

"The Road to Health" versus "The Road to Death"

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1. What is HIV?

HIV stands for Human Immunodeficiency Virus. It is classified as a retrovirus — a crucial piece of terminology for exams.

Key Definition Points:

- HIV is a retrovirus that infects cells of the immune system
- It destroys or impairs the function of immune cells
- As infection progresses, the immune system becomes weaker
- The person becomes increasingly susceptible to infections and certain cancers
- Immune function is clinically measured by CD4 cell count

A retrovirus uses RNA as its genetic material and uses the enzyme Reverse Transcriptase to convert that RNA into DNA inside the host cell.

2. HIV Anatomy (Virus Structure)

Note:- this is taken from a picture on Doctor's Slide. [I Don't think it is required / Also function is an extra information].

Component	Function/Description
gp120 Envelope Protein	Outer surface protein; helps HIV attach to host CD4 cells
gp41 Envelope Protein	Also on outer surface; assists with cell membrane fusion
p17 Matrix Proteins	Structural support between the envelope and the core
Lipid Membrane	Outer fatty layer surrounding the entire virus
p24 Capsule Proteins	Forms the inner core (capsid) of the virus
RNA	The genetic material of the virus (2 strands)
Reverse Transcriptase	Enzyme that converts RNA into DNA inside host cells — what makes HIV a retrovirus

3. HIV vs. AIDS — The Critical Distinction

Feature	HIV	AIDS
Full name	Human Immunodeficiency Virus	Acquired Immunodeficiency Syndrome
Nature	The virus itself	Most advanced stage of HIV infection
Timing	Immediate upon infection	Takes 2 to 15 years to develop
Effect of ART	Managed with antiretrovirals	Antiretrovirals slow progression further
Severity	Variable symptoms	Severe clinical manifestations
Key point	Not everyone with HIV has AIDS	AIDS only occurs at the final, most advanced stage

IMPORTANT: Not everyone with HIV develops AIDS. Antiretroviral drugs (ART) can significantly delay or even prevent reaching the AIDS stage.

4. Signs and Symptoms

Symptoms vary depending on the stage of infection.

Stage 1 — Early Infection (First Few Weeks):

- Many individuals experience NO symptoms at all
- OR flu-like illness including:
 - Fever
 - Headache
 - Rash
 - Sore throat

CRITICAL EXAM POINT: People are MOST INFECTIOUS during the first few months, yet most are UNAWARE of their status at this stage.

Stage 2 — Progressive Infection (As immune system weakens):

- Swollen lymph nodes
- Weight loss
- Fever
- Diarrhea
- Cough

Stage 3 — Without Treatment (Severe Illnesses):

- Tuberculosis (TB)
- Cryptococcal meningitis
- Cancers

5. HIV Transmission

Body Fluids That Can Transmit HIV:

- Blood
- Breast milk
- Semen
- Vaginal secretions

Blood + Sexual.

Specific Routes of Transmission:

1. Unprotected sexual intercourse
2. Transfusion of contaminated blood
3. Sharing contaminated needles
4. Mother to infant — during pregnancy, childbirth, and breastfeeding ⇒ *Vertical*

How HIV is NOT Transmitted:

HIV CANNOT be spread through ordinary daily contact such as:

- Hugging
- Shaking hands
- Sharing personal objects
- Sharing food or water

6. Risk Factors

Behaviors and conditions that increase the risk of contracting HIV:

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5. Having unprotected sex
6. Having another sexually transmitted infection (STI) such as:
 - Syphilis
 - Herpes
 - Chlamydia
 - Gonorrhea
 - Bacterial vaginosis
7. Sharing contaminated needles, syringes, and other injecting equipment and drug solutions
8. Receiving unsafe injections, blood transfusions, or medical procedures involving unsterile cutting or piercing
9. Experiencing accidental needle stick injuries — especially among healthcare workers

7. Global HIV/AIDS Statistics (2022)

Since the Start of the Epidemic:

