



# HIV Basics



# OBJECTIVES



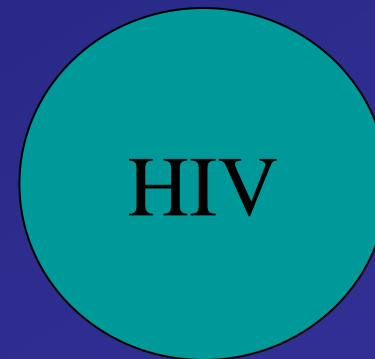
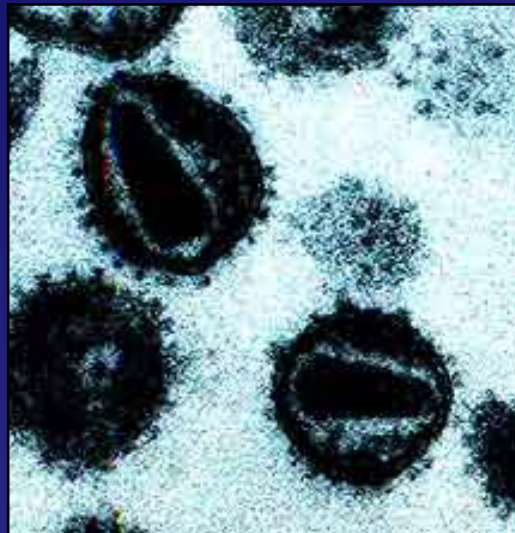
1. What is HIV?
2. How is HIV transmitted?
3. What is the immune system?
4. What does HIV do?
5. What is AIDS?
6. What are principles of ARV treatment?
7. What are the goals of ARV treatment?



# 1. WHAT IS HIV?

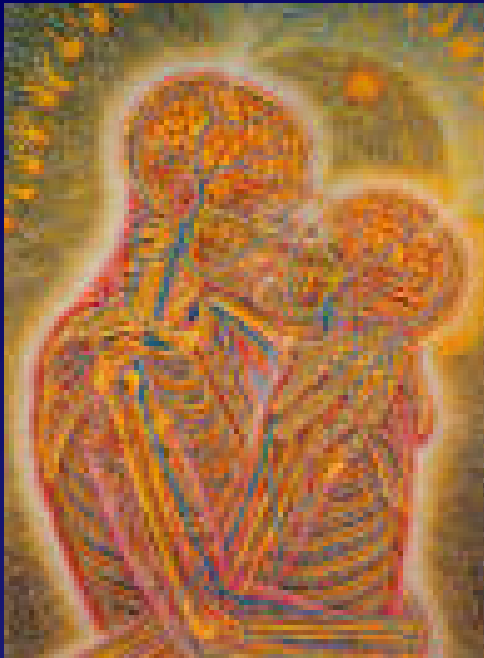


HIV is a virus that hides in the blood, semen, or genital tract of infected people. It makes people sick by attacking their immune system.

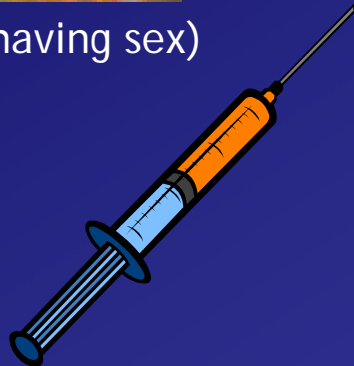




## 2. WAYS SOMEONE CAN GET HIV



Sexual fluids (having sex)



Blood (infected needles or blood transfusions)



Mother to baby during pregnancy or delivery



Mother to baby through breastfeeding



## 2. WAYS HIV IS **NOT** TRANSMITTED:



- Coughing / Being in the same room
- Sharing the toilet
- Touching/Shaking hands
- Eating from the same dish
- Sharing Clothes
- Mosquitoes
- Water
- Urine
- Saliva



### 3. WHAT IS THE IMMUNE SYSTEM?



- Viruses and bacteria (germs) cause many diseases by entering the body and reproducing in the body.
- These germs are everywhere, but they are so small that we can't see them.
- We breathe germs, eat germs, and touch germs.
- Our immune system protects us from these germs so we don't get sick.





# HOW DOES THE IMMUNE SYSTEM WORK?



- Creates a barrier to prevent germs from entering the body
- Detects and eliminates germs before they can reproduce inside your body
- Eliminates those germs which have entered and reproduced in the body.





