HIV Prevention among Women

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Objectives

• HIV prevention among US Women
• Potential role for PrEP among women
• PrEPception and Breastfeeding
Subpopulations representing 2% or less of the overall US epidemic not reflected in this chart. Abbreviations: MSM, men who have sex with men; IDU, injection drug user.

- Approximately 25% of people living with HIV in the US are women.

CDC. HIV Surveillance Supplemental Report 2012;17(4).
Diagnoses of HIV Infection and Population among Adult and Adolescent Females, by Race/Ethnicity 2014—United States

Diagnoses of HIV Infection
N = 8,328

- American Indian/Alaska Native: <1%
- Asian: <1%
- Black/African American: 16%
- Hispanic/Latino: 2%
- Native Hawaiian/other Pacific Islander: 1%
- White: 62%
- Multiple races: 18%

Female Population, United States
N = 136,147,401

- American Indian/Alaska Native: <1%
- Asian: <1%
- Black/African American: 64%
- Hispanic/Latino: 15%
- Native Hawaiian/other Pacific Islander: 13%
- White: 6%
- Multiple races: 2%

Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.

*a Hispanics/Latinos can be of any race.
Risk Factors

• Majority of transmission among US women via intercourse
• High prevalence of HIV among US Black women
• Disproportionate to their engagement in traditional risk behaviors
  • number of partners
  • non-condom use

Aral SO, Lancet 2008
Risk Factors

• Sexual mixing patterns
  • High HIV prevalence in African American and Hispanic/Latino communities
  • Many people tend to have sex with partners of the same race/ethnicity
  • Women from these communities face a greater risk of HIV infection with each new sexual encounter.
• Injection drug and other substance use
  • Directly
    • sharing drug injection equipment contaminated with HIV
  • Indirectly
    • engaging in high-risk behaviors while under the influence of drugs or alcohol
Risk Factors

• Structural factors
  • Poor access to health care
  • Lack of stable housing
  • Limited HIV prevention education
• Increased prevalence of other STIs
HIV risk among women

- HIV risk during vaginal sex without a condom or other protection such as PrEP higher for women for men
- Anal sex without a condom or PrEP riskier for women than vaginal sex
  - More than 20% of women aged 20 to 39 who responded to a national survey reported anal sex in the past year.
- Some women afraid partner will leave them or physically abuse them if they try to talk about condom use
Barriers to condom use

• Personal perception of being low-risk
• Educational status
• Low socio-economic status
• Desire to conceive
• High partner-related barriers to condom use
  – fear of perceptions of unfaithfulness
  – intimate partner violence
  • Sexually abused women may be more likely to exchange sex for drugs, have multiple partners, or have sex with a partner who is physically abusive when asked to use a condom

Comprehensive HIV Prevention

- Harm reduction counseling
- Behavioral Interventions
- Condoms
- HIV testing
- Link HIV+ clients to care
  - Treatment as Prevention (TasP)
- STI diagnosis and treatment
- nPEP: non-occupational post-exposure prophylaxis
- PrEP: pre-exposure prophylaxis
Comprehensive HIV Prevention

• Harm reduction counseling
  • Partner selection
  • Age of sexual debut
  • Not sharing needles
  • Education
• Behavioral Interventions
• Condoms
• HIV testing
• Link HIV+ clients to care
• STI diagnosis and treatment
• nPEP: non-occupational post-exposure prophylaxis
• PrEP: pre-exposure prophylaxis
Comprehensive HIV Prevention

• Harm reduction counseling

• Behavioral Interventions
  • Wide range of evidence-based interventions
  • brief single-session, one-on-one skill-building interventions
  • Multi-session, group interventions
  • Community level promoting social norms

• Condoms

• HIV testing

• Link HIV+ clients to care

• STI diagnosis and treatment

• nPEP: non-occupational post-exposure prophylaxis

• PrEP: pre-exposure prophylaxis

www.effectiveinterventions.org
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Comprehensive HIV Prevention

• Harm reduction counseling
• Behavioral Interventions
• Condoms
  • Correct and consistent use
  • Condom distribution
    • Lubricant
    • Male and Female condoms
• HIV testing
• Link HIV+ clients to care
• STI diagnosis and treatment
• nPEP: non-occupational post-exposure prophylaxis
• PrEP: Pre-exposure prophylaxis

HIV Testing Recommendations

• CDC 2006 and USPSTF 2013

  • In all health-care settings, providers should routinely screen for HIV infection in people aged 13 - 64 years old unless the patient declines – opt-out screening.

    Grade A: “high certainty” of net benefit

  • Providers should annually screen all at-risk people regardless of age.

