



# HIV PREVENTION COUNSELING: THE FACTS

## Medical Overview March 7, 2019

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# Inova Juniper Program Sites

Offering medical care, case management  
and mental health for youth and adults  
who are infected with HIV disease

## Main Office: Fairfax

2740 Prosperity Ave, Suite 200

Fairfax, VA 22031

703-321-2600

- Falls Church

- Herndon

- Mt Vernon

- Leesburg

- Dumfries

- Manassas



# What is HIV?

- HIV is the Human Immunodeficiency Virus
- Attacks the body's immune system
- Can lead to AIDS (Acquired Immunodeficiency Syndrome) if left untreated
- HIV can be treated and controlled, but not cured



# How Is HIV Transmitted?

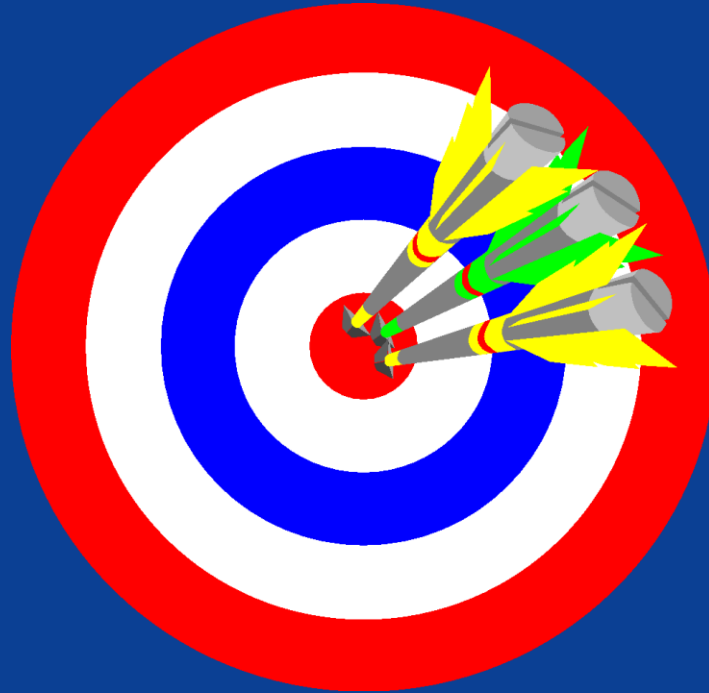
## Infectious body fluids

- Blood
- Semen/Pre-Ejaculation fluid
- Vaginal/Cervical fluid
- Breast Milk

## Risks

- Anal sex, vaginal sex and oral sex
- Sharing needles and other injection equipment
- From infected mother to child during pregnancy, delivery, or breastfeeding
- Occupational exposure

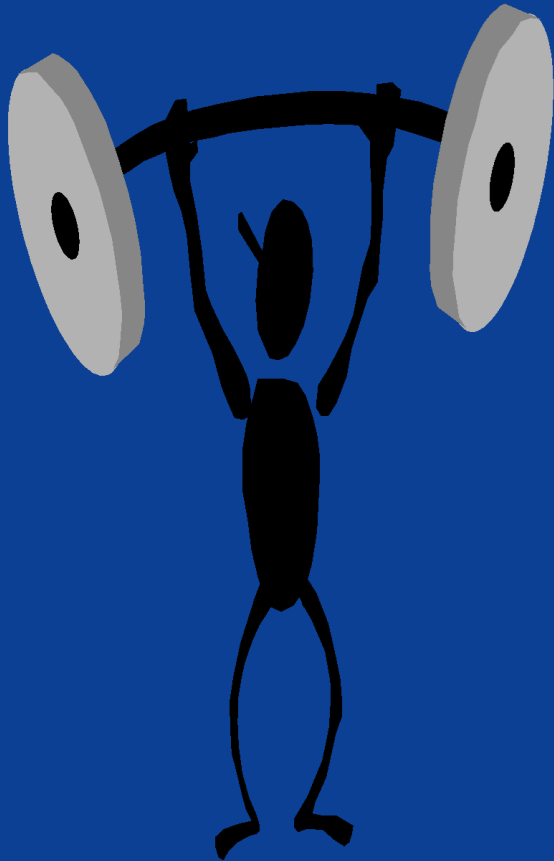
# The CD4+ T Helper Cell



## THE TARGET OF HIV

CD4 cells are destroyed during viral replication

# WHAT IS A “NORMAL” CD4 CELL COUNT?



600 -  
1200

# WHAT IS HIV VIRAL LOAD?

VIRAL LOAD IS THE NUMBER OF PARTICLES OF HIV CIRCULATING IN BLOOD

But remember HIV can also be found in:

