

## HIV prevention strategies

Melissa A Cabecinha  
John Saunders

**Melissa A Cabecinha BSc MSc** is a PhD student at University College London, UK. Competing interests: none declared.

**John Saunders MB BS MRCP PhD** is Consultant Physician and Clinical Academic at Public Health England, University College London, and the Mortimer Market Centre, London, UK. Competing interests: none declared.

### Abstract

Advances in treatment and prevention technologies have led to a decrease in incident HIV infections in the UK; however, sustained efforts are required to meet global and national targets to end HIV transmission. Combination HIV prevention programmes employ a mix of biomedical, behavioural and structural interventions and strategies to meet the prevention needs of a given population. They operate at the three levels of prevention in public health: preventing transmission and acquisition of HIV (primary prevention), reducing the severity of HIV infection through early detection and diagnosis (secondary prevention), and improving the quality of life for people living with HIV through treatment and support (tertiary prevention). HIV stigma can act as a barrier to accessing prevention and treatment. Educational and awareness campaigns, increasing opportunities for engagement through community and self-testing, and integrating HIV testing into routine healthcare environments can decrease stigma and encourage testing uptake. A 'status-neutral' approach to prevention can provide an entry point for testing and engagement with HIV care and prevention, encouraging testing uptake, and reducing stigma around HIV.

### Keywords

Anti-retroviral agents; health promotion; HIV; HIV testing; post-exposure prophylaxis; pre-exposure prophylaxis; primary prevention; secondary prevention; sex education; tertiary prevention

### Key points

- Combination HIV prevention strategies must be employed to have a sustained impact on the incidence of HIV
- Antiretroviral medication is a key biomedical tool for preventing transmission before an exposure (pre-exposure prophylaxis) or immediately after an exposure (post-exposure prophylaxis), and suppressing the virus in people living with HIV (treatment as prevention)
- HIV testing should be confidential, voluntary, non-discriminatory, easily accessible and free
- Reducing stigma around HIV is a vital component to overcoming barriers to prevention, treatment and care

## Introduction

Human immunodeficiency virus (HIV) is an issue of public health concern. In 2020, >1.5 million people worldwide acquired HIV, and an estimated 37.7 million people were living with HIV. The most recently available data from the UK reported 4139 new diagnoses of HIV and 98,522 people seen for HIV care in 2019.

HIV transmission occurs through sexual exposure (vaginal or anal sex), sharing injection equipment (e.g. needles), and rarely through occupational exposure (e.g. needlestick injuries). Perinatal (vertical) transmission can also occur during pregnancy, birth or breastfeeding, but where robust antenatal screening practices and effective care are available, vertical transmission can be prevented.

HIV is a manageable chronic condition when effective treatment and care are available. However, without treatment, people living with HIV experience progressive damage to their immune system, leaving them susceptible to life-threatening infections and cancers. Advances in treatment and prevention methods and technologies have led to a decrease in incident HIV infections in the UK, but sustained efforts are needed to meet national and international targets such as the Joint United Nations Programme on HIV/AIDS (UNAIDS) 90-90-90 target (where 90% of people living with HIV are aware of their status, 90% of people diagnosed with HIV are on treatment and 90% of people on treatment are virally suppressed), and the UK government's goal to end HIV transmissions by 2030.

No single prevention method in isolation is sufficient to end HIV transmission, or is appropriate for every individual or community. Instead, a combination of HIV prevention strategies must be employed – known as combination HIV prevention.

### Combination HIV prevention

Combination HIV prevention is defined by UNAIDS as 'rights-based, evidence-informed, and community-owned programmes that use a mix of biomedical, behavioural, and structural interventions, prioritized to meet the current HIV prevention needs of particular individuals and communities, so as to have the greatest sustained impact on reducing new infections'. A combination HIV prevention approach must consider the local HIV epidemiology, tailor the interventions to individuals at elevated risk, and prioritize and engage with affected communities. Prevention activities operate at multiple levels of the social-ecological model (e.g. individual, community, societal), and at each of the three levels of prevention in public health: primary, secondary and tertiary (Table 1).

