HIV update: 2021

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Continuing Education Disclosure

- The activity planners and speaker do not have any financial relationships with commercial entities to disclose.

This slide set has been peer-reviewed to ensure that there are no conflicts of interest represented in the presentation.

Objectives

- Recognize the global, national and local epidemiology of HIV
- Discuss “Ending the HIV Epidemic: A Plan for America”
- Describe the indications for HIV screening and characteristics of the HIV antibody test
- Recognize the role of test and treat in rapid initiation of antiretroviral therapy and current HIV treatment guidelines
- Report new HIV therapy options
- Identify current HIV prevention
HIV
- Retrovirus that infects and destroys CD4 cells
- CD4 count: normal range is ~460-1600 cells/mm³
- HIV viral load (VL): goal once patient is on medications is <20 “undetectable”

WHAT IS HIV?
*Human Immunodeficiency Virus (HIV)* is a virus that attacks cells that help the body fight infection.

There’s no cure, but it is treatable with medicine.

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**Summary of the global HIV epidemic, 2019**

- 38.0 million people living with HIV
  - 0.7 million new infections
  - 1.7 million HIV-related deaths
- 2019

**People living with HIV by WHO region, 2019**

- 38.0 million people living with HIV globally
- 25.7 million in Africa
- 3.7 million in Western Pacific
- 2.6 million in Europe
- 3.7 million in South-East Asia
- 2.8 million in Eastern Mediterranean
- 1.9 million in Western Pacific

Source: UNAIDS/WHO estimates
**Decline in HIV incidence and mortality over time**
Impact of COVID-19 on HIV diagnoses in Florida
• From January 1-September 25 2020, there were 3217 cases of HIV reported to the Florida Department of Health
• This is a 14% decrease in the number of HIV cases

Table 2: Reported HIV Diagnoses by Race/Ethnicity and Year of Report, Florida (2015–2019)

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>2015 YTD</th>
<th>% of Total</th>
<th>N</th>
<th>2016 YTD</th>
<th>% of Total</th>
<th>N</th>
<th>2017 YTD</th>
<th>% of Total</th>
<th>N</th>
<th>2018 YTD</th>
<th>% of Total</th>
<th>N</th>
<th>2019 YTD</th>
<th>% of Total</th>
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<tbody>
<tr>
<td>White</td>
<td>901</td>
<td>24.1%</td>
<td>836</td>
<td>20.6%</td>
<td>793</td>
<td>20.0%</td>
<td>793</td>
<td>20.0%</td>
<td>793</td>
<td>19.3%</td>
<td>743</td>
<td>19.6%</td>
<td>793</td>
<td>19.6%</td>
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<tr>
<td>Black</td>
<td>1,451</td>
<td>38.8%</td>
<td>1,127</td>
<td>29.6%</td>
<td>1,085</td>
<td>27.9%</td>
<td>1,085</td>
<td>27.9%</td>
<td>1,085</td>
<td>23.7%</td>
<td>967</td>
<td>25.0%</td>
<td>922</td>
<td>23.4%</td>
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<tr>
<td>Hispanic</td>
<td>1,315</td>
<td>35.2%</td>
<td>1,085</td>
<td>27.9%</td>
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<td>27.9%</td>
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<td>27.9%</td>
<td>1,085</td>
<td>23.7%</td>
<td>967</td>
<td>25.0%</td>
<td>922</td>
<td>23.4%</td>
<td>922</td>
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<tr>
<td>Other</td>
<td>72</td>
<td>1.9%</td>
<td>72</td>
<td>1.9%</td>
<td>72</td>
<td>1.9%</td>
<td>72</td>
<td>1.9%</td>
<td>72</td>
<td>1.7%</td>
<td>72</td>
<td>1.7%</td>
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<td>1.7%</td>
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</tr>
<tr>
<td>Total</td>
<td>3,798</td>
<td>100.0%</td>
<td>3,217</td>
<td>100.0%</td>
<td>3,217</td>
<td>100.0%</td>
<td>3,217</td>
<td>100.0%</td>
<td>3,217</td>
<td>100.0%</td>
<td>3,217</td>
<td>100.0%</td>
<td>3,217</td>
<td>100.0%</td>
<td>3,217</td>
</tr>
</tbody>
</table>

