

Introduction to Antiretroviral Therapy / Goals and Principles

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 (ARV)



The goals of ARV's are as follows

1. Reduce HIV-related **morbidity** and **mortality**
2. Reduce the **viral load** (to undetectable levels) for as long as possible in order to halt disease progression and prevent/reduce resistant variants
3. Achieve **immune reconstitution** that is quantitative (CD4 count in normal range) and qualitative (fewer infections and illnesses)

The HIV viral load



THE VIRAL LOAD is

1. A count of the number of HIV RNA molecules in 1 ml of plasma (copies/ml)
2. A direct measure of the level of HIV infection
3. A predictor of disease symptoms and of the rate of CD4+ T cell decline
4. What's a good viral load for a patient on treatment? *An undetectable viral load (<50 copies/ml)!*
 - * If viral load is this low, patients are unlikely to have disease progression, resistance, or to pass HIV through MTCT

Antiretrovirals keeps 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 isn't a constant attack from HIV, CD4 cell levels rise and they can do their job

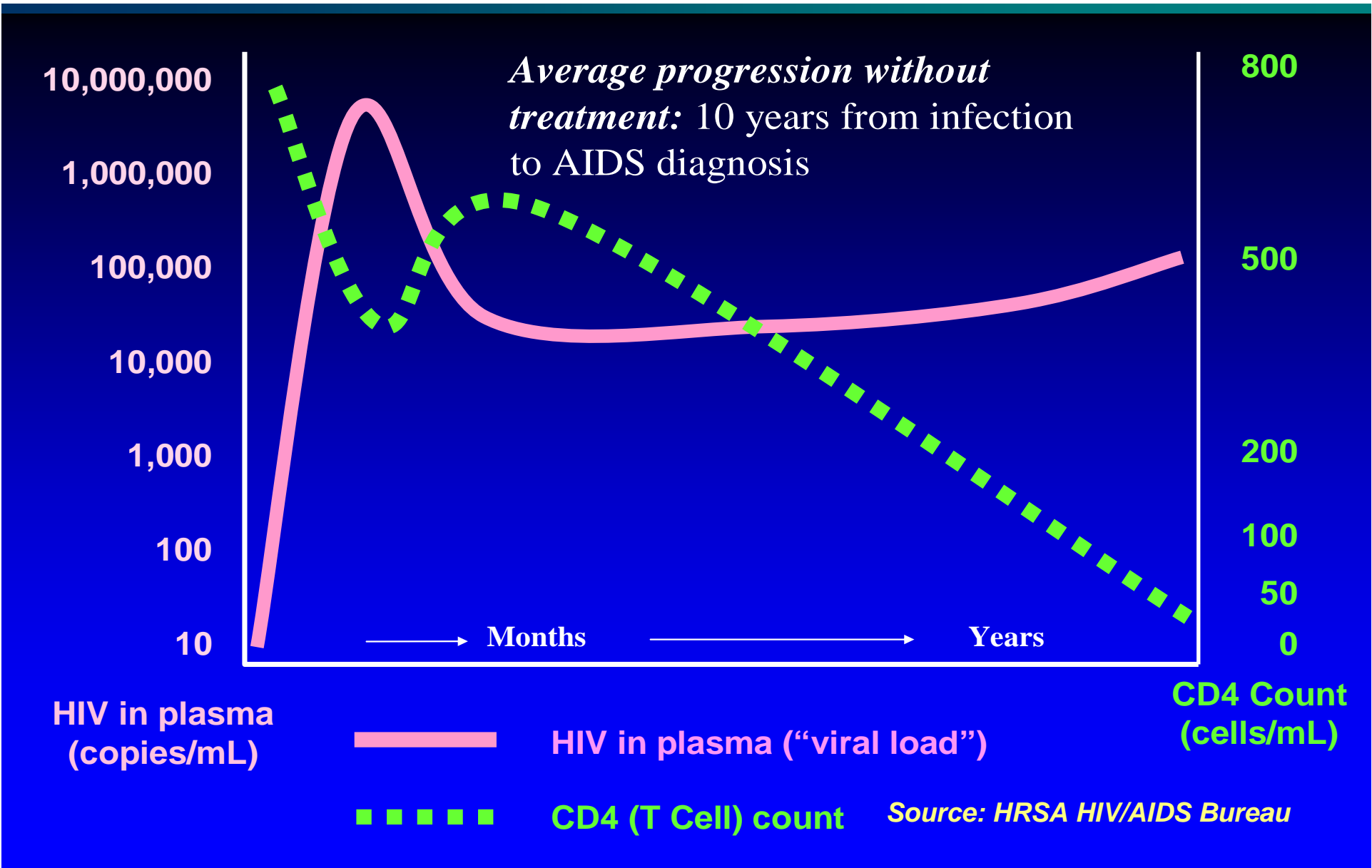
New CD4 cells

Normal level

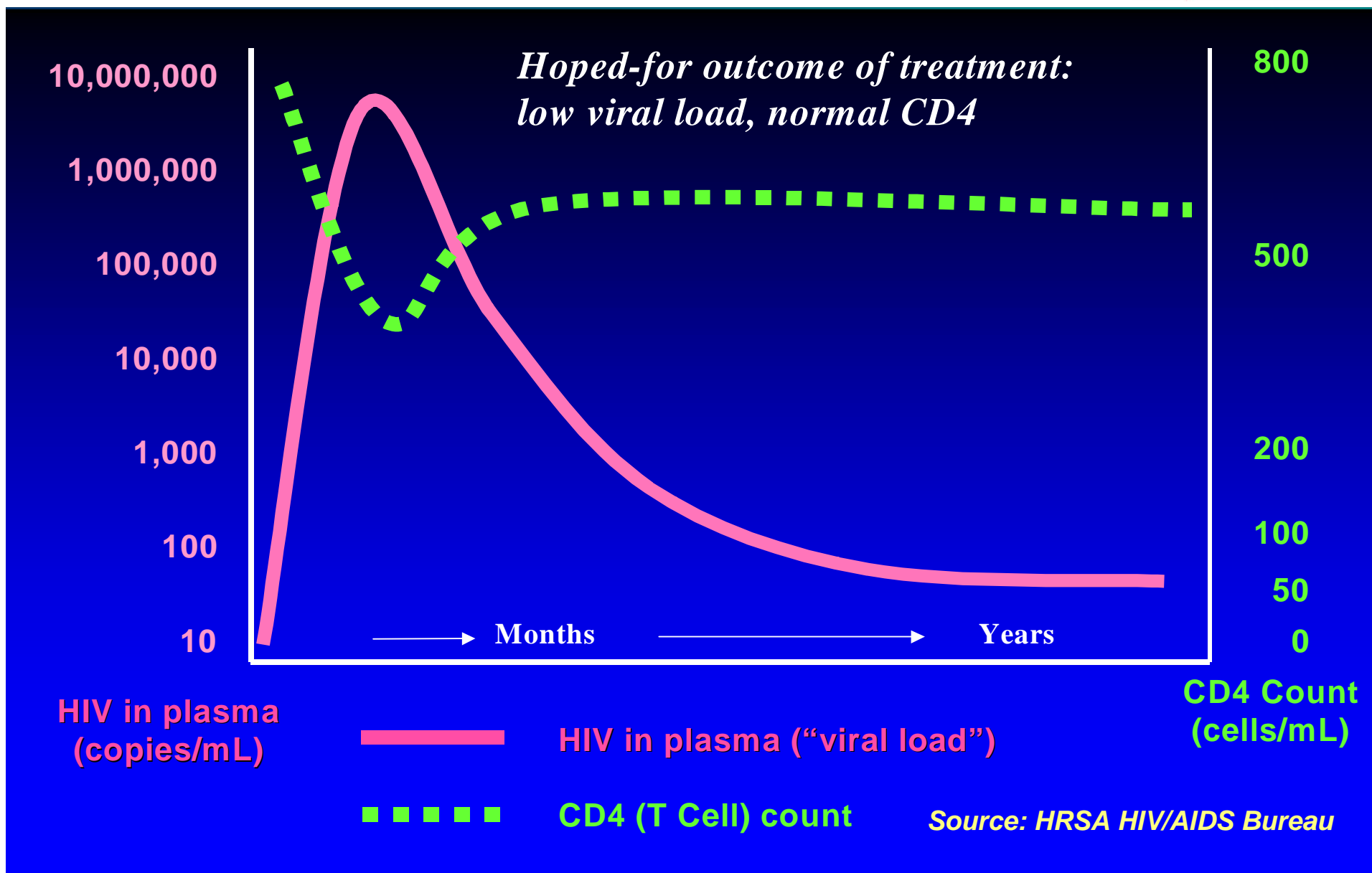


CD4 cells killed by HIV

HIV Progression without treatment



HIV Progression with treatment



Benefits of ARV



The benefits of ARVs include:

- I. ↑ voluntary testing/counseling
- II. ↑ awareness of HIV
- III. ↑ motivation of health care workers
- IV. ↓ expenses for palliative and OI care
- V. ↓ number of orphans
- VI. Keeps households and businesses intact
- VII. 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