### Primary prevention

Primary prevention methods aim to reduce the transmission and acquisition of HIV. This includes promotion and use of safer sex practices that reduce exposure (e.g. use of condoms), education relating to sexual and reproductive health (e.g. school educational programmes, public campaigns, campaigns targeted to key populations) and biomedical interventions (e.g. pre-exposure prophylaxis (PrEP), post-exposure prophylaxis (PEP), treatment as prevention (TasP)). Vaccines to prevent HIV are under development, but no effective vaccine has yet been produced.

### Education, awareness and health promotion

Education is an important facet of primary prevention. Educational attainment has an impact on HIV risk and transmission rates, particularly for young women and girls. In addition, comprehensive sexual and relationship education can delay the age of sexual debut and decrease risk-taking behaviour. Specifically, educational programmes and campaigns to build awareness and knowledge around HIV can increase engagement with HIV prevention, such as testing, and reduce HIV-related stigma.

Health promotion is 'the process of enabling people to increase control over, and to improve, their health' and a core part of primary prevention. It can include interventions intended to

change specific behaviours and risk, but also those to change societal and environmental factors. Health promotion can be targeted to specific key population groups at higher risk of infection, for example gay and bisexual men, or involve general population campaigns to raise levels of knowledge. However, because of differences in HIV awareness, behaviours and attitudes, messages should be tailored for and created in partnership with the communities for which they are intended.

### **Condoms**

Condoms are an inexpensive and effective method of HIV prevention. In 2002 a Cochrane review of longitudinal studies reported that consistent use of condoms for vaginal sex results in an 80% reduction of HIV.<sup>1</sup> Condom use for anal sex reduces HIV incidence by an estimated 70–90%. Currently, condoms are the only method that also protects against other sexually transmitted infections (STIs) and unintended pregnancy.

### **Voluntary male medical circumcision (VMMC)**

VMMC for HIV prevention has been shown to be effective in both clinical trials and observational cohort studies<sup>2</sup> and can reduce heterosexual acquisition of HIV in men by approximately 60%. VMMC has been recommended by the World Health Organization (WHO) and UNAIDS as an additional prevention strategy for areas with a generalized HIV epidemic (i.e. where transmission of HIV is not concentrated in clearly defined vulnerable groups and is sustained by the sexual behaviour of the general population). Typically, this refers to areas where the population prevalence is >1%.

### **Support for people who inject drugs**

HIV can be transmitted to people who inject drugs through the use of shared needles, syringes and other injecting drug paraphernalia. Opiate substitution programmes can reduce drug dependency and injecting frequency, and needle and syringe exchange programmes provide clean injecting equipment to reduce unsafe injecting practices (e.g. sharing used syringes). The most recent National Institute for Health and Care Excellence guidance on needle and syringe programmes includes recommendations on consulting with people who inject drugs, practitioners and local communities to develop tailored services to meet local need.

### **Antiretroviral (ARV) medication for HIV prevention**

ARVs are a powerful biomedical tool for HIV prevention. They can be used by people without HIV in anticipation of a potential transmission event or exposure (PrEP) or immediately after a potential exposure event (PEP). They can also be used by people living with HIV (ARV therapy (ART)) to suppress the virus, thereby removing any chance of transmission.

**Pre-exposure prophylaxis:** PrEP is ARV medication that can be taken by HIV-negative people before and after sex to prevent infection with HIV. The WHO recommends PrEP as an additional prevention choice for people who are at substantial risk of HIV, alongside other combination prevention methods.

Country-specific prescribing criteria can vary. In general, however, PrEP may be appropriate for anyone at higher risk of HIV acquisition as indicated by sociodemographic or behavioural characteristics.<sup>3</sup> For example, in the UK, PrEP is recommended for men who have sex with men (MSM), and transgender women reporting condomless anal sex, and should be considered on a case-by-case basis as individuals considered at risk through a combination of other factors (Table 2).