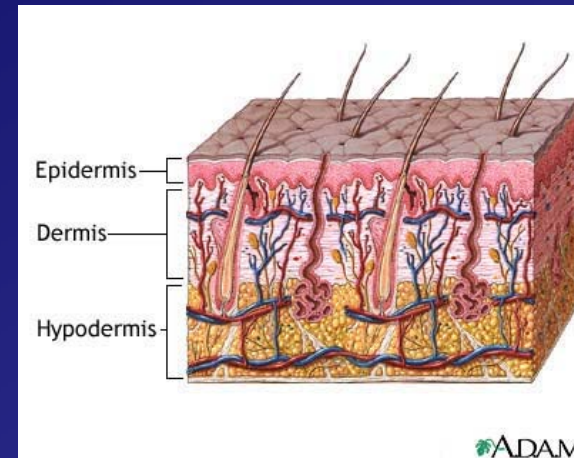
# HOW DOES THE IMMUNE SYSTEM WORK?



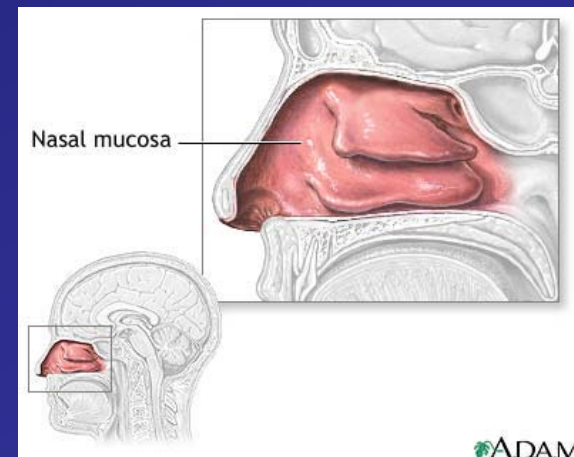
What protects us when germs are outside the body?

- Skin
- Tears
- Mucus
- Saliva

Pictures from  
<http://health.allrefer.com/pictures-images/skin-layers.html>  
<http://www.health.allrefer.com/health/mucosa-info.html>



A layer of the skin



The mucus in the sinuses

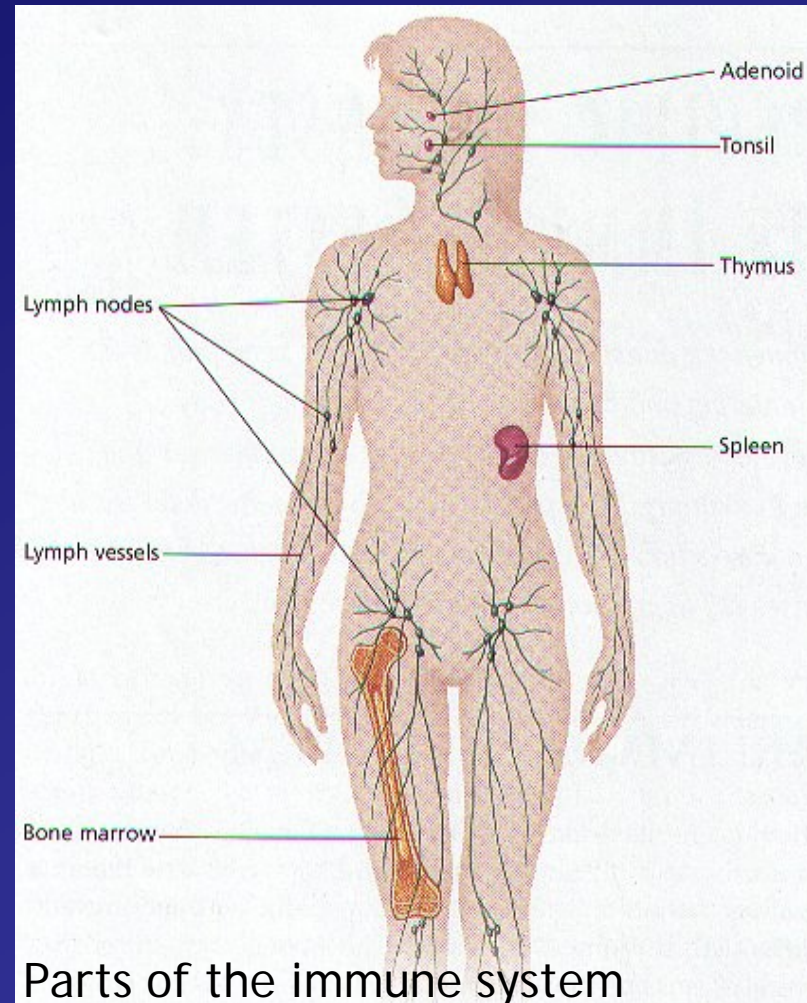


# HOW DOES THE IMMUNE SYSTEM WORK?



What protects us when germs are inside the body?

