# HIV/AIDS Update

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## Disclosures

I am a current employee of ViiV Healthcare (GSK) and previous employee of Janssen (Johnson & Johnson)

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## Objectives

| | |
|---|---|
| Outline | Outline the pathophysiology of HIV and how it is contracted |
| Identify | Identify epidemiological trends of HIV |
| Describe | Describe various prevention and testing strategies for HIV |
| Discuss | Discuss current Florida laws on AIDS and partner notification |
| Discuss | Discuss clinical management of HIV |
| Summarize | Summarize the role of the Pharmacist in HIV Care |
| Discuss | Discuss future implications on the role of the Pharmacist in HIV Prevention |

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## Human Immunodeficiency Virus

- Retrovirus that attacks the immune system
  - CD4 cells
- Over time, HIV reduces the number of CD4 cells & if left untreated it causes the inability to naturally fight off infections and disease
- Progression of HIV is measured by:
  - CD4+ count
    - Degree of immune suppression
    - Lower CD4+ count means decreasing immune function
      - Normal range 500-1200cells/mm$^3$
  - Viral load
    - Amount of virus in the blood
    - Higher viral load means more immune suppression
      - Viral suppression <200 copies of HIV per mL of blood
        - FDA uses <50 copies/ml as definition of suppression

https://aidsinfo.nih.gov/understanding-hiv-aids/fact-sheets/19/45/hiv-aids--the-basics

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## Acquired Immunodeficiency Syndrome (AIDS)

- HIV can eventually lead to AIDS, the last stage of HIV infection
  - Immune system begins to fail, leading to life-threatening opportunistic infections
  - AIDS is defined by:
    - CD4 count <200 or
    - CD4 percentage <14% or
    - Having an AIDS defining illness

https://aidsinfo.nih.gov/understanding-hiv-aids/fact-sheets/19/45/hiv-aids--the-basics

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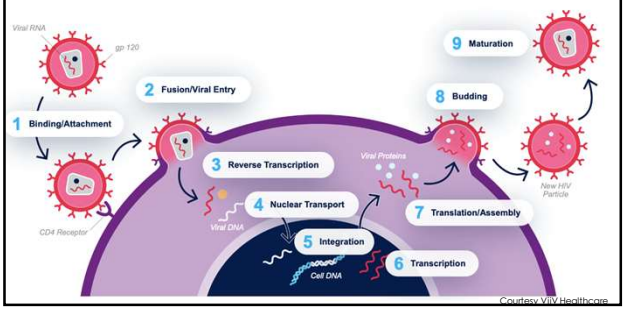
## HIV Life Cycle




Courtesy ViiV Healthcare

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## HIV Transmission

HIV CAN ONLY BE TRANSMITTED THROUGH 5 BODY FLUIDS

BREAST MILK | BLOOD | RECTAL FLUID | VAGINAL FLUID | SEMEN & PRE-SEMINAL FLUID

HIV is NOT transmitted by:

Air or Water | Saliva, Sweat, Tears, or Closed-Mouth Kissing | Insects or Pets | Sharing Toilets, Food, or Drinks

https://www.positivevibes.org.za/learn-more/hiv-side-basics/hiv-transmission/

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## Diagnostic Testing

**Antibody Tests**

- Check for HIV antibodies in blood
- It can take 3-12 weeks for a person's body to make enough antibodies for an antibody test to detect HIV infection

**Combination Tests (antibody/antigen tests)***

- Can detect both HIV antibodies and HIV antigens (a part of the virus) in blood
- A combination test can detect HIV infection before an HIV antibody test.
- It can take 2-6 weeks for a person's body to make enough antigens and antibodies for a test to detect HIV infection

**Nucleic Acid Test (NAT)**

- Can detect HIV infection about 7-28 days after a person has been infected with HIV
- Very expensive and not routinely used for HIV screening
- **Western Blot** — This is a very sensitive blood test used to confirm a positive test result

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## Prevalence

**Who is Impacted?**

New HIV diagnoses in the United States and dependent areas and the most-affected subpopulations

**1.2M** people living with HIV in US at the end of 2021[1]

**~38K** new HIV diagnoses occurred in 2022[2]

**79%** occurred in cisgender men[2]

**67%** occurred among gay, bisexual, and other men who have sex with men[2]

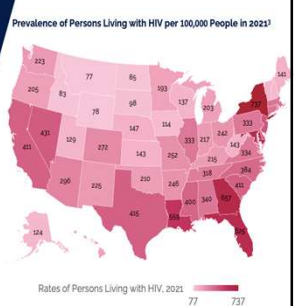
**22%** were among people who reported heterosexual contact[2]

**56%** occurred among those between 13-34 years of age[2]

**HIV by Geography**

**Southern states** make up **38%** of the US population but have the highest burden of HIV infection, accounting for **53%** of annual HIV infections in the US in 2021[2]