    Grade A ("high certainty" of net benefit)

• All pregnant women should be HIV tested.
Treatment as Prevention

HIV Prevention Trials Network (HPTN) O52 2011

- RCT of 1763 HIV serodiscordant couples
- sub-Saharan Africa, Asia and the Americas
- Early ART at CD4 count 350–550 vs. 200–250
- 96% decrease in HIV-1 sexual transmission

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Cohen M, NEJM, 2011
Why we need more...

- Genetic analysis of transmitted viral strains
  - 11 of 39 (28%) uninfected participants who seroconverted on-study acquired HIV from partners outside of their partnership

- Treating infected partners may not provide complete protection for members of discordant couples with other sexual partners.

Cohen M, NEJM, 2011
Why we need more...

• Many new HIV infections occur in context of acute HIV
  • 8x - 10x more infectious
  • First month viral load may be in millions.
• High risk networks
• No behavior change
Why we need more...

Abbreviations: HIV = human immunodeficiency virus; ART = antiretroviral therapy.

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A Role for PrEP among Women
Pre-exposure prophylaxis (PrEP)

- Vulnerable people take a pill on a daily basis to prevent HIV.
- Only one FDA approved drug
  - Once daily tablet
  - co-formulated tenofovir disoproxil fumarate 300 mg (TDF) and emtricitabine (FTC) 200 mg
- 44 to 67% effective in clinical trials
  ....If taken perfectly **92% effective** in clinical trials and 100% effective in published data on real world implementation.
Oral PrEP
TDF2-CDC

- Randomized Control Trial
- 1200 men and women
  - Botswana
  - Daily oral
  - FTC-TDF vs. placebo

- 63% reduction in the risk of HIV acquisition
Oral PrEP
Partners PrEP

• 4758 HIV sero-discordant heterosexual couples
  – Kenya & Uganda
  – TDF vs. FTC-TDF vs. placebo
  – Pregnancy rate was high (10.3 per 100 person–years) with no diff between groups

• TDF \(\rightarrow\) 62% fewer infections
• FTC-TDF \(\rightarrow\) 73% fewer infections
<table>
<thead>
<tr>
<th>Detecting substantial risk of acquiring HIV infection</th>
<th>Men Who Have Sex with Men</th>
<th>Heterosexual Women and Men</th>
<th>Injection Drug Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV-positive sexual partner</td>
<td>HIV-positive sexual partner</td>
<td>HIV-positive injecting partner</td>
<td></td>
</tr>
<tr>
<td>Recent bacterial STI</td>
<td>Recent bacterial STI</td>
<td>Sharing injection equipment</td>
<td></td>
</tr>
<tr>
<td>High number of sex partners</td>
<td>High number of sex partners</td>
<td>Recent drug treatment (but currently injecting)</td>
<td></td>
</tr>
<tr>
<td>History of inconsistent or no condom use</td>
<td>History of inconsistent or no condom use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial sex work</td>
<td>Commercial sex work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In high-prevalence area or network</td>
<td>In high-prevalence area or network</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinically eligible</th>
<th>Documented negative HIV test result before prescribing PrEP</th>
<th>No signs/symptoms of acute HIV infection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal renal function; no contraindicated medications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Documented hepatitis B virus infection and vaccination status</td>
<td></td>
</tr>
</tbody>
</table>

| Prescription                                              | Daily, continuing, oral doses of TDF/FTC (Truvada), ≤90-day supply | |

| Other services                                            | Follow-up visits at least every 3 months to provide the following: | |
|                                                          | HIV test, medication adherence counseling, behavioral risk reduction support, | |
|                                                          | side effect assessment, STI symptom assessment                    | |
|                                                          | At 3 months and every 6 months thereafter, assess renal function | |
|                                                          | Every 6 months, test for bacterial STIs                           | |
|                                                          | Do oral/rectal STI testing                                       | |

| Assess pregnancy intent                                  | Assess pregnancy intent | Access to clean needles/syringes and drug treatment services | |
|----------------------------------------------------------|-------------------------|-------------------------------------------------------------|
Potential PrEP Users

• Known partner who has HIV
  • Indicate that they do not always use condoms
  • HIV + partner’s viral load not consistently undetectable
• Recent history of transactional sex
• Bacterial sexually transmitted infection
• Inconsistent or non-condom use
• Injection drug use, alcohol dependence
• Incarceration
• High risk partner
How long until it takes effect?

