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PrEP
guidelines

**PREVENT
HIV BY
PRESCRIBING
PrEP**

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Glossary

AIDS	acquired immunodeficiency syndrome
ART	antiretroviral therapy
ARTG	Australian Register of Therapeutic Drugs
ASHM	Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine
BMD	bone mineral density
eCrCl	estimated creatinine clearance rate
eGFR	estimated glomerular filtration rate
GAHT	gender-affirming hormone therapy
FTC	emtricitabine (trade name Emtriva)
HBV	hepatitis B virus
HCV	hepatitis C virus
HIV	human immunodeficiency virus
iPrEx	Pre-exposure Prophylaxis Initiative
MSM	men who have sex with men
nPEP	non-occupational post-exposure prophylaxis
NSP	needle and syringe program
OST	Opioid Substitution Therapy
PBAC	Pharmaceutical Benefits Advisory Committee
PBS	Pharmaceutical Benefits Scheme
PCR	urine protein: creatinine clearance
PEP	post-exposure prophylaxis
PrEP	pre-exposure prophylaxis

PIS	Personal Importation Scheme
PoCT	point-of-care test
PWID	people who inject drugs
s100	a section of the Pharmaceutical benefits Scheme which provides access to highly specialised drugs
STI	sexually transmissible infection
TD*	tenofovir disoproxil maleate or fumarate or phosphate
TDF	tenofovir disoproxil fumarate (trade name Viread)
TDM	tenofovir disoproxil maleate (trade name Trucitavir)
TDP	tenofovir disoproxil phosphate (trade name Tenofovir EMT Lupin)
TDF/FTC	tenofovir disoproxil fumarate coformulated with emtricitabine (trade name Truvada, or in generic form Tenvir). In Australia, the TGA has also approved the generic Trucitavir, which is coformulated tenofovir disoproxil maleate and emtricitabine and Tenofovir EMT Lupin which is co-formulated tenofovir disoproxil phosphate and emtricitabine
TFV-DP	tenofovir diphosphate
TGA	Therapeutic Goods Administration
TGM	Transgender Men
TGW	Transgender Women
WHO	World Health Organization



1. Introduction

Widespread availability and uptake of human immunodeficiency virus (HIV) pre-exposure prophylaxis (PrEP) has the potential to significantly reduce HIV transmission in Australia and globally.

Co-formulated tenofovir and emtricitabine for use as HIV pre-exposure prophylaxis (PrEP) by people at risk of HIV infection is now recommended as standard care in clinical guidelines in the United States of America, Europe and Australia (1, 2, 3), as well as globally through World Health Organization (WHO) guidelines (4). When used with optimal medication adherence, daily PrEP is a highly effective HIV prevention strategy for men who have sex with men (MSM), heterosexual men and women, transgender people, and people who inject drugs who are at-risk of HIV acquisition (5-11). In addition, on-demand PrEP is highly effective in MSM (12-14) and has recently been recommended by the World Health Organisation as an option for MSM (15).

These clinical PrEP guidelines update the 2018 ASHM PrEP guidelines (3) which were initially an adaptation and update of the 2014 United States Centers for Disease Control's PrEP guidelines (16).

On May 2016, the Australian Therapeutic Goods Administration (TGA) approved the entry of Truvada (co-formulated tenofovir disoproxil fumarate and emtricitabine TDF/FTC; Gilead Sciences) onto the Australian Register of Therapeutic Goods (ARTG) for HIV PrEP for people at risk of HIV infection. Since then, a number of generic co-formulations of tenofovir disoproxil* and FTC have been registered by the TGA for HIV PrEP (for simplicity, TD* is used in these guidelines to denote the tenofovir disoproxil component present in the medicines registered for PrEP use in Australia).

From 1 April 2018, the brand and generic versions of TD*/FTC became available through the Australian Pharmaceutical Benefits Scheme (PBS) at subsidised cost for HIV PrEP (17). Whereas previously PrEP was available only through clinical trials, private scripts or through personal importation, it can now be prescribed by all general practitioners (GP) using PBS scripts. People with Medicare numbers can fill their scripts through the PBS, however people who are Medicare ineligible can either legally import generic PrEP using the TGA Personal Importation Scheme (PIS) (18), or pay the full price with a private script.

The recommendations in these guidelines are designed to:

- support the prescribing of PrEP using either ARTG-listed and PBS subsidised drugs, or the same or other generic drugs that are available through personal importation, or by paying the full price with a private script
- assist clinicians in their evaluation and HIV risk assessment of patients who are seeking PrEP
- assist clinicians in initiating their patients on PrEP by providing information on PrEP dosing schedules
- assist clinicians in the monitoring of patients on PrEP, including testing requirements and management of side-effects and toxicity

- assist clinicians to be aware of more complex situations such as the use of PrEP in pregnancy and in chronic hepatitis B infection
- assist clinicians in understanding how to safely cease PrEP.

These guidelines are intended for use by:

- general practitioners who provide care to people at risk of acquiring HIV infection
- sexual health physicians who provide care to people at risk of acquiring HIV infection
- infectious disease and HIV treatment specialists who may provide PrEP for, or serve as consultants to primary-care physicians about the use of antiretroviral medications
- trainees and registrars in each of the above categories
- nurse practitioners
- nurses working in nurse-led clinics in consultation with doctors
- peer workers
- counsellors and people performing HIV testing, including point-of-care testing
- health program policymakers
- health consumers and others with an interest in HIV PrEP.

Key recommendations of the ASHM PrEP Guidelines Panel

The ASHM PrEP Guidelines Panel recommends that daily TD*/FTC should be recommended by clinicians as a crucial HIV-prevention strategy for all people who are at risk of HIV infection, that is, men who have sex with men (MSM), transgender people, heterosexual men and women, and people who inject drugs.

The ASHM PrEP Guidelines Panel endorses the recent recommendation by WHO that on-demand PrEP should be offered to cis-gender MSM ([15](#)).

On-demand PrEP is recommended only for cis-gender MSM because its efficacy is yet to be determined in all other populations at risk of HIV infection. On-demand PrEP would be a suitable choice for cis-gender MSM who express a preference for on-demand PrEP, who have at-risk sex less than twice a week and who can plan ahead for at-risk sex at least 2 hours in advance.

The ASHM PrEP Guidelines Panel recommends that caution be used in recommending on-demand versus daily PrEP to adolescent MSM because there have been no trials of on-demand PrEP in adolescent MSM and because adherence rates to daily PrEP have been consistently low in studies of adolescent MSM ([19](#), [20](#)).

On-demand PrEP is contraindicated in people with chronic hepatitis B infection.

Of note, the Panel will continue to monitor the data on the efficacy of on-demand PrEP for MSM who use on-demand PrEP less frequently than fortnightly ([14](#), [21](#)).

References

1. US Preventive Services Task Force; Owens DK, Davidson KW, Krist AH, et al. Preexposure prophylaxis for the prevention of HIV infection: US Preventive Services Task Force Recommendation Statement. *JAMA* 2019;321:2203-13.
2. European AIDS Clinical Society (EACS) guidelines for the treatment of HIV-positive adults in Europe. Version 9.1, October 2018. Available at: <http://www.eacsociety.org/guidelines/eacs-guidelines/eacs-guidelines.html> (last accessed 18 July 2019).
3. Wright E, Grulich A, Roy K, Boyd M, Cornelisse V, Russell D, et al. Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine HIV pre-exposure prophylaxis: clinical guidelines. Update April 2018. *J Virus Erad* 2018;4:143-59.
4. World Health Organization. Guideline on when to start antiretroviral therapy and on pre-exposure prophylaxis for HIV. September 2015. Available at: <https://www.who.int/hiv/pub/guidelines/earlyrelease-arv/en/> (last accessed 9 September 2019).
5. Grant RM, Lama JR, Anderson PL, et al; iPrEx Study Team. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med* 2010;363:2587-99.
6. Baeten JM, Donnell D, Ndase P, et al; Partners PrEP Study Team. Antiretroviral prophylaxis for HIV prevention in heterosexual men and women. *N Engl J Med* 2012;367:399-410.
7. Thigpen MC, Kebaabetswe PM, Paxton LA, et al; TDF2 Study Group. Antiretroviral preexposure prophylaxis for heterosexual HIV transmission in Botswana. *N Engl J Med* 2012;367:423-34.
8. Anderson PL, Glidden DV, Liu A, et al; iPrEx Study Team. Emtricitabine-tenofovir concentrations and pre-exposure prophylaxis efficacy in men who have sex with men. *Sci Transl Med* 2012;4:151-68.
9. Choopanya K, Martin M, Suntharasamai P, et al; Bangkok Tenofovir Study Group. Antiretroviral prophylaxis for HIV infection in injecting drug users in Bangkok, Thailand (the Bangkok Tenofovir Study): a randomised, double-blind, placebo-controlled phase 3 trial. *Lancet* 2013;381:2083-90.
10. Grant RM, Anderson PL, McMahan V, et al. Uptake of pre-exposure prophylaxis, sexual practices, and HIV incidence in men and transgender women who have sex with men: a cohort study. *Lancet Infect Dis* 2014;14:820-9.
11. McCormack S, Dunn DT, Desai M, et al. Pre-exposure prophylaxis to prevent the acquisition of HIV-1 infection (PROUD): effectiveness results from the pilot phase of a pragmatic open-label randomised trial. *Lancet* 2016;387:53-60.
12. Molina JM, Capitant C, Spire B, et al; ANRSIPERGAY Study Group. On-demand preexposure prophylaxis in men at high risk for HIV-1 infection. *N Engl J Med* 2015;373:2237-46.
13. Molina JM, Charreau I, Spire B, et al; ANRS IPERGAY Study Group. Efficacy, safety, and effect on sexual behaviour of on-demand pre-exposure prophylaxis for HIV in men who have sex with men: an observational cohort study. *Lancet HIV* 2017;4:e402-10.
14. Molina JM, Ghosn J, Algarte-Génin M, et al; ANRS Study Group. Incidence of HIV-infection with daily or on-demand PrEP with TDF/FTC in Paris area. Update from the ANRS Prévenir Study. Abstract TUAC0202. Oral abstracts of the 10th IAS Conference on HIV Science, 21-24 July 2019, Mexico City, Mexico. *J Int AIDS Soc* 2019;22 Suppl 5:e25327.