[2]CDC surveillance data are for those 13 years of age and older
HIV, Human immunodeficiency virus; US, United States
1. HIV.gov. US Statistics




Courtesy ViiV Healthcare

https://www.cdc.gov/nchhstp/newsroom/docs/factsheets/cdc-hiv-aa-508.pdf

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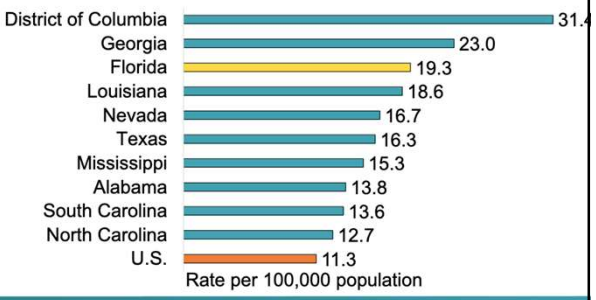
## Prevalence by State




[1]U.S. data: HIV Surveillance Report, 2022 Vol. 35, Table 20. Published May 2024. stacks.cdc.gov/view

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## Florida Statistics

- **1 in 154 adults in Florida are living with HIV**
  - 1 in 65 Blacks
  - 1 in 177 Hispanics/Latinos
  - 1 in 343 Whites
- **4,606 HIV diagnosis in the state**
  - 1,088 in Miami-Dade County
  - 607 in Broward County
  - 423 in Orange County
  - 309 in Palm Beach County
  - 307 Hillsborough County
  - 294 in Duval County
  - 76 in Leon County

http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/epi-slide-sets.html

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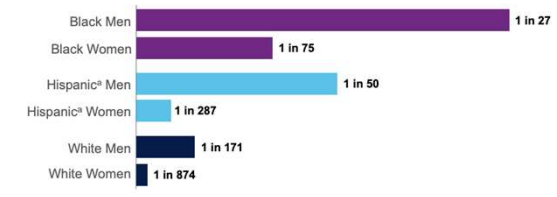
## Lifetime Risk of HIV Diagnosis by Ethnicity

Lifetime risk of 1 in 76 for males and 1 in 309 for females—2017–2019[1]




- Lifetime risk for men who have sex with men (MSM) from 2010–2014 analysis:
  - 1 in 2 Black MSM; 1 in 5 Hispanic MSM; 1 in 11 White MSM[2]

[a]Hispanic/Latino persons can be of any race.
HIV, human immunodeficiency virus.
1. Singh S, et al. CROI 2022; Virtual. Oral Presentation 04. 2. Hess KL, et al. *Ann Epidemiol*. 2017;27(4):238-243.

Courtesy ViiV Healthcare https://www.cdc.gov/nchhstp/newsroom/2014/croi-press-release-risk.html

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## DHHS HIV Treatment Guidelines

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## Goals of Treatment

- Reduce HIV-related morbidity
  - Prolong duration and quality of life
- Restore and preserve immune function
  - Increase CD4 count
- Virologic goals : Greatest possible reduction in viral load for as long as possible
  - **Viral Suppression (UNDETECTABLE)**
- Prevent HIV transmission

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## Recommendations for Initiating Anti-Retroviral Therapy (ART)

- ART should be initiated as soon as possible, regardless of CD4 count
  - On a case-by-case basis, ART may be deferred because of clinical and/or psychological factors
- Patients should understand that indefinite treatment is required
- ART does not cure HIV
- Address strategies to optimize adherence

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## Baseline Laboratory Evaluation

| | | | |
|---|---|---|---|
| HIV antibody testing | Lymphocyte Panel | Plasma HIV RNA | Complete blood count |
| Chemistry profile | Transaminase levels | Urinalysis | Serologies for hepatitis A, B, and C viruses |
| Fasting blood glucose and serum lipids | Blood urea nitrogen (BUN) | Creatinine | **Genotypic resistance testing** |

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## Selecting an Initial Treatment Regimen

- Complete regimen should consist of 2-3 drugs from at least 2 different drug classes
- Identify patient specific factors such as:
  - Co-Morbidities
  - Drug-Drug Interactions
  - Genotype Results (Drug Resistance)
  - Pregnancy Potential
- Potential for Non-adherence:
  - Food Restrictions
  - Pill Burden
  - Dosing
- Cost/Access

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## Antiretroviral Medication Classes

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## Highly Active Antiretroviral Therapy (HAART)

- 5 classes, each acting at a specific site of the HIV life cycle
  1. Entry Inhibitors
     - CCR5 Antagonist
     - Post-Attachment Inhibitors
     - Fusion Inhibitors
  2. Capsid Inhibitors
  3. Nucleoside/tide Reverse Transcriptase Inhibitors **(NRTI)**
  4. Non-Nucleoside/tide Reverse Transcriptase Inhibitors **(NNRTI)**
  5. Integrase Strand Transfer Inhibitors **(INSTI)**
  6. Protease Inhibitors **(PI)**