• Oral PrEP maximum intracellular concentration
  • Cervicovaginal tissue – 20 days
  • Blood – 20 days
  • Rectal tissue - 7 days
PrEP works, if taken consistently

<table>
<thead>
<tr>
<th>Study</th>
<th>Overall Efficacy</th>
<th>Efficacy if TFV detected (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>iPrEx</td>
<td>44%</td>
<td>92%</td>
</tr>
<tr>
<td>Partners PrEP</td>
<td>75</td>
<td>90</td>
</tr>
<tr>
<td>TDF2</td>
<td>62</td>
<td>85</td>
</tr>
<tr>
<td>Bangkok IDU</td>
<td>49</td>
<td>74</td>
</tr>
</tbody>
</table>

Grant RM, NEJM. 2010.
Thigpen MC, NEJM 2012.
Baeten JM, NEJM 2012.
Importance of Adherence and Acceptance

• Adherence assessment and support
  • Nonjudgmental
• Acceptability
  • Many at-risk people may not be engaged in care
  • Prescriber
Oral PrEP: *Importance of Adherence*

Fem-PrEP and VOICE

- **Fem-PrEP**
  - RCT ~2000 high-risk women
    - Kenya, South Africa, Tanzania
    - > 1 partner in past month
    - ≥ 1 intercourse in past week
  - Daily oral FTC-TDF vs. placebo
- **Interim data no difference** in rate of new HIV infections
- **Adherence < 40%**
  - Only 30% felt themselves to be at risk.
Efficacy and Safety

• Real world efficacy

• Drug safety considerations
  – nausea and mild inadvertent weight loss
    • in about 1-2% of the study participants
  – Renal insufficiency
  – 1% BMD loss at the total hip and femoral neck
    • rate of bone fractures was no different
PrEP Failure/Drug Resistance

- **Randomized trials:** Participants already HIV-infected at the time of enrollment
  - Window period of acute HIV
- **Real world:** rare PrEP users with multiple mutations upon seroconversion.

Knox DC, CROI Boston, 2016

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Risk compensation

• Sexual disinhibition and reduction in use of condoms as an adjunct safety measure
• In many clinical trials trend toward decreased sexual risk behavior
  • Self-report, clinical trial setting, coupled with behavioral interventions
• In non-trial settings, risk-taking behavior varies by personal, psychosocial and health-related features.
PrEPception

• PrEP should be discussed with heterosexually-active women and men whose partners are known to have HIV infection
  – one of several options (IIB)
  – Begin one month before conception
  – Continue one month after conception

• Breastfeeding
  – Details of PrEP safety for infants exposed during lactation could benefit from further study.
  – *Infants born to HIV-infected mothers and exposed to TDF or FTC through breast milk suggest limited drug exposure.*
PrEPception

- Discuss with heterosexual women and men whose partners have HIV infection (IIB)
  - One of several options
  - Begin one month before conception
  - Continue one month after conception
  - Antiretroviral Pregnancy Registry
    http://www.apregistry.com/

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Breastfeeding and PrEP

- Tenofovir detected at concentrations consistent with steady-state use
- tenofovir was unquantifiable in 46/49 samples (94%),

Maternal plasma emtricitabine concentrations consistent with steady-state use

Emtricitabine concentrations in breast milk were more similar to plasma concentrations than had been seen for tenofovir

Emtricitabine was detectable in 47/49 (96%) infant plasma samples


- National electronic patient-level data from 80% of US retail pharmacies
- 79,684 individuals started FTC/TDF for PrEP.
- 1,671 in Q4 2012 → 14,000 in Q4 2015

Disparities in PrEP Utilization

PrEP use among AA and Hispanics is low relative to the rate of new HIV infections

Bush S, et al. ASM/ICAAC 2016; Boston, MA. #2651

a. https://www.census.gov/quickfacts/table/PST045215/00
b. Other: American Indian or Alaska Native, and Native Hawaiian or other Pacific Islander. CDC. HIV Surveillance Report, 2014
c. These data represent 43.7% (n=21,463) of unique individuals who have started TVD for PrEP from 2012-3Q2015.
New FTC/TDF PrEP Starts by Race/Ethnicity and Sex/Gender*

- Number of women who initiate FTC/TDF for PrEP is low across all races/ethnicities
- Rate of FTC/TDF for PrEP initiation among AA and Hispanic women is significantly less than that of white women

* These data represent 43.7% (n=21,463) of unique individuals who have started FTC/TDF for PrEP from 2012-3Q2015.

Bush S, et al. ASM/ICAAC 2016; Boston, MA. #2651
PrEP empowers women!

- Can control risk of getting infected with HIV
  - Without relying on HIV+ partner ART adherence
  - Without relying on ability to navigate condom use
- Privately and safely

- CDC estimates 468,000 US women could benefit from PrEP
Selected References