15. World Health Organization. Technical brief. What's the 2+1+1? Event-driven oral pre-exposure prophylaxis to prevent HIV for men who have sex with men: update to WHO's recommendation on oral PrEP. July 2019. Available at: <https://apps.who.int/iris/bitstream/handle/10665/325955/WHO-CDS-HIV-19.8-eng.pdf?ua=1> (last accessed 3 September 2019).
16. US Public Health Service. Preexposure prophylaxis for the prevention of HIV infection in the United States - 2014. A clinical practice guideline. Atlanta: Centers for Disease Control and Prevention; 2014.
17. PrEP on the PBS: an opportunity in HIV prevention. 16 April 2018. Available at: <https://www.nps.org.au/news/prep-on-the-pbs-an-opportunity-in-hiv-prevention> (last accessed 3 September 2019).
18. Australian Government. Department of Health. Therapeutic Goods Administration. Personal importation scheme. 2015 [internet]. Available at: www.tga.gov.au/personal-importation-scheme (last accessed 4 September 2019).
19. Hosek SG, Rudy B, Landovitz R, et al; Adolescent Trials Network (ATN) for HIV/AIDS Interventions. An HIV preexposure prophylaxis demonstration project and safety study for young MSM. *J Acquir Immune Defic Syndr* 2017;74:21-9.
20. Hosek SG, Landovitz RJ, Kapogiannis B, et al. Safety and feasibility of antiretroviral preexposure prophylaxis for adolescent men who have sex with men aged 15 to 17 years in the United States. *JAMA Pediatr* 2017;171:1063-71.
21. Antoni G, Tremblay C, Charreau I, et al. On-demand PrEP with TDF/FTC remains highly effective among MSM with infrequent sexual intercourse: a sub-study of the ANRS IPERGAY trial. Abstract TUAC0102. 9th International AIDS Society (IAS) Conference on HIV Science. July 2017; Paris, France.



2. PrEP safety and efficacy

For a full review of PrEP safety and efficacy please see the CDC “Pre-exposure prophylaxis for the prevention of HIV Infection in the United States– 2017 update” starting from page 16:

<https://www.cdc.gov/hiv/pdf/risk/prep/cdc-hiv-prep-guidelines-2017.pdf>



3. Indications for PrEP in Australia

HIV epidemiology

Australia has a concentrated human immunodeficiency virus (HIV) epidemic, whereupon in 2018 sexual contact between men accounted for approximately 70% of new HIV diagnoses (1). During 2018, 23% of new diagnoses occurred in heterosexuals, and about one-third of these occurred where the person, or their partner came from a country with high HIV prevalence. Only 3% of new HIV diagnoses were attributable to injecting drug use alone.

Overall, the annual number of HIV diagnoses in Australia declined by 23% during 2014-2018 (1), and this decrease was attributable to a 30% decline in notifications among men who have sex with men (MSM). There was no decline in HIV in Aboriginal and Torres Strait Islander people (hereafter referred to as Indigenous), in heterosexual people or in those born overseas.

In MSM, an 11% decline in HIV notifications was observed over five years between 2013 and 2017, but the decline increased to 15% in 2016-2017. However, this decline in HIV diagnoses among MSM was not uniform. In the last 10 years, notifications declined by 21% in Australian-born MSM, while the proportion of notifications almost doubled (from 28% to 52%) among overseas-born MSM (1). The estimated proportion of undiagnosed HIV was also high among people born in Southeast Asia (27%) (1). The uptake of HIV pre-exposure prophylaxis (PrEP) remained low in this population, comprising only 9% of PrEP participants in the EPIC NSW trial (2). In Victoria, the incidence of HIV infection in newly arrived Asian-born MSM attending a sentinel sexual health clinic did not decline during 2013-2017 whereas the incidence fell by 45% in Australian-born MSM attending the same site (3).

A 10% increase in HIV notifications of heterosexual exposure was reported between 2013 and 2017, with a 14% increase between 2016 and 2017, which was mainly attributed to the increase in the number of notifications among Australian-born men over these time periods (37% and 31%, respectively) (1). In women, the notification rate remained stable during 2013-2017 (between 0.7 and 0.9 per 100,000), however, was low compared with that in men (0.9 vs 7.1 per 100,000 in 2017).

In the Indigenous population the rate of HIV notifications increased by 41% between 2013 and 2016, compared with a 12% decline in Australian-born non-Indigenous people, and in 2017 was 1.6 times higher than in the Australian-born non-Indigenous population (1). During 2015-2017, more HIV notifications in the Indigenous population were attributed to heterosexual sex (21%) and injecting drug use (18%) than in the Australian-born non-Indigenous population (18% and 3%, respectively).

Among female sex workers, HIV incidence remained stable at or below 0.13 per 100 person-years during 2013-2017, and was 0.13 per 100 person-years in 2017 (1). Similarly, for people who inject drugs (PWID), HIV prevalence has remained low in the past 10 years and ranged between 1.0% and 2.1% among people attending needle and syringe programs (2.1% in 2017), and 0.7% if gay and bisexual men were excluded

from the sample. However, prevalence of HIV among Indigenous men in these programs has increased almost five times between 2010–2011 and 2016–2017 from 0.9% to 4.2% (1).

HIV prevention

Overall, recent declines in HIV incidence and notifications concurred with Initiatives focused on improved uptake in HIV testing and treatment with simpler HIV treatment regimens. Consequently, 74% of people living with HIV in 2017 reached viral load suppression, thereby achieving zero risk of onward HIV transmission (1).

By the end of 2018, 18,530 people, of whom 99% were male, were receiving Pharmaceutical Benefits Scheme (PBS)-subsidised PrEP in Australia (4). Largely related to PrEP implementation, a 25% decline in new HIV diagnoses was observed among MSM in New South Wales, from 295 in the 12 months before the Expanded PrEP Implementation in Communities New South Wales (EPIC-NSW) study commenced to 221 in the 12 months following study commencement (2).

As described above, HIV notifications in Indigenous populations increased by 41% between 2013 and 2016 and diverged from the trends in the Australian-born non-Indigenous population (1). This divergence in HIV rates between the two populations possibly relates to a number of factors including a higher proportion of undiagnosed cases of HIV in the Indigenous population, sexual and drug-injecting practices and, importantly, a slower adoption of biomedical prevention strategies such as treatment as prevention and PrEP (5). Hence intensive HIV prevention and treatment efforts, including the use of PrEP, are required to reverse this alarming trend (6).

There are no available recent data about HIV testing uptake and access to antiretroviral drugs for PrEP for temporary residents who are ineligible to access Medicare (including short-term visitors, international students, skilled workers and some temporary residents awaiting decisions regarding their permanent residency as partners of citizens or permanent residents, asylum seekers and refugees).

In other population groups, harm reduction strategies for PWID and HIV and sexually transmissible infection (STI) prevention strategies for sex workers have been highly successful in keeping the prevalence and incidence of HIV at extremely low levels in Australia and among the lowest in the world. Current health promotion and HIV prevention strategies support PWID and sex workers to maintain these achievements, while access to PrEP may expand HIV prevention options (7).

HIV risk categories and targeted availability of PrEP in Australia

Informed by the local epidemiology of HIV, access to PrEP in Australia has been pragmatically targeted to MSM at increased risk of HIV acquisition. Criteria for increased HIV risk were originally defined based on the evidence from the Sydney-based Health in Men (HIM) study (8).

The [Table 3.1](#) summarises the main factors associated with an increased risk of HIV acquisition among gay and bisexually identified men in the Sydney-based HIM study (8). Four factors were associated with HIV incidence of above 1.8 per 100 person-years; these factors formed the criteria for identifying people at high risk of HIV acquisition. Two more factors with an HIV incidence above 1.0 and below 1.8 per 100 person-years formed the criteria for identifying people at medium HIV acquisition risk. Although the HIM study

collected data from 2001 to 2007 and HIV notification trends have changed since then, the same factors are likely to remain relevant to HIV transmission and its prevention today, and these factors were validated as eligibility criteria in an analysis of data from the Victorian PrEPX study (9) and continue to guide PrEP prescribing throughout Australia.

Risk factor	HIV incidence per 100 person years (95% CI)
All gay and bisexual men regardless of behavioural practices	0.78 (0.59–1.02)
A regular sexual partner of an HIV-positive man with whom condoms were not consistently used in the last 6 months	5.36 (2.78–10.25)
At least one episode of receptive, unprotected anal intercourse with any casual male partner with HIV infection or a male partner of unknown HIV status during the last 6 months	2.31 (1.48–3.63)
Rectal gonorrhoea diagnosis in last 6 months	7.01 (2.26–21.74)
Rectal chlamydia diagnosis in last 6 months	3.57 (1.34–9.52)
Methamphetamine use in last 6 months	1.89 (1.25–2.84)
More than one episode of anal intercourse during the last 3 months when proper condom use was not achieved (e.g. condoms slipped off or broke)	1.30 (0.95–1.77)
A regular sexual partner of CLAI or having at least one episode of insertive CLAI where the serostatus of partner is not known or is HIV positive	0.94 (0.35–2.52)
In uncircumcised men having at least one episode of insertive CLAI where the serostatus of partner is not known or is HIV positive	1.73 (0.43–6.90)
In circumcised men (comparison group, low risk, PrEP not recommended)	0.65 (0.16–2.61)

Table 3.1 Factors associated with elevated risk of HIV acquisition among men who have sex with men in the Health in Men (HIM) study, Australia, 2001–2007 (8)

Note that while the HIM study uses the terminology of ‘gay and bisexual men’, this guideline uses ‘men who have sex with men’ to focus on behaviour, rather than identity

CI: confidence interval; CLAI: condomless anal intercourse; HIV: human immunodeficiency virus; PrEP: pre-exposure prophylaxis

Of note, due to the specifics of data collection for the HIM study, not all indicators were available to support each individual eligibility criterion for PrEP. Some indicators were collected in different forms, or had a different denominator or reference period. Most importantly, the HIV viral load of HIV-positive regular partners is now known to have a significant impact on HIV transmission (10–12), and data on the HIV viral load of the source partners were not collected in the HIM study. Similarly, infectious syphilis was uncommon in the HIM cohort and was not associated with HIV transmission. However, its incidence has increased greatly since 2007 in Australia. Syphilis is associated with an increased risk of HIV among MSM globally (13, 14), and is therefore included in the PrEP suitability assessment. Drug use is another important factor that influences sexual behaviour and HIV risk acquisition and that has emerged since the HIM study. Methamphetamine use has been associated with increased risk of HIV infection in high-income countries internationally (15). In Australia associations have been observed between injecting drug use and sexual risk taking (16) with a higher incidence of drug use initiation occurring in younger versus older MSM (17).