The risks of ARVs include:

- I. 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
- II. Possible short and long term side effects for patients
- III. Possible interactions with other medications or natural remedies

Strategies to reduce ARV risks



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

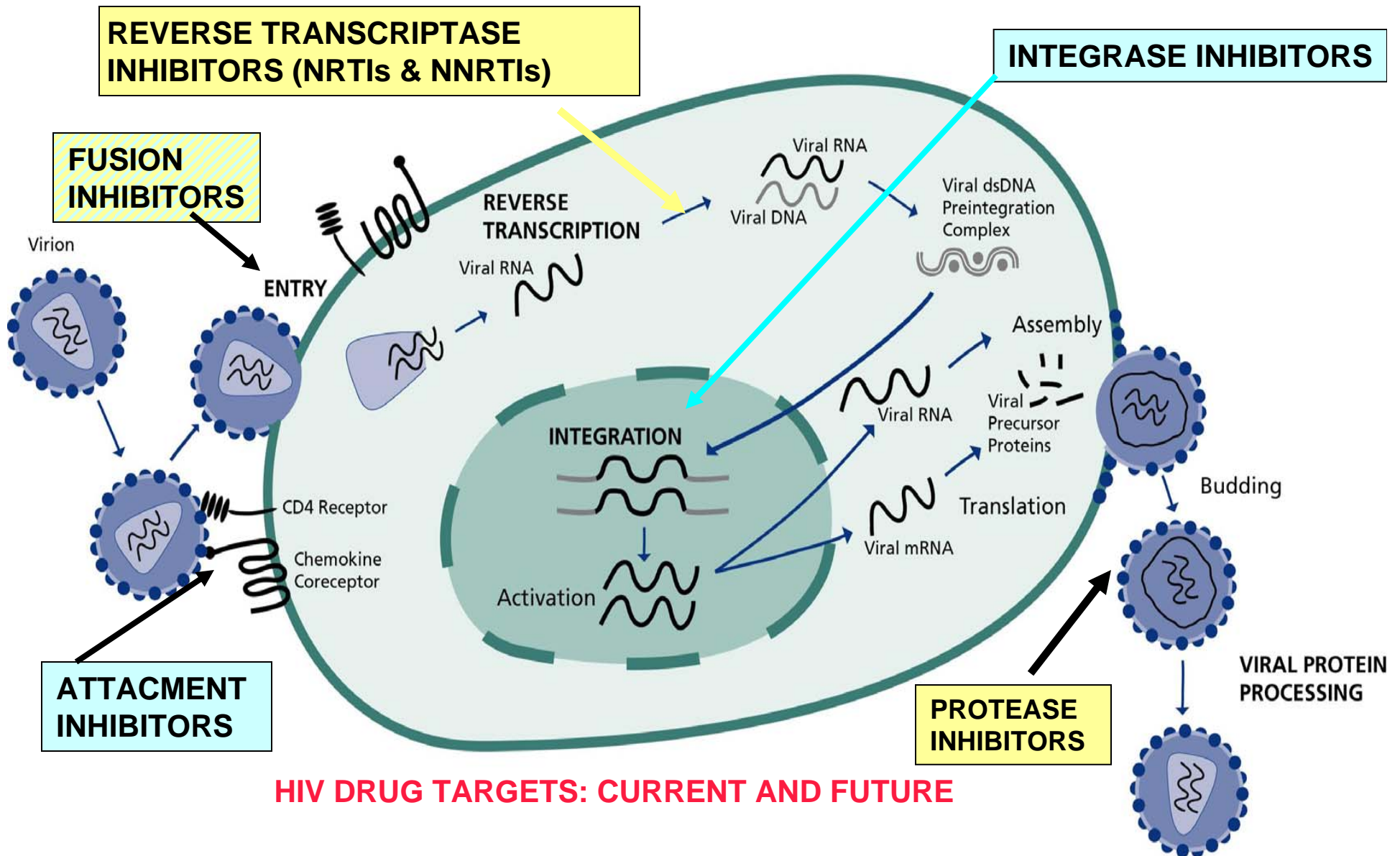
ARV Medication Groups



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:

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



HIV DRUG TARGETS: CURRENT AND FUTURE

Highly active antiretroviral therapy (HAART)



