To PrEP or not to PrEP

Michael Blank, MD
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Disclosures

• None
Objectives

• Define PrEP & PEP and understand rationale behind it
• Identify candidates for PrEP and PEP
• Learn about how to prescribe and manage PrEP and PEP
HIV Preventative Measures

• Abstinence
• Decrease number of sexual partners
• Regular condom use
• Avoid sex with partners symptomatic for STIs
• Regular STI screening
• Partners screened regularly for STIs
• Avoid alcohol or drug use
• Syringe exchange and other harm reduction
• PEP
• PrEP (Pre-Exposure Prophylaxis)
New HIV Diagnoses in the US and Dependent Areas for the Most-Affected Subpopulations, 2017

Subpopulations representing 2% or less of all people who received an HIV diagnosis in 2017 are not represented in this chart.

New HIV Diagnoses in the US and Dependent Areas by Age, 2017

PrEP vs. nPEP

Case #1:
24 year old white MSM who presents 4 hours after unprotected receptive anal sex, for the first time, with his HIV-infected partner.
Occupational vs. non-occupational exposures

Occupational
• Work-related exposures to HIV
  – Needle-stick injuries
  – Sharp objects

Non-occupational (nPEP)
• Exposures outside of the workplace
  – Non-consensual sex
  – Consensual sex
  – Needle sharing
Does PEP work?

• No randomized controlled studies

• Observational studies
  – Studies with control groups
    • Questionnaires not always scientific
  – Evaluations of PEP programs

• Indirect evidence
  – Non-human primate (monkey) studies
  – Prevention of mother-to-child transmission
How does PEP work?

• Infection does not occur instantly after an exposure to HIV
  – The virus needs to spread throughout the body
  – This may take up to 3 days after the exposure

• The “window of opportunity” for PEP
  – The brief period of time - after an exposure - where infection has not yet occurred
  – During this time, PEP may be able to stop HIV from causing an infection
What’s involved in taking PEP?

• Assessment
  – Was the exposure within the last 72 hours?
  – Is the exposed person HIV-negative?
  – Was the exposure high-risk?
  – What activity led to the exposure?
  – What was the HIV status of the source person?

• Counseling
  – What are the risks and benefits of starting PEP?
  – Is the exposed person ready to start PEP?
  – Adherence and risk-reduction counseling
What’s involved in taking PEP?

• Prescription
  – What antiretrovirals?
  – Starter-packs

• Follow up
  – Ongoing risk-reduction and adherence counseling
  – Monitoring/management of side-effects and toxicity
  – HIV testing
Post-exposure Prophylaxis

- Taking medications after possible exposure to HIV
- Must be started within 72 hours of exposure
- Eligibility for PEP
- 28-day regimens
  - **Preferred:** Tenofovir disoproxil fumarate (tenofovir DF or TDF) (300 mg) with emtricitabine (200 mg) once daily plus raltegravir (RAL) 400 mg twice daily or dolutegravir (DTG) 50 mg daily
  - **Alternative:** Tenofovir DF (300 mg) with emtricitabine (FTC) (200 mg) once daily plus darunavir (DRV) (800 mg) and ritonavir (RTV) (100 mg) once daily

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Follow up

- Repeat HIV testing at 4 weeks and 12 weeks should be obtained.
- A negative HIV test result at 12 weeks post-exposure reasonably excludes HIV infection related to the exposure.
- Routine testing at 6 months post-exposure is no longer recommended.
PrEP vs. nPEP

Case #2:  
24 year old MSM on nPEP, day 27/28. Struggles with consistent condom use and regularly has unprotected receptive anal intercourse with his HIV-infected partner.
PrEP: Pre-exposure Prophylaxis

• How does it work?
  – Uninfected person takes antiretrovirals
  – May prevent replication of virus & infection

• Daily adherence stressed

• Candidates
  – MSM
  – Transgender Individuals
  – Heterosexual men/woman
  – IVDU
NRTI’s and NNRTI’s work here

http://www.aidsinfo.nih.gov/education-materials/fact-sheets/19/73/the-hiv-life-cycle
**PrEP Timeline**