Currently, oral emtricitabine/tenofovir disoproxil fumarate (FTC/TDF) is the most widely used form of PrEP. In 2019 TDF/tenofovir alafenamide fumarate (TAF), was approved for use as PrEP in the USA, and in 2021 the WHO recommended the dapivirine vaginal ring as an additional choice for HIV prevention for women. Other formulation and delivery methods, including long-acting injectables, implants and transdermal compounds are in development.

With good adherence, PrEP is highly effective at protecting against HIV. FTC/TDF PrEP regimens involve taking PrEP daily, or 'on demand' (i.e. only taking PrEP when sex is anticipated). Daily TDF/FTC PrEP is effective in all populations, including MSM, transgender and gender diverse people, heterosexual men and women, and people who inject drugs. TDF/FTC PrEP is also safe for people taking gender-affirming hormones, and does not interfere with hormone therapy. On-demand PrEP has not been investigated extensively in heterosexual men and women, but pharmacokinetic studies show that TDF/FTC takes longer to reach protective concentrations in vaginal tissue than rectal tissue, and therefore on-demand dosing is not recommended for vaginal sex.

Before starting PrEP, individuals should be tested to exclude infection with HIV. Once PrEP has been initiated, follow-up should include regular HIV/STI testing (at 3-month intervals) and monitoring for adverse effects and/or issues around dosing and adherence. Individuals should be supported to stop taking PrEP if it is no longer the most appropriate HIV prevention method for them (e.g. because of changes in sexual behaviour), or to change from a daily to an on-demand dosing regimen (or vice versa) if appropriate.

**Post-exposure prophylaxis:** PEP is ARV medication that is taken after a potential exposure to HIV to prevent infection. PEP can be taken after a sexual exposure (also known as PEP(SE)), occupational exposure or non-occupational exposure in the community (Table 3). PEP should be taken as soon as possible after an exposure – ideally within 24 hours, and no more than 72 hours after.

Individuals must take an HIV test before starting PEP to exclude current HIV infection. The British HIV Association/British Association for Sexual Health and HIV (BHIVA/BASHH)-recommended regimen choice for PEP is tenofovir disoproxil 245 mg/emtricitabine 200 mg and raltegravir 1200 mg once daily for 28 days. HIV testing should be completed again 8–12 weeks after exposure.

**Treatment as prevention, or 'U = U':** people living with HIV, on treatment and with an undetectable viral load (<200 copies/ml) cannot transmit HIV to their sexual partners.<sup>4</sup> This treatment is referred to as TasP, or Undetectable = Untransmittable ('U = U').

The evidence to support this statement comes from several studies. The largest is the HIV Prevention Trials Network (HPTN) 052 study including 1763 serodifferent, predominately heterosexual couples. Partners with HIV were randomized to early or delayed ART. There were no transmissions of HIV to the HIV-negative partner when the viral load was undetectable in the partner living with HIV. The PARTNER and PARTNER2 studies analysed >100,000 episodes of condomless sex among participants and found that there were no HIV transmissions when the HIV-positive partner had an undetectable viral load.

## Secondary prevention

Secondary prevention methods aim to diagnose people living with HIV in order to offer treatment to prevent complications and reduce the opportunities for transmission. This includes access to HIV testing, including outreach services, contact tracing and management, and access to and linkage to treatment services.

### HIV testing

HIV testing should be confidential, voluntary, easily accessible, non-discriminatory and free. Testing guidelines vary between countries and can be driven by differences in local epidemiology, often meaning that testing is targeted to those at greatest risk of infection (Table 4). However, it is important to balance a targeted approach with a more generalized testing strategy in order to address and reduce barriers to HIV testing. Barriers to HIV testing can occur at structural and organizational levels (e.g. lack of access to services) and at the individual level (e.g. lack of awareness, fear of discrimination or stigma). Such barriers can be overcome by increasing both opportunities and options for testing.

Integrating opt-out testing (where attendees are informed they will be automatically tested unless they decline) into routine care has been successful in settings such as antenatal clinics and sexual health services (SHSs). Providing access to community testing, self-testing (where the test is performed entirely by the user) and self-sampling (where a sample is collected by the user and returned to the laboratory for testing), alongside testing in healthcare settings, increases opportunities for HIV testing, promotes awareness and makes testing more commonplace (see Reducing HIV-related stigma).