- A. Lymph system
- B. White blood cells
  - i. T-cells (CD4 cells)
  - ii. B-cells
- C. Antibodies
- D. Thymus
- E. Bone marrow



Parts of the immune system

Picture from  
[www.sirinet.net/~jgjohnso/immunesys.jpg](http://www.sirinet.net/~jgjohnso/immunesys.jpg)



# LYMPH SYSTEM



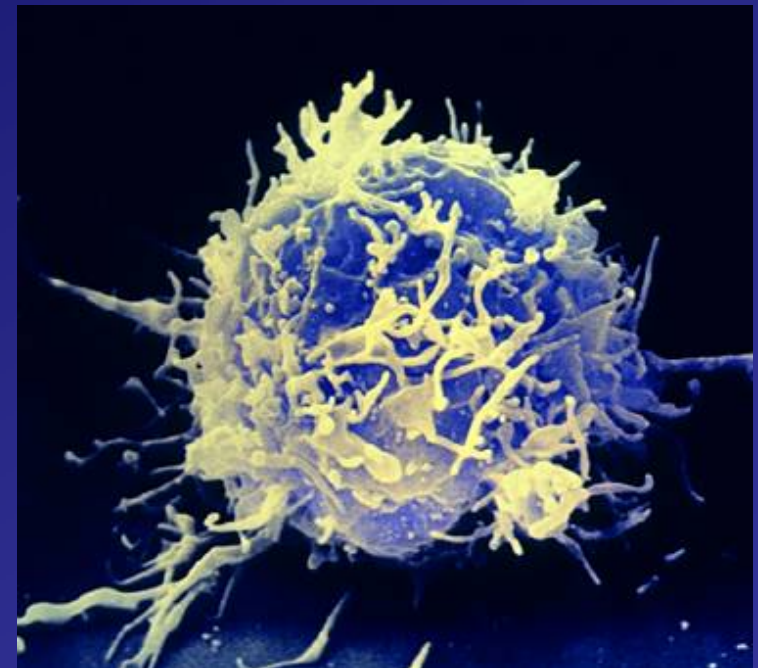
- Lymph
  - is blood plasma (the clear part of the blood)
  - absorbs nutrients, waste products, and “bad” bacteria
  - filters the good from the bad, delivers the good to the cells and carries away the bad
- Lymph nodes
  - process the waste and germs
  - swell when the body fights bacteria



# WHITE BLOOD CELLS



- T-cells (CD4 cells)
  - Produced in the thymus
  - Recognizes disease “intruders” in the body
  - Coordinates the antibody fight against the disease
- B-cells
  - Produced in bone marrow
  - Produce *antibodies*
    - Recognize specific diseases
    - Attack those diseases



A healthy t-cell

Picture from

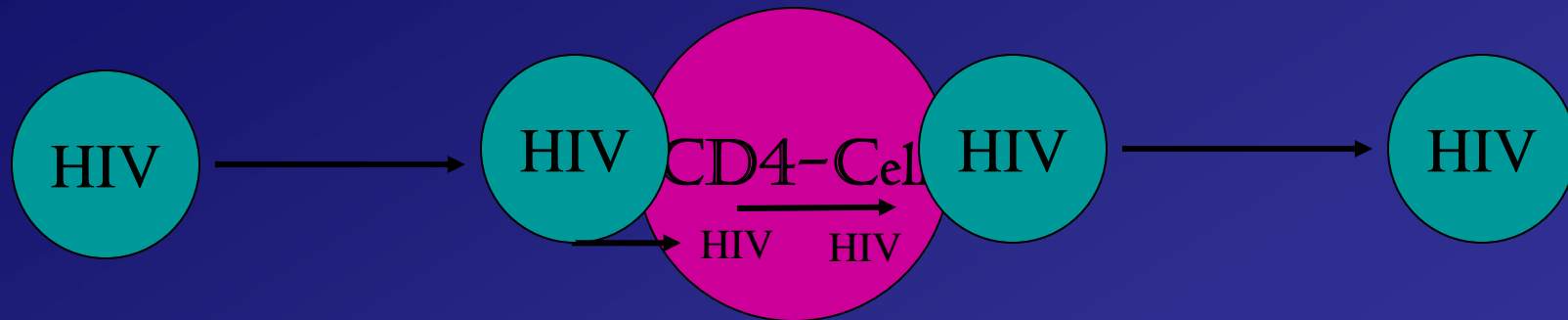
[http://ca.encarta.msn.com/media\\_461519550/Lymphocyte.html](http://ca.encarta.msn.com/media_461519550/Lymphocyte.html)