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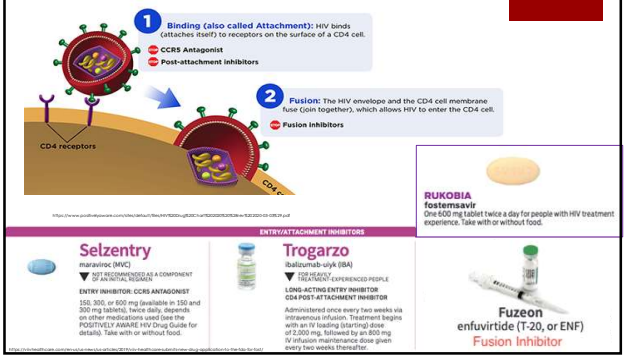
## Entry/Attachment Inhibitors

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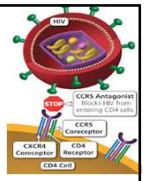
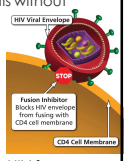
## Entry/Attachment Inhibitors




- **Selzentry (Maraviroc, MVC)**
  - Inhibits binding to the CCR5 co-receptor on the CD4 cell prevents HIV from entering the cell
  - Tropism testing required
  - Major CYP3A4 substrate
- **Trogarzo (Ibalizumab-uiyk, IBA)**
  - First monoclonal antibody for HIV; blocks entry of HIV into host cells without causing immunosuppression
  - IV Infused every two weeks
- **Fuzeon (Enfurvirtide, T20)**
  - Blocks the fusion of HIV into CD4 cell membrane
  - SubQ injection given BID
- **Rukobia (fostemsavir, FTR)**
  - Binds to the gp120 protein on the outer surface of HIV, preventing HIV from entering CD4 cells
  - Oral pill given BID

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## Capsid Inhibitors

- **Sunlenca (lenacapavir, MVC)**
  - Capsid inhibitors interfere with the HIV capsid, a protein shell that protects HIV's genetic material and enzymes needed for replication.
  - Heavily Treatment Experienced PLWHIV
  - SubQ injection every 6 months*

https://viivhealthcare.com/en-us/our-news/us-articles/2019/viiv-healthcare-submits-new-drug-application-for-the-hiv-for-first/

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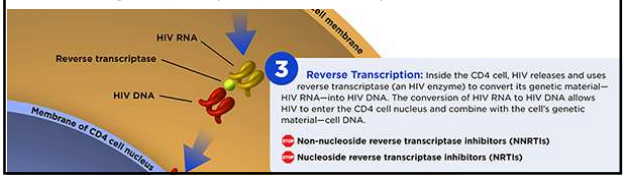
## Nucleoside Reverse Transcriptase Inhibitors (NRTI)

- Mechanism of Action:
  - **Competitively** binds to the HIV enzyme reverse transcriptase
  - Inhibits conversion of HIV RNA to DNA
- Boxed warnings
  - Lactic acidosis, Severe hepatomegaly
    - Seen more with Zidovudine, Stavudine, and Didanosine
- Renal dosing is required (except for Abacavir)

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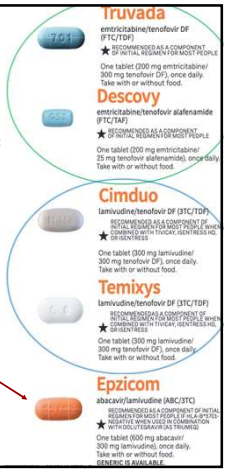
## NRTIs

- Emtricitabine (**Emtriva**®), FTC
  **200**-240mg QD
- Tenofovir Disoproxil Fumerate (**Viread**®), TDF
  - Tenofovir Alafenamide, TAF*
    300mg QD
    *25mg QD
- Lamivudine (**Epivir**®), 3TC
  150-**300mg QD**-BID
- Abacavir (**Ziagen**®), ABC
  300-**600mg QD**-BID
- Zidovudine (**Retrovir**®), AZT
- Didanosine (**Videx**®), DDI
- Stavudine (**Zerit**®), D4T

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## NRTI Highlights

- **Establishes backbone of combination therapy**
- No CYP interactions
- Side Effects:
  - ***Lactic acidosis (BBW)***
  - Hepatotoxicity (especially zidovudine, stavudine & didanosine)
  - Nausea/Vomiting
  - Lipoatrophy
- If starting patient on Abacavir must test for HLA-B*5701 prior to initiation
- Medications can be taken without regard to meals
  - (except didanosine must be taken on empty stomach)
- Low barrier to resistance
- *Do not use emtricitabine and lamivudine together (antagonist, structures too similar)

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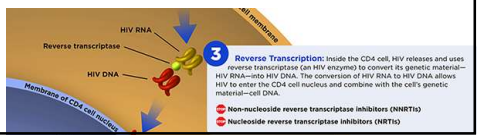
## Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTI)

