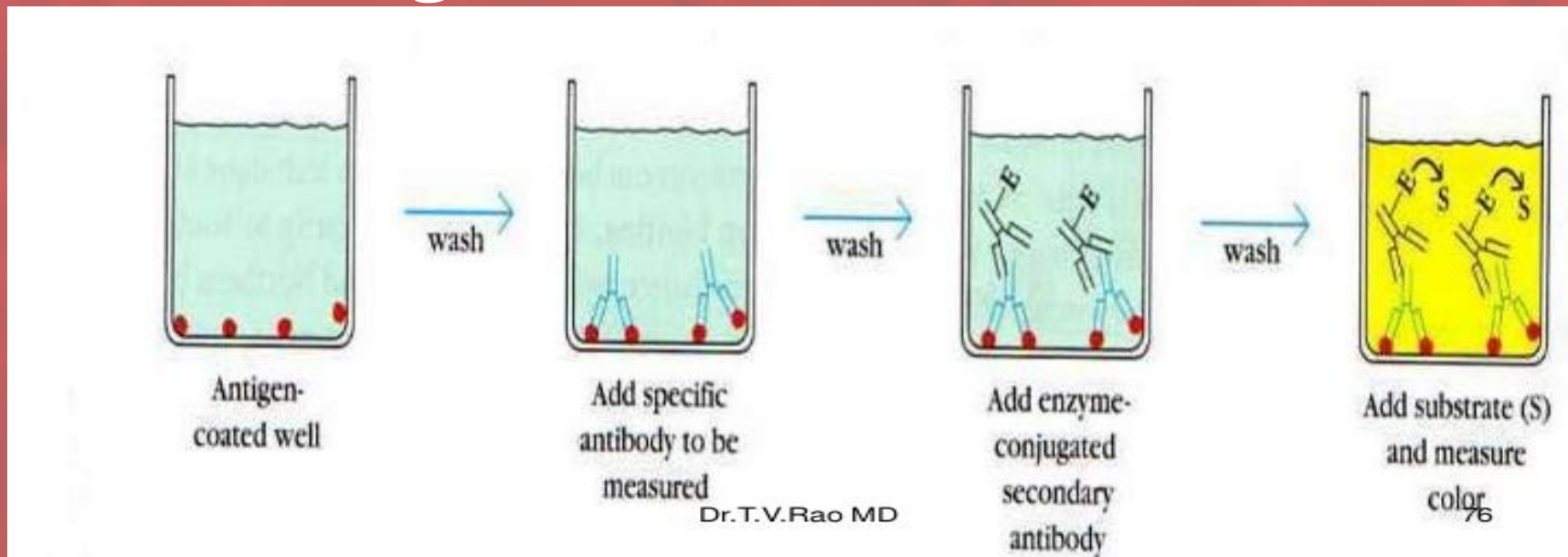
HIV-1 NAT

HIV-1 NAT (+)
Acute HIV-1 infection

HIV-1 NAT (-)
Negative for HIV-1

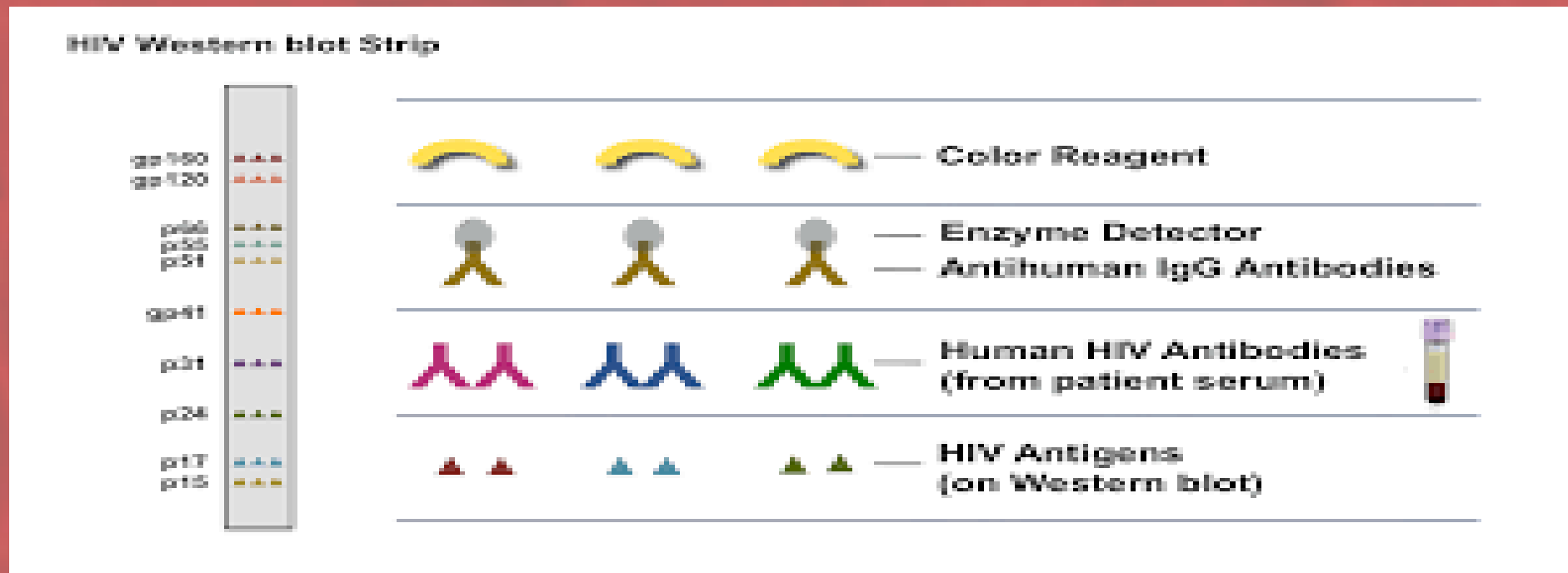
1. ELISA- detect HIV antibody

- The blood sample added to a cassette/well that contains the viral protein, called antigen.
- If the blood contains antibodies in response to **HIV**, it **will** bind with the antigen and cause the cassette's contents to change colour.

