Progress in HIV Prevention

ACTHIV 2019
American Conference for the Treatment of HIV

Charlene A. Flash MD, MPH
Associate Chief Medical Officer
Legacy Community Health
and
Clinical Assistant Professor of Medicine
Division of Infectious Disease
Baylor College of Medicine
Learning Objectives

Upon completion of this presentation, learners should be better able to:

• Explain the indications for prescribing HIV pre-exposure prophylaxis (PrEP) and its role in HIV prevention

• Describe the role of HIV treatment in prevention
Disclosure

Faculty and Planning Committee Disclosures
• Please consult your program book or Conference App
• No active disclosures for 12 months

Off-Label Disclosure
• There will be no off-label/investigational uses discussed in the presentation
41 cases of Kaposi’s Sarcoma
Young gay men
8 die with in 24 months
Majority in New York City and San Francisco
HIV Epidemiology

Rates of HIV Diagnoses Among Adults and Adolescents in the US by State, 2016

HIV Epidemiology

San Francisco
• (2017) HIV Incidence record low of 221
• Pre-exposure Prophylaxis (PrEP) roll-out
• HIV treatment rapid-start program
  • gets those who test positive into care within five days.

New York City
• HIV incidence dropped 26 percent between 2012 and 2016
• Focused public health effort
HIV Epidemiology

Houston

- HIV incidence stable between 2007 and 2013
- Black males 4.6 times rate new HIV diagnoses than White
- Black women 21 times that of White
- Men who have sex with men (MSM) 85.8% of cases among men
Houston Epidemiology: PLWH, New Diagnoses, Deaths Over Time

Figure 9: PLWH, New HIV Diagnoses, and Deaths among PLWH in Houston/Harris County, 1999 - 2013

2015: trend continues:
1470 new diagnoses and 26,495 PLWH
Figure 8: New HIV Diagnoses by Race in Young (13-24 Years) Men Who Have Sex with Men in Houston/Harris County, 1999-2014

Source: Texas eHARS, 2015. Patients with no risk reported were re-categorized by using CDC’s multiple imputation or risk program (McDavid et al., 2008).
Estimated New HIV Diagnoses:
Most Affected Populations in the United States (2016)

Total Estimated New HIV Diagnoses in 2016 (n=39,782)

Diagnoses of HIV Infection and Population among Adult and Adolescent Females, by Race/Ethnicity 2014—United States

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

• 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
  • Individuals from these communities face a greater risk of HIV infection with each new sexual encounter.

• At times rates disproportionate to engagement in traditional risk behaviors
  • number of partners
  • non-condom use

Aral SO, Lancet 2008
Risk Factors

- Structural factors
  - Poor access to health care
  - Lack of stable housing
  - Limited HIV prevention education

- Increased prevalence of other STIs

- 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
US Plan To End The Epidemic

Diagnose all people with HIV as early as possible after infection.

Treat the infection rapidly and effectively to achieve sustained viral suppression.

Protect people at risk for HIV using potent and proven prevention interventions, including PrEP, a medication that can prevent HIV infections.

Respond rapidly to detect and respond to growing HIV clusters and prevent new HIV infections.

HIV HealthForce will establish local teams committed to the success of the Initiative in each jurisdiction.

Goals: 75% reduction in new HIV diagnoses in 5 years
90% reduction in 10 years

Fauci AS. CROI 2019. #OS1.
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
Charlene A. Flash  MD MPH
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
Overview

• HIV Testing
• Treatment as Prevention
• Pre-exposure Prophylaxis
• Barriers to access
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 high-risk people regardless of age.
    Grade A (“high certainty” of net benefit

• All pregnant women should be HIV tested.
Too many Texans are *UNAWARE* of their HIV infection

- Nationally, 12.8% of people with HIV are *unaware* of their infection

- 17.3% of Texans with HIV are *unaware* of their infection.