- MOA:
  - **Non-Competitively** binds to the HIV enzyme reverse transcriptase
  - Inhibits conversion of HIV RNA to DNA
- No renal dose adjustments needed (cleared non-renally and metabolized in the liver)
  - Avoid Atripla and Complera if CrCl < 50mL/min
- Primarily CYP3A4 subtrates

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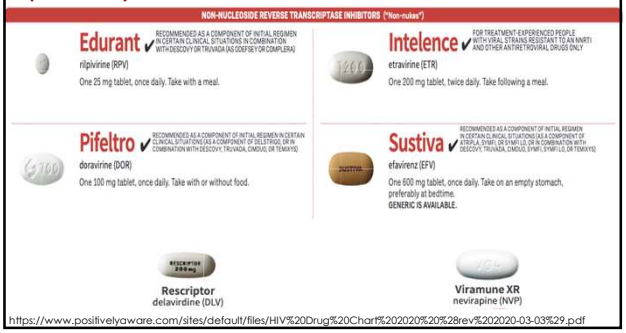
## Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTI)




https://www.positivelyaware.com/sites/default/files/HIV%20Drug%20Chart%202020%20%28rev%202020-03-03%29.pdf

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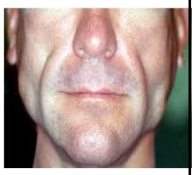
## NNRTI Highlights

- Adverse Events: Hepatotoxicity, Rash: Steven's Johnson Syndrome (SJS), Toxic Epidermal Necrolysis (TEN), **Lipoatrophy**
- Long half-lives
- Low barrier to resistance
- Food requirements:
  - With food – Etravirine, Rilpivirine
  - Without food – Efavirenz
- Potential drug interactions (CYP450)
  - All 3A4 Substrates
  - All 2C9, 2C19 Inhibitors (except rilpivirine & nevaripine)
  - Avoid: Clopidogrel, carbamazepine, oxcarbazepine, Phenobarbital, phenytoin, rifampin, St. John's Wort



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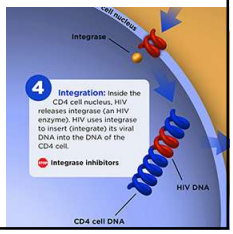
## Integrase Strand Transfer Inhibitors (INSTI)

- MOA:
  - Block the integrase enzyme needed for viral DNA to integrate with the host cell DNA/human genome
- No renal dose adjustment needed
  - Do not start Stribild if CrCl < 70 mL/min
  - Do not start Genvoya or Biktarvy if CrCl < 30 mL/min
- No major CYP450 interactions

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## Integrase Strand Transfer Inhibitors (INSTI)

- **Dolutegravir (Tivicay®), DTG**
  - 50mg QD
- ***Bictegravir*** *(w/emtricitabine + tenofovir alafenamide)* ***Biktarvy®***
  - 50mg QD
- *Raltegravir (Isentress **HD**®), RAL*
  - 400mg BID or **1200mg QD**
- Elvitegravir (Vitekta®), EVG
  - 85-**150mg QD**




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## INSTI Highlights

- "gravir"
- Space 2 hours before or 6 hours after cation-containing antacids or laxatives, sucralfate, iron or calcium supplements
- No major CYP450 interactions
  - Elvitegravir containing regimens – major CYP3A4 substrate and inducer of CYP2C9
- Take without regards to food
  - (except boosted elvitegravir regimens)
- Adverse Events: Increased Creatine Phosphokinase, Headache, Insomnia

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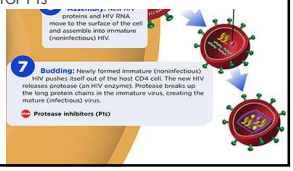
## Protease Inhibitors (PI)

- MOA:
  - Work by inhibiting HIV protease and rendering the enzyme incapable of cleaving the Gag-Pol polyprotein preventing assembly and maturation
- Recommended that all PIs be boosted
  - Taken with a pharmacokinetic booster to increase levels of the PI
- No renal dose adjustment needed for PIs
- High barrier to resistance
- All PIs are substrates of CYP3A4

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## Protease Inhibitors

- ***Darunavir (Prezista®**, Prezcobix®* w/cobicistat***), DRV***
  - 600-**800mg** BID-**QD**
- **Atazanir (Reyataz®**,Evotaz w/cobicistat**)ATZ**
  - 300-400mg QD


- Lopinavir (Kaletra® w/ritonavir), LPV
  - 400-800mg QD-BID
- Fosamprenavir (Lexiva®), FPV
  - 700-1400mg QD-BID
- Indinavir (Crixivan®), IDV
  - 800mg BID-TID
- Nelfinavir (Viracept®), NFV
  - 750-1250mg BID-TID
- Saquinavir (Invirase®), SQV
  - 500-1000mg BID
- Tipranavir (Aptivus®), TPV
  - 500mg BID