November 2010
- iPrEx

January 2011
- CDC Interim Guidance: PrEP for MSM

February 2011
- FDA Approval: TDF/FTC PrEP

August 2012
- CDC Interim Guidance: PrEP for IDU
- TDF2 Partners PrEP
- FEM-PrEP

July 2012
- CDC Interim Guidance: PrEP for heterosexuals

March 2013
- VOICE

June 2013
- CDC Interim Guidance: PrEP for IDU
- Bangkok TDF Study

June 2013
- NYS AIDS Institute Guidance for PrEP

March 2014
- US Public Health Service Clinical Practice Guideline for PrEP

May 2014
- NYS AIDS Institute Guidance for PrEP
There were over **77,000 PrEP users** in 2016.

That’s a **73% increase** year over year since 2012.
PrEP: Candidates

Substantial risk of acquiring HIV infection

• **Men who have sex with men (MSM)**
  – HIV-positive sexual partner
  – Recent bacterial STI
  – High number of sex partners
  – History of inconsistent/no condom use

PrEP: Candidates

Substantial risk of acquiring HIV infection

- **Transgender individuals**
  - Engaging in high-risk sexual behaviors
PrEP: Candidates

Substantial risk of acquiring HIV infection

- **Heterosexual women and men**
  - HIV-positive sexual partner
  - Recent bacterial STI
  - High number of sex partners
  - History of inconsistent/no condom use
  - Commercial sex work
  - High-prevalence area or network

PrEP: Candidates

Substantial risk of acquiring HIV infection

• **Injection drug users (IDU)**
  – HIV-positive injecting partner
  – Sharing injection equipment
  – Recent drug treatment (but currently injecting)

Risk Behavior Assessment:

In the past 6 months:

• Have you had sex with men, women, or both?

• *(if men or both sexes)* How many men have you had sex with?

• How many times did you have receptive anal sex in which your partner was not wearing a condom?

• How many of your sex partners were HIV-positive?

• Have you used methamphetamines (such as crystal or speed)?

PrEP: Clinical Eligibility

- Documented negative HIV test
- No signs/symptoms of acute HIV infection
- Normal renal function
- No contraindicated medications
- Documented hepatitis B infection and/or vaccination status

PrEP: HIV Testing

• Are signs/symptoms of acute HIV present now or in prior 4 weeks?
  – Option 1: retest antibody in one month
  – Option 2: HIV antibody/antigen assay
  – Option 3: HIV-1 viral load

Does PrEP use increase risk behavior?

- A number of studies are examining whether people on PrEP are less likely to use a condom, which could lead to an increase in other sexually transmitted infections (STIs).
- PROUD Study conducted in the United Kingdom reported no difference in condom usage or levels of STIs between people given PrEP and people that didn’t take the drug.
Does PrEP use increase risk behavior?

- A study between 2010 to 2015 among men who have sex with men in Montréal, Canada did find increased rates of STIs were observed in the first 12 months of taking PrEP.
- A 2019 evidence review analyzing 20 PrEP studies and trials among gay men and other men who have sex with men also found high rates of STIs among people on PrEP, ranging from 33% to 100%.
- *Keep in mind that accessing PrEP means people will be tested for HIV and other STIs before initiating it, leading to an increase in STI diagnoses.*
Cost effectiveness

• The total cost of HIV-related care was estimated to be $41.2 billion over a span of 40 years
• PrEP could initially raise costs by a maximum of $171 million during the first 10 years of its implementation
  – potential to become cost-saving following the first 10 years after its introduction,
  – amassing a total savings of $5.8 billion towards HIV-related spending by 2058
  – PrEP could still cut costs at a 70% price reduction of antiretroviral drug treatment
PrEP: Considerations

• Age
• Reproductive plan
• Osteopenia/osteoporosis

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Providing PrEP

Before starting PrEP:
• Clinical eligibility
• Educate
  – Side effects
  – Limitations
  – Daily adherence
  – Symptoms of seroconversion
  – Monitoring schedule
  – Safety
  – Criteria for discontinuation
• Partner information
• Social history: housing, substance use, mental health, domestic violence

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Checklist for Prescribers:
Initiation of Emtricitabine/Tenofovir Disoproxil Fumarate 200 mg/300 mg for HIV-1 Pre-exposure Prophylaxis (PrEP)

Instructions: Complete checklist at each visit and file in individual's medical record.