## 4. WHAT DOES HIV DO?



HIV uses the CD4-cell to make more HIV

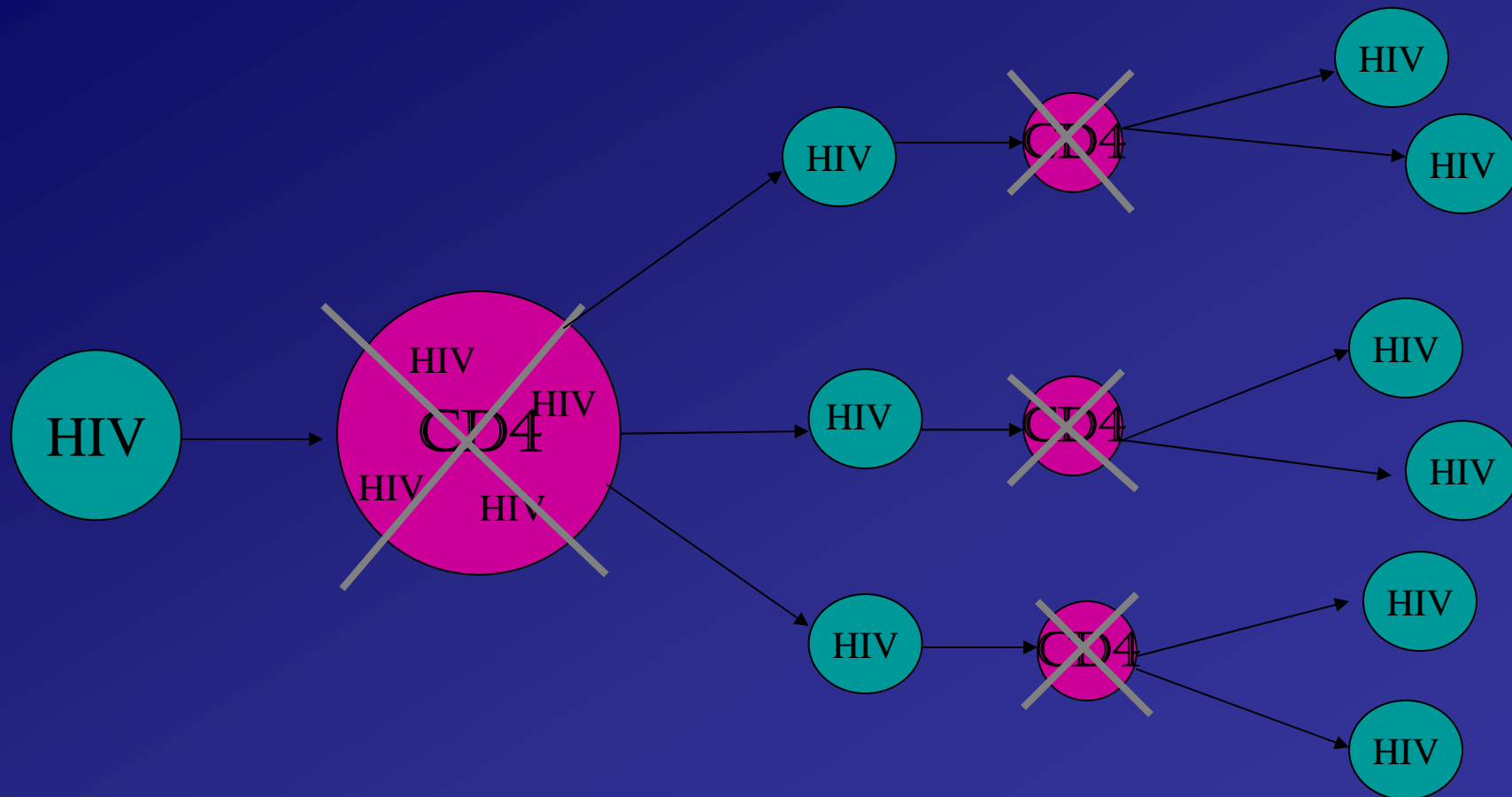




## 4. WHAT DOES HIV DO?



This eventually kills the cell, and the new virus is released into the bloodstream.