A reactive test **must** be followed by a confirmatory laboratory test before a diagnosis is made as there is a small possibility of a false-positive result with any test.

## Tertiary prevention

Tertiary prevention methods aim to improve the quality of life for people living with HIV through treatment and support.

### Antiretroviral therapy for people living with HIV

For people living with HIV, ART suppresses the ability of the virus to replicate within the body. To prevent progression of illness and co-morbidities associated with HIV, ART should be started as soon as a diagnosis is confirmed.

### Support for people living with HIV

Sustained ART is not only beneficial for the health of people living with HIV, but also helps protect their partners through U = U. However, HIV is a chronic condition, and the standard ART regimen consists of a combination of ARV medication taken daily. Different formulations and delivery systems, including long-acting injectable ART, are in development but are not yet available.

To maintain viral suppression, people living with HIV must be supported to take treatment effectively and as prescribed. Competing priorities, such as financial problems, housing instability or mental illness can act as barriers to adherence. Adherence can be supported through a combination of routine medical care and advice, and the provision of services such as peer and community support or mental health and well-being support. Referrals and signposting to wrap-around services for help with issues such as housing, transportation, finances or employment can support adherence to ART by mitigating competing priorities.

### Reducing HIV-related stigma

HIV stigma acts as a barrier to HIV testing and can make people reluctant to seek treatment. HIV-related stigma can also compound or reinforce existing stigma around marginalized groups who have an elevated risk of HIV, including MSM, sex workers and people who inject drugs. Where there is criminalization of behaviours that carry an elevated risk of HIV acquisition, for example sex work or drug use, this can also decrease willingness to test for fear of repercussions. Stigma may also be reinforced when testing is specifically targeted at marginalized groups.

A universal, comprehensive, non-targeted approach to HIV testing can help to increase uptake and reduce stigma. For example, offering testing to everyone within a healthcare setting, and making conversations around HIV testing and prevention part of routine healthcare, can make testing behaviours more commonplace. A recent independent commission recommended that an opt-out system for HIV testing should be routinely adopted throughout health services in England, including SHS, general practitioner surgeries and other settings where blood is taken, such as emergency departments.<sup>5</sup> Increasing access to community and self-tests also helps destigmatise testing behaviours.

## A 'status-neutral' approach to HIV prevention

An 'HIV status-neutral' standpoint asserts that every individual has an HIV status that guides how they engage with HIV prevention and care (Figure 1). Pioneered in New York City, the status-neutral

approach begins with an HIV test (secondary prevention). After a negative result, a person is linked to prevention engagement services (primary prevention). This can involve linkage to PrEP services, counselling for behavioural risk reduction, or reminders to test regularly. After a positive test, a person is linked to HIV care and treatment and wrap-around and support services (tertiary prevention).

By creating an entry point to HIV care and prevention, the status-neutral approach encompasses all levels of prevention and aims to prevent both the acquisition and transmission of HIV. This approach offers care and engagement to individuals, regardless of their HIV status, thereby increasing awareness of and reducing stigma around HIV.

<b>Public health prevention levels for HIV prevention</b>		
<b>Prevention level</b>	<b>Definition</b>	<b>Example</b>
Primary	Preventing the acquisition of HIV	Education, awareness campaigns, health promotion, condoms, voluntary male medical circumcision, needle and syringe exchange programmes, opiate substitution therapy, pre-exposure prophylaxis, post-exposure prophylaxis, treatment as prevention
Secondary	Reducing the severity of HIV and decreasing opportunities for HIV transmission	HIV testing, early diagnosis and treatment, contact tracing, linkage to treatment services
Tertiary	Improving the quality of life for people living with HIV	Antiretroviral therapy, peer and community support, mental health support, referrals to wrap-around services, reducing HIV stigma

