



Introduction to Antiretroviral Therapy / Goals and Principles

**Module A4 Session 2 and
Module B1 Session 1**



Objectives

1. Describe the goals and basic principles of ARV
2. Describe the different types of ARV medications and what medications are available in Nigeria
3. Describe the essential components of an ARV Program necessary for excellent patient care

Goals of Antiretroviral Therapy (ART)



- Reduce HIV-related morbidity and mortality
- Reduce the viral load (to undetectable levels) for as long as possible in order to halt disease progression and prevent/reduce resistant variants
- Achieve immune reconstitution that is quantitative (CD4 count in normal range) and qualitative (fewer infections and illnesses)
- Provide an antiretroviral regimen which
 - Has a high likelihood of success
 - preserves future therapeutic options
 - has relatively few side effects
 - is tailored to individual needs for adherence

Antiretrovirals keep HIV from getting ahead

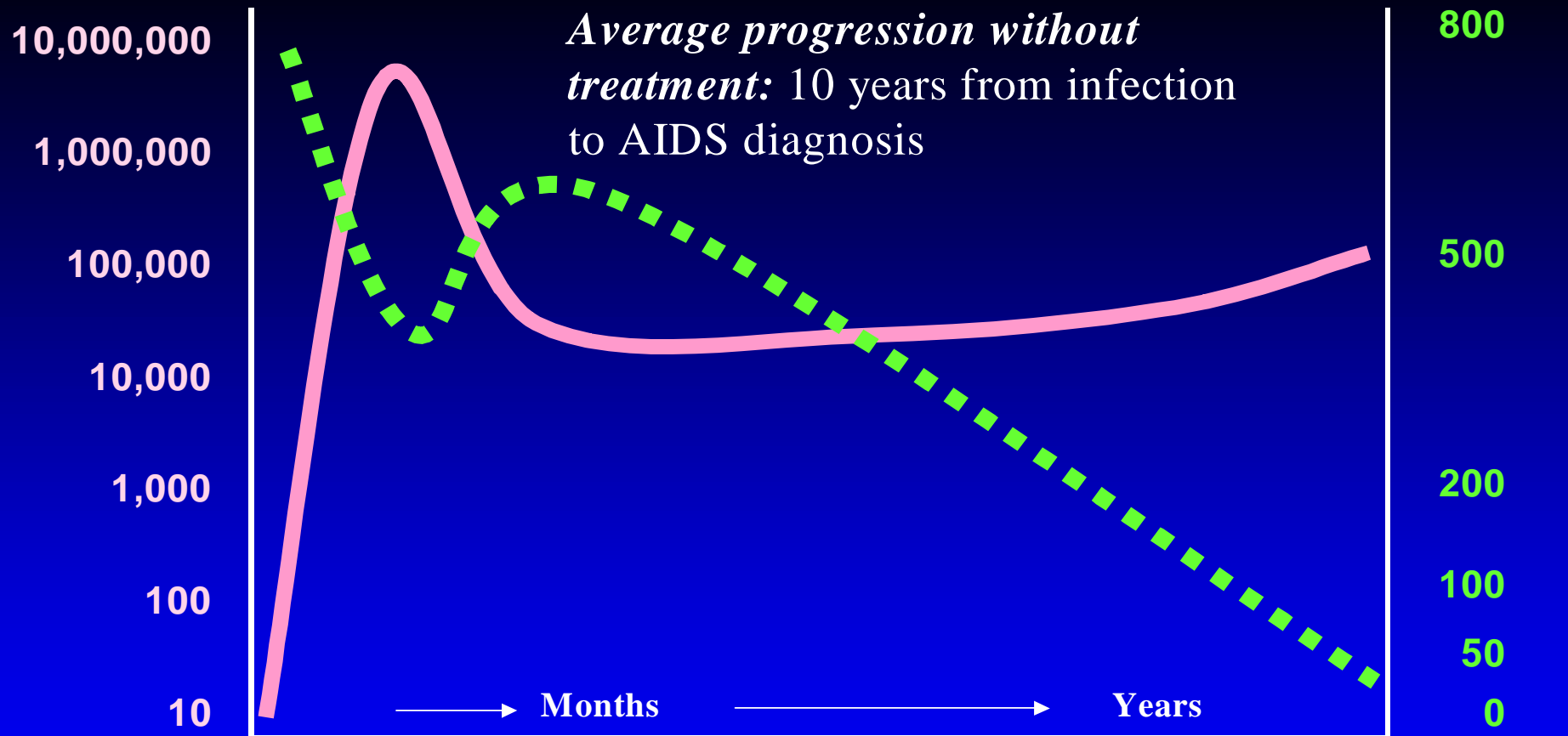
- Sometimes viral load can be reduced so much that the virus cannot be detected. That does not mean the virus is gone from the body.
- When this happens, HIV is still reproducing but not enough to weaken the immune system
- When there is not a constant attack from HIV, CD4 cell levels rise and they can do their job