- 85.6 million people have become infected with HIV
- 40.4 million people have died from AIDS-related illnesses

half have died

Currently Living with HIV (2022):

Category	Number
Total people globally living with HIV	39.0 million
Aged 15 years or older	37.5 million
Children aged 0–14 years	1.5 million
Women and girls (% of total)	53%

New Infections & Deaths (2022):

Statistic	Figure
Newly infected with HIV	1.3 million
Died from AIDS-related illnesses	630,000
AIDS mortality decline in women & girls since 2010	55% decline
AIDS mortality decline in men & boys since 2010	47% decline
People accessing antiretroviral therapy (ART)	29.8 million

8. Global Goals and Targets

Sustainable Development Goals (SDGs):

- Adopted in 2015
- Aim to end the AIDS epidemic by 2030
- Under SDG Goal 3: "Ensure healthy lives and promote well-being for all at all ages"
- Successor to the Millennium Development Goals (MDGs)
 - MDG 6: Halt and begin to reverse the spread of HIV/AIDS by 2015
 - MDG 6: Achieve universal access to treatment for HIV/AIDS by 2010

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United nation of AID

UNAIDS 95-95-95 Targets (to be achieved by 2025):

Released by UNAIDS in 2020 — three sequential ambitious targets:

Target	Goal	Achievement in 2022
1st 95%	People living with HIV know their HIV status	86% knew their status
2nd 95%	Those who know their status are on treatment	89% were on treatment
3rd 95%	Those on treatment have suppressed viral loads	93% were virally suppressed

9. Diagnosis

Types of Diagnostic Tests:

Serological tests detect the PRESENCE or ABSENCE of ANTIBODIES to HIV antigens (not the virus itself directly).

- Rapid Diagnostic Tests (RDTs)
- Enzyme Immunoassays (EIAs)

→ we study it on Micro (لدا تقلى انك اوتها!!!)

The Window Period — CRITICAL EXAM CONCEPT:

- Most individuals develop antibodies to HIV within 28 days of infection
- Before antibodies form = the WINDOW PERIOD
- During the window period, tests may be NEGATIVE even if the person IS infected
- The window period represents the time of GREATEST INFECTIVITY
- However, HIV transmission can occur at ALL stages of infection

10. HIV Testing Services

Core Principles:

- Testing must be VOLUNTARY
- The right to DECLINE testing must be recognized
- Mandatory or coerced testing by a health-care provider, authority, partner, or family member is NOT acceptable *منوع إجبار الشخص على الفحص*
- Mandatory testing violates human rights and undermines good public health practice *يعني أنه الفحص الإختياري يعزز حقوق الإنسان وهيك...*

The WHO 5 C's — All testing services MUST include:

C	Full Term	Description
1st C	Consent <i>الكوافقة</i>	Informed consent must be obtained before testing
2nd C	Confidentiality	Test results must be kept private
3rd C	Counselling	Support provided before and after testing
4th C	Correct test results	Testing must be accurate and reliable
5th C	Connection	Linkage to care, treatment, and other services

HIV Self-Testing:

- A person collects their own specimen, performs the test, and interprets results privately
- Does NOT provide a definitive diagnosis
- It is an INITIAL/SCREENING test only
- Requires further confirmation testing by a health worker

11. Prevention Strategies

Seven key prevention approaches outlined in the document:

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10. Male and female condom use
11. Testing and counseling for HIV, TB, and STDs
 - HIV testing services should integrate screening for TB and STDs
 - Anyone diagnosed with HIV who has active TB should URGENTLY start ART
12. Voluntary Medical Male Circumcision (VMMC) — *التطهير*
13. Pre-Exposure Prophylaxis (PrEP) — medication taken BEFORE potential exposure to HIV

14. Post-Exposure Prophylaxis (PEP) — medication taken AFTER potential exposure to HIV

15. Elimination of Mother-to-Child Transmission (EMTCT)

16. Harm Reduction for Injecting Drug Users, which includes:

- Using sterile syringes
- HIV testing and counseling
- HIV treatment and care
- Access to condoms
- Management of STIs, tuberculosis, and viral hepatitis

Harm Reduction for Injecting Drug Users means reducing the health risks associated with injection drug use, even if the person is not ready to stop using drugs.