**Table 1.**

<b>Factors for considering PrEP on a case-by-case basis</b>	
<b>Factor</b>	<b>Example</b>
Population level	Recent migrants to the UK, heterosexual Black African men and women, transgender women, people who inject drugs, people who report sex work/transactional sex
Clinical	Bacterial STI or hepatitis C infection in the previous year, PEP after exposure in the previous year
Sexual behaviour/sexual network	Condomless sex with partners of unknown HIV status, engaging in 'group' or group sex, condomless sex with partners from a population group in a country with a high HIV prevalence
Drug use	Sharing injecting equipment, injecting in unsafe settings, no access to needle/syringe exchanges or opioid substitution therapy
Sexual health autonomy	Inability to negotiate condom use or other HIV prevention methods with sexual partners, housing instability, coercive and/or violent power dynamics in relationships, risk of sexual exploitation and/or trafficking
Adapted from the BHIVA/BASHH guidelines on the use of HIV pre-exposure prophylaxis (PrEP) 2018 (see Further reading).	

**Table 2.**



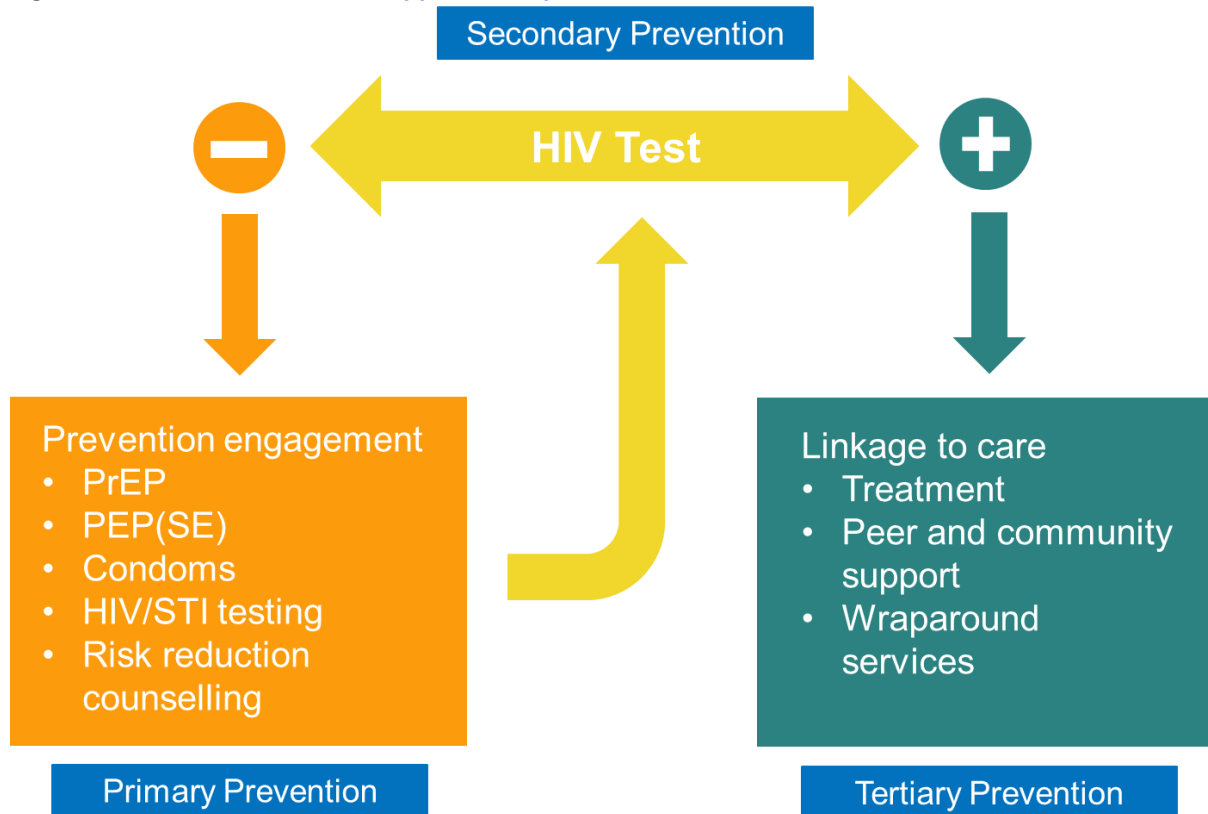
<b>Summary table of PEP prescribing recommendations</b>				
	<b>Index HIV positive</b>		<b>Index of unknown HIV status</b>	
	<b>HIV viral load unknown or detectable</b>	<b>HIV viral load undetectable</b>	<b>From a high-prevalence country or risk group</b>	<b>From a low prevalence country/group</b>
<b>Sexual exposures</b>				
Receptive anal sex	Recommended	Not recommended	Recommended	Not recommended
Insertive anal sex	Recommended	Not recommended	Consider on a case-by-case basis	Not recommended
Receptive vaginal sex	Recommended	Not recommended	Generally not recommended	Not recommended
Insertive vaginal sex	Consider on a case-by-case basis	Not recommended	Not recommended	Not recommended
Fellatio	Not recommended	Not recommended	Not recommended	Not recommended
Cunnilingus	Not recommended	Not recommended	Not recommended	Not recommended
<b>Occupational and other exposures</b>				
Sharing injective equipment	Recommended	Not recommended	Generally not recommended	Not recommended
Sharps injury	Recommended	Not recommended	Generally not recommended	Not recommended
Mucosal splash injury	Recommended	Not recommended	Generally not recommended	Not recommended
Human bite	Generally not recommended	Not recommended	Not recommended	Not recommended
Needlestick from a discarded needle in the community			Not recommended	Not recommended
Recommended: PEP should be given unless there is a clear reason not to.				
Consider: PEP should be considered on a case-by-case basis.				
Generally not recommended: PEP should not be given unless there is a clear, specific extenuating factor that increases the risk of HIV transmission.				
Not recommended: the risk of HIV transmission is negligible; PEP should not be given.				
Adapted from the UK guideline for the use of HIV post-exposure prophylaxis 2021 (see Further reading).				