Routine Screening for HIV During the COVID-19 Pandemic
• Urban ED preparations
  - Established a large temporary space for screening, testing, and treatment of patients with influenza-like illness who were considered likely to be discharged home
  - Continued HIV testing of patients who were incorporated into the design of the secondary ED space, with a station for lab draws designated for HIV screening
• HIV testing (percent of ED visits) was maintained during first 1.5 months
  - Through 4/18: 6 persons tested positive for HIV
• It is important to maintain HIV screening and linkage to care, even in the face of the COVID-19 pandemic
  - HIV elimination initiatives: substance use disorder require expansion and implementation of HIV screening and linkage to care

*Provisional data as of 9/25/20

HIV and COVID-19 Tests at an Urban ED
Florida HIV Testing
- Publicly-funded HIV testing in Florida ranges from 310,000-340,000 annually
- Average tests/month for 2019: 26,346
- Average test/month for 2020: 15,217

PrEP Prescriptions
- 2019: 1574 prescriptions
- 2020: 1026 prescriptions
- 34.8% decrease in number of prescriptions Jan-Sept 2019 vs 2020

What’s next?
- Continue to monitor the impact COVID-19 is having on testing, diagnosis and treatment of HIV
- Evaluate innovative strategies/activities to help reduce disruptions in HIV care
When should I test for HIV?

- In 2006, the CDC issued guidelines advocating routine voluntary HIV screening of all patients aged 13 to 64 years as a normal part of medical care, without the need for signed consent or counseling:
  - “Opt-out Testing”

- On July 1, 2015, a Florida law went into effect that removed need for written consent for HIV testing in healthcare settings.

Some Need More Frequent Screening

- Screen at least annually
  - People who inject drugs and their sex partners
  - People who engage in transactional sex
  - Sex partners of people with HIV infection
  - Sexually active gay, bisexual, and other men who have sex with men (every 3-6 month testing may be beneficial)
  - Heterosexuals who themselves or whose sex partners have had ≥1 sex partner since their most recent HIV test.
HIV Screening in Pregnant Women

- Universal Opt-out screening
- Address reasons for declining test
  - Document declinations in the medical records
- Timing of HIV test
  - Early during pregnancy
  - Repeat in third trimester, ideally < 36 weeks gestation
  - Rapid testing at time of delivery if indicated

CDC. MMWR 2006;55(RR14);1-17.

HIV Testing

- HIV Antigen/Antibody Test (4th generation testing)
  - Can detect acute HIV infection
- HIV Antibody Test (3rd generation)
- Rapid HIV Test
  - Blood or sputum
  - Requires confirmation
- HIV viral load
  - Can detect acute HIV infection


How Do We Test For HIV Infection?

- HIV Antigen/Antibody Test (4th generation testing)
- HIV Antibody Test (3rd generation)
- Rapid HIV Test
  - Blood or sputum
  - Requires confirmation
- HIV viral load
  - Can detect acute HIV infection
Starting the Conversation

- "I'm going to ask you a few questions about your sexual health. Since sexual health is very important to overall health, I ask all my patients these questions. Before I begin, do you have any questions or sexual concerns you'd like to discuss?"

Taking a Sexual Health History

- Assess your own comfort
- Make your patient feel comfortable
- Use neutral and inclusive terms
- Avoid assumptions
- Try not to react overtly
- Rephrase your questions
- Ask for correct pronouns and terminology

Taking a Sexual History

- Make it a normal part of each visit
- The Five “P”s
  - Partners
  - Practices
  - Protection from STDs
  - Past history of STDs
  - Prevention of pregnancy
What if the HIV test is negative?