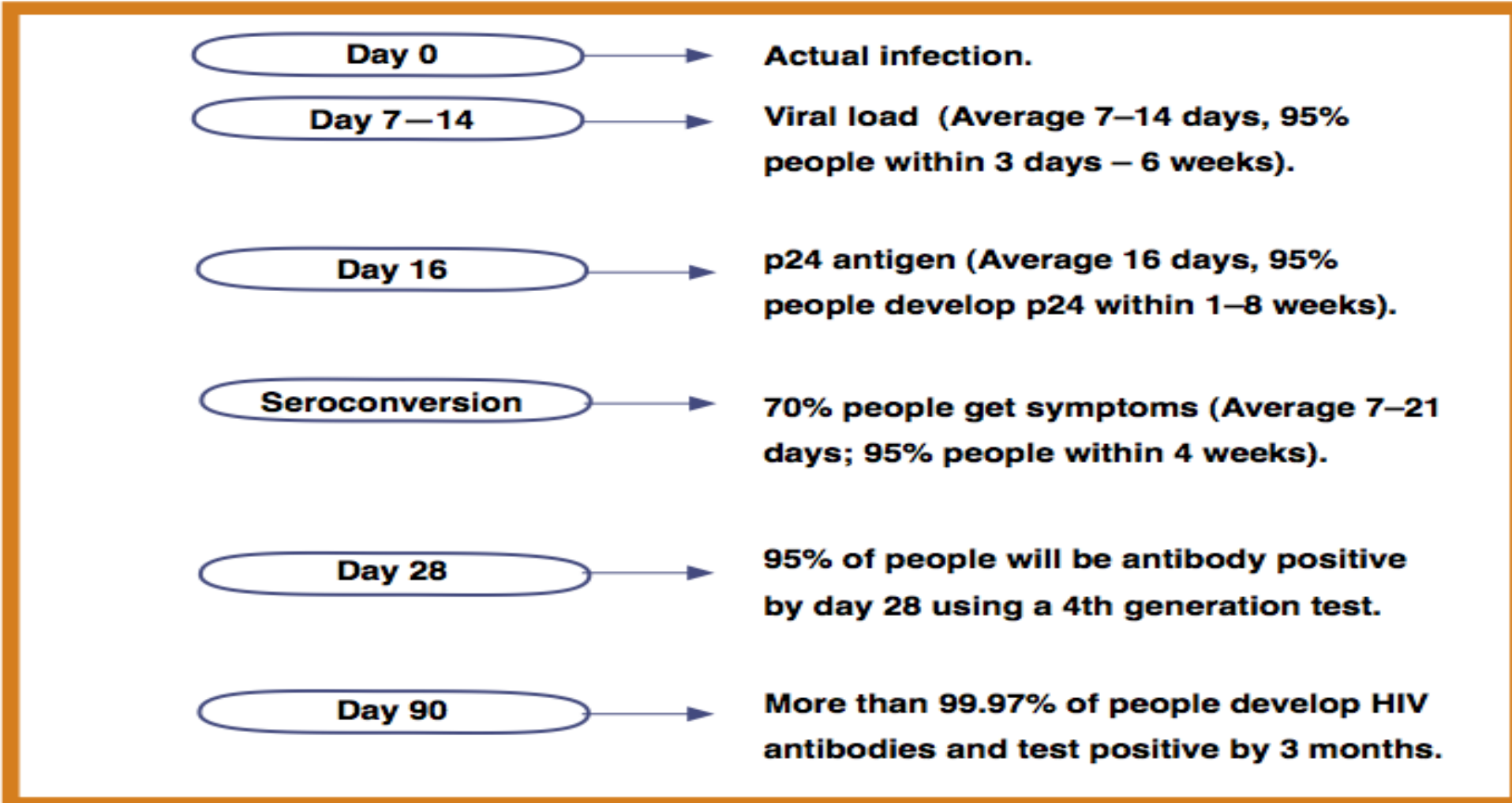


2. Western Blot- detect HIV antibodies

- It separates the blood proteins and detects the HIV specific proteins (HIV antibodies)
- It confirm a positive ELISA, and the combined tests are 99.9% accurate.



Timeline for HIV infection, immune responses and window period for tests



Window Period

- **The window period is time between HIV infection and the point when the test will give an accurate result.**
- During the window period a person can have HIV and be very infectious but still test HIV negative.
- The window period for a 4th generation antigen/antibody test is about four weeks. By this time 95% of infections will be detected .
- There is a three month window period after exposure, for the confirmatory result to detect more than 99.9% of infections.

What is the treatment for HIV?

- **Antiretroviral therapy (ART)** is the use of HIV medicines to treat HIV infection.
- ART prevents HIV from multiplying, which reduces the amount of HIV in the body (called the viral load).
- Having less HIV in the body protects the immune system and prevents HIV infection from advancing to AIDS.
- **ART can't cure HIV**, but HIV medicines help people with HIV live longer, healthier lives.