New CD4 cells

Normal level



CD4 cells killed by HIV



HIV in plasma
(copies/mL)



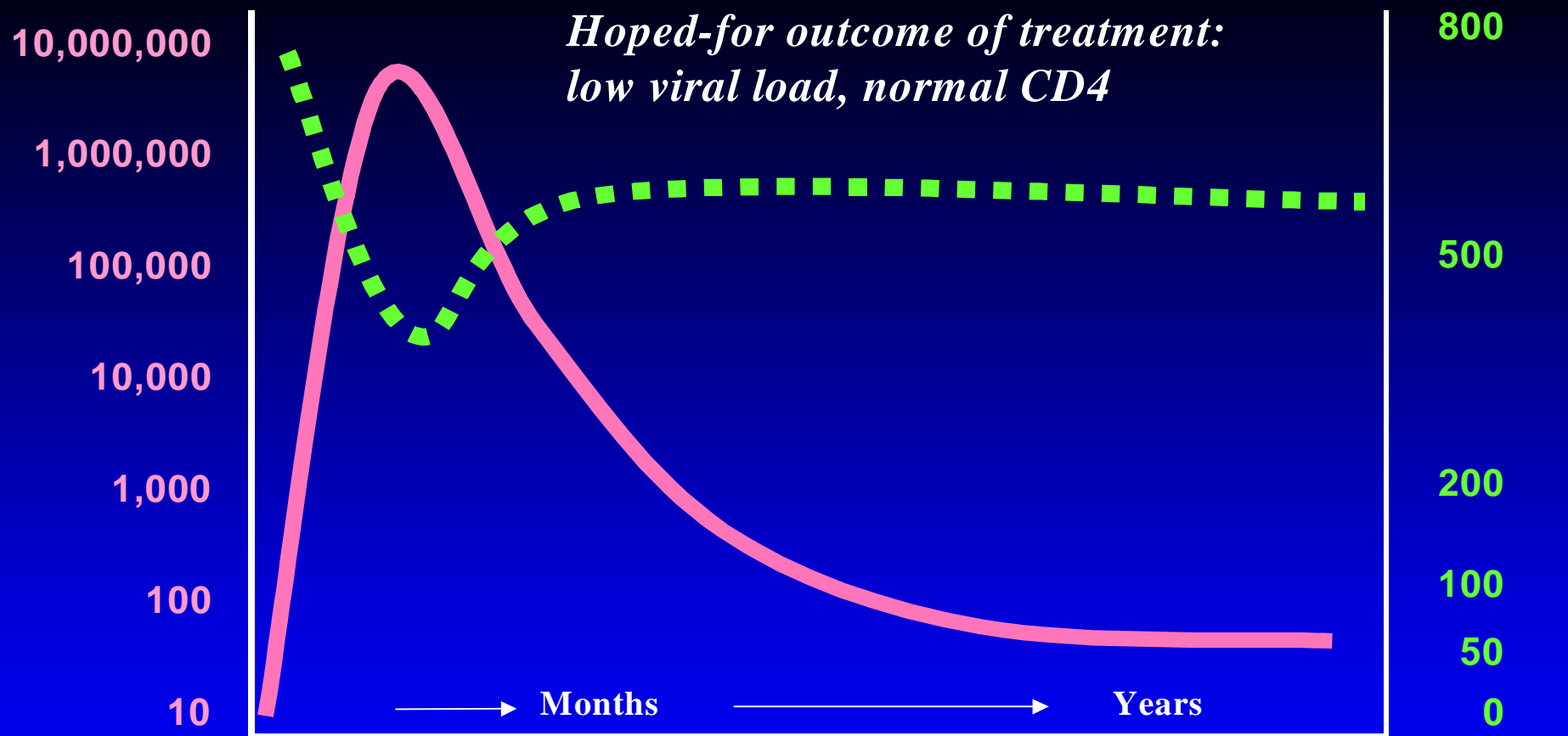
HIV in plasma ("viral load")