- Face to face notification of negative test result is not required
- Consider if patient at ongoing risk of HIV acquisition
  - Counsel on risk reduction strategies
  - Provide condoms
  - PrEP evaluation and offer
  - Make aware of HIV Post-exposure prophylaxis (PEP)
What happens if the test is positive?

- Positive rapid tests require confirmation
- Results should be communicated confidentially through personal contact
- Provide counseling
  - HIV is a manageable disease
  - Discuss HIV risk reduction
  - Discuss ways to handle the emotional consequences of a positive result
- Inform the patient that they might be contacted by health department staff

The HIV Care Continuum

Diagnosed

Linked to care

Received or were retained in care

Viral suppression

100% 82% 73% 72%

Persons Who Received an HIV Diagnosis in 2019 in Florida Along the HIV Care Continuum

HIV Diagnoses Link to Care in 30 Days Retained in Care Suppressed Viral Load
Update – HIV Treatment

Antiretroviral Mechanism of Action

Treatment Goals
• Maximally and durably suppress plasma HIV RNA
• Restore and preserve immunologic function
• Reduce HIV-associated morbidity and prolong the duration and quality of survival
• Prevent HIV transmission “Treatment as Prevention”
Predictors of Virologic Success

- Low baseline viremia
- High potency of the ARV regimen
- Tolerability of the regimen
- Convenience of the regimen
- Excellent adherence to the regimen

Considerations When Starting Antiretroviral Therapy

- Who to start on antiretroviral therapy
- When to start antiretroviral therapy
- What antiretroviral to start
- When to switch antiretroviral therapy
- What to switch to

Who to Start on Antiretroviral Therapy?

<table>
<thead>
<tr>
<th></th>
<th>CD4&lt;200</th>
<th>200-350</th>
<th>350-500</th>
<th>500+</th>
</tr>
</thead>
<tbody>
<tr>
<td>US DHHS 2018</td>
<td>Recommended</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IAS-USA 2018</td>
<td>Recommended</td>
<td></td>
<td></td>
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<tr>
<td>EACS 2018</td>
<td>Recommended</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK 2016</td>
<td>Recommended</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WHO 2016</td>
<td>Recommended</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When to Start Therapy: Balance Now Favors Earlier ART

- Delayed ART
- Early ART
Current Recommendations for Same-Day ART Initiation

- Rapid start or initiating ART on same day as HIV is diagnosed is an emerging strategy to reduce loss to follow-up and decrease time to viral suppression
- Evidence base limited but growing, and outcomes favorable thus far


Florida’s Test and Treat Program:

- Instituted in February 2017 at community health departments
- Provides:
  1. Immediate linkage to HIV care
  2. Initiation of antiretroviral therapy (ART) at time of diagnosis and/or at the time of returning to care after a gap in services

Eligibility for Test and Treat:

Newly diagnosed HIV patients defined as:
- Acute Infection: antibody (-)/RNA (+)
- Recent Infection: antibody (+) with last documented antibody (-) within prior 6 months
- Chronic Infection: antibody positive with no prior HIV test result or last documented antibody (-) > 6 months ago (inclusive of patients lost to follow up and returning to care)
Test and Treat Timeline:

- Day 1 (or earlier, if possible):
  - New HIV diagnosis or HIV positive test result
  - Referral in infectious diseases unit
  - Return to HIV provider
  - Consider starting ART

- Day 1 (or latest, day 2):
  - Medical/psychosocial evaluation
  - Eligibility assessment
  - Obtain baseline labs before or same day
  - Counseling
  - Linkage to HIV primary care

- Day 5-10:
  - Follow-up
  - Follow-up with HIV primary care
  - Review baseline labs
  - Catch-up on patient placement at 2+ days
  - Adjust ART as needed