Finally, the reference period for PrEP suitability assessment is set up in these guidelines to reflect behaviour over the previous 3 months whereas the HIM study addressed behaviour over the previous 6 months (8). In addition, the epidemiology of drug use has changed in MSM in Australia (15-19).

The 2017 ASHM PrEP guidelines classified a person's risk of HIV acquisition as high or low based on criteria from the HIM study (8). The 2017 guidelines recommended that an individual had to report HIV risk in the 3 months before commencing PrEP and that the individual anticipated that they would have HIV risk in the 3 months after commencing PrEP. Individual's risk of HIV acquisition were classified as high or low based on evidence from the HIM study (8). Additionally, in the 2017 guidelines, clinicians were invited to consider offering PrEP on a case-by-case definition to people who did not meet high- or medium-risk criteria.

Importantly, the 2019 ASHM PrEP guidelines no longer classify a person's risk of HIV acquisition as high or low and no longer require that an individual demonstrate HIV risk in the previous 3 months. Instead the 2019 guidelines provide behavioural examples of what would make a person suitable for PrEP, including whether a person's quality of life would be likely to improve if they were offered PrEP, e.g. people with high levels of anxiety about HIV acquisition. (see [Suitability for PrEP](#)).

Overall, the epidemiological data highlight the need to strengthen the current strategies for HIV prevention especially in Indigenous populations, overseas-born MSM where HIV rates are rising and heterosexuals, which would include expanding and promoting the uptake of PrEP by all eligible people.

The PrEP suitability criteria that are provided in these guidelines are not intended to limit or deny access to PrEP to any person who seeks it. Instead, they are intended to help identify and actively recommend PrEP to people suitable for PrEP and to guide clinicians in their discussions about PrEP with patients who are uncertain about their HIV risk and need for PrEP use (see [Suitability for PrEP](#)).

References

1. Kirby Institute. HIV, viral hepatitis and sexually transmissible infections in Australia: annual surveillance report 2018. Sydney: Kirby Institute, UNSW Sydney; 2018. Available at: <https://kirby.unsw.edu.au/report/hiv-viral-hepatitis-and-sexually-transmissible-infections-australia-annual-surveillance> (last accessed 27 August 2019).
2. Grulich AE, Guy R, Amin J, et al; Expanded PrEP Implementation in Communities New South Wales (EPIC-NSW) research group. Population-level effectiveness of rapid, targeted, high-coverage roll-out of HIV pre-exposure prophylaxis in men who have sex with men: the EPIC-NSW prospective cohort study. *Lancet HIV* 2018;5:e629-37.
3. Medland NA, Chow EPF, Read THR, et al. Incident HIV infection has fallen rapidly in men who have sex with men in Melbourne, Australia (2013–2017) but not in the newly arrived Asian-born. *BMC Infect Dis* 2018;18:410.
4. Kirby Institute. Monitoring HIV pre-exposure prophylaxis uptake in Australia. PBS-subsidised HIV pre-exposure prophylaxis from April 2018 to December 2018. Issue 1. 1 June 2019. Sydney: The Kirby Institute, UNSW Sydney; 2019. Available at: https://kirby.unsw.edu.au/sites/default/files/kirby/report/Monitoring-HIV-PrEP-uptake-in-Australia-newsletter_Issue1.pdf (last accessed 3 September 2019).
5. Kirby Institute. Bloodborne viral and sexually transmissible infections in Aboriginal and Torres Strait Islander people: annual surveillance report 2018. Sydney: Kirby Institute, UNSW Sydney; 2018.
6. Ward JS, Hawke K, Guy RJ. Priorities for preventing a concentrated HIV epidemic among Aboriginal and Torres Strait Islander Australians. *Med J Aust* 2018;209:56.
7. Heard S, Iversen J, Geddes L, Maher L. Australian NSP Survey National Data Report 2013-2017: prevalence of HIV, HCV and injecting and sexual behaviour among NSP attendees. Sydney: Kirby Institute, UNSW Sydney; 2018.
8. Poynten IM, Jin F, Prestage GP, Kaldor JM, Kippax S, Grulich AE. Defining high HIV incidence subgroups of Australian homosexual men: implications for conducting HIV prevention trials in low HIV prevalence settings. *HIV Med* 2010;11:635-41.
9. Cornelisse VJ, Fairley CK, Stoope M, et al; PrEPX Study Team. Evaluation of preexposure (PrEP) eligibility criteria, using sexually transmissible infections as markers of human immunodeficiency virus (HIV) risk at enrollment in PrEPX, a large Australian HIV PrEP trial. *Clin Infect Dis* 2018;67:1847-52.
10. Cohen MS, Chen YQ, McCauley M, et al; HPTN 052 Study Team. Antiretroviral therapy for the prevention of HIV-1 transmission. *N Engl J Med* 2016;375:830-9.
11. Bavinton BR, Pinto AN, Phanuphak N, et al; Opposites Attract Study Group. Viral suppression and HIV transmission in serodiscordant male couples: an international, prospective, observational, cohort study. *Lancet HIV* 2018;5:e438-47.
12. Rodger AJ, Cambiano V, Bruun T, et al; PARTNER Study Group. Risk of HIV transmission through condomless sex in serodifferent gay couples with the HIV-positive partner taking suppressive antiretroviral therapy (PARTNER): final results of a multicentre, prospective, observational study. *Lancet* 2019;393:2428-38.
13. Darrow WW, Echenberg DF, Jaffe HW, et al. Risk factors for human immunodeficiency virus (HIV) infections in homosexual men. *Am J Public Health* 1987;77:479–83.

14. Hook EW 3rd. Syphilis. *Lancet* 2017;389:1550–57.
15. Vu NT, Maher L, Zablotska I. Amphetamine-type stimulants and HIV infection among men who have sex with men: implications on HIV research and prevention from a systematic review and meta-analysis. *J Int AIDS Soc* 2015;18:19273.
16. Bui H, Zablotska-Manos I, Hammoud M, et al. Prevalence and correlates of recent injecting drug use among gay and bisexual men in Australia: results from the FLUX study. *Int J Drug Policy* 2018;55:222-30.
17. Jin F, Hammoud MA, Maher L, et al. Age-related prevalence and twelve-month incidence of illicit drug use in a cohort of Australian gay and bisexual men: Results from the Flux Study. *Drug Alcohol Depend* 2018;188:175-9.
18. Prestage G, Hammoud M, Jin F, Degenhardt L, Bourne A, Maher L. Mental health, drug use and sexual risk behavior among gay and bisexual men? *Int J Drug Policy* 2018;55:169-79.
19. Hammoud M, Vaccher S, Jin F, et al. The new MTV generation: using Methamphetamine, Truvada, and Viagra to enhance sex and stay safe. *Int J Drug Policy* 2018;55:197-204.



4. Suitability for PrEP

Pre-exposure prophylaxis (PrEP) medications are registered in Australia with the Therapeutic Goods Administration (TGA) and they are subsidised by the Australian Pharmaceutical Benefits Scheme (PBS). All general practitioners and other medical specialists can prescribe PrEP using a PBS streamlined authority arrangement. No specialist training is required to prescribe PrEP, however resources and training guidance are available for clinicians who are new to prescribing PrEP.

People presenting for PrEP are typically at high risk of human immunodeficiency virus (HIV) infection and they should not be dissuaded from using PrEP. To do so is to deny a person access to one of the most effective HIV prevention tools currently available. Doctors who are not comfortable prescribing PrEP should refer the patient immediately to a colleague, or another service that does provide PrEP.

It should also be highlighted that sexual history taking is a necessary and routine part of medical practice, and when this process identifies that a patient may be at risk of HIV, clinicians should proactively offer these patients PrEP. Furthermore clinicians are encouraged to raise PrEP as an HIV prevention strategy with patients whom they perceive to be at risk of HIV infection, even if the purpose of the patient's visit is not related to sexual health, sexually transmissible infections (STIs) or drug use.

These ASHM 2019 PrEP guidelines recommend daily PrEP for all people at risk of HIV infection. In addition, these guidelines also recommend that on-demand PrEP should be offered as an alternative option to cis-gender men who have sex with men (MSM). Please refer to section [Providing PrEP](#) for further information on initiating PrEP.

PrEP providers need to obtain a thorough sexual and drug-use history at baseline to determine a person's suitability for PrEP and to review their ongoing need for PrEP at each 3-monthly clinical review. It is important to acknowledge that a person's behaviour may change over time, and that a person may wish to continue PrEP even if their current HIV acquisition risk is not high.

These guidelines acknowledge that PrEP should be recommended as an HIV prevention strategy for people who have been at risk of HIV infection during the previous 3 months and who foresee having similar risks in the next 3 months. These guidelines also recommend PrEP for people who have not been at risk of HIV infection during the previous 3 months, but whose circumstances have changed, and they foresee HIV risk occurring in the next 3 months.

Please note that people who are eligible for PrEP based on their sexual behaviour may be simultaneously eligible for PrEP based on their injecting and other drug use behaviour and vice versa.

The following suitability criteria can be used to help structure a discussion with a patient about their sexual health and behaviour. Guidance on how to initiate and guide a discussion about a person's sexual and drug using behaviour in primary practice is available (1).

Clinicians who have limited experience with prescribing PrEP are encouraged to discuss with a PrEP experienced clinician those patients whose PrEP suitability is unclear.

For clinicians who are skilled at and who prefer to evaluate people's PrEP suitability according to how the person reports their gender identity and sexuality, please refer to the alternative [Suitability for PrEP chapter, Chapter 14](#).