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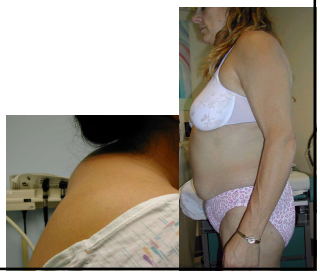
## PI Highlights

- "navir"
- Side Effects:
  - Metabolic complications (insulin resistance, **lipohypertrophy**, hyperlipidemia)
  - Increased risk of bleeding
  - Increased CVD risk
  - Hepatoxicity
  - GI intolerance
- Take with food
- No renal dose adjustments
- **Major drug interactions**
  - 3A4 Substrate & Inhibitors



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## PI Drug Interactions

- **Avoid with PIs:**
  - Rifampin and St. John's wort
  - Antiarrhythmics – Dronedarone, Amiodarone
- **Anticonvulsants**
  - Decrease PI concentrations
- **Anticoagulants**
  - Increased bleeding risk
- **Hormonal contraceptives**
  - Ritonavir may decrease levels
- **Phosphodiesterase-5 inhibitors (PDE-5)**
  - PIs can increase levels of PDE-5 inhibitors and increase risk of toxicity
- **Statins**
  - PIs can increase statin levels
  - Lovastatin and Simvastatin are contraindicated
  - *Rosuvastatin and Atorvastatin are preferred*

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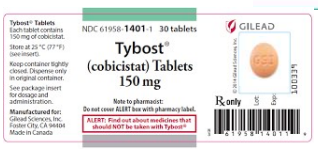
## Pharmacokinetic Enhancers (PKE)

- **"Boosters"**
  - Strong CYP450 inhibition to boost levels of other drugs
- NORVIR® (ritonavir)
  - PI, w/ some ARV activity
- TYBOST® (cobicistat)
  - No ARV activity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## Building a Regimen

- Step 1: Build NRTI backbone
- Step 2: Add additional agent from another drug class

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## Recommended Initial Regimens

| NRTI backbone | + 1 INTSI | | |
|---|---|---|---|
| Tenofovir + Emtricitabine* (Truvada or Descovy) | Dolutegravir | or Bictegravir (Biktarvy®) | or Raltegravir |
| Abacavir + Lamivudine (Epizom) | Dolutegravir (Triumeq®) | | |
| Lamivudine | Dolutegravir (Dovato®) | | |

***Lamivudine can be given in place of Emtricitabine**

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## Alternative Recommended Regimens

**2 NRTI BACKBONE**
**Tenofovir + Emtricitabine (or lamivudine)**
or
**Abacavir + Lamivudine***

+

**1 PI**
Darunavir (Symtuza®)* OR Atazanavir (+PKE "booste

or

**1 INSTI**
Elvitegravir/cobicistat (Genvoya®/Stribild®)

or

**1 NNRTI**
Doravirine (Delstrigo®) OR Efavirenz (Symfi®) OR Rilpivirine (Odefsey®)

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## Things to Consider When Selecting Additional Agent

- INSTI
  - High barrier to resistance (dolutegravir, bictegravir)
  - Minimal drug interactions and side effects
  - Neural tube defects in infants born to mothers on dolutegravir during conception
- PI
  - High barrier to resistance
  - CYP 3A4 drug interactions, metabolic effects and GI side effects
- NNRTI
  - Efavirenz has minimal drug interactions with rifampin but increased CNS side effects
  - Rilpivirine is in smallest single tablet regimen but should not be initiated in patients with high viral loads and low CD4 counts and must be taken with food

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## Additional Considerations

- **Pre-ART Characteristics**
  - *CD4 cell count <200 cells/mm$^3$*
    - Avoid RPV or DRV/r plus RAL
  - *HIV RNA >100,000 copies/mL*
    - Avoid RPV or DRV/r plus RAL or ABC/3TC plus EFV or ATV/r
  - *HLAB*5701 positive*
    - Avoid ABC
- **Co-Infections**
  - *Hep. B*
    - Use TDF or TAF, with FTC or 3TC, whenever possible
  - *TB*
    - Avoid TAF, BIC, EVG, DOR, RPV, PIs(contraindicated)
    - Rifampin has a less significant effect on EFV

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## Additional Considerations

- **Treatment for opioid dependence**
- **Pregnancy**
- **Psychiatric illnesses**
- **Osteoporosis**
- **High cardiac risk**
- **Hyperlipidemia**
- **Homelessness or food insecurities**

