Strategies to Reduce Transmission of HIV

Learning Objectives

- Implement guideline-recommended assessment and evaluation to determine risk of HIV acquisition
- Initiate an effective discussion of patient sexual history as part of screening for HIV acquisition risk
- Counsel patients on pharmacologic and nonpharmacologic strategies for HIV prevention
- Provide ongoing and appropriate management of patients receiving PrEP

HIV = human immunodeficiency virus; PrEP = pre-exposure prophylaxis

Burden of Disease: HIV in the United States

- An estimated 1.2 million adults and adolescents are living with HIV
  - About 1 in 8 (12.8%) do not know they are infected; more than half of persons aged 13-24 years who are HIV-infected do not know
  - Infected patients not accessing treatment are likely to infect others
    - Those at a higher level of behavioral risk (eg, unprotected sex, concurrent sex partners, sharing injection equipment) raise the number of those infected

Strategies to Reduce Transmission of HIV

Lifetime Risk of HIV Diagnosis by Transmission Group

- **MSMs**: 1 in 6
- **Women Who Inject Drugs**: 1 in 23
- **Men Who Inject Drugs**: 1 in 36
- **Heterosexual Women**: 1 in 241
- **Heterosexual Men**: 1 in 473

Lifetime Risk of HIV Diagnosis Among MSMs by Race/Ethnicity

- **African American**: 1 in 2
- **Hispanic**: 1 in 4
- **White**: 1 in 11

Estimated HIV Transmission From Those Unaware of Their HIV Status

- ~87% unaware of their infection
- ~13% aware of their infection
- Account for ~62% of new infections
- Account for ~38% of new infections

New HIV Infections Per Year (~47,500)

1,242,000 People Living With HIV/AIDS

Case Study: Stephen

- Stephen, 45, presents for annual physical
- Married to his college sweetheart, Catherine, for 20 years; 2 children
- You note on chart that he has never had an HIV test documented
- It’s time to have Stephen tested...

Let’s Meet Stephen

HIV Screening:
The First Step in the Continuum of Prevention

- Rationale for screening:
  - Many people are unaware they are infected
  - Identification leads to initiation of antivirals
  - Treatment improves health and reduces transmission
- Recommendations for screening:
  - USPSTF: adolescents and adults aged 15-65 years, pregnant women
  - CDC: adolescents and adults aged 13-64 years, pregnant women

USPSTF = US Preventive Services Task Force
CDC 2006 Recommendations for HIV Screening

- HIV screening for all patients aged 13-64 years
- Opt-out screening: tell patients that screening should be performed but that they may decline testing
- Written consent and prevention counseling not required
- Annual HIV screening for those at high risk for HIV
- Prompt clinical care for HIV-infected persons

Frequency of HIV Testing

- 1-time testing:
  - Low-risk patients
- Annual or more frequent testing for high-risk patients:
  - MSMs (3-6 months)
  - Injection-drug users
  - Exchange sex for money
  - Unknown status of partners
  - Pregnant women
  - Seeking treatment for STI

Unfortunately...

- Early detection and early treatment of HIV are recommended in current guidelines and are essential to improving outcomes
- Unfortunately, <50% of patients are screened for HIV; 40% report never having discussed HIV with their clinicians
- Therefore, many patients are not diagnosed until later stages of disease

STI = sexually transmitted infection.

References:
Sexual Health Assessment: The 5 P’s

- Practices
- Partners
- Pregnancy prevention
- Protection from STIs
- Past STI history

Stephen Returns 6 Months Later…

- He initiates an appointment, although he knew that all of his lab tests from the previous visit were normal
- He has some concerns that he wants to discuss with his practitioner

Introducing a Discussion of Sexual History: Relax as You Address Your Patient

- “So that I can best advise you about your health, I’d like to ask some questions related to sexual behaviors that I ask all my patients.”
- OR
- “It is our standard practice here to take a sexual history for every patient we serve.”
Taking a Sexual History

- Have you been sexually active in the last year (or since we last saw each other)?
- Are you having sex with anyone right now?
- How many sexual partners have you had in the last 6 months? How about in the last month?
- Have you had sex with women, men, or both?
  - What type of sex do you have most often? Oral, anal, vaginal?
- What percentage of the time do you use condoms while having anal sex?
  - How about for oral sex?