- Semen
- Vaginal Secretions
- Breast Milk

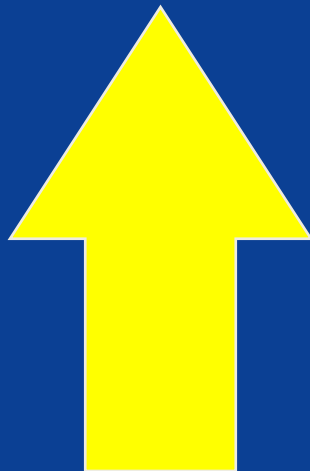
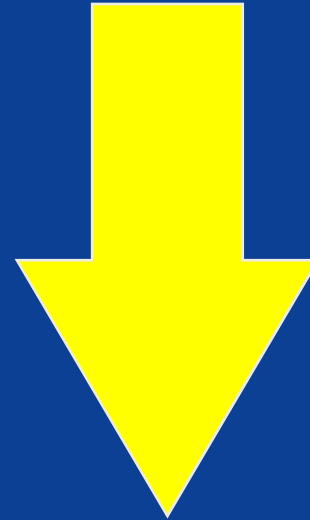
And also:

- Lymphoid tissue (nodes)
- Cerebrospinal fluid (and other potentially infectious materials-OPIM)

# GOALS OF TREATMENT

## VIROLOGICAL

UNDETECTABLE HIV viral load. Amount of virus is **BELOW LIMITS** of test, (i.e. <50, <75) **NOT** that HIV is gone.