PrEP suitability criteria for men who have sex with men

Box 4.1 PrEP suitability criteria for men who have sex with men

HIV risk in the previous 3 months and the future 3 months

The clinician should prescribe PrEP if the patient describes a history of any of the following HIV acquisition risks in the previous 3 months and if the patient foresees that there are likely to be similar acquisition risks in the next 3 months:

- At least one episode of condomless anal intercourse (insertive or receptive) with a regular HIV-positive partner who is either not on treatment, or who is on treatment but has a detectable HIV viral load
- At least one episode of receptive condomless anal intercourse with any casual male partner
- One or more episodes of engaging in sexualised drug use, sometimes referred to as 'chemsex'. In the Australian context this typically involves the use of crystal methamphetamine (Ice), but can also include the use of gamma hydroxybutyrate (GHB)
- One or more episodes of rectal gonorrhoea, rectal chlamydia or infectious syphilis, including any STIs diagnosed at screening for PrEP
- More than one episode of anal intercourse where a condom slipped off or broke where the HIV serostatus of the partner was not known, or where the partner was HIV positive and not on treatment or had a detectable viral load on treatment.

HIV risk in the future 3 months

The clinician should prescribe PrEP if the patient foresees that they will have HIV acquisition risk in the upcoming 3 months, despite not having had HIV acquisition risk in the previous 3 months.

Note: The following list is not exhaustive and there are likely to be many other scenarios where PrEP could be suitably offered for people whose HIV risk acquisition is exclusively in the future:

- When a person plans to travel during which time they anticipate that they will be having condomless sex with casual partners
- When a person plans to return home to an overseas country which has a high HIV prevalence during which time they anticipate that they will be having condomless sex with casual partners
- When a person reports that they have recently left a monogamous relationship and will be having condomless sex with casual partners in the future
- When a person reports that they will be entering or leaving institutional or correctional facilities in the near future where they may have condomless sex with casual partners in the future
- When a person presents with concerns of deteriorating mental health and a history of having previously increased their HIV acquisition risk behaviour in this setting
- When a person presents with a history of intermittent binge drinking of alcohol or recreational drug use and a history of having had increased their HIV acquisition risk behaviour in this setting.

The clinician should consider prescribing PrEP also in the following circumstances:

- When an HIV serodiscordant couple experience undue suffering and anxiety about inter-couple HIV transmission despite the positive partner being virologically suppressed on treatment
- When a person reports being so anxious about HIV infection that it may prevent them from having regular HIV testing, or engaging in any form of anal sex
- When a person presents with a history of recurrent genital ulceration or dermatoses (e.g. psoriasis), as this may increase the risk of HIV transmission.

PrEP suitability criteria for trans and gender diverse people

Only a small proportion of participants in PrEP studies have been transgender (trans) or gender diverse people (2, 3, 4). As a result, limited data are available for these populations. Incorrect assumptions can be made about trans people and their sexual practices, as they may practice vaginal/neovaginal and anal intercourse, both insertive and receptive. Trans and gender-diverse people who are at risk of acquiring HIV on the basis of their sexual history are eligible to access PrEP. It is essential for clinicians to take a sexual history using appropriate and sensitive language to assess risk.

Box 4.2 PrEP suitability criteria for trans and gender diverse people

HIV risk in the previous 3 months and the future 3 months

The clinician should prescribe PrEP if the patient describes a history of any of the following HIV acquisition risks in the previous 3 months and if the patient foresees that there are likely to be similar acquisition risks in the next 3 months:

- At least one episode of condomless anal intercourse (insertive or receptive) with a regular HIV-positive partner who is either not on treatment, or who is on treatment but has a detectable HIV viral load
- At least one episode of receptive condomless anal intercourse with any with any casual bisexual male partner of unknown status
- More than one episode of anal or vaginal intercourse where a condom slipped off or broke where the HIV serostatus of the partner was not known, or where the partner was HIV positive and not on treatment or had a detectable viral load on treatment
- One or more episodes of engaging in sexualised drug use, sometimes referred to as 'chemsex'. In the Australian context this typically involves the use of crystal methamphetamine (Ice) but can also include the use of gamma hydroxybutyrate (GHB)
- One or more episodes of rectal gonorrhoea, rectal chlamydia or infectious syphilis including any STIs diagnosed at screening for PrEP.

HIV risk in the future 3 months

The clinician should prescribe PrEP if the patient foresees that they will have HIV acquisition risk in the upcoming 3 months, despite not having had HIV acquisition risk in the previous 3 months:

- When a person plans to travel during which time they anticipate that they will be having condomless sex with casual partners
- When a person plans to return home to an overseas country which has a high HIV prevalence during which time they anticipate that they will be having condomless sex with casual partners
- When a person reports that they have recently left a monogamous relationship and will be having condomless sex with casual partners in the future
- When a person reports that they will be entering or leaving institutional or correctional facilities in the near future where they may have condomless sex with casual partners in the future
- When a person presents with concerns of deteriorating mental health and a history of having previously increased their HIV acquisition risk behaviour in this setting
- When a person presents with a history of intermittent binge drinking of alcohol or recreational drug use and a history of having had increased their HIV acquisition risk behaviour in this setting.

The clinician should consider prescribing PrEP also in the following circumstances:

- When an HIV serodiscordant couple experience undue suffering and anxiety about inter-couple HIV transmission despite the positive partner being virologically suppressed on treatment
- When a person reports being so anxious about HIV infection that it may prevent them from having regular HIV testing or engaging in any form of anal or vaginal sex
- When a person presents with a history of recurrent genital ulceration or dermatoses (e.g. psoriasis), as this increases the potential risk of HIV transmission.

PrEP suitability criteria for heterosexuals

Box 4.3 PrEP suitability criteria for heterosexuals

HIV risk in the previous 3 months and the future 3 months

The clinician should prescribe PrEP if the patient describes a history of any of the following HIV acquisition risks in the previous 3 months and if the patient foresees that there are likely to be similar acquisition risks in the next 3 months

- At least one episode of condomless anal or vaginal intercourse (insertive or receptive) with a regular HIV-positive partner who is either not on treatment, or who is on treatment but has a detectable HIV viral load
- At least one episode of receptive anal or vaginal condomless intercourse with any casual HIV-positive partner or a male homosexual or bisexual partner of unknown status
- Episodes of planned condomless insertive or receptive vaginal sex in an effort to conceive with an HIV-positive partner, regardless of the HIV-positive partner's viral load

HIV risk in the future 3 months

The clinician should prescribe PrEP if the patient foresees that they will have HIV acquisition risk in the upcoming 3 months, despite not having had HIV acquisition risk in the previous 3 months:

- Future episodes of planned condomless insertive or receptive vaginal sex in an effort to conceive with an HIV-positive partner, regardless of the HIV-positive partner's viral load
- When a person plans to travel to countries with high HIV prevalence during which time they anticipate having condomless sex with casual partners who are HIV positive or of unknown HIV serostatus
- When a person plans to return home to an overseas country which has a high HIV prevalence during which time they anticipate that they will be having condomless sex with casual partners
- When a person reports that they have recently left a monogamous relationship and will be having condomless sex with a casual HIV-positive partner, or a male or female partner of unknown HIV serostatus from a country with high HIV prevalence, or a male partner who is thought to have sex with men
- When a person presents with concerns of deteriorating mental health and a history of having had increased their HIV acquisition risk behaviour in this setting
- When a person presents with a history of intermittent binge drinking of alcohol or recreational drug use and a history of having had increased their HIV acquisition risk behaviour in this setting.

The clinician should consider prescribing PrEP also in the following circumstances:

- When an HIV serodiscordant couple experience undue suffering and anxiety about inter-couple HIV transmission despite the positive partner being virologically suppressed on treatment.

PrEP suitability criteria for people who inject drugs

In the first instance, people who inject drugs (PWID) should be advised of and provided with options for using sterile needles, syringes and other injecting equipment, and offered opioid substitution therapy for those who use opioids. People who inject drugs can be referred to local needle and syringe programs, or the [Australian Injecting and Illicit Drug Users League](#) affiliates in their state or territory.

Because PWID are susceptible to a range of infections and injuries, PrEP and other HIV-prevention interventions should be integrated into prevention and clinical care services for hepatitis A, B and C infection and other infectious diseases, and overdose prevention. These interventions include screening for hepatitis A, B and C viruses and providing incentivised vaccination for hepatitis A and B where clinically indicated, as well as screening for injection-related injuries and infections including abscesses, septicaemia and endocarditis (5).

The ASHM PrEP Guidelines Panel is cognisant of the concerns of the International Network of People who Use Drugs. The Network cautions against prioritising PrEP at the expense of other proven interventions as the prime HIV-prevention strategy for people who inject drugs, and emphasises that access to harm-reduction services remains a critical component of HIV prevention in people who inject drugs (6). This approach is particularly relevant in Australia where sterile needle and syringe coverage is high and HIV prevalence and incidence among people who inject drugs remains low and stable (7, 8).

A recent systematic review of HIV-treatment adherence among PWID in the United States and Canada, undertaken to inform potential PrEP adherence interventions for people who inject drugs, found that younger age, female sex, homelessness and incarceration were obstacles to HIV treatment adherence (9). By comparison, self-sufficiency, use of opioid substitution therapy, and high quality patient-provider relationships were facilitators for adherence (9). Self-reports from HIV-negative people who inject drugs were that HIV-related stigma in social networks, negative experiences with health-care providers, lack of money, homelessness and the criminal justice system were likely barriers to PrEP access (10). These factors should be considered when providing support to people commencing PrEP when they are at risk of HIV through injecting drug use.

The ASHM PrEP Guidelines Panel will continue to monitor the outcomes of the few ongoing studies of HIV PrEP in PWID.

Box 4.4 PrEP suitability criteria for people who inject drugs

HIV risk in the previous 3 months and the future 3 months

The clinician should prescribe PrEP if the patient describes a history of any of the following HIV acquisition risks in the previous 3 months and if the patient foresees that there are likely to be similar acquisition risks in the next 3 months:

- Shared injecting equipment with an HIV-positive person or with a gay or bisexual man of unknown HIV status
- At least one episode of condomless anal or vaginal intercourse (insertive or receptive) with a regular HIV-positive partner who is either not on treatment, or who is on treatment but has a detectable HIV viral load
- At least one episode of receptive anal or vaginal condomless intercourse with any casual HIV-positive partner or a male homosexual or bisexual partner of unknown status.

HIV risk in the future 3 months

The clinician should prescribe PrEP if the patient foresees that they will have HIV acquisition risk in the upcoming 3 months, despite not having had HIV acquisition risk in the previous 3 months.