I have completed the following prior to prescribning emtricitabine/tenofovir disoproxil fumarate for HIV-1 pre-exposure prophylaxis (PrEP) for the adult or adolescent weighing at least 35 kg who is about to start or is taking emtricitabine/tenofovir disoproxil fumarate for HIV-1 PrEP:

Lab Tests/Evaluation
- Completed risk evaluation of uninfected individual
- Confirmed a negative HIV-1 test immediately prior to initiating emtricitabine/tenofovir disoproxil fumarate for HIV-1 PrEP
  - If clinical symptoms consistent with acute viral infection are present and recent (<1-month) exposure is suspected, delay starting HIV-1 PrEP for at least 1 month and reconfirm HIV-1 status or use a test approved or cleared by the FDA as an aid in the diagnosis of HIV-1 infection, including acute or primary HIV-1 infection. (Note: emtricitabine/tenofovir disoproxil fumarate for HIV-1 PrEP is contraindicated in individuals with unknown HIV-1 status or who are HIV-1 positive)
- Performed HBV screening test
- Confirmed estimated creatinine clearance (CrCl) 250 mL/min prior to initiation and periodically during treatment
- On a clinically appropriate schedule, assessed serum creatinine, estimated creatinine clearance, urine glucose, and urine protein in all patients before initiation of emtricitabine/tenofovir disoproxil fumarate and periodically while taking emtricitabine/tenofovir disoproxil fumarate is being used. In patients with chronic kidney disease, also assess serum phosphorus. If a decrease in estimated CrCl is observed in uninfected individuals while using emtricitabine/tenofovir disoproxil fumarate for HIV-1 PrEP, evaluate potential causes and re-assess potential risks and benefits of continued use
- Confirmed that the uninfected at-risk individual is not taking other HIV-1 medications or HBV medications
- Euthelial risk/benefit for women who may be pregnant or may want to become pregnant

Counseling/Follow-up
- Discussed known safety risks with use of emtricitabine/tenofovir disoproxil fumarate for HIV-1 PrEP
- counseled on the importance of scheduled follow-up every 2 to 3 months, including regular HIV-1 screening tests (at least every 3 months), while taking emtricitabine/tenofovir disoproxil fumarate for HIV-1 PrEP to reconfirm HIV-1-negative status
- Some individuals, such as adolescents, may benefit from more frequent visits and counseling
- Discussed the importance of discontinuing emtricitabine/tenofovir disoproxil fumarate for HIV-1 PrEP if seroconversion has occurred, to reduce the development of resistant HIV-1 variants
- Counseled on the importance of adherence to daily dosing schedule
- Counseled that emtricitabine/tenofovir disoproxil fumarate for HIV-1 PrEP should be used only as part of a comprehensive prevention strategy
- Educated on practicing safer sex consistently and using condoms correctly
- Discussed the importance of the individual knowing their HIV-1 status and, if possible, that of their partner(s)
- Discussed the importance of virologic suppression in partner(s) with HIV
- Discussed the importance of and performed screening for sexually transmitted infections (STIs), such as syphilis, chlamydia, and gonorrhea, that can facilitate HIV-1 transmission
- Offered HBV vaccination as appropriate
- Provided education on where information about emtricitabine/tenofovir disoproxil fumarate for HIV-1 PrEP can be accessed
- Discussed potential adverse reactions
- Reviewed the Emtricitabine/Tenofovir Disoproxil Fumarate Mediation Guide with the uninfected at-risk individual

Agreement Form
for Initiating TRUVADA for Pre-exposure Prophylaxis (PrEP)

Instructions: Review form with an HIV-negative person who is about to start or is taking TRUVADA for a PrEP indication at each visit. File form in the person's medical record.