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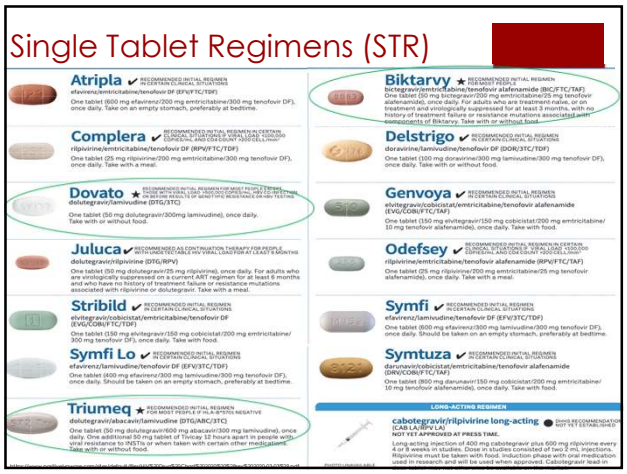
## Single Tablet Regimens (STR)

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## Single Table Regimens Food Considerations

**With Food**

- Rilpivirine containing regimens
  - Complera
  - Juluca
  - Odefsey
- Protease Inhibitor or PK booster containing regimens
  - Genvoya
  - Stribild
  - Symtuza

**Empty Stomach**

- Efavirenz containing regimens
  - Atripla
  - Symfi/Symfi Lo


**All others can be taken without regard to food**

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## FDA Approval of HIV Medicines

1981: First AIDS cases are reported in the United States.


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## HIV Drug Development Pipeline

- Ultra Long-Acting Injectables
- Broadly Neutralizing Antibodies (bNABs)
- Capsid Inhibitors
- 3rd generation integrase inhibitors
- Nucleoside Reverse Transcriptase Translocation Inhibitors (NRTTIs)

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## HIV Prevention

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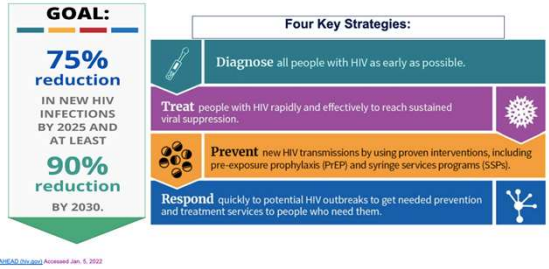
**Prevention is a key strategy of Ending the HIV Epidemic in the US (EHE)**

**The EHE initiative aims to provide areas most in need with additional expertise, technology, and resources required to scale up four key strategies to end the HIV epidemic.**

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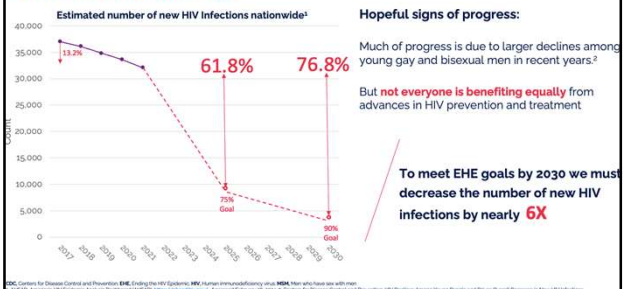
## We've got a long way to go




**Hopeful signs of progress:**

Much of progress is due to larger declines among young gay and bisexual men in recent years.[2]

But **not everyone is benefiting equally** from advances in HIV prevention and treatment

**To meet EHE goals by 2030 we must decrease the number of new HIV infections by nearly 6X**

CDC, Centers for Disease Control and Prevention; **EHE**, Ending the HIV Epidemic; **HIV**, Human immunodeficiency virus; **MSM**, Men who have sex with men

1. AIDEAD. America's HIV Epidemic Analysis Dashboard (AMEAD). https://ahead.hiv.gov/. Accessed February 26, 2024. 2. Centers for Disease Control and Prevention. HIV Declines Among Young People and Drives Overall Decrease in New HIV Infections. https://www.cdc.gov/nchhstp/newsroom/2023/2023-hiv-prevention.html. Accessed February 26, 2024.

Courtesy ViiV Healthcare

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## Of the 48 counties targeted by the "Ending the HIV Epidemic" initiative, almost half of the counties with highest HIV burden are in southern states[1]

| | |
|---|---|
| AZ | Maricopa County |
| CA | Alameda County |
| | Los Angeles County |
| | Orange County |
| | Riverside County |
| | Sacramento County |
| | San Bernardino County |
| | San Diego County |
| | San Francisco County |
| FL | Broward County |
| | Duval County |
| | Hillsborough County |
| | Miami-Dade County |
| | Orange County |
| | Palm Beach County |
| | Pinellas County |
| GA | Cobb County |
| | DeKalb County |
| | Fulton County |
| | Gwinnett County |
| IL | Cook County |
| IN | Marion County |
| LA | East Baton Rouge Parish |
| | Orleans Parish |
| MD | Baltimore City |
| | Montgomery County |
| | Prince George's County |
| MA | Suffolk County |
| MI | Wayne County |
| NV | Clark County |
| NJ | Essex County |
| | Hudson County |
| NY | Bronx County |
| | Kings County |
| | New York County |
| | Queens County |
| NC | Mecklenburg County |
| OH | Cuyahoga County |
| | Franklin County |
| | Hamilton County |
| PA | Philadelphia County |
| TN | Shelby County |
| TX | Bexar County |
| | Dallas County |
| | Harris County |
| | Tarrant County |
| | Travis County |
| WA | King County |
| Washington, DC | |
| PR | San Juan Municipio |