Linkage to Care:
- Monitoring compliance with follow-up lab and appointments
- Transition to long-term primary HIV Care

What Antiretroviral Therapy to Start—Considerations:
- Viral load and CD4 count
- HIV resistance test result
- Drug interactions
- Potential side effects
- Pill burden
- Access and Cost

TAT MEDICATIONS:

<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Generic Name</th>
<th>Therapeutic Class</th>
<th>Pharmacological Class</th>
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</thead>
<tbody>
<tr>
<td>HIVAIVY</td>
<td>abacavir/efavirenz/tenofovir alafenamide</td>
<td>antiretroviral</td>
<td>INSTI/NNRTI combo</td>
</tr>
<tr>
<td>DESCQX</td>
<td>efavirenz/tenofovir alafenamide</td>
<td>antiretroviral</td>
<td>INSTI Combo</td>
</tr>
<tr>
<td>SYMTUZA</td>
<td>darunavir/cobicistat/tenofovir alafenamide</td>
<td>antiretroviral</td>
<td>NNRTI Combo</td>
</tr>
<tr>
<td>TIVICAY</td>
<td>didanosine</td>
<td>antiretroviral</td>
<td>INI</td>
</tr>
<tr>
<td>TRUVADA</td>
<td>emtricitabine/tenofovir disoproxil fumarate</td>
<td>antiretroviral</td>
<td>INSTI</td>
</tr>
<tr>
<td>SENTRY</td>
<td>raltegravir</td>
<td>antiretroviral</td>
<td>INSTI</td>
</tr>
</tbody>
</table>
### Single Tablet Combination Regimens

- **Atripla®** (EFV/TDF/FTC)
- **Biktarvy®** (BIC/TAF/FTC)
- **Complera®** (RPV/TDF/FTC)
- **Delstrigo™** (DOR/TDF/3TC)
- **Genvoya®** (EVG/c/TAF/FTC)
- **Juluca®** (DTG/RPV)
- **Odefsey®** (RPV/FTC/TAF)
- **Stribal®** (EVG/c/TDF/FTC)
- **Symfi™ and Symfi Lo®** (EFV/TDF/3TC)
- **Symtuza®** (DRV/c/TAF/FTC)
- **Triumeq®** (DTG/ABC/3TC)
Low Viral Failure and Treatment Emergent Resistance with Dolutegravir and Bictegravir

<table>
<thead>
<tr>
<th>Year</th>
<th>Treatment</th>
<th>Viral Failure, %</th>
<th>Treatment Emergent Resistance Mutations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>Dolutegravir</td>
<td>0.15%</td>
<td>0</td>
</tr>
<tr>
<td>2020</td>
<td>Bictegravir</td>
<td>0.08%</td>
<td>0</td>
</tr>
<tr>
<td>2021</td>
<td>Dolutegravir</td>
<td>0.06%</td>
<td>0</td>
</tr>
</tbody>
</table>

Increased Persistence of Initial ART with INSTI-Containing Regimens

- Tibenic Davi, Sonia Nabhak, Orkana Zaidstov, Joseph J. Irvin

Example of Studies of Recommended INSTIs as First-Line ART Regimens

<table>
<thead>
<tr>
<th>Trial</th>
<th>INSTI Regimen</th>
<th>Comparator</th>
<th>Wks</th>
<th>Results</th>
<th>Outcome vs Comparator</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS-148F1</td>
<td>Dolutegravir + TDF + FTC</td>
<td>Dolutegravir + FTC</td>
<td>96</td>
<td>88% vs 90%</td>
<td>Noninferior</td>
</tr>
<tr>
<td>GS-149F1</td>
<td>Dolutegravir + TDF + FTC</td>
<td>Dolutegravir + FTC</td>
<td>96</td>
<td>93% vs 90%</td>
<td>Noninferior</td>
</tr>
<tr>
<td>SIMPLIIFY1</td>
<td>Dolutegravir + TDF + FTC</td>
<td>Dolutegravir + FTC</td>
<td>54</td>
<td>71% vs 53%</td>
<td>Favor INI</td>
</tr>
<tr>
<td>FLAMINGO2</td>
<td>Dolutegravir + TDF + FTC</td>
<td>Dolutegravir + FTC</td>
<td>96</td>
<td>80% vs 64%</td>
<td>Favor INI</td>
</tr>
<tr>
<td>SPRING-2</td>
<td>Dolutegravir + TDF + FTC</td>
<td>Dolutegravir + FTC</td>
<td>96</td>
<td>81% vs 76%</td>
<td>Noninferior</td>
</tr>
</tbody>
</table>