TRUVADA is indicated in combination with safer sex practices for pre-exposure prophylaxis (PrEP) to reduce the risk of sexually acquired HIV-1 in adults at high risk. The following factors may help to identify individuals at high risk:
- Has partner(s) known to be HIV-1 infected, or
- Engages in sexual activity within a high prevalence area or social network and one or more of the following:
  - Inconsistent or no condom use
  - Diagnosis of sexually transmitted infections
  - Exchange of sex for commodities (such as money, shelter, food, or drugs)
  - Use of illicit drugs, alcohol dependence
  - Incarceration
  - Partner(s) of unknown HIV-1 status with any of the factors listed above

Healthcare Provider Agreement
By signing below, I signify my understanding of the risks and benefits of TRUVADA for a PrEP indication and my obligation as a prescriber to educate the HIV-negative person about these risks, counsel the person on risk reduction, monitor the person appropriately, and report adverse events. Specifically, I attest to the following:
- Confirmed the negative HIV-1 status of this person prior to starting TRUVADA for a PrEP indication
- Read the Prescribing Information, including the BOXED WARNING
- Discussed with the HIV-negative person the known safety risks with use of TRUVADA for a PrEP indication
- Reviewed the importance of adherence with a comprehensive prevention strategy, including practicing safer sex
- Discussed the importance of regular HIV-1 testing (at least every 3 months) while taking TRUVADA for a PrEP indication
- Reviewed the TRUVADA Medication Guide with the HIV-negative person at high risk prior to prescribing TRUVADA for a PrEP indication
- Completed the items on the Checklist for Prescribers: Initiation of TRUVADA for Pre-exposure Prophylaxis (PrEP)

HIV-Negative Person Agreement
By signing below, I acknowledge that I have talked with my healthcare provider about the risks and benefits of TRUVADA to reduce the risk of getting HIV-1 infection and I understand them clearly. Specifically, I attest to the following:
- My healthcare provider talked with me about the importance of follow-up HIV-1 testing, and I agree to have repeat HIV-1 screening tests (at least every 3 months) as scheduled by my healthcare provider
- My healthcare provider talked with me about the safety risks involved with using TRUVADA to reduce the risk of getting HIV-1 infection
- My healthcare provider talked with me about a complete prevention strategy and always practicing safer sex by using condoms correctly
  - I will talk with my healthcare provider if I have any questions
  - I have read the TRUVADA Medication Guide

<table>
<thead>
<tr>
<th>Healthcare Provider's Signature</th>
<th>Date</th>
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<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>HIV-Negative Person's Signature</th>
<th>Date</th>
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<tbody>
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</tbody>
</table>
It’s simple....

An HIV-negative person who engages in risk behavior for HIV takes one pill TDF/FTC (Truvada) TAF/FTC (Descovy) * once a day to prevent from becoming infected with HIV

HIV PrEP: More Than a Daily Medication

1. Once daily pill

BUT...PrEP Involves More Than Just A Pill...
Approach to keep at-risk HIV negative individuals healthy

2. Periodic HIV tests
3. Periodic STI screens
4. Multidisciplinary team provide risk reduction
   – Counseling about condom use
   – Education about harm reduction
   – Counseling to promote adherence to PrEP

Great Opportunity to Provide Screening and Counseling to Healthy High Risk Individuals Every 3 Months!
Minimum Recommended PrEP Follow Up

• Follow-up appointments 1 month and 3 months after PrEP start, then at least every 3 months
• Only 90 day supply of medication prescribed
• **At each appointment**
  • Screen for difficulties with daily adherence
  • Screen for adverse effects
  • Screen for STI symptoms
  • Discuss risk reduction and provide condoms

• **Recommended testing every 3 months**
  • HIV test
  • Pregnancy test

• **Recommended testing every 6 months**
  • Serum creatinine and Creatinine (starting 3 months after PrEP start)
  • STI tests (Triple Screen)
  • Hepatitis C serology – annually

• Adolescents on PrEP frequently benefit from more frequent appointments
Support & Adherence