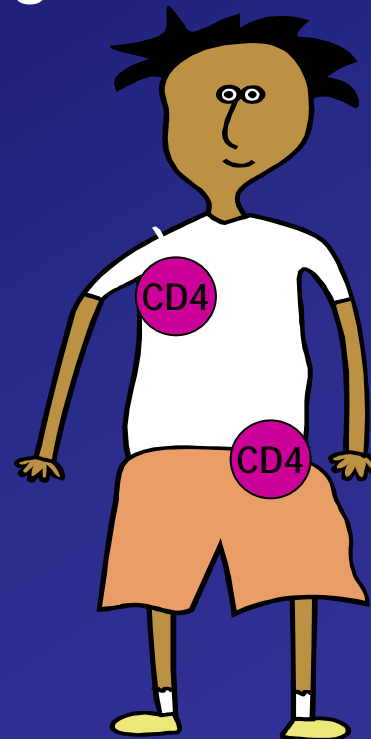
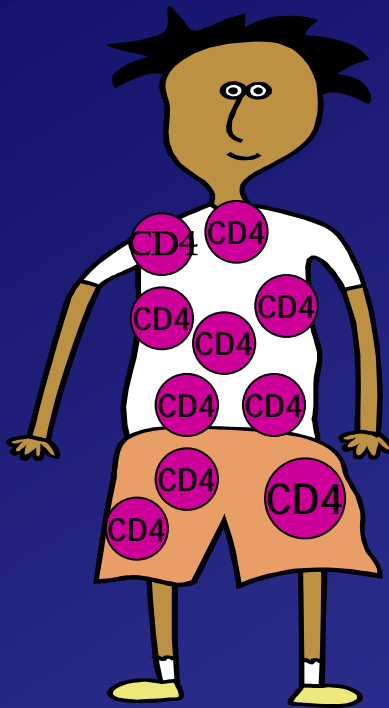




## 4. WHAT DOES HIV DO?



- When this happens, CD4 cells may get dangerously low.
- The immune system is very weak without its CD4 cells and cannot fight off infections

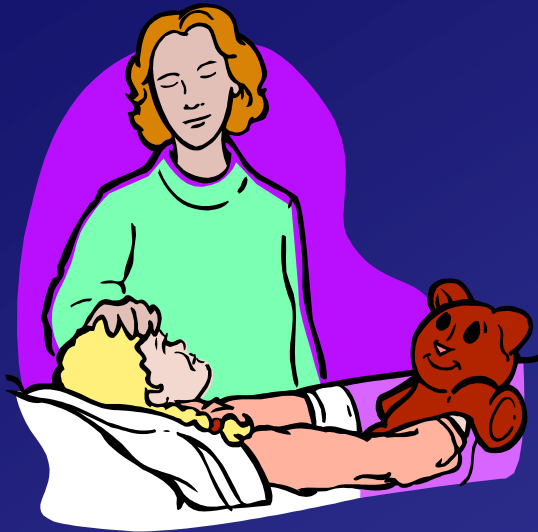




## 4. WHAT DOES HIV DO?



When this happens, people get sick and may get AIDS.





## 5. WHAT IS AIDS?



**AIDS happens when the immune system is very weak.**

- Some signs and symptoms of AIDS are easy to recognize:
  - Wasting/ weight loss
  - Chronic diarrhea
  - Thrush/Candidal esophagitis
  - Hair changes
  - Kaposi's Sarcoma
  - Skin infections
- Other AIDS-related diseases are less easy to recognize:
  - Different types of pneumonias
  - Different types of cancers



# COMMON SIGNS AND SYMPTOMS OF AIDS



Wasting and skin disease



Oral thrush



Kaposi's Sarcoma (KS)



# HOW QUICKLY DOES THE IMMUNE SYSTEM BECOME WEAK FROM HIV?



- Some people can have HIV for years and have no symptoms of AIDS.
- Others can become infected with HIV and develop symptoms of AIDS within months.
- This difference is unpredictable and depends on the patient's own immune system and its reaction to HIV.



Because children are still growing, their immune systems are still growing too





**Children with HIV have faster progression of disease than adults**





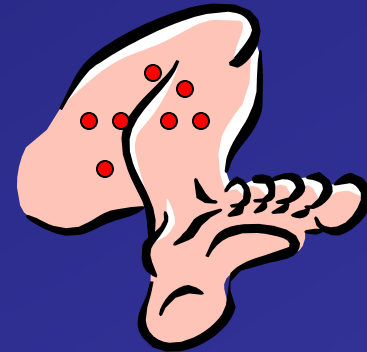
- Children have more frequent bacterial infections
- Children have more frequent opportunistic infections