- No resistance mutations (INR or NRTI) in treatment naive studies of dolutegravir-bictegravir.
- Rates of discontinuation for AEs numerically lower with INSTIs vs PI or NRTIs.
- Moderate difference in adverse events between arms in head-to-head comparisons of dolutegravir with bictegravir if dolutegravir given with abacavir.
Integrase Inhibitors Considerations

- There may be transmitted resistance with integrase resistance but very rare
- Women of childbearing potential – risk of birth defects continues to fall
- Possible weight gain – now convincingly associated with weight gain

Tenofovir alafenamide (TAF)

- Tenofovir alafenamide (TAF) (Vemlidy®) is an oral prodrug of tenofovir, which is hydrolyzed to tenofovir in plasma then converted to its active form intracellularly
- This results in lower plasma concentrations and higher intracellular concentrations than tenofovir disoproxil fumarate (TDF) (Viread®)
- TAF: Lower potential for adverse kidney issues and bone effects

Effect of Switching ART on Weight and Metabolic Changes

<table>
<thead>
<tr>
<th>Study</th>
<th>Switch</th>
<th>Weight/Metabolic Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPERA (observational)</td>
<td>TDF to TAF</td>
<td>2-4.5 kg/y; greatest in those also switching to newer INSTI (DTG, BIC)</td>
</tr>
<tr>
<td>TRO (observational)</td>
<td>TDF or ABC to TAF</td>
<td>Greater weight gain after switching from TDF to TAF than after switching from ABC to TAF</td>
</tr>
<tr>
<td>TANGO (randomized)</td>
<td>TAF-based regimen to DTG/TFC</td>
<td>Weight: no difference DTG/TFC: improved lipids, insulin resistance, especially after switching from boosted regimen</td>
</tr>
</tbody>
</table>
Dual therapy

- GEMINI-1,-2 and TANGO: Virologic Outcomes With DTG + 3TC as Initial or Switch Therapy
  - GEMINI-1,-2: Initial therapy with DTG + 3TC noninferior to DTG + TDF/FTC for primary endpoint of HIV-1 RNA < 50 c/mL
  - TANGO: Switch to DTG/3TC noninferior to continued TAF-based ART for primary endpoint of HIV-1 RNA ≥ 50 c/mL

Dual Therapy Treatment Option

Dolutegravir/lamivudine → Dovato®
- Treatment naïve
- Switch from three drug regimen
- No Hep B, NRTI/Integrate mutations or history of treatment failure

How Commonly Will 2 drugs Be Used

- Multiple unboosted combinations approved or in development (DTG/3TC, DTG/RPV and cabotegravir/RPV)
- Few differences yet in AE or long term outcomes
- No substantial cost differences
- Fewer metabolic effects – no TAF?
When to switch antiretroviral therapy?

Reasons:
- adverse events,
- drug-drug or drug-food interactions
- pill burden, cost, simplification
- virologic failure

When to switch antiretroviral therapy?