## IMMUNOLOGICAL

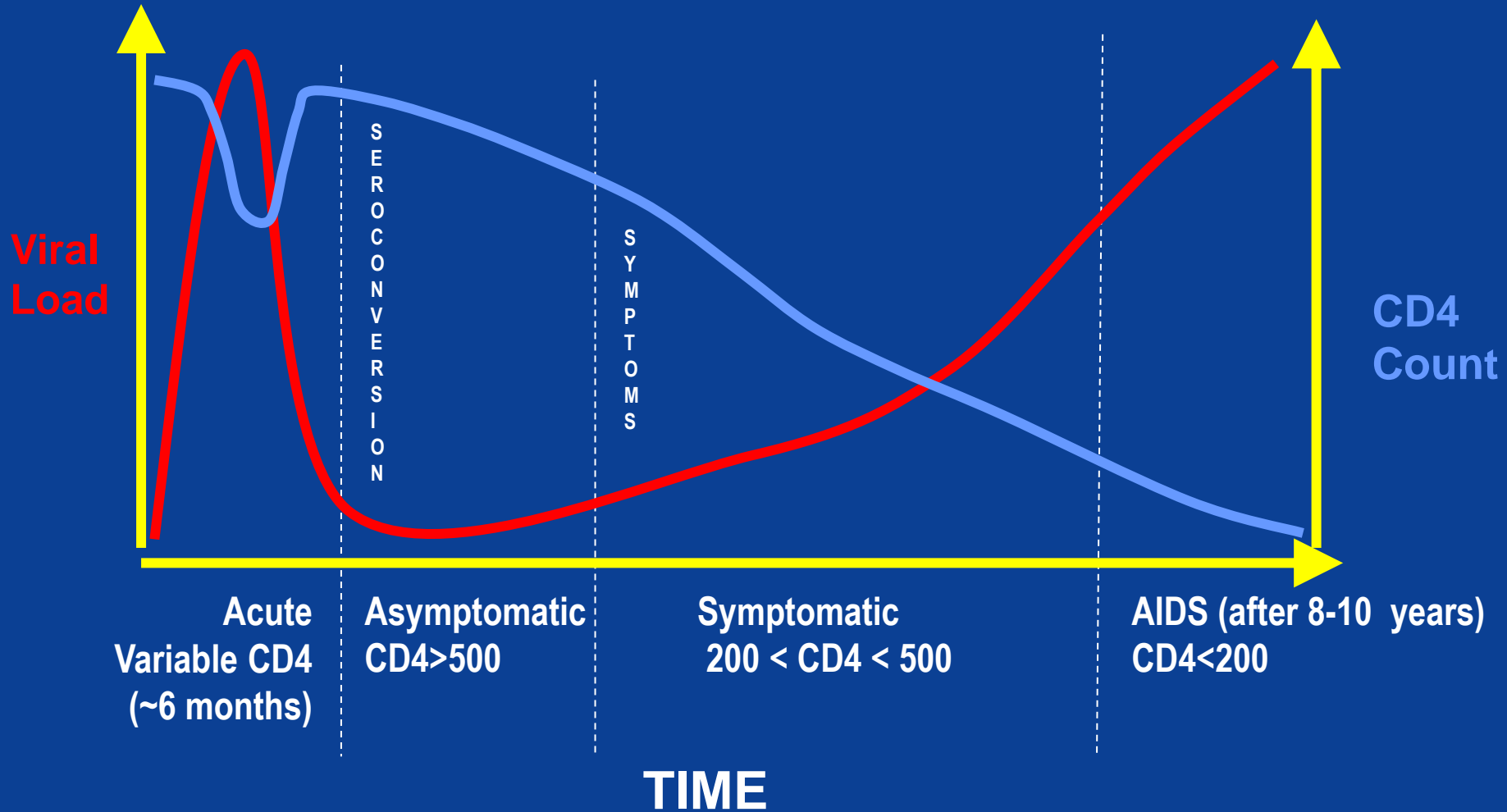
Increase in CD4 count

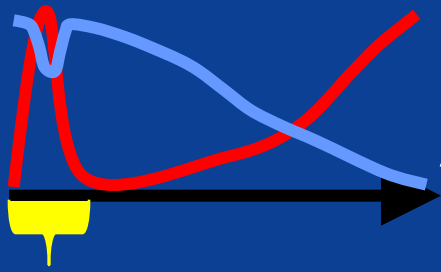




# Progression of HIV Infection without Treatment

← CO-INFECTIONS: STDs, HBV, HCV, TB →



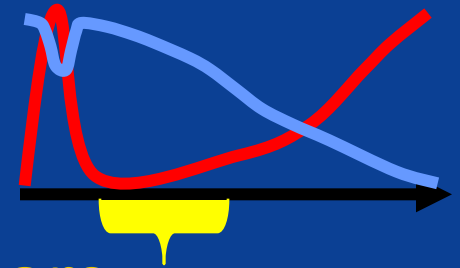


# Acute/Early Phase

- By sheer numbers of viral particles, this phase is highly infectious.
  - Many people don't know they are infected and remain sexually active.
  - Estimated 40% of transmissions during this phase
- Symptoms **MAY** include fever, swollen lymph glands, sore throat, rash, muscle aches, but may be without symptoms (30%)
- Lasts 1 to 6 weeks.
- HIV test may be negative during this “flu-like” illness; if concerned check VL as well

# Asymptomatic Chronic Infection

- No clinical symptoms
- Enlarged lymph nodes
- High rates of HIV replication
- Destruction of CD<sub>4</sub> cells
- Can last several months to tens of years





# Symptomatic Infection

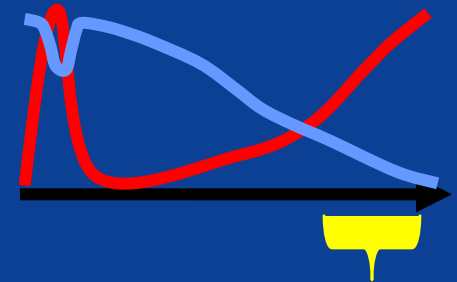
## Non-AIDS indicator conditions

- thrush (yeast infection of tongue/mouth)
- oral hairy leukoplakia (viral infection of tongue)
- peripheral neuropathy (HIV effect on nerves)
- idiopathic thrombocytopenic purpura (ITP)
- cervical dysplasia
- fever
- weight loss
- anemia
- recurrent herpes



# Late Stage Disease/AIDS

- CD<sub>4</sub> count <200/mm<sup>3</sup>
  - opportunistic infections
  - selected tumors
  - wasting
  - neurological complications
- Untreated: median survival is 3.7 years
- AIDS defining complication: median survival is 1.3 years



# Opportunistic Infections

- Infections that are more frequent or more severe because of immunosuppression in persons living with HIV
- In the early days of the epidemic “the face of AIDS” was caused by OIs. By the early 90s the advancement of treatment improved & reduced OIs
- Many patients are unaware of their HIV infection and seek medical care when an OI becomes the initial indicator of their disease