**Table 3.**

<b>Summary of UK HIV testing recommendations</b>	
<b>HIV testing recommended for individuals</b>	<b>Examples</b>
Belonging to groups at increased risk of HIV exposure	MSM, female sexual contacts of MSM, Black African individuals, sex workers, prisoners, trans women, people reporting drug use
Attending certain healthcare settings	Sexual health services; addiction and substance misuse services; antenatal services; healthcare services for hepatitis B and C, tuberculosis and lymphoma
Presenting with symptoms/signs consistent with an HIV indicator condition	Mononucleosis-like illness; sexually transmitted infections; candidaemia; hepatitis A, B or C; unexplained weight loss; anal cancer/dysplasia; invasive pneumococcal disease
Accessing secondary and primary healthcare in areas of high and extremely high HIV seroprevalence	Accessing healthcare in areas of high HIV prevalence (2–5 per 1000) and undergoing venepuncture; accessing healthcare in areas of extremely high prevalence (>5 per 1000)
Adapted from the BHIVA/BASHH/BIA Adult HIV testing guidelines 2020 (see Further reading).	

Table 4.

Figure 1. An HIV status-neutral approach to prevention



Adapted from Myers JE, Braunstein SL, Xia Q, et al. Redefining prevention and care: a status-neutral approach to HIV. *Open Forum Infect Dis* 2018; **5**: ofy097.

## KEY REFERENCES

1. Weller SC, Davis-Beatty K. Condom effectiveness in reducing heterosexual HIV transmission. *Cochrane Database Syst Rev* 2002; **2012(3)**: CD003255.
2. Farley TMM, Samuelson J, Grabowski MK, Ameyan W, Gray RH, Baggaley R. Impact of male circumcision on risk of HIV infection in men in a changing epidemic context – systematic review and meta-analysis. *J Int AIDS Soc* 2020; **23(6)**: e24590.
3. Clutterbuck D, Collins S, McCormack, S, et al. UK guide to PrEP. 2021. <https://i-base.info/guides/prep> (accessed 7 Dec 2021).
4. Cohen MS. Successful treatment of HIV eliminates sexual transmission. *Lancet* 2019; **393**: 2366–7.
5. Griffin S. Test for HIV wherever blood is taken, commission recommends. *BMJ* 2020; **371**: m4694.