Virologic failure:
- VL undetectable – drug resistance unlikely
- VL <200 – controversial; one large retrospective analysis found no increased risk of failure
- VL persistently >200 – drug resistance often associated (particularly >500)
- Caution with change to newer VL assays and "blips"

Guideline Recommendations for Switching ART in Virologically Suppressed Patients:

- Principle of switching: Maintain viral suppression without jeopardizing future treatment options
- In general, if the older regimen is well tolerated without evidence of toxicity, there is little reason to switch to a newer regimen

Consider switching:
- Simplify regimen
- Enhance tolerability and/or decrease toxicity
- Prevent/eliminate DDIs
- Eliminate food or fluid requirements
- Reduce costs

Proactive switching:
- From TDF- or TDF-based ART if high risk of renal/skeletal toxicity

Consider switching:
- If evidence of/potential for chronic toxicity, DDIs, or emergent AEs
- From 3-drug to 2-drug regimen if no prior VF

Indications:
- Documented toxicity
- Prevention of long-term toxicity
- DDIs (including with DAAs for HCV)
- Planned pregnancy
- Aging and/or comorbidity
- Simplification

Consider substitution according to national recommendations in the context of drug supply and patient choice.
What antiretroviral therapy to change to

- Review ART history
- Assess adherence, tolerability, and drug interactions
- Perform resistance testing while on ART (or within 4 weeks of d/c of ART)
- Identify susceptible drugs/drug classes
- Consider newer agents (expanded access or clinical trials)
- Design a regimen with 2 (preferably 3) fully active agents

ART: What NOT to use as Initial therapy

Nucleosides (NRTI)
- 3 or 4 all NRTI combination regimens
- Older drugs (didanosine, stavudine, zidovudine)

Non-nucleosides (NNRTI)
- Older drugs (delavirdine, nevirapine)
- Etravirine in initial regimens

Protease Inhibitors (PI)
- Unboosted PIs
- Older drugs (fosamprenavir, indinavir, lopinavir, nefaviravir, ritonavir [except as booster], saquinavir)

Entry inhibitors (EI)
- Enfuvirtide, maraviroc,ibalizumab

ART: What NOT to use (EVER)

- All monotherapy
- All-NRTI regimens
- 2-NNRTI regimens
- Unboosted PIs
- Older drugs: delavirdine (DLV), didanosine (ddI), indinavir (IDV), nefaviravir (NFV), and stavudine (d4T)
- Two of the same thing: cobi + RTV, FTC + TDF, TDF + TAF
- Nevirapine in women (CD4 >250), men (CD4 >400)
- ETR + [FPV/r or TPV/r] (unfavorable drug interactions)
Why Does Treatment Fail Patients?

- ADHERENCE
- Baseline resistance or cross-resistance
- Prior use of antiretroviral therapy
- Less potent antiretroviral regimens
- Drug levels and drug interactions
- Tissue reservoir penetration
- Provider inexperience
- Other

Importance of Adherence to ART

- Adherence is strongly correlated with
  - Suppression of HIV-1 RNA: greater adherence associated with higher likelihood of viral suppression
  - Reduced rates of drug resistance: poor adherence can allow selective pressure and expansion of resistant virus in the absence of full viral suppression
  - Increased survival: lack of adherence to ART a significant predictor of progression to AIDS and death
  - Improved quality of life

Enhancing Engagement in Treatment and Care

- Poor engagement in care is a predictor of higher mortality among patients with HIV infection
  - Mortality ~ 50% higher among patients with poor retention in care
  - Developing an effective patient–provider relationship is key to enhancing patient engagement in care
  - Endeavor to encourage open and frank communication
  - Devote sufficient time to addressing needs of each patient
  - Shorten wait time from patient’s request to schedule an initial HIV care appointment until the date of the initial HIV medical visit
Long acting antiretrovirals – cabotegravir

- Now FDA approved
- Integrase inhibitor similar to dolutegravir
- Similar resistance profile
- Initially will require an oral lead in
- Injected into Gluteus Medius
- Exciting -Nanotechnology formulation : SC and IM injections
- Safety- mostly injection site reactions and nodules with SC dosing
- RPV long acting needs cold chain