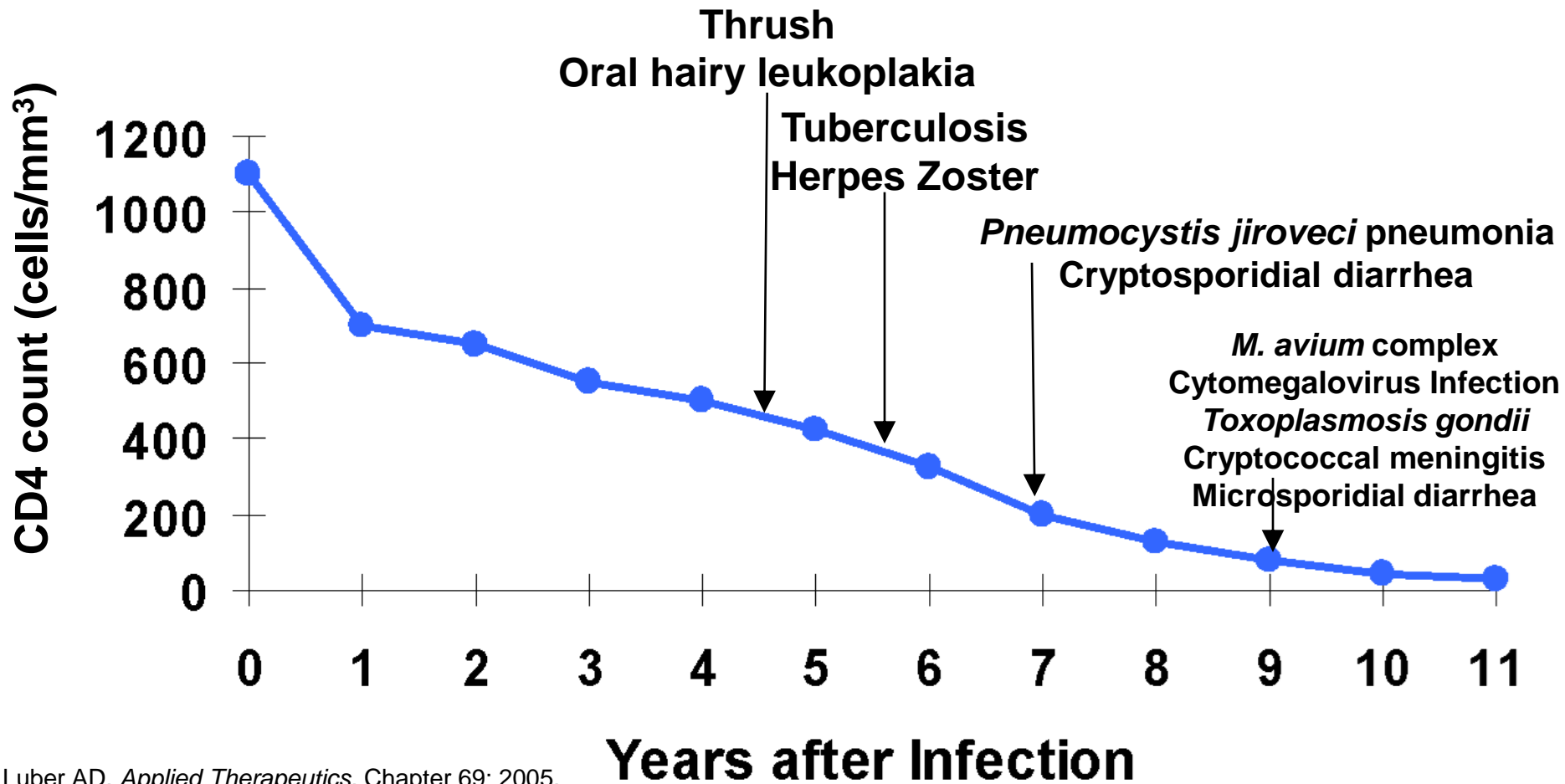
# AIDS Indicator Conditions

*include but not limited to*

- Severe HIV-related immunosuppression CD4 <200
- *Pneumocystis (carinii) jiroveci* pneumonia
- HIV wasting syndrome
- Esophageal candidiasis
- Kaposi's Sarcoma
- Severe herpes simplex
- Cryptococcosis
- HIV encephalopathy
- Cytomegalovirus retinitis / colitis / esophagitis
- Invasive Cancer (anal and cervical); lymphoma
- Mycobacterium avium complex (MAC) – CD4 <50



# CD4 Cell Count and Risk for Opportunistic Infections



Luber AD. *Applied Therapeutics*, Chapter 69; 2005.





# HAART

## Highly-Active Antiretroviral Therapy

(circa 1996)