- ART also reduces the risk of HIV transmission. A main goal of ART is to reduce a person's viral load to an undetectable level.

Antiretroviral Therapy...

What does it do?



Antiretroviral therapy (ART) is the daily use of a combination of HIV medicines to treat HIV. ART saves lives, but does not cure HIV.

Reduces the amount of HIV in the body

Reduces the risk of HIV transmission

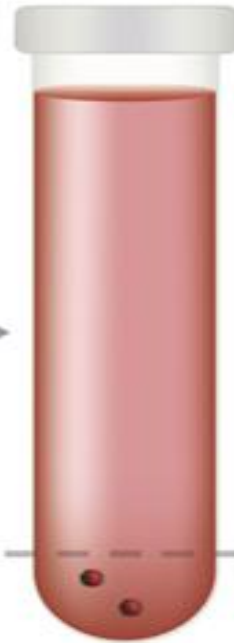
Prevents HIV from advancing to AIDS

Protects the immune system

Viral Suppression

Viral Load
Before
ART

Viral Load
With
ART



Detectable
Level

Undetectable
Level



Anti-Retroviral Treatment

- Antiretroviral (ARV) HIV drugs are divided into seven drug classes based on how each drug interferes with the HIV life cycle.
- These seven classes include:-
 - nucleoside reverse transcriptase inhibitors (NRTIs),
 - non-nucleoside reverse transcriptase inhibitors (NNRTIs), protease inhibitors (PIs),
 - fusion inhibitors,
 - CCR5 antagonists,
 - post-attachment inhibitors, and
 - integrase strand transfer inhibitors (INSTIs).

People living with HIV work with a health care provider to choose an HIV regimen.



HIV medicines are grouped into seven drug classes according to how they fight HIV.



Protect yourself and community from getting infected with HIV

THANK YOU!