MMWR June 26, 2015. vol. 64. No. 24

*HIV/AIDS In the Houston Area*

2014 Epidemiologic Supplement for HIV/AIDS Prevention and Care Services Planning
New HIV Infections: Impact of Those Undiagnosed and Not Retained in Care

- **1,148,200** HIV Prevalence
- **91.5% of New HIV Infections**
- **30.2% of New Infections**
- **207,600** 18% Are Undiagnosed, HIV Infected
- **519,414** 61.3% of New Infections
- **45% Are Diagnosed, Not Retained in Care**

Overview

• HIV Testing
• **Treatment as Prevention (TasP)**
• Pre-exposure Prophylaxis
• Barriers to access
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

Cohen M, NEJM, 2011
Partners 2
HIV incidence in discordant MSM couples

- 972 gay couples were recruited, of which 783 couples contributed 1596 eligible CYFU
  - Positive partner: VL <200 copies/mL
  - Uninfected partner: condom-less sex with +partner, no PrEP
  - RESULT: ZERO transmissions after 76,991 sex acts

15 New Infections Among Neg Partner: None Linked

Rodger A, et al. AIDS 2018; Amsterdam, the Netherlands; July 23-27, 2018; Abst. WEAX0104LB.
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
HIV Care Continuum Outcomes, 2015 – U.S. Persons Living with Diagnosed or Undiagnosed HIV Infection

- Infected: 100%
- Diagnosed: 86%
- Linked to Care: 63%
- Retained in Care: 49%
- Suppressed VL: 51%
Overview

• HIV Testing
• Treatment as Prevention
• Pre-exposure Prophylaxis (PrEP)
• Barriers to access
Pre-exposure Prophylaxis

• 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

# CDC Guidelines - 2017

## Table 1: Summary of Guidance for PrEP Use

<table>
<thead>
<tr>
<th></th>
<th>Men Who Have Sex with Men</th>
<th>Heterosexual Women and Men</th>
<th>Injection Drug Users</th>
</tr>
</thead>
</table>
| Detecting substantial risk of acquiring HIV infection | HIV-positive sexual partner  
Recent bacterial STI  
High number of sex partners  
History of inconsistent or no condom use  
Commercial sex work          | HIV-positive sexual partner  
Recent bacterial STI  
High number of sex partners  
History of inconsistent or no condom use  
Commercial sex work  
In high-prevalence area or network | HIV-positive injecting partner  
Sharing injection equipment  
Recent drug treatment (but currently injecting) |
| Clinically eligible                    | Documented negative HIV test result before prescribing PrEP  
No signs/symptoms of acute HIV infection  
Normal renal function; no contraindicated medications  
Documented hepatitis B virus infection and vaccination status |                                                                  |                                                                  |
| 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  
Pregnancy test every 3 months | Access to clean needles/syringes and drug treatment services |

STI: sexually transmitted infection
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
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.

Question: The majority of PrEP prescriptions in the United States are written for:

- A. White men who have sex with men (MSM)
- B. Black MSM
- C. White women
- D. Black women
- E. Transgender women
There were over **77,000 PrEP users** in 2016.

That’s a **73% increase** year over year since 2012.
Disparities in PrEP Utilization

- People of color comprise a disproportionate number of new HIV infections in the US, yet have limited uptake of HIV pre-exposure prophylaxis (PrEP).

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Estimated Population Distribution</th>
<th>Estimated New HIV Infections</th>
<th>Total FTC/TDF for PrEP Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>62%</td>
<td>44%</td>
<td>74%</td>
</tr>
<tr>
<td>White</td>
<td>12%</td>
<td>27%</td>
<td>10%</td>
</tr>
<tr>
<td>Hispanics</td>
<td>18%</td>
<td>23%</td>
<td>12%</td>
</tr>
<tr>
<td>Asians</td>
<td>2%</td>
<td></td>
<td>4%</td>
</tr>
<tr>
<td>Multiracial/Other</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
TABLE 2. Estimated percentages and numbers of adults with indications for preexposure prophylaxis (PrEP), by transmission risk group — United States, 2015