- A person has recently (re)commenced injecting drugs and is injecting with a person who is HIV positive, or with a gay or bisexual man whose HIV status is unknown
- When a person plans to travel to countries with high HIV prevalence during which time they anticipate injecting drugs with other people who are HIV positive or of unknown HIV serostatus
- When a person reports that they will be entering, or leaving institutional or correctional facilities in the near future during which time they may inject drugs with people who are HIV positive or of unknown HIV serostatus

References

1. Australasian Sexual Health Alliance (ASHA). Australian STI management guidelines for use in primary care [internet]. Taking a sexual history and contact tracing. Updated December 2018. Available at: <http://www.sti.guidelines.org.au/resources/how-to-take-a-sexual-history#how-to-take-a-sexual-history> (last accessed 3 September 2019).
2. Grant RM, Sevelius JM, Guanira JV, Aguilar JV, Chariyalertsak S, Deutsch MB. Transgender women in clinical trials of pre-exposure prophylaxis. *J Acquir Immune Defic Syndr* 2016;72 Suppl 3:S226-9.
3. Grant RM, Lama JR, Anderson PL, et al; iPrEx Study Team. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med* 2010;363:2587-99.
4. Mehrotra ML, Westreich D, McMahan VM, et al. Baseline characteristics explain differences in effectiveness of randomization to daily oral TDF/FTC PrEP between transgender women and cisgender men who have sex with men in the iPrEx Trial. *J Acquir Immune Defic Syndr* 2019; 81:e94-8
5. Centers for Disease Control and Prevention (CDC). Integrated prevention services for HIV infection, viral hepatitis, sexually transmitted diseases, and tuberculosis for persons who use drugs illicitly: summary guidance from CDC and the U.S. Department of Health and Human Services. *MMWR Recomm Rep* 2012;61(RR-5):1–40.
6. International Network of People who Use Drugs (INPUD). Position paper: pre-exposure prophylaxis (PrEP) for people who inject drugs. April 2015. Available at: www.inpud.net/INPUD_PositionPaper_Pre-exposure_prophylaxis_PrEP_April15.pdf (last accessed 3 September 2019).
7. Wodak A, Maher L. The effectiveness of harm reduction in preventing HIV among injecting drug users. *NSW Public Health Bulletin* 2010;21(3–4):69-73.
8. Kwon JA, Iversen J, Law M, Dolan K, Wand H, Maher L. Estimating the number of people who inject drugs and syringe coverage in Australia, 2005-2016. *Drug Alcohol Depend* 2019;197:108-14.
9. Bazzi AR, Drainoni ML, Biancarelli DL, et al. Systematic review of HIV treatment adherence research among people who inject drugs in the United States and Canada: evidence to inform pre-exposure prophylaxis (PrEP) adherence interventions. *BMC Public Health* 2019;19:31.
10. Biello KB, Bazzi AR, Mimiaga MJ, et al. Perspectives on HIV pre-exposure prophylaxis (PrEP) utilization and related intervention needs among people who inject drugs. *Harm Reduct J* 2018;15:55.



5. Clinical assessment before starting PrEP

All patients whose sexual or drug injection history indicates the recommendation or consideration of pre-exposure prophylaxis (PrEP), and who are interested in taking PrEP, must undergo laboratory testing. The tests identify those for whom this intervention would be harmful, or in whom it could present specific health risks that would require close monitoring.

HIV testing

For patients' safety, those with acute or chronic human immunodeficiency virus (HIV) infection should be identified through taking a medical history and HIV testing. A negative HIV test result must be documented at the time the patient is evaluated for PrEP as the daily, or on-demand tenofovir disoproxil* and emtricitabine (TD*/FTC) combination alone is insufficient for treatment of acute or chronic HIV infection.

HIV testing must be repeated every 3 months when patients attend for a prescription refill. This requirement for quarterly visits should be explained to patients during the initial discussion about whether PrEP is appropriate for them.

A fourth-generation HIV antibody/antigen venous blood test should be used and should be performed within 7 days of the patient being evaluated for PrEP. Clinicians should tell patients to start PrEP within 7 days of the day that their HIV-negative test was performed.

Rapid, point-of-care tests (PoCT) should not be used alone to screen for HIV infection when considering PrEP because they are less sensitive than blood tests. Failure to detect very early HIV infection by rapid testing in the PrEP context has been reported (1). This includes the Atomo HIV Self-Test, a rapid home-based HIV testing kit which was approved for online purchase in Australia by the TGA in November 2018. However, a rapid PoCT can be used for the same day initiation of PrEP providing that a venous blood test for a fourth generation HIV antibody/ antigen test is obtained and tested simultaneously. A PoCT can exclude potential PrEP users who are found to be HIV positive, and any reactive PoCT should be confirmed by conventional laboratory testing in line with the [Australian HIV Testing Policy](#). Clinicians should not accept patient-reported HIV test results, including home-based HIV test results, or documented anonymous test results. Any positive HIV antibody test result must be managed according to the Australian HIV Testing Policy and local management guidelines (www.testingportal.ashm.org.au).

A course of non-occupational post-exposure prophylaxis (nPEP) may be required before transitioning to PrEP, in accordance with the PEP and nPEP guidelines (2) if a patient has had a recent high-risk exposure (within 72 hours). See the [PEP guidelines](#) for more information.

Patients who have had a recent high-risk exposure outside the 72 hour window for the commencement of nPEP should be started on PrEP and closely monitored for seroconversion using a fourth-generation HIV test for the next 2–8 weeks before reverting to standard PrEP monitoring. HIV viral load and HIV proviral DNA tests are not recommended to screen for early HIV infection. These tests are not reimbursed by Medicare and may take 10-14 days for results to be available.

Acute HIV infection should be suspected in individuals at high risk of HIV who may have had recent exposure to HIV (e.g. no condom or a condom broke during sex with an HIV-positive partner not on treatment, or casual partner of MSM; recent injecting drug use with shared injection equipment with MSM, or person known to be HIV positive).

In a prospective study of 2,226 people at high risk of HIV infection who underwent twice-weekly HIV nucleic acid testing, 50 people were evaluated for their clinical signs and symptoms during acute HIV infection. Symptoms and signs occurred in 94% of participants with acute HIV infection, just before and around the time of peak HIV viraemia (3). The most common symptoms were fever, headache and malaise, while the most common signs were related to the head, eyes, ears, nose, throat, tachycardia and lymphadenopathy (Table 5.1).

	Africa (n=31)		Thailand (n=17)		Overall (n=48)	
	n	%	n	%	n	%
Symptom						
Fever	18	55	7	41	25	50
Headache	17	52	6	35	23	46
Feeling of illness	14	42	5	29	19	38
Coughing	10	30	9	535	19	38
Abnormality						
HEENT ^a	6	18	16	94	22	44
Lymphadenopathy ^b	9	9	16	94	19	38
Tachycardia	11	33	5	29	16	32

Table 5.1 Symptoms and abnormalities associated with primary or acute HIV infection, overall and by region (3).

^a Head, ears, eyes, nose and throat.

^b A condition or disease affecting the lymph glands of the body resulting in lymph nodes that are abnormal in size, consistency or number

Initiation of TD*/FTC PrEP in individuals with undiagnosed primary or acute (symptomatic) HIV infection has been associated with the development of resistance to TD*/FTC, mostly commonly to the FTC component (4-7).

People who present with signs or symptoms consistent with acute HIV infection should not be commenced on PrEP until HIV infection has been excluded.

Patients with indeterminate HIV test results at baseline should not be started on PrEP. They should be assessed for early HIV infection and treated according to local antiretroviral treatment guidelines (8). Such patients can only be started on PrEP if and when HIV infection is excluded.

Concerns about TD* or FTC resistance

Overall, the risk of developing TD* or FTC resistance among participants on PrEP is low (9). According to a World Health Organization (WHO) meta-analysis of HIV resistance data from randomised clinical trials of PrEP, participants on PrEP versus placebo who started PrEP at the time of acute HIV infection had a higher risk of developing resistance, with more cases of resistance developing to FTC than to TD*. Only a few TD* or FTC mutations were recorded among participants who seroconverted after randomisation into clinical trials (9). Similar findings were reported in a more recent review of clinical trials and case reports of HIV resistance occurring in the PrEP setting (10). Mathematical modelling shows that the number of HIV-1 infections that would be averted by PrEP greatly exceeds the number of drug-resistant infections that could occur (11).

Assessment of renal function at baseline

In HIV-positive patients, the use of tenofovir was reviewed in a meta-analysis and was associated with a statistically significant loss of renal function, with the effect being judged as clinically modest (12). Tenofovir use was not associated with increased risk of fractures, hypophosphataemia or severe proteinuria (12). Rarely, proximal renal tubular dysfunction (including Fanconi syndrome) may occur with TD* use (12-14).

Overall, tenofovir use in PrEP studies has not been associated with significant clinical renal problems (15-17). The Iniciativa Profilaxis Pre-Exposición (iPrEX) study showed a small but statistically significant mean decline in creatinine clearance (CrCL) from baseline but the decline in CrCL was reversible upon PrEP cessation (15). Factors associated with a decline in estimated Glomerular Filtration Rate (eGFR) include commencement of PrEP at age 40 years or over, a baseline eGFR below 90 mL/min/1.73m², and good adherence (17). **There are no data for people using PrEP who have an eGFR below 60 mL/min/1.73m² therefore starting PrEP in individuals whose eGFR is well established to be below 60 mL/min/1.73m² is not recommended.** However, see comments below on managing individuals who are found to newly have an eGFR around 60 mL/min/1.73m² at baseline testing.

Data from the iPrEx open-label extension (iPrEX-OLE) study found a significant increase in both urine alpha-1 microglobulin, a urine marker of impaired tubular reabsorption, and proteinuria after 6 months of TDF/FTC exposure suggesting that subclinical tubular injury occurs on PrEP (18).

There are limited data regarding whether on-demand versus daily PrEP reduces the likelihood of renal toxicity. However, in the Intervention Préventive de l'Exposition aux Risques avec et pour les Gays (IPERGAY) study, no significant decline was observed in the mean slope of eGFR in the tenofovir and emtricitabine versus placebo arms over a median of 9.3 months follow-up (19), suggesting that on-demand PrEP may not influence renal function. In the ADAPT study, a creatinine elevation was observed in 9% of 178 participants evaluated, but creatinine elevation did not differ between participants in the daily, time-driven and on-demand PrEP study arms (P = 0.05) (20).