Develop trust, avoid judgment

- Plan
- Monitor
- Educate
- Identify barriers
- Assess for side effects

Adverse Effects of PrEP

• Mild GI affects (Nausea, Diarrhea, Gas) in ~9% of individuals
• Occasional Headache or dizziness
• Pregnancy Category B
• Renal toxicity (<4%) *
  • Reversible if medication stopped
• Slight decreased bone mineral density*
  • Most self-resolved
• *Noted in HIV+ individuals on TDF-FTC
  • Descovy
Discontinuing PrEP

- Positive HIV result
- Acute HIV signs or symptoms
- Non-adherence
- Renal disease
- Changed life situation: lower HIV risk

PrEP Summary

- Effective
- FDA approved
- Well-tolerated

However,
- Short-term data only
- Daily adherence required
- Side effects
- Drug resistance in acute infection
- Could lead to fewer condoms being used
- Cost
- Logistics
Acute HIV Infection

Symptoms

- Fever
- Fatigue
- Myalgia
- Skin rash
- Headache
- Pharyngitis
- Cervical Lymphadenopathy
- Arthralgia
- Night sweats
- Diarrhea

The beginning: Acute Retroviral Syndrome ("acute HIV")

• Up to 80% of new HIV infections present with symptoms of viral illness, many misdiagnosed (influenza, infectious mononucleosis)
• Fever, fatigue, rash, and headache
• Lymphadenopathy, pharyngitis, myalgia, arthralgia, oral candidiasis
• Nausea, vomiting, diarrhea; night sweats; oral ulcers
• Duration of illness ranges from a few days to more than 10 weeks
Acute retroviral syndrome rash
Natural history of untreated HIV infection

CDC's new recommendations for HIV testing in laboratories capitalize on the latest available technologies to help diagnose HIV infections earlier – as much as 3-4 weeks sooner than the previous testing approach. Early diagnosis is critical since many new infections are transmitted by people in the earliest ("acute") stage of infection.

By putting the latest testing technology to work in laboratories across the United States, we can help address a critical gap in the nation’s HIV prevention efforts.

**Step 1:** "Fourth generation" HIV test
Detecting HIV sooner

Detects HIV in the blood earlier than previously recommended antibody tests by identifying the HIV-1 p24 antigen, a viral protein which appears in the blood sooner than antibodies.

- **Negative**
  - Diagnosis: HIV-negative
  - False Positive

- **Positive**
  - Diagnosis: Acute HIV-1 Infection

**Step 2:** HIV-1/HIV-2 antibody differentiation immunoassay
Diagnosing HIV-1 vs. HIV-2

- Produces results faster than the previously recommended Western Blot.
- Distinguishes between HIV-1 and HIV-2, which the previously recommended Western Blot cannot do – this distinction can have important treatment implications for a patient.

- **Negative or Indeterminate**

- **Positive**
  - Interpret Test Results as HIV-1 or HIV-2

**Step 3:** Nucleic Acid Test (NAT)
Acute HIV-1 infection or "false positive"?

Ensures accurate detection of early infection or indicates a false positive from the fourth generation test.

- **Negative**
  - Diagnosis: HIV Infection

This graphic is designed to illustrate key concepts of the new testing approach in laboratories. For more detail, please see the full guidelines here:
# Antiretroviral Drug Chart