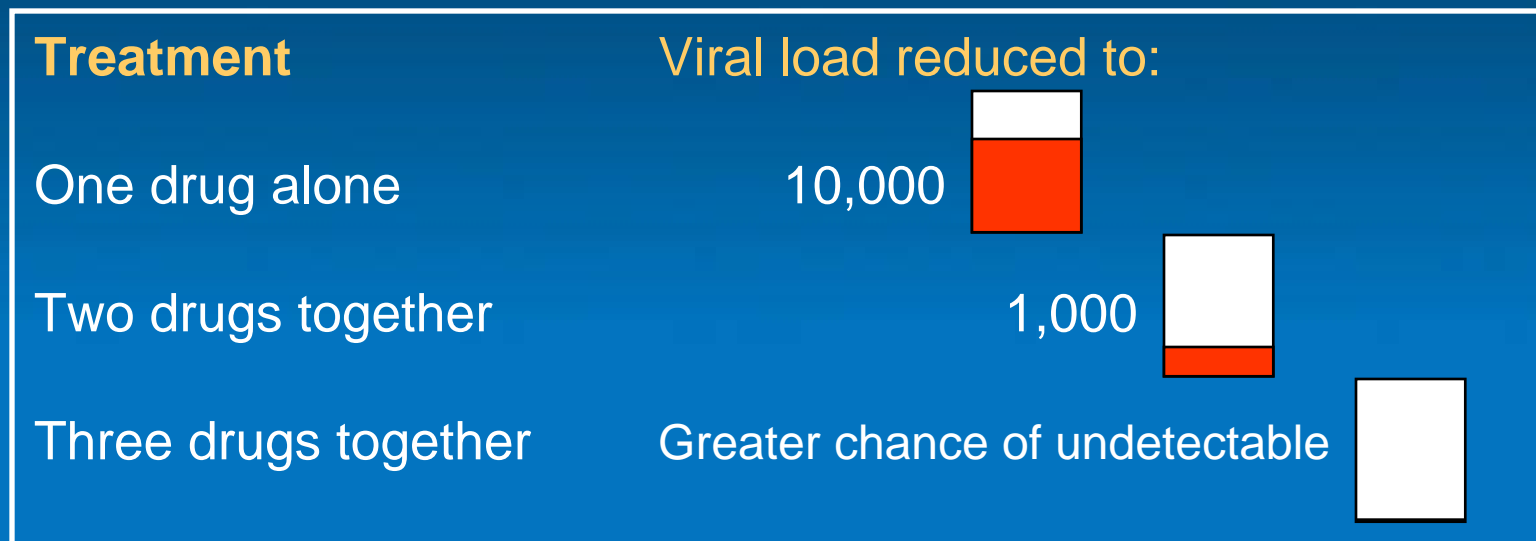
HAART is defined as:

- Any antiretroviral regimen that will:
 - * Prevent disease progression
 - * Optimize opportunity for recovery
 - * Prevent selection for drug resistance
- In practice, must maintain viral load <50 copies/ml *to prevent resistance*
- Usually requires 3 or more drugs in at least 2 different classes

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) |
|---|---|---|--|
| <ul style="list-style-type: none"> • Zidovudine (ZDV, AZT) • Didanosine (ddI) • Stavudine (d4T) • Lamiduvine (3TC) • Emtricitabine (FTC) • Abacavir (ABC) | <ul style="list-style-type: none"> • Tenofovir disoproxil fumarate (TDF) | <ul style="list-style-type: none"> • Nevirapine (NVP) • Efavirenz (EFZ) | <ul style="list-style-type: none"> • Saquinavir (SQV) • Ritonavir (RTV) (pharmacoenhancer) • Indinavir (IDV) • Nelfinavir (NFV) • Lopinavir/ritonavir (LPV/r) • Atazanavir (ATV) • Amprenavir (APV) |

Goals of Antiretroviral Therapy



Considerations for Regimen Choice

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

Importance of adherence



ARVs, when taken correctly, can tremendously enhance a patient's life and dramatically halt progression of disease

However, in order to derive the most benefit from the medications, adherence must be EXCELLENT

Adherence Points

- Should work with the patient to develop adherence strategy
- If ARVS are taken improperly, problems may occur on a personal and public health level
 - * Implications on resistance, cross resistance, spreading resistant virus and cost
- Will be discussed in more detail in a separate presentation

Challenges for ART Programs in Resource-Constrained Countries



CHALLENGES

- 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



A SUCCESSFUL ARV PROGRAM SHOULD HAVE:

- 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

The 3 most important things to know about HIV treatment



MUST NOT FORGET

- Resistance will evolve if virus grows in the presence of drug
- Treatment must be potent enough to stop virus from growing and must present a high genetic barrier to resistance
- All drugs must be taken every day *or all drugs must be stopped* (but can later be restarted).

Accomplishing successful treatment requires that the patient and HIV care team work together.

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

THANK YOU