<table>
<thead>
<tr>
<th>Transmission risk group</th>
<th>% with PrEP indications*</th>
<th>Estimated no.</th>
<th>(95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men who have sex with men, aged 18–59 yrs†</td>
<td>24.7</td>
<td>492,000</td>
<td>(212,000–772,000)</td>
</tr>
<tr>
<td>Adults who inject drugs, aged ≥18 yrs§</td>
<td>18.5</td>
<td>115,000</td>
<td>(45,000–185,000)</td>
</tr>
<tr>
<td>Heterosexually active adults, aged 18–59 yrs¶</td>
<td>0.4</td>
<td>624,000</td>
<td>(404,000–846,000)</td>
</tr>
<tr>
<td>Men**</td>
<td>0.2</td>
<td>157,000</td>
<td>(62,000–252,000)</td>
</tr>
<tr>
<td>Women</td>
<td>0.6</td>
<td>468,000</td>
<td>(274,000–662,000)</td>
</tr>
<tr>
<td>Total</td>
<td>—</td>
<td>1,232,000</td>
<td>(661,000–1,803,000)</td>
</tr>
</tbody>
</table>

Smith DK, MMWR, Nov 2015
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CROI Briefs: PrEP

• 60% decline in HIV incidence in England in past 2 years associated with high PrEP uptake

• Rapid PrEP uptake in British Columbia w/ public funding
  • 2,000 enrollees in 6 months by 350 providers

• Good adherence (by TDF-TP levels) in young women on PrEP in SA

Ogaz et al, CROI 2019 #0048; Toy et al, CROI 2019 #0956; Celum et al, CROI 2019, #0095
Overview

• Hard to Reach?
• HIV Testing
• Treatment as Prevention
• Pre-exposure Prophylaxis
• Barriers to access
PrEP Uptake

• Social Determinants and Structural factors
  • Poor access to health care in the most at-risk communities
  • Limited risk awareness among many vulnerable populations
  • Limited HIV prevention education
  • Lack of stable housing
  • Transportation
**CROI Briefs: PrEP**

- PrEP for Black MSM via **telemedicine** in GA & MS
  - led to 32/50 (64%) enrolled
  - 3% found to be HIV+
  - 33% lost to F/U
  - 24% refused linkage.
  - 15/50 (30%) started PrEP, of whom 93% said they would choose this approach over standard PrEP care.

- Chicago PrEP linkage study of 143 PrEP-eligible AA MSM using **cognitive behavioral therapy (CBT)** or SOC.
  - 85% completed all CBT sessions
  - Linkage to PrEP care was low in both groups and higher in the PS-PrEP group, 23% vs 12%, p=0.08.

Siegler et al, CROI 2019 #0955; Da Silva et al, CROI 2019 #0954
CROI Briefs: PrEP

• 299 PrEP eligible young Black MSM in Atlanta
  • clinic visits, lab tests, transportation, and navigation
  • 125 (43%) started PrEP and were ‘on PrEP’ for 69% of the time following initiation over 24 months.
  • Of 69 discontinuers, 68% (54/79) restarted PrEP, and 22% of subjects stopped PrEP ≥ 2 times.
  • Marijuana use, age < 22 years, and having fewer than 3 partners predicted PrEP discontinuation.

Serota et al, CROI 2019 #0963
On the horizon...

• Adherence assessment tool (2020)
  • 24 hr urine tenofovir levels to assess adherence via $2 urine test

• FTC/TAF efficacy (2020)
  • among MSM and trans women
  • less impact on bone and kidney

• Same Day PrEP

• Long acting forms of PrEP, i.e. injectable (cabotegravir) and implantable drugs
Question: The following drugs have received FDA approval for use as pre-exposure prophylaxis (PrEP)

A. cabotegravir
B. co-formulated tenofovir disoproxil fumarate with emtricitabine
C. co-formulated tenofovir alafenamide with emtricitabine
D. A and B
E. B and C
F. All of the above
Overview

• HIV Epidemiology - Hard to Reach?
• HIV Testing
• Treatment as Prevention
• Pre-exposure Prophylaxis
• Barriers to access