<table>
<thead>
<tr>
<th>Generic name</th>
<th>Trade name</th>
<th>Formulation</th>
<th>Standard adult dose</th>
<th>Pills/day</th>
<th>Major side-effects</th>
<th>Food restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Single-tablet regimens</strong></td>
<td></td>
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</tr>
<tr>
<td>Bictegravir/</td>
<td>Bikzvy</td>
<td>Tablet compr. 50mg bictegravir, 200mg bictegravir, 25mg tenofovir alafenamide</td>
<td>One tablet once a day</td>
<td>1</td>
<td>Common: Depression, abnormal dreams, headache, dizziness, tiredness</td>
<td>Take with or without food</td>
</tr>
<tr>
<td>efavirenz/tenofovir disoproxil fumarate</td>
<td>Etravirine</td>
<td>Tablet compr. 100mg efavirenz, 300mg tenofovir disoproxil fumarate</td>
<td>One tablet once a day</td>
<td>1</td>
<td>Common: Nausea, diarrhea, vomiting, abdominal pain, skin darkening, low blood phosphorus, liver enzymes, renal failure, elevated/low lactic acid, kidney failure</td>
<td>Take with or without food</td>
</tr>
<tr>
<td>Emtricitabine</td>
<td>Epzicom</td>
<td>200mg capsule</td>
<td>200mg once a day</td>
<td>1</td>
<td>Common: Nausea, diarrhea, vomiting, headache, dizziness, weakness, fatigue, elevated liver enzymes, creatinine, creatinine kinase, lipids, kidney failure</td>
<td>Take with or without food</td>
</tr>
<tr>
<td>Tenofovir disoproxil fumarate</td>
<td>Atripla</td>
<td>Tablet compr. 300mg tenofovir disoproxil fumarate</td>
<td>900mg once a day</td>
<td>3</td>
<td>Common: Nausea, vomiting, diarrhea, abdominal pain, skin darkening, low blood phosphorus, kidney failure</td>
<td>Take with or without food</td>
</tr>
<tr>
<td><strong>Nucleoside/nucleotide reverse transcriptase inhibitors (NRTIs)</strong></td>
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<tr>
<td>Emtricitabine</td>
<td>Emtriva</td>
<td>200mg capsule</td>
<td>200mg once a day</td>
<td>1</td>
<td>Common: Nausea, diarrhea, vomiting, headache, dizziness, weakness, fatigue, elevated liver enzymes, creatinine, creatinine kinase, lipids, kidney failure</td>
<td>Take with or without food</td>
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<tr>
<td>Lamivudine</td>
<td>generic</td>
<td>150 and 300mg tablets</td>
<td>150mg twice a day or 300mg once a day</td>
<td>2</td>
<td>Common: Nausea, vomiting, diarrhea, headache, general feeling of being unwell, cough, runny nose, abdominal pain, skin darkening, low blood phosphorus, kidney failure</td>
<td>Take with or without food</td>
</tr>
<tr>
<td>Tenofovir disoproxil fumarate</td>
<td>generic</td>
<td>245mg tablet</td>
<td>245mg once a day</td>
<td>1</td>
<td>Common: Nausea, vomiting, diarrhea, malaise, fatigue, skin darkening, low blood phosphorus, kidney failure</td>
<td>Take with or without food</td>
</tr>
<tr>
<td>Zidovudine</td>
<td>generic</td>
<td>200mg capsule</td>
<td>200mg twice a day</td>
<td>2</td>
<td>Common: Nausea, vomiting, diarrhea, general feeling of being unwell, cough, runny nose, abdominal pain, skin darkening, low blood phosphorus, kidney failure</td>
<td>Take with or without food</td>
</tr>
</tbody>
</table>
## NRTI fixed-dose combinations