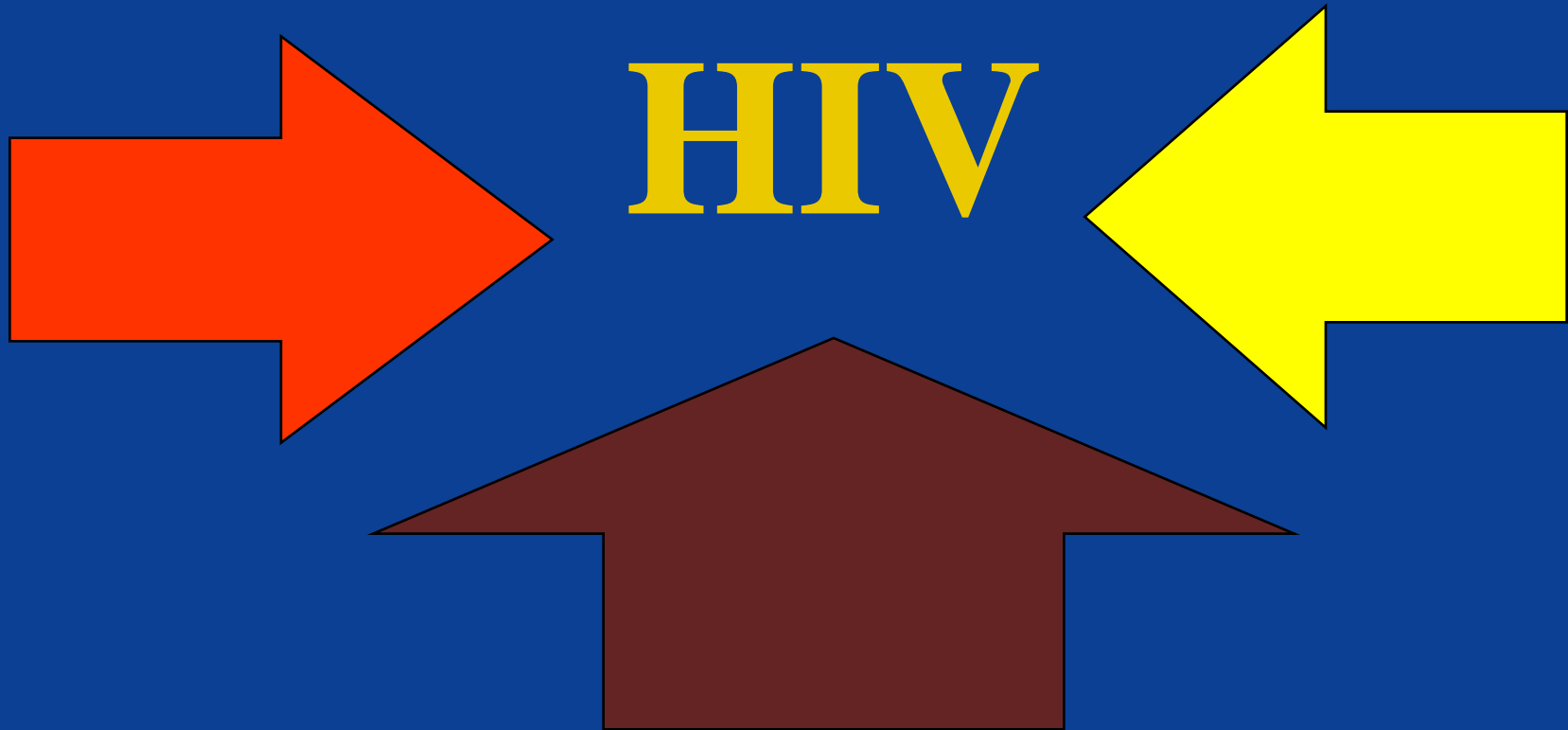


Medications from different classes of drugs used in combination with each other to treat HIV

Combination Antiretroviral Therapy



*3 drug therapy is the  
standard of care to treat*



# When do we treat?

- **As of 2012 Antiretroviral therapy (ART) is recommended for all individuals with HIV, regardless of CD4 count, to reduce the morbidity and mortality associated with HIV infection (AI).**
- ART is also recommended for individuals with HIV to prevent HIV transmission (AI).
- When initiating ART, it is important to educate patients regarding the benefits and considerations of ART, and to address strategies to optimize adherence.

*October 2017, DHHS Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents*



# When do we treat?



- While ART is recommended for all patients, the following conditions increase the urgency to initiate therapy:
- Pregnancy
- AIDS-defining conditions, including HIV-associated dementia (HAD) and AIDS-associated malignancies
- Acute opportunistic infections (OIs)
- Lower CD4 counts (e.g.,  $<200$  cells/mm<sup>3</sup>)
- HIV-associated nephropathy (HIVAN)
- Acute/early infection
- HIV/hepatitis B virus coinfection
- HIV/hepatitis C virus coinfection

October 2017, DHHS, Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents



# ARV Classes

- There are currently six drug classes all based on how each drug interferes with the HIV life cycle:
  1. NRTIs – Nucleoside Reverse Transcriptase Inhibitors
  2. NNRTIs – Non-Nucleoside Reverse Transcriptase Inhibitors
  3. INSTIs – Integrase Strand Transfer Inhibitors
  4. PIs – Protease Inhibitors
  5. Entry/Fusion Inhibitors
  6. CCR5 Inhibitors




# Nucleoside Reverse Transcriptase Inhibitors (NRTIs) (Nukes)

- Blocks reverse transcriptase (HIV enzyme). HIV uses reverse transcriptase to convert RNA to DNA.
- This essentially blocks that process and prevents HIV from replicating.



**TRIZIVIR\***  
(abacavir + zidovudine + lamivudine)  
One tablet twice a day. Each tablet contains 300 mg abacavir + 300 mg zidovudine + 150 mg lamivudine. Take with or without food. Should be used only by individuals who are HLA-B\*5701 negative.




**TRUVADA**  
(tenofovir disoproxil + emtricitabine)  
One tablet once a day. Each tablet contains 300 mg tenofovir disoproxil + 200 mg emtricitabine. Take with or without food.