## FURTHER READING

British HIV Association. BHIVA/BASHH guidelines on the use of HIV pre-exposure prophylaxis (PrEP) 2018. <https://www.bhiva.org/PrEP-guidelines> (accessed 21 Apr 2021).

British HIV Association. BHIVA/BASHH/BIA adult HIV testing guidelines 2020. <https://www.bhiva.org/HIV-testing-guidelines> (accessed 21 Apr 2021).

British HIV Association. UK guideline for the use of HIV post-exposure prophylaxis 2021. <https://www.bhiva.org/pep-guidelines> (accessed 21 Apr 2021).

UNAIDS. *Combination HIV Prevention: Tailoring and Coordinating Biomedical, Behavioural and Structural Strategies to Reduce New HIV Infections*. 2010. [https://www.unaids.org/en/resources/documents/2010/20101006\\_JC2007\\_Combination\\_Prevention\\_paper](https://www.unaids.org/en/resources/documents/2010/20101006_JC2007_Combination_Prevention_paper) (accessed 23 Jul 2021).

Rodger AJ, Cambiano V, Bruun T, et al. Sexual Activity Without Condoms and Risk of HIV Transmission in Serodifferent Couples When the HIV-Positive Partner Is Using Suppressive Antiretroviral Therapy. *JAMA*. 2016;316(2):171-181. doi:10.1001/JAMA.2016.5148

## TEST YOURSELF

To test your knowledge based on the article you have just read, please complete the questions below. The answers can be found at the end of the issue or online [here](#).

### Question 1

A 28-year-old man attended a sexual health clinic because he had had receptive anal sex one week prior to attendance with a new male partner of unknown HIV status. He had no symptoms. He reported having a regular male partner who was HIV positive, had been on treatment for several years and had an undetectable viral load. The patient had been fully vaccinated for hepatitis A, hepatitis B and human papillomavirus. Appropriate tests for sexually transmitted infections, HIV and other blood-borne viruses were performed.

**What is the best advice regarding pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis (PEP) ?**

- A Advise that he should start PEP
- B He is at risk of acquiring HIV from his regular partner and should use condoms to reduce this risk
- C Advise that he should start PrEP
- D Advise that he should start PrEP and PEP
- E Advise him to avoid sex and reattend for another HIV test after the window period before starting PrEP

**Correct answer: C.** Taken correctly, pre-exposure prophylaxis (PrEP) would give additional protection to this man who is at risk of acquiring HIV from condomless sex with one-off and occasional male partners of unknown HIV status. The last condomless anal sex was >72 hours ago. Therefore, post-exposure prophylaxis (PEP; A) is not appropriate as there is no evidence that this works if started >72 hours after any potential exposure. His partner is on treatment and has an undetectable viral load. Therefore, he cannot transmit HIV sexually and there is no risk to his sexual partners (B). Condoms could be appropriate, however, to reduce the risk of other sexually transmitted infections. The last condomless anal sex was >72 hours ago. Therefore, PEP is not appropriate as there is no evidence that it will work if started >72 hours after any potential exposure (D). Although this man may already be HIV positive and it is important to rule out HIV when starting PrEP, delaying PrEP or asking his to reattend later may allow for additional episodes of condomless sex and a missed opportunity to prevent HIV (E).

**What is the best advice to offer?**

- A Start PrEP now if the HIV test is negative
- B Start PEP now without waiting for a result
- C Wait until the window period is past and retest before giving any medication
- D Advise him to use a condom with his regular partner
- E

A 28-year-old man attended a sexual health clinic because he had had receptive anal sex one week before attendance with a new male partner of unknown HIV status. He reported condomless anal sex with new male partners every two weeks on average. He had no symptoms. He reported having a regular male partner who was HIV positive, had been on treatment for several years and had an

undetectable viral load. The patient had been fully vaccinated for hepatitis A, hepatitis B and human papillomavirus. Appropriate tests for sexually transmitted infections, HIV and other blood-borne viruses were performed.