Recent data from the DISCOVER study where MSM and transgender women at risk of HIV were randomised to TDF/FTC versus tenofovir alafenamide (TAF)/FTC reported a significant difference in change in eGFR

and tubular proteins during the study favouring TAF/FTC (21). More broadly the DISCOVER study found that TAF/FTC was non-inferior to TDF/FTC in terms of preventing HIV infection (21), however TAF/FTC has not been licensed yet in Australia for use as PrEP.

For all patients considered for PrEP, their risk factors for chronic kidney disease (CKD) should be assessed at baseline. These risk factors include diabetes, hypertension, smoking, concurrent medications and a known history of renal impairment or history of kidney injury or structural abnormality and Aboriginal and Torres Strait Islander status. Measurements of baseline serum creatinine, eGFR, the urine protein: creatinine ratio (PCR) and blood pressure should also be taken. The Cockcroft–Gault formula for estimating creatinine clearance (CrCl) (see Appendix 1) is regarded as the ideal way to measure the eGFR. However, for most practitioners, this is not practical. Instead, it is reasonable to measure the patient's renal function using the eGFR as reported by the laboratories.

For individuals who are found to newly have an eGFR around 60 mL/min/1.73m² at baseline, the eGFR should be repeated within 7 days because clinical situations occur when the eGFR may be unreliable, e.g. recent consumption of cooked meat. In this setting the clinician should ask the individual to fast or avoid a cooked meat meal within 4 hours of repeat eGFR testing. Exceptional dietary intake e.g. vegetarian diet, high protein diet, creatinine supplements, and extremes of body size (e.g. high muscle mass) may underestimate eGFR. Being underweight or having low muscle mass may overestimate eGFR.

If after repeat testing an individual's eGFR remains just below or just above 60 mL/min/1.73m², it is recommended that the clinician speak to a specialist in PrEP as these patients may still be able to commence PrEP with close monitoring. Of note, this setting on-demand PrEP may be a suitable option if the patient is a cis-gender MSM.

These guidelines recommend that creatinine, eGFR and urinary PCR measurements for each person are evaluated at baseline. The eGFR should be repeated 3 months after commencing PrEP then 6 monthly thereafter. However, based on currently available evidence, more intensive monitoring may be warranted in the following individuals:

- those over the age of 40 years
- those with a baseline eGFR of less than 90 mL/min/1.73 m²
- those with other comorbidities (e.g. hypertension, diabetes)
- those taking nephrotoxic drugs.

A minority of individuals may experience a decline in eGFR; the Australian CKD Management in General Practice recommends further investigations and consideration of a referral to a specialist renal service when there is sustained decrease in eGFR of 25% or more or a sustained decrease in eGFR of 15 mL/min/1.73 m² (22).

Assessment and management of sexually transmissible infections at baseline

Individuals at risk for HIV infection are also at high risk for STIs. Clinicians should screen for STIs (specifically gonorrhoea, chlamydia and infectious syphilis) using the standard-of-care tests and procedures, and manage any detected STI as recommended by the Australian STI Management Guidelines (23). Importantly the presence of an STI at baseline should not delay the commencement of PrEP. Of note,

in the PrEPX study it was reported that 10.2% of 1,774 evaluable study participants tested positive for STIs at baseline (24).

Patients starting on PrEP should be informed about:

- prevention of STI acquisition and transmission
- frequency of STI testing
- signs and symptoms of STIs.

Patients should be encouraged to present for testing and treatment whenever signs or symptoms of STIs appear.

Assessment of hepatitis A, B and C status

Patients being suitable for PrEP can also be at risk of acquiring hepatitis A, hepatitis B virus (HBV) infection (25) and hepatitis C virus (HCV) [infection (26)]. Hepatitis A, HBV and HCV infection status should be documented by screening serology when PrEP is initiated.

Vaccination against hepatitis A and HBV is recommended for all susceptible priority populations, which include MSM, sex workers, people from countries with a high HIV, HBV or HCV prevalence, and their sexual partners and people who inject drugs (27, 28). Individuals identified at baseline as having undiagnosed chronic hepatitis B should be referred to a clinician experienced in the management of hepatitis B for treatment assessment. Individuals with chronic hepatitis B infection should only be offered daily PrEP and not on-demand PrEP. They should also be counselled on the importance of strict adherence to PrEP to prevent both a flare in their hepatitis B infection and the development of hepatitis B resistance to TD*/FTC. Individuals identified at baseline with undiagnosed hepatitis C infection should be referred to a clinician experienced in hepatitis C management for consideration of hepatitis C treatment. A diagnosis of hepatitis B or hepatitis C is not an obstacle to HIV PrEP initiation.

Assessment of bone health

Low bone mineral density (BMD) was observed at baseline in approximately 10% of individuals receiving TD*/FTC for PrEP in the IPREX study (29). Individuals should be counselled about the effects of TD* on BMD and counselled to decrease alcohol and cigarette use, to undertake weight-bearing exercise and ensure their diet provides adequate amounts of calcium and vitamin D (30). A clinician may suspect that an individual is vitamin D deficient and may wish to test their vitamin D levels. There is no evidence that over-the-counter vitamin D supplements reduce tenofovir-related BMD changes.

A small but statistically significant decline in BMD was observed by week 24 in participants of the iPrEX study. The decline in BMD correlated directly with levels of intracellular TD*-DP and was found to be reversible once PrEP was ceased (31).

There are no data available on whether on-demand PrEP is less likely to cause a decline in BMD.

Recent data from the DISCOVER study, found that TAF/FTC versus TDF/FTC was associated with less decline in BMD (21).

A person with a history of osteoporosis will require careful monitoring while on PrEP. If the clinician suspects that a person may have osteoporosis, they may recommend BMD testing. BMD testing is rebated in Australia under specific clinical circumstances; information about BMD rebates can be found at: www.health.gov.au/internet/main/publishing.nsf/content/diagnosticimaging-bd.htm. In those people over the age of 40 years thought to be at risk of having reduced BMD, a FRAX® tool to evaluate fracture risk can be used to assess the need for dual-energy X-ray absorptiometry (DXA) scanning. For further information see <https://www.sheffield.ac.uk/FRAX/tool.aspx?country=31>.

Assessment for pregnancy in women of childbearing age

The risk of HIV transmission to women increases by over two-fold when they are pregnant (32). As reviewed recently, current evidence suggests that PrEP can be used safely during pregnancy and breastfeeding (33).

The use of TD*-containing regimens by HIV positive women throughout pregnancy has not been associated with adverse pregnancy outcomes, but lowered BMD has been observed in newborns exposed to TD* in utero (34, 35) as has a lower length and head circumference at 1 year of age (35).

In the Partners PrEP study, which compared the efficacy of TDF/FTC versus TDF versus placebo to reduce HIV transmission in African heterosexual HIV-serodifferent couples, 431 pregnancies occurred; the average duration of in utero PrEP exposure was 5 weeks. There was no difference in the incidence of pregnancy, birth outcomes or infant growth in women who received TDF or TDF/FTC versus placebo PrEP (36). However, as noted by the authors, the confidence intervals for these findings were wide and therefore definitive statements about the safety of TDF/FTC as PrEP during pregnancy could not be made based on this study's findings. A subsequent study from this group examined the pregnancy outcomes of 30 women who continued to use PrEP during pregnancy compared to 96 pregnancies without PrEP exposure. The authors found that there was no increase in adverse pregnancy outcomes or restrictions in infant growth between the two groups (37). The World Health Organization has included PrEP as an HIV prevention strategy during pregnancy (38) and a number of other jurisdictions recommend PrEP for safe conception and for use during pregnancy and breastfeeding (39).

Some women with an HIV-positive partner may prefer to continue PrEP while pregnant, due to an increased risk of acquisition of HIV if their partner is not reliably virologically suppressed during pregnancy (39). The lead in time for PrEP to reach highly effective levels in women is 7 days. A study evaluating antiretroviral excretion in breast milk and infant absorption suggests PrEP can be safely used during breastfeeding with minimal infant drug exposure (40).

The ASHM PrEP Guidelines Panel will continue to monitor the safety of TD*/FTC PrEP regimens when used during pregnancy and breastfeeding.

References

1. Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM). National HIV testing policy. February 2017. Available at: www.testingportal.ashm.org.au/hiv/types-of-hiv-diagnostic-tests (last accessed 18 July 2019).
2. Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM). Post-exposure prophylaxis after non-occupational and occupational exposure to HIV: Australian National Guidelines (Second edition). August 2016. Available at: <https://www.ashm.org.au/HIV/PEP/> (last accessed 18 July 2019).
3. Robb ML, Eller LA, Kibuuka H, et al. Prospective study of acute HIV-1 infection in adults in East Africa and Thailand. *N Engl J Med* 2016;374:2120-30.
4. Baeten JM, Donnell D, Ndase P, et al. Antiretroviral prophylaxis for HIV prevention in heterosexual men and women. *N Engl J Med* 2012;367:399-410.
5. Grohskopf LA, Chillag KL, Gvetadze R, et al. Randomized trial of clinical safety of daily oral tenofovir disoproxil fumarate among HIV-uninfected men who have sex with men in the United States. *J Acquir Immune Defic Syndr* 2013;64:79-86.
6. Marrazzo JM, Ramjee G, Richardson BA, et al. Tenofovir-based preexposure prophylaxis for HIV infection among African women. *N Engl J Med* 2015;372:509-18.
7. Thigpen MC, Kebaabetswe PM, Paxton LA, et al. Antiretroviral preexposure prophylaxis for heterosexual HIV transmission in Botswana. *N Engl J Med* 2012;367:423-34.
8. Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM). Antiretroviral guidelines: US DHHS guidelines with Australian commentary. Last Updated: 25 October 2018. Available at: www.arv.ashm.org.au (last accessed 23 July 2019).
9. Fonner VA, Dalglish SL, Kennedy CE, et al. Effectiveness and safety of oral HIV preexposure prophylaxis for all populations. *AIDS* 2016;30:1973-83.
10. Gibas KM, van den Berg P, Powell VE, Krakower DS. Drug resistance during HIV pre exposure prophylaxis. *Drugs* 2019;79:609-19.
11. Parikh UM, Mellors JW. Should we fear resistance from tenofovir/emtricitabine pre-exposure prophylaxis? *Curr Opin HIV AIDS* 2016;11:49-55.
12. Cooper RD, Wiebe N, Smith N, et al. Systematic review and meta-analysis: renal safety of tenofovir disoproxil fumarate in HIV-infected patients. *Clin Infect Dis* 2010;51:496-505.
13. Hall AM, Hendry BM, Nitsch D, Connolly JO. Tenofovir-associated kidney toxicity in HIV-infected patients: a review of the evidence. *Am J Kidney Dis* 2011;57:773-80.
14. Phair J, Palella F. Renal disease in HIV-infected individuals. *Curr Opin HIV AIDS* 2011;6:285-9.
15. Solomon MM, Lama JR, Glidden DV, et al; iPrEx Study Team. Changes in renal function associated with oral emtricitabine/tenofovir disoproxil fumarate use for HIV pre-exposure prophylaxis. *AIDS* 2014;28:851-9.
16. Liu AY, Cohen SE, Vittinghoff E, et al. Preexposure prophylaxis for HIV infection integrated with municipal- and community-based sexual health services. *JAMA Intern Med* 2016;176:75-84.
17. Gandhi M, Glidden D, Mayer K, et al. Age, baseline kidney function, and medication exposure are associated with declines in creatinine clearance on PrEP: an observational cohort study. *Lancet HIV* 2016;3:e521-e528.