**States with substantial rural HIV burden**

AL AR KY MO MS OK SC

Courtesy ViiV Healthcare

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## Prevention

- Abstinence
- Use condoms
- Limit number of sexual partners
- Choose less risky sexual behaviors
- Abstain from injection drug use
  - Needle exchange program
- **U=U**
- **Get tested!**
  - Get tested and treated for STIs & HIV
- **Treatment as Prevention!**


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- Undetectable = Untransmittable
  - Undetectable viral load = there is not enough HIV in their body fluids to pass HIV on during sex
- 3 large studies of sexual HIV transmission among thousands of serodiscordant couples
  - Between 2007 and 2016 there was not a single case of sexual transmission of HIV from a virally suppressed person living with HIV to their HIV-negative partner

https://www.unaids.org/en/resources/presscentre/featurestories/2018/july/undetectable-untransmittable

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## HIV Testing in Florida

**Florida follows the HIV testing guidelines issued by the CDC**

- HIV screening is recommended for patients in ALL health-care settings
- Persons at high risk for HIV infection should be screened for HIV at least annually
- Separate written consent for HIV testing should not be required;

**Pregnancy**

- Initial prenatal care visit and again at 28-32 weeks gestation

**Patient's may "opt-out"**

- Specify which tests were refused
- Signed and placed in medical record

**Positive HIV test will be reported to the county health department**

Governed by **section 381.004, Florida Statutes, Florida Administrative Code rule 64D-2.004, Internal Operating Procedures, and Model Protocols**

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http://www.floridahealth.gov/diseases-and-conditions/aids/prevention/_documents/Counseling_testing/500-501-Participant-Manual-2018.pdf

## Partner Services (PS)

- The process by which partners of HIV-positive clients are identified, located, and informed of their possible exposure to HIV
- Three methods of follow-up of partners used by the Florida Department of Health:

**Client Referral:**
- The HIV-infected individual chooses how to contact partners

**CHD Referral:**
- The HIV-infected individual consents to having the CHD STD Program take responsibility for contacting the partners

**Contract Referral:**
- CHD STD Program does the informing of partners only if the client does not notify the partner within a negotiated time period

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## Pre-Exposure Prophylaxis (PrEP)

- PrEP is HIV prevention for those who are **HIV negative**, but may be at increased risk for contracting the disease
- Antiviral medication that helps block HIV infection from spreading in the body
- Single tablet taken once a day or long acting injectable taken every other month
- Reduces risk of contracting HIV by >90%

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## Currently Available Biomedical Interventions to Prevent HIV

| | Prevent Acquiring Infection | | Treat HIV and Prevent Transmitting Infection |
|---|---|---|---|
| | **PrEP**[3] (Pre-Exposure Prophylaxis) **PRIOR TO EXPOSURE** | **PEP**[1,2] (Post-Exposure Prophylaxis) **TIME OF EXPOSURE** | **TasP**[4] (Treatment as Prevention) **AFTER INFECTION** |
| | • Use of ARV medications to reduce the risk of HIV infection in HIV-negative individuals at risk for acquiring HIV-1 **before a sexual exposure occurs**<br>• **FTC/TDF or FTC/TAF or CAB-ER are approved for PrEP;** all require regular HIV/STI testing, as well as periodic counseling and support around adherence and sexual behavior | • Use of a complete multiclass ART regimen **after** an uninfected person has come into contact with bodily fluids that represent a substantial HIV risk<br>• Need for PEP is **a medical emergency** and **must be initiated within 72 hours** of the exposure | • Use of complete multiclass ART regimen by an HIV-positive individual to suppress viral load in bodily fluids, has effectively no risk of sexually transmitting HIV to HIV-negative partners |

Courtesy ViiV Healthcare

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## Oral PrEP Treatment





- Truvada® (emtricitabine + tenofovir disoproxil fumerate)
  - FDA approved for PrEP in 2012
- Descovy® (emtricitabine + tenofovir alafenamide)*
  - FDA approved for PrEP in **men** in 2019
- Precautions & Side Effects:
  - Do not use if impaired kidney function
    - Truvada: CrCl <60ml/min
    - Descovy: CrCl <30ml/min
  - May experience headache, nausea, abdominal pain
- Stress the importance of using safe sex practices in addition to being adherent to medication

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## Long-Acting Injectable PrEP