Cabotegravir: Phase 3 trials

<table>
<thead>
<tr>
<th>Study (reference)</th>
<th>Study population</th>
<th>Design</th>
<th>Result (week 48)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLAIR Chan et al. NCTM 2020-022123-133 Subcutaneous adults (n=438)</td>
<td>ABC/3TC/TDF or 2trt + CAB + RPV (oral X 4 wks, then IM monthly) or continue oral regimen (non-inferiority, 80%)</td>
<td>VS &gt;90%; CAB + RPV non-inferior to oral regimen</td>
<td>Glasgow 2020: 144 wks</td>
</tr>
<tr>
<td>ATLAS Serene et al. NCTM 2020-022132-123 Adults with vi (NRTI + PIs, NNRTI, or INSTI) (n=146)</td>
<td>continue ART or change to CAB + RPV (oral X 4 wks, then IM monthly) (non-inferiority, 66%)</td>
<td>VS &gt;90%; CAB + RPV non-inferior to oral regimen</td>
<td>Glasgow 2020: 96 wks</td>
</tr>
<tr>
<td>ATLAS-2M Chariton CROI 2020 Abstract 34 Adults on SOCA ART or CAB + RPV (A) or VL &gt;30 (n=1448)</td>
<td>CAB 400 + RPV 600 (A) or VL &lt;30 or CAB 800 + RPV 600 (A) or VL &lt;30 (non-inferiority, 66%)</td>
<td>VS &gt;90%; CAB + RPV non-inferior to oral ART</td>
<td></td>
</tr>
</tbody>
</table>

Drugs in the Pipeline

- CAB – Prodrug in Rhesus Macaques – Nano formulated
- Has extended release Q6 month dosing

- Cabotegravir – Micro needle Patches
Pre-exposure Prophylaxis

PrEP IS AN HIV PREVENTION METHOD IN WHICH PEOPLE WHO DO NOT HAVE HIV INFECTION TAKE A PILL DAILY TO REDUCE THEIR RISK OF BECOMING INFECTED. ONLY PEOPLE WHO ARE HIV-NEGATIVE SHOULD USE PrEP. A NEGATIVE HIV TEST IS REQUIRED BEFORE STARTING PrEP AND THEN EVERY 3 MONTHS WHILE TAKING PrEP.

Why PrEP?

- Estimated 50,000 new HIV infections each year in the US
- No cure
- No effective vaccine yet
- In multiple studies, there is a significantly decreased risk of HIV acquisition in those who took PrEP consistently

<table>
<thead>
<tr>
<th>Transmission Route</th>
<th>Effectiveness Estimate</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexual</td>
<td>69%</td>
<td>Very high levels of adherence to PrEP ensures maximum effectiveness.</td>
</tr>
<tr>
<td>Injection drug use</td>
<td>74% - 84%</td>
<td>These estimates are based on tenofovir alone and not necessarily when taken daily. The effectiveness may be greater for the two-drug oral therapy and if used daily.</td>
</tr>
</tbody>
</table>


Smith, DK., et al. CROI 2018; March 4-7, Boston, MA, USA.
2 FDA-Approved Medications for PrEP

Each consists of two drugs combined in a single oral tablet taken daily

1. Emtricitabine (F) 200 mg combined with tenofovir disoproxil fumarate (TDF) 300 mg (F/TDF – brand name Truvada®)

2. Emtricitabine (F) 200 mg combined with tenofovir alafenamide (TAF) 25 mg (F/TAF – brand name Descovy®)

Approved to prevent HIV infection in adults and adolescents weighing at least 77 pounds (35 kg)