**DESCOVY**  
(tenofovir alafenamide + emtricitabine)  
One tablet once a day. Each tablet contains 25 mg tenofovir alafenamide + 200 mg emtricitabine. Take with or without food.



**EMTRIVA**  
(emtricitabine)  
One 200 mg capsule once a day. Take with or without food.



**RETROVIR\***  
(zidovudine)  
One 300 mg tablet twice a day. Take with or without food.

# Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs) (Non-Nukes)

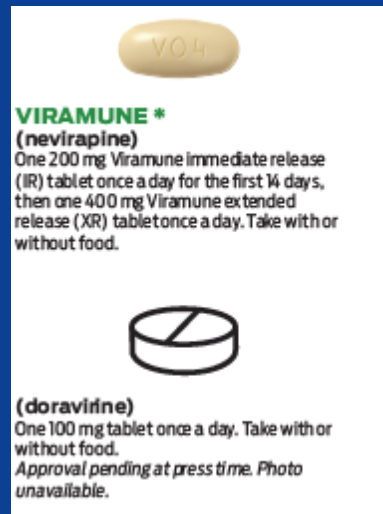

- Blocks reverse transcriptase (HIV enzyme). HIV uses reverse transcriptase to convert RNA to DNA.
- This essentially blocks that process and prevents HIV from replicating.




**EDURANT**  
(rilpivirine)  
One 25 mg tablet once a day. Take with food.




**INTELENCE**  
(etravirine)  
One 200 mg tablet twice a day.  
Take with food.




**VIRAMUNE \***  
(nevirapine)  
One 200 mg Viramune immediate release (IR) tablet once a day for the first 14 days, then one 400 mg Viramune extended release (XR) tablet once a day. Take with or without food.




**(doravirine)**  
One 100 mg tablet once a day. Take with or without food.  
*Approval pending at press time. Photo unavailable.*



**RESCRIPTOR**  
(delavirdine)  
Two 200 mg tablets three times a day, or four 100 mg tablets three times a day. Take with or without food. Discontinued by manufacturer; phaseout to be completed by 2020.



**SUSTIVA \***  
(efavirenz)  
One 600 mg tablet once a day, or three 200 mg capsules once a day. Take on an empty stomach or with a low-fat snack. Dose should be taken at bedtime to minimize dizziness, drowsiness and impaired concentration.



# Integrase Inhibitors

- Blocks integrase (HIV enzyme). HIV uses integrase to insert its NDA into the DNA of the host .
- This essentially blocks that process and prevents HIV from replicating.



**ISENTRESS**  
(raltegravir)

Two 600 mg ISENTRESS HD tablets (above) once a day for those who are treatment-naïve or whose virus has been suppressed on an initial regimen. One 400 mg ISENTRESS tablet twice daily for people with HIV treatment experience. Take with or without food.




**TIVICAY**  
(dolutegravir)

One 50 mg tablet once a day for those first starting ARV therapy or for those who have not used an integrase inhibitor in the past. One 50 mg tablet twice a day for treatment-experienced individuals who have HIV that is resistant to other integrase inhibitors and when taken with certain ARVs. Take with or without food.




# Protease Inhibitors (PIs)

- Blocks protease (HIV enzyme) by blocking protease.
- Prevents new HIV from becoming a mature virus that can infect other CD4 cells.




**PREZISTA**  
(darunavir)  
One 800 mg tablet (or two 400 mg tablets) plus one 100 mg Norvir tablet, or one 150 mg Tybost tablet once a day, or one 600 mg tablet plus one 100 mg Norvir tablet twice a day, depending on drug resistance. Take with food.



**REYATAZ\***  
(atazanavir)  
Two 200 mg capsules once a day, or one 300 mg capsule plus one 100 mg Norvir tablet, or one 150 mg Tybost tablet once a day. Take with food.



**KALETRA**  
(lopinavir + ritonavir)  
Two tablets twice a day, or four tablets once a day, depending on HIV drug resistance. Each tablet contains 200 mg lopinavir + 50 mg ritonavir. Take with or without food.



**PREZCOBIX**  
(darunavir + cobicistat)  
One tablet once a day. Each tablet contains 800 mg darunavir + 150 mg cobicistat. Take with food.

# Entry Inhibitors or Fusion Inhibitors

- Interferes with the binding, fusion and entry of an HIV virion to a human cell
- This essentially slows the progression from HIV to AIDS

Entry Inhibitors



**FUZEON**  
(enfuvirtide)  
One 90 mg (1ml solution) subcutaneous injection twice a day. Take with or without food. Fuzeon comes as a white powder that must be mixed with sterile water in a vial each day.



**SELZENTRY**  
(maraviroc)  
One 150 mg, 300 mg or 600 mg tablet twice a day, depending on other meds used. Take with or without food.