# Early HIV infection results in more severe and recurrent infections

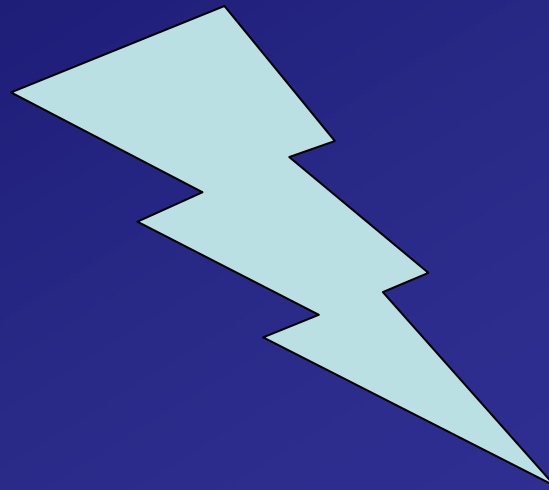


- Pneumonias
- Sepsis
- Tuberculosis
- Measles





These illnesses present similarly in HIV-positive and HIV-negative children; however, they are more frequent and often more severe in HIV-positive children





# Common symptoms of HIV infection



- Oral thrush--white patches in the mouth
- Lymphadenopathy-enlarged lymph nodes
- Hepatomegaly-enlargement of the liver
- Splenomegaly-enlargement of the spleen
- Diarrhea lasting > 1 month
- Failure to thrive





# Symptoms of HIV (cont.)



- Fever ( $>38.5$ ) lasting  $> 1$  month
- Chronic dermatitis
- Parotitis
- Recurrent or persistent upper respiratory infection, sinusitis or otitis media
- Developmental delay



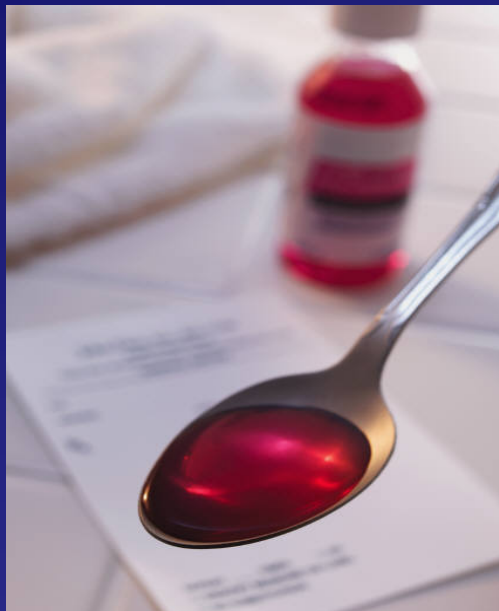


The most common AIDS-defining illness in infants is pneumonia caused by *Pneumocystis carinii* (PCP)



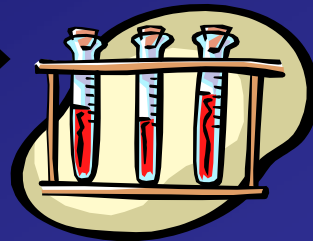


PCP can be prevented by giving a prophylactic antibiotic to infants until their HIV status is determined





Doctors can tell how much HIV is in your body by checking a blood test called the “**HIV Viral Load**” (this test is not widely available in Nigeria right now).