Which medication should I prescribe for daily PrEP

<table>
<thead>
<tr>
<th></th>
<th>TDF/FTC</th>
<th>TAF/FTC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOSAGE</td>
<td>200 mg (F) + 300 mg (TDF)</td>
<td>200 mg (F) + 25 mg (TAF)</td>
</tr>
<tr>
<td>SAFETY</td>
<td>30 mg/m²/day</td>
<td>10 mg/m²/day</td>
</tr>
<tr>
<td>COST</td>
<td>$300/month</td>
<td>$200/month</td>
</tr>
<tr>
<td>BODY WT (kg)</td>
<td>80 kg</td>
<td>60 kg</td>
</tr>
</tbody>
</table>

Approved to prevent HIV infection in adults and adolescents weighing at least 77 pounds (35 kg)

Table: Summary of Guidance for PrEP Use

<table>
<thead>
<tr>
<th>Group</th>
<th>Prescription</th>
<th>Other Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV-positive partner</td>
<td>Daily, starting and dosing of TDF/FTC (Thuday, 30-day supply)</td>
<td>Follow-up visits at least every 3 months to provide the following:</td>
</tr>
<tr>
<td>Non-HIV infected sex partners</td>
<td></td>
<td>HIV test, medication adherence counseling, behavioral risk reduction support,</td>
</tr>
<tr>
<td>Non-HIV infected sex partners</td>
<td></td>
<td>HIV counseling, 60% compliance assessment, 6 months, 3 months, 6 months, 12</td>
</tr>
<tr>
<td>Commercial or work</td>
<td></td>
<td>months, 6 months, 12 months, 12 months, 12 months, 12 months, 12 months, 12</td>
</tr>
<tr>
<td>Clinically eligible</td>
<td></td>
<td>All 6 months, 3 months, 9 months, 12 months, 12 months, 12 months, 12 months, 12</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>months, 12 months, 12 months, 12 months, 12 months, 12 months, 12 months, 12</td>
</tr>
<tr>
<td>Other services</td>
<td></td>
<td>months, 12 months, 12 months, 12 months, 12 months, 12 months, 12 months, 12</td>
</tr>
</tbody>
</table>

Approved to prevent HIV infection in adults and adolescents weighing at least 77 pounds (35 kg)
Ready, Set, PrEP

- Launched by the US Department of Health and Human Services on 12/3/19
- To qualify, patients must:
  - Test negative for HIV
  - Have a valid prescription from a healthcare provider
  - Not have prescription drug coverage
- Beginning no later than March 30, 2020, patients may obtain PrEP through CVS, Walgreens, Rite Aid or mail order all at no cost
- [https://www.getyourprep.com/](https://www.getyourprep.com/) or 855-447-8410
- HIV.gov Locator

HPTN 083- PrEP with IM CAB vs TDF/FTC

- Phase 3 randomized double blinded HIV PrEP international study
- Study population: High risk adult MSM/TGW (n=4750)
- Study population 67% 30 years
- 12% TGW
- Cabotegravir oral lead in 5 weeks ->IM q2 months vs TDF/FTC po daily

HPTN 083- PrEP with IM CAB vs TDF/FTC

- Results:
  - DSMB stopped study early
  - New HIV infections 13 (CAB) vs 39 (TDF/FTC)
  - HIV incidence 0.41(CAB) vs 1.22( TDF/FTC)
- Conclusion CAB non inferior and superior
The PARTNER1 study looked at 888 couples where one was HIV positive and on antiretroviral treatment (ART) and who were already having sex without condoms:
- 548 heterosexual couples
- 340 MSM
They found that in more than 58,000 acts of condomless sex there were no HIV transmissions from the HIV positive partner among those on treatment with an undetectable viral load
Couples were followed for a median of 1.3 years

Partner2 Study:
- Prospective observational study in 14 European countries
- Enrolled 927 homosexual serodiscordant couples between September 2010 and July 2017
- Positive partner was on suppressive ART
- A total of 74,568 condomless sex acts were reported, with 0 cases of within couple HIV transmission

http://programme.aids2018.org/Abstract/Abstract/13470

QUESTIONS?
THANK YOU!