# Combination Therapy

*(simplification of pill burden)*

- Combining classes together to into one pill
- Essentially making pill taking much easier and tolerable; results in folks being more adherent to their medication



**ATRIPLA**  
(efavirenz + tenofovir disoproxil + emtricitabine)  
One tablet once a day. Each tablet contains 600 mg efavirenz + 300 mg tenofovir disoproxil + 200 mg emtricitabine. Take on an empty stomach. Dose should be taken at bedtime to minimize dizziness, drowsiness and impaired concentration.



**BIKTARVY**  
(bictegravir + emtricitabine + tenofovir alafenamide)  
One tablet once a day. Each tablet contains 50 mg bictegravir + 200 mg emtricitabine + 25 mg tenofovir alafenamide. Take with or without food.




**COMPLERA**  
(rilpivirine + tenofovir disoproxil + emtricitabine)  
One tablet once a day. Each tablet contains 25 mg rilpivirine + 300 mg tenofovir disoproxil + 200 mg emtricitabine. Take with a meal.



**GENVOYA**  
(elvitegravir + cobicistat + tenofovir alafenamide + emtricitabine)  
One tablet once a day. Each tablet contains 150 mg elvitegravir + 150 mg cobicistat + 10 mg tenofovir alafenamide + 200 mg emtricitabine. Take with food.



**STRIBILD**  
(elvitegravir + cobicistat + tenofovir disoproxil + emtricitabine)  
One tablet once a day. Each tablet contains 150 mg elvitegravir + 150 mg cobicistat + 300 mg tenofovir disoproxil + 200 mg emtricitabine. Take with food.



**TRIUMEQ**  
(dolutegravir + abacavir + lamivudine)  
One tablet once a day. Each tablet contains 50 mg dolutegravir + 600 mg abacavir + 300 mg lamivudine. Take with or without food. Should be used only by individuals who are HLA-B\*5701 negative.



**JULUCA**  
(dolutegravir + rilpivirine)  
One tablet once a day. Each tablet contains 50 mg dolutegravir + 25 mg rilpivirine. Take with a meal.



**ODEFSEY**  
(rilpivirine + tenofovir alafenamide + emtricitabine)  
One tablet once a day. Each tablet contains 25 mg rilpivirine + 25 mg tenofovir alafenamide + 200 mg emtricitabine. Take with a meal.

# Recommended Initial Regimens for Most Treatment Naïve People with HIV

- **Recommended Regimens:**
  - **Triumeq** (Dolutegravir/abacavir/lamivudine)—**only** for patients who are HLA-B\*5701 negative **(AI)**
  - **Dolutegravir plus Truvada** (tenofovir disoproxil fumarate (tenofovir)/emtricitabine<sup>a</sup>) **(AI)**
  - **Stribild** (Elvitegravir/cobicistat/tenofovir/emtricitabine) **(AI)**
  - **Isentress** (Raltegravir) plus Truvada(tenofovir/emtricitabine) **(AI** for tenofovir disoproxil fumarate, **AI** for tenofovir alafenamide)

Guidelines for the Use of ARVs in HIV-1-Infected Adults and Adolescent,  
Last updated 10/2017 (DHHS)



# Medication Recommendations For an Experienced Patient

- Assessment of severity of disease, ARV history, other medications, viral load and CD4 count trends
- Drug resistance testing (past and present)
- Is there a regimen that can fully suppress the virus?
- If not, is there a regimen that can minimize toxicity while preserving CD4 counts and avoiding clinical progression?



# Common side effects of ARVs

- Diarrhea
- Nausea
- Fatigue
- Dizziness, confusion, poor sleep
- Headache
- Rashes
- Neuropathy
- Fat redistribution
- Liver or kidney toxicity
- Metabolic changes
- Bone changes



# Long term effects of ART

- Lipodystrophy – buffalo hump
- Lipoatrophy – sunken cheeks
- Elevated triglycerides and cholesterol
- Diabetes
- Mitochondrial toxicity (e.g. lactic acidosis)
- ??????



# Access to Medications

- Private insurance / ACA
- Governmental Insurance Program
- AIDS Drug Assistance Programs (ADAP)
- Copay assistance
- Copay Cards
- Patient Assistance Programs (PAPs)





# Patient teaching on ARV medication

- Is patient ready and able:
  - Psychosocial components
  - Economic factors
  - Access to ongoing supply
- Drug education: how they work, possible side effects, what to expect
- Commitment: must be taken consistently, daily, into the foreseeable future
- Monitoring necessary: kidney, liver function tests, viral load and CD4 count testing done regularly



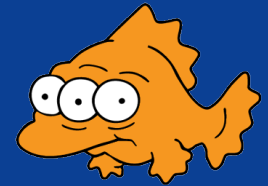
# Adherence and HIV Medications

**To avoid resistance, adherence goal is  
95%**

- medications taken every day
- medications taken on time
- medications taken all the time
- medications taken “together”
- no missed doses



# HIV Viral Resistance



- Suboptimal adherence leads to viral mutations which result in resistance to existing therapies.
- Varying half-lives of medications can potentially lead to resistance.
- Once a mutation is present, it will always be present (archived); resistance is not reversible.
- Once the HIV virus becomes resistant to one drug of a class, it may be resistant to additional drugs of that class.
- Resistant HIV can be transmitted to others.