18. Jotwani V, Scherzer R, Glidden DV, et al. Pre-exposure prophylaxis with tenofovir disoproxil fumarate/emtricitabine and kidney tubular dysfunction in HIV-uninfected individuals. *J Acquir Immune Defic Syndr* 2018;78:169-174.
19. Liegeon G, Antoni G, Pialoux G, et al. Changes in kidney function among MSM initiation on-demand TDF/FTC for HIV PrEP. Paper presented at conference on Retroviruses and Opportunistic Infections (CROI); 4-7 March 2019, Seattle, Washington.
20. Grant RM, Mannheimer S, Hughes JP, et al. Daily and nondaily oral preexposure prophylaxis in men and transgender women who have sex with men: The Human Immunodeficiency Virus Prevention Trials Network 067/ADAPT Study. *Clin Infect Dis* 2018;66:1712-21.
21. Hare CB, Coll J, Ruane P, Molina J-M, et al. The Phase 3 Discover Study: daily F/TAF or F/TDF for HIV preexposure prophylaxis. Abstract 104. Retroviruses and Opportunistic Infections (CROI) conference; Seattle, Washington. 4-7 March 2019.
22. Kidney Health Australia. Chronic Kidney Disease (CKD) Management in General Practice. Guidance and clinical tips to help identify, manage and refer patients with CKD in your practice. 3rd edition. 2015. Available at: https://kidney.org.au/cms_uploads/docs/ckdm-in-gp-handbook.pdf (last accessed 18 July 2019).
23. Australasian Sexual Health Alliance (ASHA). Australian STI management guidelines for use in primary care [internet]. Updated December 2018. Available at: <http://www.sti.guidelines.org.au> (last accessed 18 July 2019).
24. Cornelisse VJ, Fairley CK, Stoove M, et al; PrEPX Study Team. Evaluation of preexposure (PrEP) eligibility criteria, using sexually transmissible infections as markers of human immunodeficiency virus (HIV) risk at enrollment in PrEPX, a large Australian HIV PrEP trial. *Clin Infect Dis* 2018;67:1847-52.
25. Wolitski RJ, Fenton KA. Sexual health, HIV, and sexually transmitted infections among gay, bisexual, and other men who have sex with men in the United States. *AIDS Behav* 2011;15:S9-17.
26. Helm JJ, Prins M, Amo J, et al. The hepatitis C epidemic among HIV-positive MSM: incidence estimates from 1990 to 200. *AIDS* 2011;25:1083-91.
27. Australian Government Department of Health. Third national hepatitis B strategy 2018–2022. 2018. Available at: <https://www.ashm.org.au/HBV/strategies-hepb/> (last accessed 18 July 2019).
28. Australian Government Department of Health. The Australian Immunisation Handbook. Updated 12 April 2019. Available at: <https://immunisationhandbook.health.gov.au> (last accessed 23 July 2019).
29. Liu AY, Vittinghoff E, Sellmeyer DE, et al. Bone mineral density in HIV-negative men participating in a tenofovir pre-exposure prophylaxis randomized clinical trial in San Francisco. *PLOS ONE* 2011; 6:e23688.
30. Glidden DV, Mulligan K, McMahan V, et al. Brief Report: Recovery of bone mineral density after discontinuation of tenofovir-based HIV pre-exposure prophylaxis. *J Acquir Immune Defic Syndr* 2017;76:177-182. d
31. Mulligan K, Glidden DV, Anderson PL, et al; Preexposure Prophylaxis Initiative Study Team. Effects of emtricitabine/tenofovir on bone mineral density in HIV-negative persons in a randomized, double-blind, placebo-controlled trial. *Clin Infect Dis* 2015;61:572-80.
32. Mugo NR, Heffron R, Donnell D, et al; Partners in Prevention HSV/HIV Transmission Study Team. Increased risk of HIV-1 transmission in pregnancy: a prospective study among African HIV-1 serodiscordant couples. *AIDS* 2011; 25:1887–95.
33. Horgan L, Blyth CC, Bowen AC, Nolan DA, McLean-Tooke AP. Pre-exposure prophylaxis for HIV prevention during pregnancy and lactation: forget not the women and children. *Med J Aust* 2019;210:281-4.

34. Siberry GK, Jacobson DL, Kalkwarf HJ, et al. Lower newborn bone mineral content associated with maternal use of tenofovir disoproxil fumarate during pregnancy. *Clin Infect Dis* 2015;61:996-1003.
35. Van Dyke RB, Chadwick EG, Hazra R, Williams PL, Seage GR. The PHACS SMARTT Study: Assessment of the safety of in utero exposure to antiretroviral drugs. *Front Immunol* 2016;7:199.
36. Mugo NR, Hong T, Celum C, et al. Pregnancy incidence and outcomes among women receiving pre-exposure prophylaxis for HIV prevention: a randomised clinical trial. *JAMA* 2014;312:362–71.
37. Heffron R, Mugo N, Hong T, et al; Partners Demonstration Project and the Partners PrEP Study Teams. Pregnancy outcomes and infant growth among babies with in utero exposure to tenofovir-based pre-exposure prophylaxis for HIV prevention. *AIDS* 2018;32:1707-13.
38. World Health Organization. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach. Second edition. 2016. Available at: <https://www.who.int/hiv/pub/arv/arv-2016/en/> (last accessed 18 July 2019).
39. Davies N, Heffron R. Global and national guidance for the use of pre-exposure prophylaxis during peri-conception, pregnancy and breastfeeding. *Sex Health* 2018;15:501–12.
40. Mugwanya KK, Hendrix CW, Mugo NR, et al. Pre-exposure prophylaxis use by breastfeeding HIV-Uninfected women: a prospective short-term study of antiretroviral excretion in breast milk and infant absorption. *PLoS Med* 2016;13:e1002132.



6. Providing PrEP

Goals of PrEP

The ultimate goal of HIV pre-exposure prophylaxis (PrEP) is to reduce the acquisition of HIV infection and its resultant morbidity, mortality and associated cost to individuals and society. Therefore, clinicians initiating the provision of PrEP should:

- prescribe medication regimens that are proven safe and effective for HIV-negative people who are suitable for PrEP to reduce their risk of HIV acquisition. Only co-formulated tenofovir and emtricitabine (TD*/FTC) is licensed in Australia for use as PrEP and is the only regimen that should be used.
- educate patients about the medications and the dosing regimen (daily for all patients, or on-demand for cis-gender men who have sex with men (MSM)) to optimise safe medication use.
- provide counselling on sexually transmissible infections (STIs) and their prevention.
- provide medication-adherence support and counselling to help patients achieve and maintain protective levels of medication.
- provide HIV risk-reduction support and offer harm reduction including referrals to help patients minimise their risk of acquiring HIV, viral hepatitis B and C and STIs.
- provide effective contraception to women who are taking PrEP and who do not wish to become pregnant.
- monitor patients on a quarterly basis to screen for HIV infection, STIs and toxicity and to determine whether PrEP remains indicated.

PrEP licensing in Australia

Co-formulated TD*/FTC is registered by the Therapeutic Goods Administration (TGA) for daily use and is subsidised by the Pharmaceutical Benefits Scheme (PBS) in Australia.

Daily PrEP

Daily PrEP is the most commonly prescribed PrEP regimen in Australia. Daily use of TD*/FTC is highly efficacious at preventing HIV transmission in MSM (1, 2), heterosexuals (3), transgender women (4) and people who inject drugs (PWID) (5) in the setting of high medication adherence. A detailed review of these and other studies that have demonstrated the efficacy and effectiveness of daily PrEP is beyond the scope of these guidelines. For more information see [PrEP efficacy](#).

The ASHM PrEP Guidelines Panel continues to recommend that daily TD*/FTC should be offered to all populations at risk of HIV infection.

On-demand PrEP

On-demand PrEP involves taking two tablets of TD*/FTC 2–24 hours before a potential sexual exposure to HIV, followed by a third tablet 24 hours after the first dose and a fourth tablet 48 hours after the first dose. This regimen is referred to as 'The 2 + 1 + 1' dosing of PrEP (6). If sex continues for several days, people take one tablet of TD*/FTC daily until the last sex act, following which one dose 24 hours later and again at 48 hours are taken after the last episode of sex.

The World Health Organization (WHO) recently released a technical brief recommending the use of on-demand PrEP for cis-gender men who have sex with men (MSM) (6). **The 2019 ASHM PrEP Guidelines Panel endorses WHO's recommendation that on-demand PrEP should be offered to cis-gender MSM.**

On-demand PrEP is recommended only for cis-gender MSM because its efficacy is yet to be determined in all other populations at risk of HIV infection. The ASHM PrEP guidelines panel recommends that caution be used in recommending on-demand versus daily PrEP to adolescent MSM because there have been no trials of on-demand PrEP in adolescent MSM and because adherence rates to daily PrEP have been consistently low in studies of adolescent MSM (7, 8). **Of note, on-demand PrEP is contraindicated in people with chronic hepatitis B infection.**

Evidence in support of on-demand PrEP dosing

Data on the efficacy of non-daily PrEP dosing are available for cis-gender MSM. Very few transgender women have been evaluated in randomised controlled trials of on-demand PrEP (9-11); nor have such trials been undertaken in cis-gender women or cis-or transgender men, or in people whose principal HIV exposure risk is injecting drug use. Pharmacological studies in cis-gender women suggest that on-demand PrEP does not provide adequate tissue levels of PrEP to provide high levels of HIV protection and on-demand PrEP should not be recommended for cis-gender women.