CD4 (T Cell) count

CD4 Count
(cells/mL)

Source: HRSA HIV/AIDS Bureau



HIV in plasma
(copies/mL)



HIV in plasma ("viral load")




CD4 (T Cell) count

CD4 Count
(cells/mL)

Source: HRSA HIV/AIDS Bureau

Benefits of ARV

- 
- A. ↑ voluntary testing/counseling
 - B. ↑ awareness of HIV
 - C. ↑ motivation of health care workers
 - D. ↓ expenses for palliative and OI care
 - E. ↓ number of orphans
 - F. Keeps households and businesses intact
 - G. Potential to enhance prevention
 - a. **Behavioral:** access to prevention education during care encounters
 - b. **Biological:** decreased transmission due to lowered viral load

Risks Of ARV

Strategies to Reduce These Risks

- Risk: If the virus is not suppressed fully, drug resistance can develop which will make the current ARV regimen less effective and limit future ARV treatment options
- Risk: Possible short and long term side effects for patients
- Risk: Possible interactions with other medications or natural remedies

Strategies to Reduce Risks:

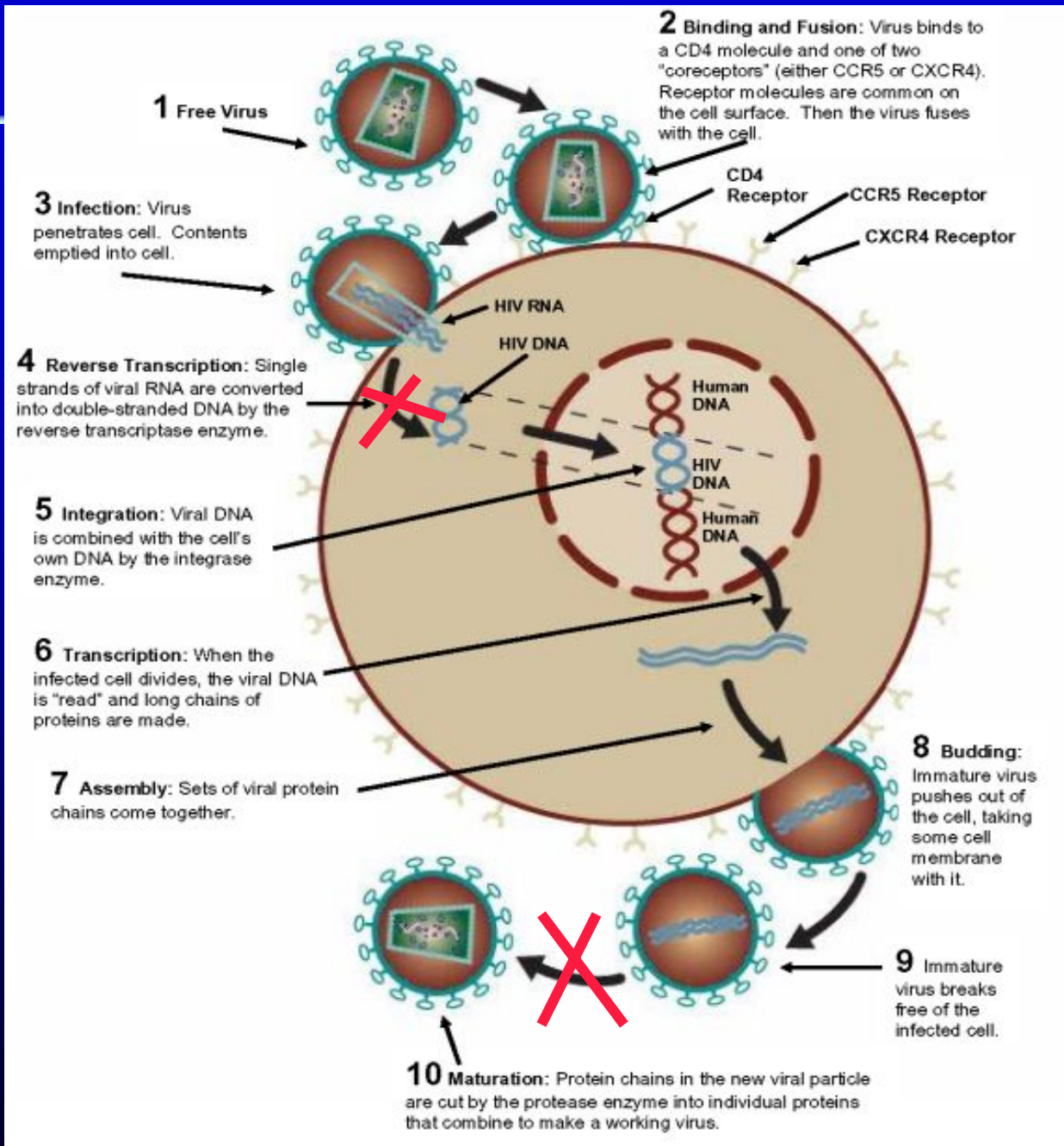
- A comprehensive ARV program
- Excellent patient education and preparation before starting ARVs
- Perfect or near perfect patient adherence to ARVs
- Provider knowledge of ARVs and proper use
- Excellent patient follow-up and monitoring



ARV Medication Groups

Mode of action: antiretroviral drugs (ARVs) act on the HIV by interfering with its reproductive cycle. The main stages of the cycle where these drugs act to inhibit replication of the virus are:

- Nucleoside (and nucleotide) reverse transcriptase inhibitors (NRTI)
- Non-nucleoside reverse transcriptase inhibitors (NNRTI)
- Protease inhibitors (PI)
- Fusion inhibitors (not available in Nigeria yet)