<table>
<thead>
<tr>
<th>Name</th>
<th>Dose</th>
<th>Frequency</th>
<th>Side effects</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abacavir/3TC</td>
<td>600mg/300mg or 200mg/150mg</td>
<td>once a day</td>
<td>Common: Headache, abdominal pain, hair loss, insomnia, tiredness, loss of appetite, nausea, joint pain</td>
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</tr>
<tr>
<td>Tenofovir/3TC</td>
<td>250mg/300mg</td>
<td>twice a day</td>
<td>Common: Headache, dizziness, abdominal pain, nausea, vomiting, diarrhea, rash, tiredness</td>
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<tr>
<td>Integrase inhibitors</td>
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<tr>
<td>Dolutegravir</td>
<td>50mg tablet</td>
<td>once a day</td>
<td>Common: Nausea, diarrhea, headache, rash, itching, vomiting, abdominal pain or discomfort, difficulty in sleeping, abdominal dreams, depression, dizziness, vertigo, restless, abdominal pain, bloating, diarrhea, nausea, vomiting, indigestion, rash, weakness, fatigue, fever, raised liver or pancreatic enzymes, raised triglycerides</td>
<td></td>
</tr>
<tr>
<td>Raltegravir</td>
<td>400mg and 600mg tablets</td>
<td>twice a day</td>
<td>Common: Loss of appetite, headache, dizziness, difficulty in sleeping, abdominal dreams, depression, dizziness, vertigo, restless, abdominal pain, bloating, diarrhea, nausea, vomiting, indigestion, rash, weakness, fatigue, fever, raised liver or pancreatic enzymes, raised triglycerides</td>
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<tr>
<td>Non-nucleoside reverse transcriptase inhibitors (NNRTIs)</td>
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<tr>
<td>Darunavir</td>
<td>800mg or 800mg/100mg capsules</td>
<td>twice a day</td>
<td>Common: Nausea, diarrhea, headache, rash, itching, abdominal pain, vomiting, elevated blood pressure, triglycerides or cholesterol levels, anxiety, difficulty in sleeping, headache, heart attack, high blood pressure, indigestion and acid reflux, diarrhea, nausea, vomiting, flatulence, abdominal pain, kidney failure, tiredness, rash, parathoracic neuropathy (damage to nerves in the hands or feet)</td>
<td></td>
</tr>
<tr>
<td>Rilpivirine</td>
<td>25mg tablet</td>
<td>once a day</td>
<td>Common: Nausea, diarrhea, headache, rash, itching, dizziness, abdominal pain, vomiting, reduced white or red blood cell count, low platelet count, raised cholesterol or triglycerides or liver enzymes or pancreatic amylase or lipase levels, reduced appetite, difficulty in sleeping, abdominal dreams, low mood, tiredness, drowsiness, dry mouth</td>
<td></td>
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<tr>
<td>Protease inhibitors</td>
<td></td>
<td></td>
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<tr>
<td>Atazanavir</td>
<td>150, 200, and 300mg capsules</td>
<td>300mg with 100mg ritonavir once a day</td>
<td>Common: Nausea, diarrhea, rash, abdominal pain, headache, vomiting, heartburn, tiredness, raised bilirubin levels, sometimes leading to jaundice</td>
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<tr>
<td>Tisfamivir</td>
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</table>
......so many choices!
Treatment regimens are much simpler today

- Fixed-drug, multi-class combination pills (one pill once daily)
  - Tenofovir/emtricitabine/efavirenz
  - Elvitegravir/cobicistat/emtricitabine/tenofovir disoproxil fumarate
  - Emtricitabine/rilpivirine/tenofovir disoproxil fumarate

- Once daily or twice daily regimens (3 pills once daily, 3 pills twice daily)
Goals of Treatment

• Reduce HIV-associated morbidity and prolong the duration and quality of survival
• Restore and preserve immunologic function
• Maximally and durably suppress plasma HIV viral load
• Prevent HIV transmission

Undetectable = Untransmittable
CONCLUSIONS AND RELEVANCE  Among serodifferent heterosexual and MSM couples in which the HIV-positive partner was using suppressive ART and who reported condomless sex, during median follow-up of 1.3 years per couple, there were no documented cases of within-couple HIV transmission (upper 95% confidence limit, 0.30/100 couple-years of follow-up). Additional longer-term follow-up is necessary to provide more precise estimates of risk.
When ART results in viral suppression, defined as less than 200 copies/ml or undetectable levels, it prevents sexual HIV transmission. Across three different studies, including thousands of couples and many thousand acts of sex without a condom or pre-exposure prophylaxis (PrEP), no HIV transmissions to an HIV-negative partner were observed when the HIV-positive person was virally suppressed. *This means that people who take ART daily as prescribed and achieve and maintain an undetectable viral load have effectively no risk of sexually transmitted the virus to an HIV-negative partner.*
Conclusion

• To PrEP or not to PrEP?

– To PrEP
  • Assess
  • Educate
  • Monitor
  • Routine follow up
  • Re-assess for cessation