# Who Will Be Adherent?

- Age, race, sex, socioeconomic level, educational level, socioeconomic status, and a past history of alcoholism or drug use are **NOT** reliable predictors of poor adherence
- Active drug use or alcoholism, unstable housing, mental illness, and major life crises may be predictors of poor adherence



# Improving Adherence

- Establish a partnership (*based on TRUST*)
- Select regimen with adherence in mind
  - Simplified dosing strategies
- “Fit” medication to patient’s daily life
- Prepare for and manage side effects
- Monitor drug and alcohol use and distress
- Follow-up on Partnership as a “Team”

Chesney - 2008

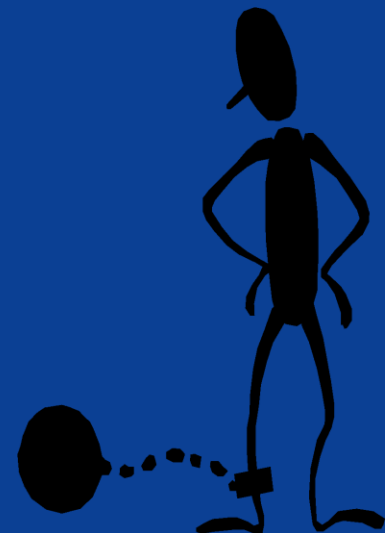


# MEDICATIONS DON'T WORK IF PEOPLE DON'T TAKE THEM.



other demands

-Koop



quality of life



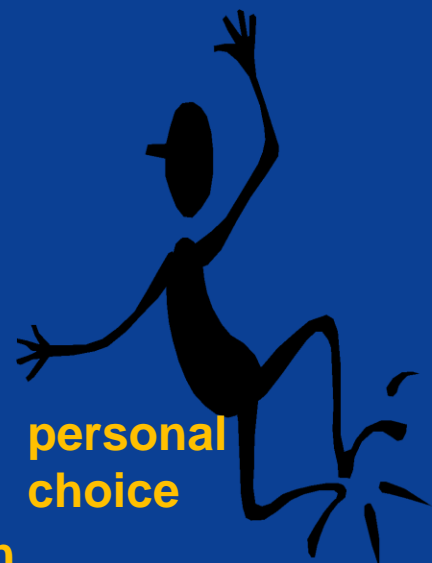
frustration



denial



poor follow-through



personal choice



# Post-exposure Prophylaxis

## 1) Healthcare workers

- Blood and body fluid exposure




## 2) Sexual Interactions and nonoccupational exposures

- “condom breakage”
- Rape
- Risk based on act
- recommended 4 weeks ARVS in non-occupational exposures with high risk



# Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HIV and Recommendations for Post-Exposure Prophylaxis

- Recommend 4 weeks of PEP
  - Use of 3 drug regimen, Within 72 hours of exposure
  - Based on resistance profile of source, if possible
  - PEP should be given if known or suspected HIV+ source; if source is tested negative

Truvada	Isentress®
 Once daily	Morning  Evening 

National Clinician's Post-Exposure Prophylaxis Hotline  
(PEPline) 888-448-4911



# Pre-Exposure Prophylaxis(PrEP)- What is it?

- PrEP is an FDA approved (2012) HIV prevention strategy where **HIV negative people** who are at risk of getting HIV **take one pill of Truvada daily to reduce their chance of getting HIV.**
- Clinical Practice Guidelines released in 2014

Daily oral PrEP with TDF/FTC is recommended as one HIV prevention option for sexually-active MSM at substantial risk of HIV acquisition because the iPrEx trial presents evidence of its safety and efficacy in this population, especially when medication adherence is high. **(IA)**

Daily oral PrEP with TDF/FTC is recommended as one HIV prevention option for heterosexually-active men and women at substantial risk of HIV acquisition because these trials present evidence of its safety and 2 present evidence of efficacy in these populations, especially when medication adherence is high. **(IA).**



# PrEP Services Locator:

Enter your zip code to find a PrEP provider near you:

[www.vdh.virginia.gov/disease-prevention/disease-prevention/prep-and-npep/](http://www.vdh.virginia.gov/disease-prevention/disease-prevention/prep-and-npep/)



# Questions?



# MidAtlantic AIDS Education and Training Center - Contact Information

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