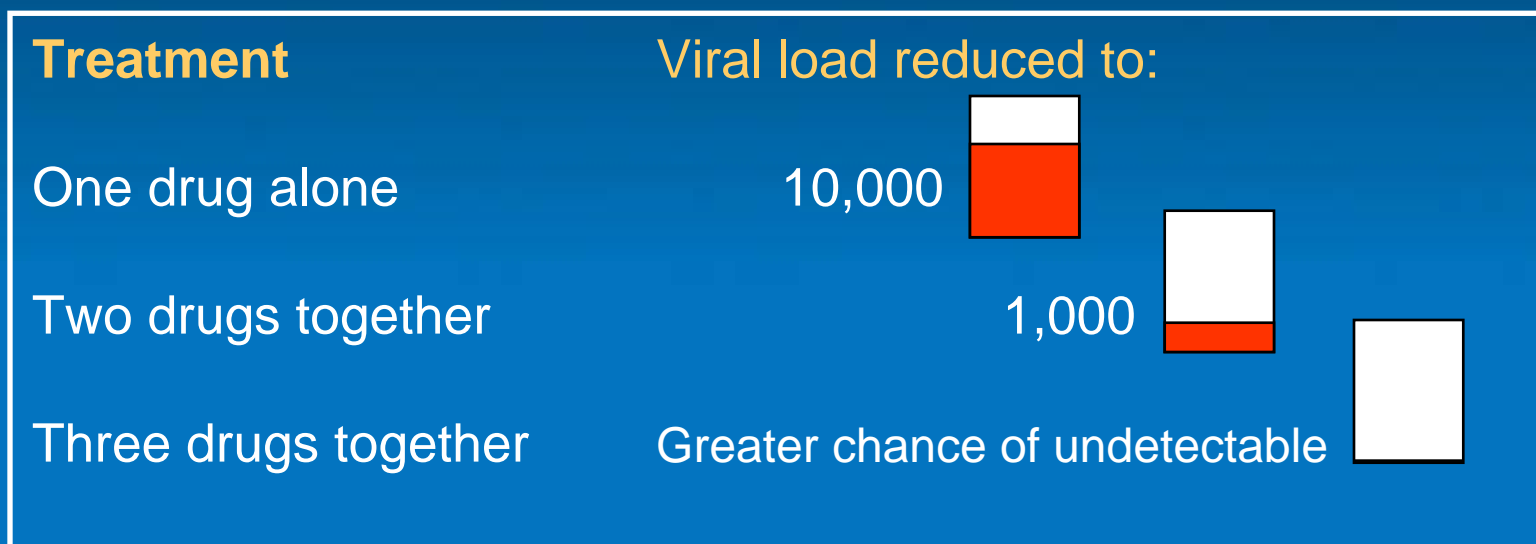
HAART: what is it?

- HAART = highly active antiretroviral therapy
- Requires the use of three different antiretrovirals to maximally suppress the virus
- Usually, at least two different mechanisms have to be utilized
 - Examples
 - Most common ones:
 - 2 NRTI and 1 NNRTI
 - 2 NRTI and 1 PI
 - Examples of others
 - 2 NRTI and 1 NNRTI and 1 PI
 - 2 NRTI and 2 PI
- HAART is now the standard of care for initiation of antiretroviral therapy worldwide
- Mega-HAART: May use as many as 6 ARVs in combination when multiple-drug resistance is present

Different drugs work together to reduce viral load

Example:

Viral load before treatment might be 100,000 copies/ml



ARV Agents Included in Nigeria's ARV Guidelines


Nucleoside reverse transcriptase inhibitors (NsRTIs)	Nucleotide reverse transcriptase inhibitor (NtRTI)	Non-nucleoside reverse transcriptase inhibitors (NNRTIs)	Protease inhibitors (PIs)
zidovudine (ZDV, AZT) didanosine (ddI) stavudine (d4T) lamiduvine (3TC) abacavir (ABC)	tenofovir disoproxil fumarate (TDF)	Nevirapine (NVP) Efavirenz (EFZ)	Saquinavir (SQV) Ritonavir (RTV) (pharmacoenhancer) Indinavir (IDV) Nelfinavir (NFV) Lopinavir/ritonavir (LPV/r)



Challenges for ART Programs in Resource-Constrained Countries

- Limited resources
- Procurement of affordable ARVs
- Ensuring ARV supply
- Security of ARV storage
- Limited physical infrastructure
- Providing necessary laboratory monitoring
- Need for trained doctors and nurses
- Staff turnover

Prerequisites for a Successful ARV Program

- 
- Adequate infrastructure
 - Lab facilities for patient diagnosis and monitoring
 - Access to OI/symptomatic treatment
 - Continuous supply of ARVs
 - Informed communities
 - Counseled patients
 - Physicians/nurses/ other team members trained
 - ARV treatment guidelines in place
 - Political will & view for sustainable program



Summary

- Antiretroviral therapy should reduce morbidity and mortality from HIV/AIDS
- While there are risks of drug resistance and anticipated side effects from medications, antiretroviral therapy's benefits outweigh the risks
- Monitoring patients on therapy is critical
- Adherence to therapy is the key to success
- ART programs should address programmatic challenges to ensure success in scaling up ART