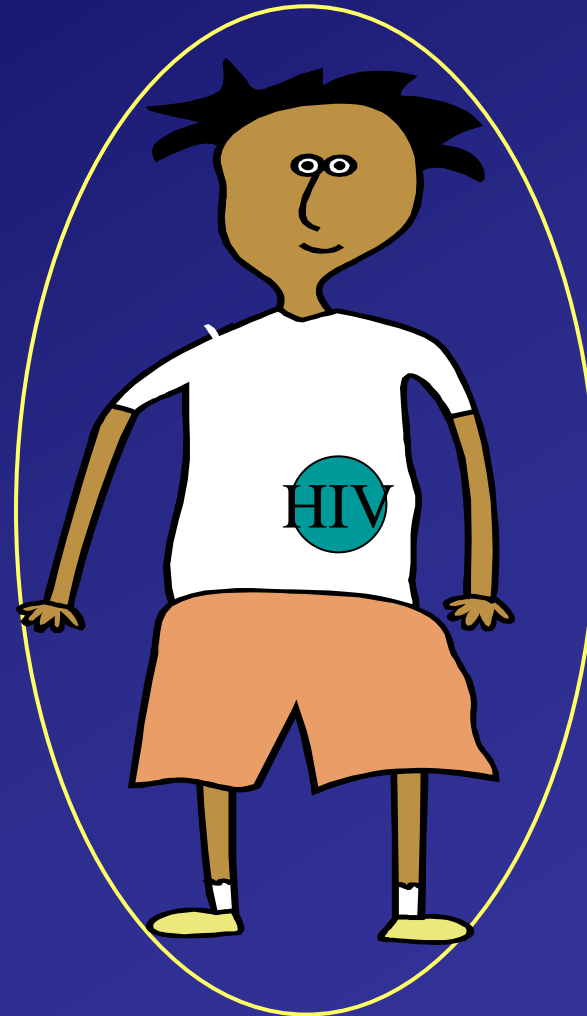
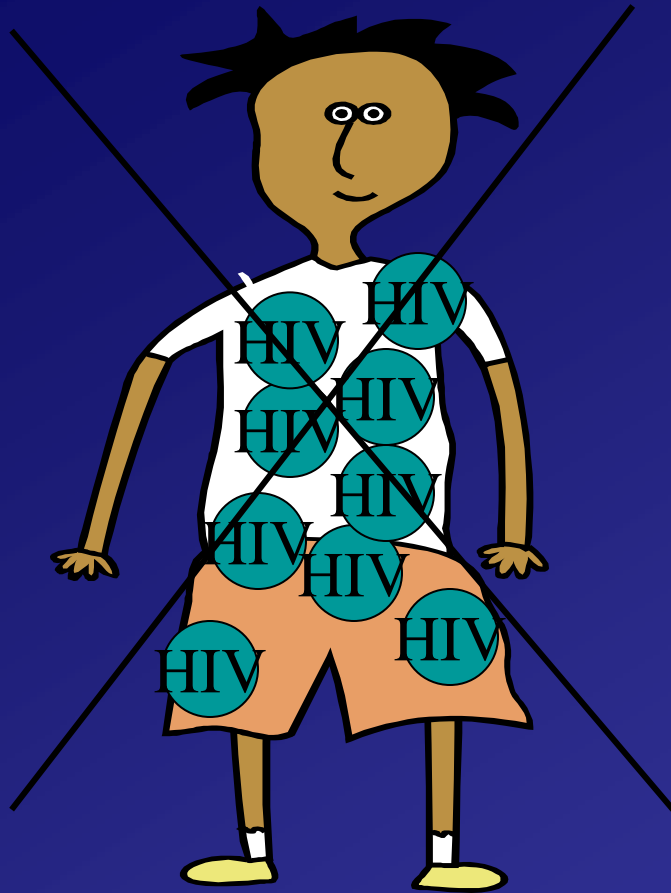




# 4. WHAT ARE THE GOALS OF TREATMENT?



We want the **viral load** to be **low** !

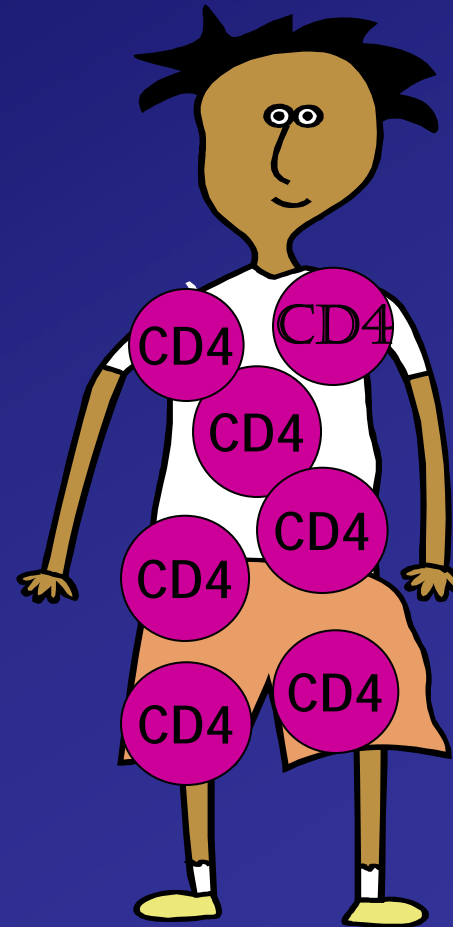




## 4. WHAT ARE THE GOALS OF TREATMENT?



Doctors can also check to see how many **CD4 cells (or T-cells)** a patient has in his/her body. We want this number to be **HIGH!**