Communication With Transgender Patients

- Patients may identify themselves as LGBTQ (lesbian, gay, bisexual, transgender, queer/questioning)
- Ask which pronouns the patient prefers (eg, he/his, she/her) or use "you" and "your"
- Ask which name the patient prefers (may not be the patient's given name)
- In the waiting room, have health education literature with diverse images and inclusive language
- Have unisex restrooms

Talking About HIV Prevention

**Nonpharmacologic prevention strategies**
- Interactive client-centered counseling and goal-setting
  - Issues to cover through patient counseling:
    - Safe sex and drug-use practices
    - Strategies to communicate with sexual partners
  - Referral to interventions eg, substance abuse therapy, needle exchange

**Pharmacologic strategies**
- Pre-exposure prophylaxis (PrEP)
- Post-exposure prophylaxis (PEP)
What Is PrEP?

- Treatment as prevention
- Post-exposure prophylaxis
- Pre-exposure prophylaxis

PrEP Overview

- Daily fixed-dose combination pill contains tenofovir/emtricitabine
  - Chosen out of the almost 30 drugs available for HIV treatment for their	potency, safety, tolerability, and convenience
  - In the future, there will be new drugs, new formulations of existing drugs,
    and perhaps new dosing regimens for existing drugs
  - PrEP is not necessarily a lifelong prevention strategy; it is recommended
    for use during periods when people are at high risk of acquiring HIV
  - PrEP is prescribed as only one part of a prevention plan

PrEP: Single-Tablet Treatment for Those at Substantial Risk of HIV

- Contains tenofovir and emtricitabine
  - Used in combination with other medicines, counseling, and monitoring
  - If exposed to HIV (eg, through sex or injection drug use), treatment may
    prevent the virus from establishing a permanent infection
  - PrEP reduces the risk of acquiring HIV, but does not eliminate risk
  - PrEP does not protect against other sexual transmitted infections, cure
    HIV, or function as an HIV treatment alone for someone with HIV
Strategies to Reduce Transmission of HIV


More Than 80% of MSMS Have Not Discussed PrEP With Their PCP

Survey conducted on gay dating website

Summary of Guidance for PrEP Use

PCE 2017 Series 1
Talking to Stephen About PrEP

Conversations To Assess Risk and Initiate PrEP

- Completing a sexual history before offering PrEP information can increase PrEP acceptability and comprehension
- Barriers:
  - Provider’s lack of comfort or experience
  - Lack of time or bias
  - Patient’s embarrassment, perception of stigma, lack of awareness about sexual health

Introducing PrEP to Patients

- Taken consistently, PrEP can reduce the risk of HIV infection in those at high risk by up to 92%
- PrEP is much less effective if it is not taken consistently
- PrEP is a powerful HIV prevention tool and can be combined with condoms and other prevention methods to provide even greater protection than when used alone
- Patients using PrEP should commit to taking the drug every day and to seeing their health care provider for follow-up every 3 months

Strategies to Reduce Transmission of HIV

Before Prescribing PrEP: Important Evaluations

- Required screenings:
  - Renal function
    - Avoid PrEP with TDF/FTC in anyone with creatinine clearance <60 mL/min; PrEP can impair renal function
  - HBV infection
    - Document HBV negative and vaccinate patients who are HBV-susceptible
- Recommended screenings:
  - Metabolic panel
  - Urinalysis
  - STI (eg, syphilis, gonorrhea, chlamydia, HCV)
  - Pregnancy


- Scenario 1: Projection new infections by 2020 at current testing and treatment rates
- Scenario 2: If PrEP use increases among high-risk populations at current testing and treatment rates
- Scenario 3: Achieving NHAS goals: if 85% of people diagnosed are linked to care, 90% achieve viral suppression, plus PrEP use
- Scenario 4: If 85% of people diagnosed are linked to care, 60% achieve viral suppression, plus PrEP use

New HIV infections

<table>
<thead>
<tr>
<th>Scenario</th>
<th>New HIV Incidents</th>
<th>HIV infections prevented due to expanded testing and treatment</th>
<th>HIV infections prevented due to PrEP use among high-risk populations (30% MSM; 10% PWID; 10% HET)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>265,330</td>
<td>48,221</td>
<td>168,132</td>
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<td>Scenario 2</td>
<td>217,109</td>
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<td>168,132</td>
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<td>Scenario 3</td>
<td>31,998</td>
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HIV infections prevented through PrEP

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HIV infections prevented through testing and treatment

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Real-World PrEP: PROUD Study

- Fewer new HIV infections with immediate versus deferred PrEP (3 vs 20 cases)
  - 86% reduction ($P = .0002$)
  - Incident HIV infection in the immediate group
  - HIV infection preceded start of ART (n = 1)
  - No drug/not adherent (n = 2)
  - NNT: 13

HIV incidence (per 100 person-years) ranged from 0-10

<table>
<thead>
<tr>
<th>HIV Incidence</th>
<th>Immediate</th>
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<td>8.9</td>
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86% reduction ($P = .0002$) with immediate PrEP

HIV/STI Incidence in a Clinical Practice Setting Where PrEP Is Offered

- Analysis of PrEP use and HIV/STI incidence in a large healthcare system (Kaiser Permanente San Francisco), 2012-2015:
  - 1045 referrals for PrEP; 801 individuals with ≥1 intake visit
  - 657 initiated PrEP (82%); mean duration of use 7.2 months
- Key results (PrEP initiators):
  - After 12 months, 50% diagnosed with any STI
  - 33% rectal STI, 33% chlamydia, 28% gonorrhea
  - No HIV diagnoses in 388 patient-years’ follow-up
  - After 6 months of PrEP, self-reported condom use decreased in 41% of patients