'What is the best advice regarding HIV prevention?'

- A) Advise that he should start PEP (incorrect);
- B) Advise that using condoms with one-off partners is the best option for HIV prevention (incorrect);
- C) Advise that he should start PrEP following a negative HIV test today (correct);
- D) Wait until the window period for HIV is past and retest before starting PrEP (incorrect);
- E) Advise him to use condoms with his regular partner (incorrect)

Correct answer C: Taken correctly, pre-exposure prophylaxis (PrEP) would give additional protection to this man who is at risk of acquiring HIV from condomless sex with one-off and occasional male partners of unknown HIV status. The last condomless anal sex was >72 hours ago. Therefore, post-exposure prophylaxis (PEP; A) is not appropriate as there is no evidence that this works if started >72 hours after any potential exposure. Condoms are less effective than PrEP for the prevention of HIV (70-90% reduction in HIV when condoms used for anal sex) so are not the best option for HIV prevention in this man (B). Although this man may already be HIV positive and it is important to rule out HIV when starting PrEP, delaying PrEP or asking him to reattend later may allow for additional episodes of condomless sex and a missed opportunity to prevent HIV (D). His partner is on treatment and has an undetectable viral load. Therefore, he cannot transmit HIV sexually and there is no risk to his sexual partners (E). Condoms could be appropriate, however, to reduce the risk of other sexually transmitted infections.

## Question 2

A 32-year-old cis-gender (same sex as assigned at birth) woman and her cis-gender male partner presented for pre-conception advice. They had been using condoms consistently throughout their relationship. Her last HIV test had been a month previously and had been negative. Her partner has had an undetectable viral load since shortly after starting antiretroviral therapy for HIV 5 years previously.

### What is the best advice to give regarding conception?

- A They should be referred for sperm washing to remove any risk of HIV transmission during conception
- B They can stop using condoms to conceive because the male partner's viral load is undetectable and he cannot transmit HIV to his partner sexually
- C The woman should start pre-exposure prophylaxis before trying to conceive
- D There is always a risk of transmission if they do not use condoms because the viral load could unexpectedly increase
- E Following delivery, condoms are the best option to prevent unintended pregnancy

**Correct answer: B.** Sperm washing (A) is not necessary as the male partner has an undetectable viral load and cannot transmit HIV sexually. Pre-exposure prophylaxis (C) is not necessary because the male partner's viral load is undetectable. A long-term undetectable viral load since being on treatment predicts future undetectable viral load (so D is incorrect). Other forms of contraception would be more effective at preventing unintended pregnancy and there is no need to use condoms (E) to prevent HIV transmission.

### Question 3

A 54-year-old cisgender (same gender as assigned at birth) woman was admitted with community-acquired pneumonia for intravenous antibiotics. She was white and had been born in the UK. She lived in an area of high diagnosed HIV prevalence (between 2 and 5 per 1000 people aged 15 to 59 years). During the ward round, a plan for further investigations was discussed.

#### What advice should be offered regarding HIV testing?

- A** An HIV test is not required because the prevalence of HIV in white, UK-born 54-year-old women is extremely low
- B** She should be advised to have an HIV test at her local sexual health clinic after she has been discharged from hospital
- C** An HIV test should be performed after her inflammatory markers have returned to normal because otherwise there is an increased risk of a false-positive result
- D** A sexual health colleague should be called to discuss and perform HIV testing for this woman
- E** The medical team should explain to her that an HIV test is one of the routine investigations for people admitted with community-acquired pneumonia

**Correct answer: E.** The statement on prevalence (A) is true, but a test is required as the undiagnosed HIV prevalence is likely to be >1 in 1000, the threshold at which HIV testing is recommended. HIV testing should be performed by the medical team before discharge (so B is incorrect). Raised inflammatory markers (C) do not make a false-positive HIV test result more likely. HIV testing can be requested or performed by any member of her medical team (so D is wrong).