# NATURAL HISTORY OF PAEDIATRIC HIV



## Immunologic Parameters

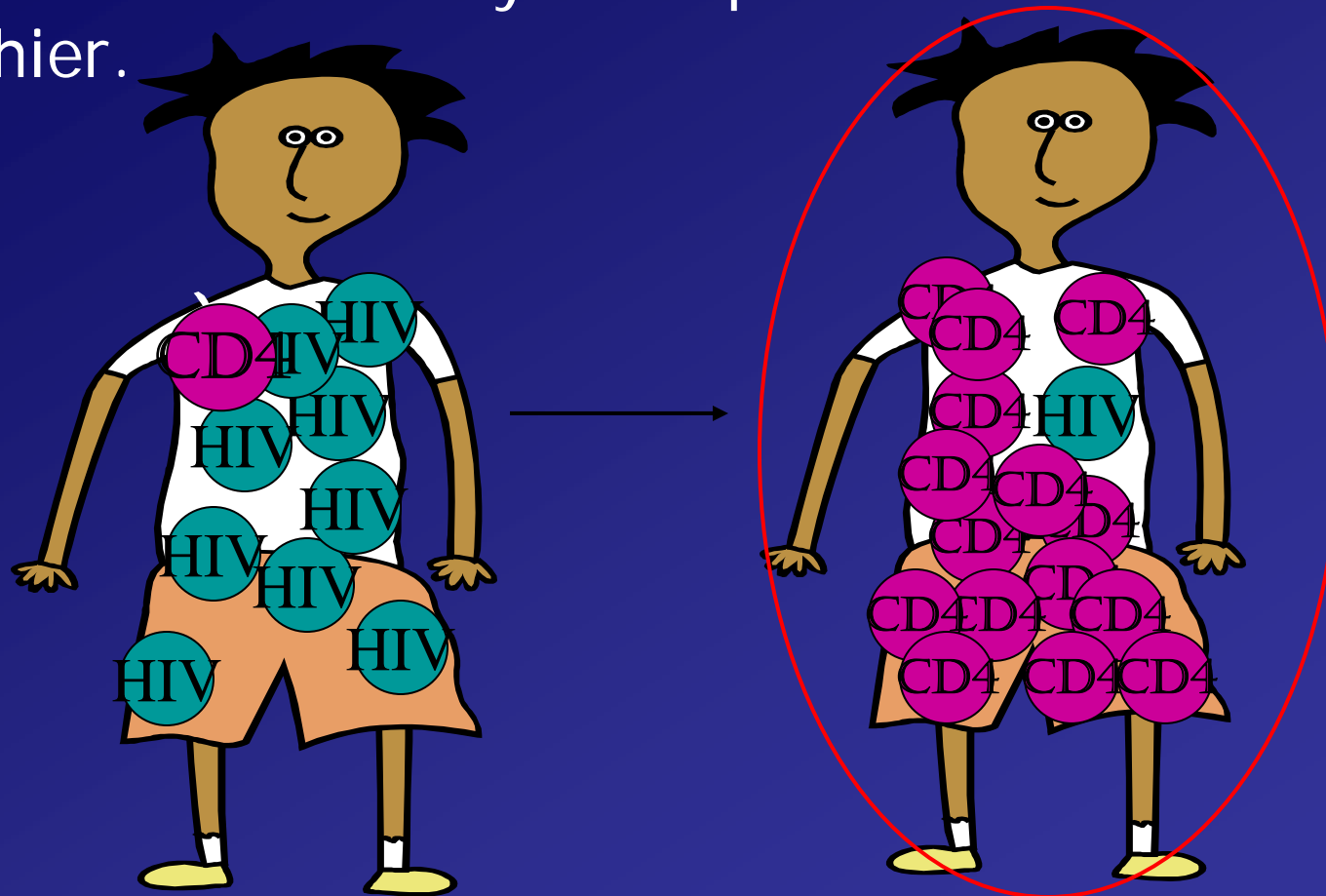
- **Absolute CD4 count** higher in healthy children than in adults.
- **Absolute CD4 count** varies with age
- Normal **absolute CD4 counts** slowly decline to adult levels by age 6
- **CD4 percentage** does not change with age.
- In children < 6 yr, **CD4 percentage** is the preferred way to monitor disease progression.



## 4. WHAT ARE GOALS OF ARV TREATMENT?



When the medicines are working, the patient's CD4 count (or percentage) will be high and there will be very little virus in his or her body. The patient will feel stronger and healthier.





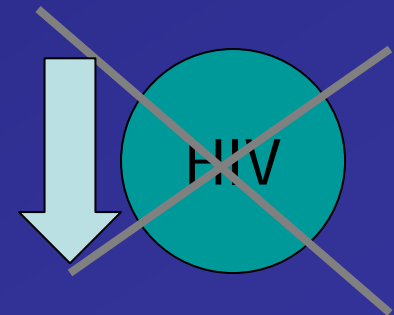
# 5. WHAT ARE THE GOALS OF TREATMENT?



CD4



If your **CD4 cells** are **high** and your **viral load** is **low**, you can be productive and healthy for a very long time





# QUESTIONS?



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