Follow-up in Patients Receiving PrEP

<table>
<thead>
<tr>
<th>At Least Every 3 Months</th>
<th>At Least Every 6 Months</th>
<th>At Least Every 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV test</td>
<td>Monitor renal function</td>
<td>Evaluate need to continue PrEP</td>
</tr>
<tr>
<td>Pregnancy test for women</td>
<td></td>
<td></td>
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<tr>
<td>90-day prescription</td>
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<td></td>
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<tr>
<td>Assess for adverse events, adherence, risk behaviors</td>
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<td></td>
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<tr>
<td>Provide support for medication adherence, risk reduction</td>
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<tr>
<td>STI testing</td>
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PrEP Studies: Adherence Is the Key to Efficacy

- Risk reduction much greater in those with detectable levels of medication in blood
- Fem-PrEP and VOICE show how poor adherence reduces the efficacy of PrEP
- Recent meta-analysis of randomized controlled trials including women found that at high levels of adherence (75%), oral PrEP in women is effective in reducing HIV risk (risk ratio 0.39 [95% CI, 0.25-0.60])
- Women may require greater level of adherence
Key Challenges of PrEP in Heterosexual Women

- Efficacy of PrEP in women
  - Disparate results between men and women
  - Adherence
  - Drug delivery in rectal versus vaginal tissues
  - HIV protection in younger versus older women
- Elevated risk for HIV acquisition
  - Vaginal microbiome
  - Inflammation
- PrEP and pregnancy

Pharmokinetics of Oral PrEP in Women and Impact on Efficacy

- Combined in vitro efficacy target with mucosal tissue pharmacokinetic data and mathematical modeling to determine number of doses required for effective PrEP
- Measured endogenous nucleotides that compete with TFVdp (dATP, dCTP)
- Use of tenofovir to prevent vaginal acquisition of HIV requires greater adherence than does protection against rectal acquisition

HIV in Persons Over 50

- In 2014, people aged ≥50 years accounted for 17% (7391) of an estimated 44,073 HIV diagnoses in the United States
- ~20% of people over 50 engage in high-risk insertive sex (anal or vaginal)
- Condom use tends to decrease in older adults; older men may not use condoms due to inability to sustain an erection
- Many older women believe neither they nor their partner need a condom because they are not at risk of pregnancy
- Avoiding HIV becomes even more imperative in older adults, given their high number of coexisting medical conditions

Strategies to Reduce Transmission of HIV

PrEP Is Effective: Adherence Is Critical

Partners in HIV Prevention (PrEP) effectiveness varied by adherence levels.

Cost Effectiveness Linked to PrEP Adherence

- Multiple cost-effectiveness analyses show that PrEP is cost effective at a population level at standard US willingness-to-pay thresholds for those at high risk for HIV infection (MSMs).
  - With a standard level of PrEP adherence, the NNT was 64 (range, 26-176), treated at a cost of $160,000.
  - With a high level of PrEP adherence, the NNT was 30 (range, 21-57).
- In contrast, for monogamous serodiscordant relationships with partner ARV use, the NNT was 90 (39-157); cost per QALY at $280,000 (range, $14,000-$670,000).

Support Adherence

- Develop trust, avoid judgment
  - Plan for adherence
  - Monitor
  - Educate
  - Identify barriers
  - Assess for adverse events
- Plan with the patient
  - Tailor dosing time to correspond with patient’s schedule and daily routine
- Use reminders and devices
  - Consider organizational needs and tools (calendars, pillboxes)
- Review disclosure issues and privacy
  - Identify people who can help support the patient’s adherence

QALY = quality-adjusted life year.
Options for Serodiscordant Couples

- Screen and treat both partners for STIs
- Prescribe ART to maximally suppress and maintain the infected partner's viral load
- Prescribe PrEP for the uninfected partner

Integrating PrEP Care Into Practice: 5 Steps

- Test all adolescent and adult patients for HIV as a routine part of medical care
  - Patients who test positive should receive ART immediately
- Discuss HIV risks and prevention with all patients
  - If HIV-negative patient has indications for PrEP and is interested in it, move to next step
- Perform recommended lab tests, including tests to exclude acute HIV and tests for renal function and HBV
  - If patient is still a candidate for PrEP, move on to the next step
- If you prescribe PrEP, counsel patients to ensure that PrEP is taken every day
  - If cost is an issue, provide information about assistance
- Schedule for follow-up, including HIV testing and prescription refills

What's Next?

Expected innovations include:
- Injectable medications
- Rectal microbicides
- Vaginal rings
## Strategies to Reduce Transmission of HIV

### PCE Action Plan

- Offer 1-time universal HIV testing to all adult and adolescent patients; annual or more frequent for high-risk patients.
- Take a sexual history as a routine part of a patient’s visit.
- Offer PrEP to all HIV-negative patients who are at high risk for HIV.
- Initiate regular and thorough follow-up of all patients receiving PrEP.
- Support adherence to PrEP to maximize prevention of HIV.

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PCE Promotes Practice Change