The measures listed are:

- 1. Using sterile syringes**
 - A new, clean needle and syringe for every injection.
 - Prevents transmission of HIV, hepatitis B, and hepatitis C.
- 2. HIV testing and counseling**
 - Regular HIV screening for early detection.
 - Counseling educates individuals about safer practices and risk reduction.
- 3. HIV treatment and care**
 - People diagnosed with HIV receive **antiretroviral therapy (ART)**.
 - ART improves health and reduces the chance of transmitting HIV to others.
- 4. Access to condoms**
 - Many injecting drug users also have sexual risk factors.
 - Condoms help prevent **HIV and other sexually transmitted infections (STIs)** and unintended pregnancies.
- 5. Management of STIs, tuberculosis (TB), and viral hepatitis**
 - Early diagnosis and treatment of:
 - **STIs** (e.g., syphilis, gonorrhea)
 - **Tuberculosis (TB)**, which is more common in people with HIV and substance use disorders.
 - **Viral hepatitis** (especially hepatitis B and C), commonly spread through shared needles.

◆ AI Overview

Elimination of Mother-to-Child Transmission (EMTCT) is a global public health strategy aimed at halting the vertical transmission of diseases from pregnant individuals to their infants. Originally focused on HIV and syphilis, the World Health Organization's "triple elimination" framework now includes Hepatitis B virus (HBV). [World Health Organization \(WHO\) +2](#)

Key Strategies and Interventions

Preventing vertical transmission relies on a comprehensive, integrated approach starting at the antenatal care (ANC) stage. The critical elements include: [World Health Organization \(WHO\)](#)

- **Routine Testing:** Early and universal screening of pregnant women for HIV, syphilis, and HBV. [World Health Organization \(WHO\)](#)
- **Medical Intervention:** Prompt administration of lifelong antiretroviral therapy (ART) for HIV, penicillin for syphilis, and antivirals/immunoprophylaxis for Hepatitis B. [World Health Organization \(WHO\) +1](#)
- **Safe Delivery & Feeding:** Utilizing safe delivery practices and providing counseling on optimal infant feeding to minimize postpartum transmission risk. [World Health Organization \(WHO\)](#)
- **Infant Follow-Up:** Regular testing for exposed infants and providing the Hepatitis B vaccine birth dose. [World Health Organization \(WHO\)](#)

12. Master Summary Revision Table

Use this table for quick last-minute revision before your exam:

Topic	Key Facts to Remember
HIV type	Retrovirus
HIV targets	Immune system / CD4 cells
Immune function measured by	CD4 cell count
AIDS development time	2 to 15 years from HIV infection
ART effect on AIDS	Slows progression even further
Most infectious period	First few weeks (often no symptoms)
Transmission fluids	Blood, breast milk, semen, vaginal secretions
Transmission routes	Sex, blood transfusion, needles, mother-to-child
NOT transmitted by	Hugging, handshakes, sharing food/water/objects
Global burden (2022)	39 million living with HIV
Women/girls share	53% of all cases
New infections (2022)	1.3 million
Deaths (2022)	630,000
On ART (2022)	29.8 million
Historical total infected	85.6 million
Historical total deaths	40.4 million
Antibody development	~28 days
Window period risk	Most infectious; tests may be NEGATIVE
WHO 5 C's	Consent, Confidentiality, Counselling, Correct results, Connection
UNAIDS 95-95-95	Know status / On treatment / Virally suppressed — by 2025
95-95-95 results 2022	86% / 89% / 93%
SDG goal	End AIDS by 2030 (SDG Goal 3)
Self-test limitation	Not definitive — needs health worker confirmation
PrEP vs PEP	PrEP = before exposure; PEP = after exposure