- Apretude® (cabotegravir)
  - FDA approved 2021


**Dosing Schedule and Formulations[1,2]**

| Oral Lead-in (OLI) "OPTIONAL"* | Initiation Injections: Month 1 & 2 | Continuation Injections: Month 4 and Q2 Months Thereafter |
|---|---|---|
| To assess tolerability, daily OLI can be given for 1 month before injections | If OLI used, administer 1st injection on final day of the OLI or within 3 days thereafter | All subsequent injections* are given every 2 months |
| Cabotegravir 30 mg | LA cabotegravir 600 mg/3 mL | LA cabotegravir 600 mg/3 mL |

| Cabotegravir Attributes | |
|---|---|
| Half-life (t½) | • Oral tablet: 30 mg (41 hours) ; LA suspension 200 mg/mL (5.6–11.5 weeks) |
| Metabolism | • Primarily metabolized by UGT1A1, with no CYP3A involvement |
| Hepatic dose adjustment | • No adjustment required: mild-to-moderate impairment (Child-Pugh A/B) |
| Renal dose adjustment | • No adjustment required: mild to moderate (CrCL ≥ 30 to < 90 mL/min) impairment.<br>• Increased monitoring for adverse events is recommended: severe impairment (CrCL 15 to < 30 mL/min) or end-stage disease (CrCL < 15 mL/min)<br>• Effects on the pharmacokinetics of cabotegravir are unknown: end-stage renal disease **not** on dialysis.<br>• Dialysis is not expected to alter exposures of cabotegravir due to being > 99% protein bound |

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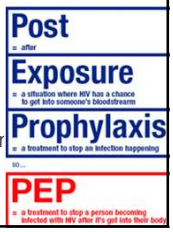
## Post Exposure Prophylaxis (PEP)

- PEP is HIV prevention for those that are **HIV negative**, but have recently been exposed to the virus
  - This can be in an occupational setting or non-occupational setting
  - oPEP vs nPEP
- Must be seen by healthcare provider or emergency room
- Must initiate Treatment <72 hours of exposur HIV
- 3 drug regimen taken for 4 weeks

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## Transitioning from nPEP to PrEP

- If patient engages in behavior that results in:
  - Frequent, recurrent exposures
  - Sequential or near-continuous courses of nPEP they should be offered PrEP
- Once HIV-negative status is confirmed, PrEP can begin immediately

https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5011a1.htm

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## Accessibility of Medication

- Insurance
- If patients are uninsured or underinsured:
  - Patient assistance program through drug manufacturers
  - Florida Health Dept.
  - FQHC
  - ADAP
  - Ryan White Program Assistance
- If patients are prescribed nPEP after a sexual assault:
  - Reimbursement through the Office for Victims of Crime (US Department of Justice)
- oPEP, covered through workplace health insurance or workers' compensation

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## The Role of Healthcare Professionals

- Counsel patients on safe sex practices
- Inform patients of medication related side effects and necessary monitoring parameters
- Educate, provide support and provide resources to improve adherence and prevent the contraction and spreading of HIV
- Access adherence at EVERY visit
- Identify non-adherence and barriers*, consider therapy that may be more conducive for patient lifestyle
- Provide Resources
  - (pillboxes, referrals for mental health etc.)

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## Future implications on the Pharmacist role in HIV Prevention


**May 2019, California passed a bill that allows pharmacist to dispense 30-60day supply of PrEP/nPEP without a prescription**

First complete a training program approved by the California State Board of Pharmacy

When providing the drugs, they must determine that the patient meets the clinical criteria for use

Increased access is estimated to increase use of HIV prevention drugs by 2%, preventing at least 25 new cases

**HB 159**

- Law will enable pharmacists who enter into collaborative agreements with physicians to dispense post-exposure prophylaxis (PEP)
- Bill was originally filed to allow pharmacists to dispense both PrEP and PEP, but the legislation was amended to include only PEP

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## Strategies to Improve Adherence

- Accessible, Non-Judgmental Multidisciplinary Team Approach
  - Collaborate with other health care professionals to ensure patients remains in care
    - (Pharmacists, Technicians, Physicians, Nurses, Social Workers, Psychologist)
- Evaluate patients' knowledge and fill in the gaps by educating
- Encourage safer sex/needle practices
- Regular HIV testing of self and partner(s)
- Knowledge of their own HIV status as well as the status of their partner(s)

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## Summary

- Prevention & Early Detection is KEY!
- Initial ART = 1-2 NRTIs + (INSTI or PI or NNRTI)
  - Regimens that act on at least 2 steps of the life cycle
- Guidelines are only a starting point for medical decision making
  - HIV therapy should be individualized to fit patient specific needs
- With HIV therapy increasing life span, be sure to control other co-morbidities
- GOALS
  - Increase CD4 count
  - Decrease Viral Load
- Patient **compliance** is vital for survival
- Education is key in treatment and prevention

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