Data on how efficacious on-demand PrEP is for MSM in reducing HIV transmission came initially from the randomised, placebo-controlled trial, IPERGAY (Intervention Préventive de l'Exposition aux Risques avec et pour les Gays) (12). This study evaluated the efficacy of on-demand PrEP comprising two tablets of TDF/FTC (versus placebo) taken 2–24 hours before potential sexual exposure to HIV, followed by a third tablet 24 hours after the first dose and a fourth tablet 48 hours after the first dose. If multiple episodes of sex occurred, the participants were advised to continue to take one tablet daily until the last sex act then take the two final doses, 24 hours apart. If sexual activity was resumed within a week, a single, rather than a double dose before sex was recommended. If sexual activity resumed more than a week later, the loading dose schedule (two tablets) was recommenced. The incidence of HIV was high in the placebo group (6.6 per 100 person-years) and a risk reduction in the TDF-FTC group of 86% [95% confidence interval (CI), 40 to 98; $p = 0.002$] was observed (12).

Demonstration studies have been undertaken to determine how effective on-demand PrEP is when used in community settings. In an open-label extension study of the IPERGAY study, an HIV risk reduction of 97% (95% CI, 81–100) with on-demand PrEP was reported in 361 participants with a median follow-up of 18 months (10). In a study of 1,069 people commencing PrEP in a single clinic in France, four HIV infections were diagnosed over 486 years of person follow-up (9). In the French Prévenir study, an interim analysis presented in July 2019 at the IAS conference on HIV science showed that of 2,143 participants, 47% took daily PrEP and 52% took on-demand PrEP (11). The median number of partners in the 3 months before PrEP commencement was 15 (IQR: 7-25) in the daily group and 10 (IQR 5-15) in the on-demand group ($p < 0.001$). The median number of condomless sex events in the previous 4 weeks was 2 (0 to 8) and 2 (0 to 4), in the daily and on-demand participants, respectively ($p = 0.04$). Follow-up in the daily and on-demand groups was 744 and 830 person-years, respectively. The HIV-1 incidence was 0 (95% CI: 0-0.5) and 0 (95% CI: 0-0.4) per 100 person-years in the daily and on-demand groups, respectively (11).

The efficacy of on-demand PrEP in people who use it infrequently

To address the question of whether on-demand PrEP is efficacious for people using it infrequently, the IPERGAY study team undertook a post-hoc analysis of IPERGAY study participants who reported relatively infrequent sex (13). Overall, IPERGAY participants reported using a median of 15 PrEP tablets per month (interquartile range (IQR) 9–21). The post-hoc study looked at the follow-up time between two consecutive visits during which participants in the placebo and active study arms used ≤ 15 tablets per month and reported they used PrEP ‘systematically or often’ and not ‘from time to time or never’. During these periods of lower PrEP use, participants had a median of five episodes of sex per month (IQR 2-10) and used a median of 9.5 tablets per month (IQR 6-13). Six HIV infections occurred in the placebo arm (incidence: 9.3 per 100 person-years, total follow-up time: 64.8 person-years) and 0 in the TDF/FTC arm (incidence: 0 per 100 person-years, total follow-up time: 68.9 person years, $p = 0.013$). The relative reduction of HIV incidence in the treatment group was 100% (95% CI, 20-100). The study investigators concluded that an on-demand PrEP strategy remains highly effective in MSM even when they have infrequent sex (13).

Notably, of concern to the ASHM PrEP Guidelines Panel were the wide 95% confidence intervals of the relative risk reduction in this group of IPERGAY participants practising infrequent sex. However, the recently updated data from the Pr evenir study (11) are reassuring in terms of the efficacy of less frequent use of on-demand PrEP. These updated data show that the median number of partners in the previous 3 months for participants using on-demand PrEP was 10 (IQR 5-15) and the median number of condomless sex events in the previous 4 weeks was 2 (0 to 4) ($p = 0.04$) with an associated HIV incidence in the on-demand participants of 0 (95% CI: 0-0.4) (11).

Toxicity and on-demand PrEP

There are few data available to determine whether on-demand PrEP offers less toxicity. In the IPERGAY study, no significant decline in the mean slope of estimated glomerular filtration rate (eGFR) in the TD*/FTC versus placebo arms was observed over a median of 9.3 months follow-up (14). In the HIV Prevention Trials Network (HPTN) study 067, the Alternative Dosing to Augment PrEP Pill Taking (ADAPT) study, 9% of 178 participants at one study site had creatinine elevation, but this was not significantly different between participants in the daily, time-driven and on-demand PrEP study arms ($p = 0.05$) (15).

Preference for on-demand versus daily PrEP

In the ongoing French Pr evenir study, in which MSM are offered the choice of daily or on-demand PrEP, approximately half of the participants opt for each regimen (11). In the AM PrEP (the Netherlands) and Be PrEPared (Belgium) implementation studies, approximately one-third of men opted to take PrEP on-demand (16). In a report from the PRELUDE study from New South Wales, one third of participants enrolling in the study expressed a preference for non-daily PrEP (17). Recent data from previous participants of the Victorian PrEPX study showed that 48% would be interested in participating in an on-demand PrEP study (18) and this interest was most strongly associated with having sex infrequently and concerns about long-term toxicity) (18).

The choice of PrEP schedule: daily versus on-demand PrEP

Daily PrEP is suitable for all people who are at risk of HIV. Daily PrEP is the only PrEP regimen that is recommended for cis-gender and transgender women, for transgender men who have vaginal sex, for men who have anal or vaginal sex with women, PWID and for people with chronic hepatitis B (6).

Only cis-gender MSM have a choice between daily and on-demand PrEP. In this setting, daily PrEP would be preferential for those MSM who cannot predict when sex will occur, who cannot delay sex for more than 2 hours and for those whose potential exposure to HIV occurs more than twice a week. Daily PrEP is the only suitable regimen for cis-gender MSM with chronic hepatitis B infection to maintain virological suppression, prevent drug resistance and hepatitis flares.

On-demand PrEP would be suitable for those MSM whose preference is for the on-demand regimen, who have sex less than twice a week, and who can plan ahead for sex at least 2 hours in advance. Other reasons that MSM may choose or merit on-demand PrEP include side-effects from daily PrEP, poor kidney function or financial constraints.

The ASHM PrEP Guidelines Panel will continue to monitor HIV incidence in MSM using on-demand PrEP, including those who use on-demand PrEP less than fortnightly (11).

Summary of when to recommend daily and on-demand PrEP

Based on the evidence, the ASHM PrEP Guidelines Panel continues to recommend daily TD*/FTC dosing for all populations suitable for PrEP. The ASHM PrEP Guidelines Panel recommends that on-demand PrEP should be offered to cis-gender MSM. For cis-gender MSM, on-demand PrEP should be offered when this preference is expressed, when the person has at-risk sex less than twice a week, when the at-risk sex is unpredictable, or when sex cannot be delayed for 2 hours. Daily PrEP is the only suitable regimen for cis-gender MSM with chronic hepatitis B infection.

Other PrEP dosing schedules

There is some online guidance currently available that recommends that MSM taking PrEP can use a dosing schedule where they take a single dose of PrEP on Tuesdays, Thursdays, Saturdays and Sundays, known as ‘the Ts and Ss’. While the motive for simplifying the PrEP dosing schedule is laudable the ASHM PrEP Guidelines Panel does not recommend the ‘Ts and Ss’ dosing schedule as it has not been tested in a clinical trial to demonstrate its efficacy in preventing HIV transmission.

Evaluation of the need for ongoing PrEP

Along with encouraging safer sex practices and safer injecting techniques, as needed, clinicians should support their patients to decide when to commence PrEP and when to discontinue its use.

The duration of PrEP use will depend on whether the person’s risk of HIV continues over time. PrEP should only be prescribed to those patients who are able to adhere to a regimen that has been shown to be efficacious and who express a willingness to do so.

Adherence to PrEP should be assessed at each follow-up visit. PrEP users who explain that they have had suboptimal adherence, but who are willing and suitable to continue on PrEP, should be offered additional adherence education (see [Medication adherence](#), including offering referral to peer-based support services). If a PrEP user repeatedly reports adherence that is sufficiently suboptimal to compromise both PrEP’s efficacy (i.e. fewer than four tablets per week when taking a daily regimen) and the patient’s safety, the clinician should discontinue prescribing PrEP. See also Chapter 9. *nPEP and PrEP* for the course of action to follow if a patient is not adherent to PrEP and has had a risk of exposure in the last 72 hours.

PrEP script duration including extension of PrEP scripts

The initial and ongoing prescriptions should offer a 90-day medication supply. PrEP scripts can be dispensed and filled on the same day as the baseline HIV test is done as long as the clinician is confident that the pathology service they use will provide a 4th generation HIV test result within 24-48 hours, at which time HIV antiretroviral treatment can be offered if the HIV test is found to be positive.

Typically, PrEP prescriptions should cover no more than 90 days of TD*/FTC supply at a time. Scripts can be provided and dispensed before the repeat quarterly HIV test results are available. However, people who are travelling overseas for prolonged periods may be given more than 90 days supply of PrEP, but the patient should agree to undergo HIV and STI testing at the usual 90-day period when they are overseas and to provide the results to their PrEP prescriber in Australia. People who use on-demand PrEP should also present for HIV and STI testing on a quarterly basis even if they do not need a prescription refill at that time.

Laboratory and clinical follow-up schedule at baseline and follow-up

The recommended schedule of testing and follow-up of people on PrEP is outlined in the [Table 7.1 in Clinical follow-up and monitoring of patients on PrEP](#).

Indicated medication

The medications proven safe and effective, and currently approved by the TGA for PrEP in healthy adults at risk of acquiring HIV infection, are the fixed-dose combination of TD* and FTC in a single daily dose. Therefore, TD*/FTC or other generic versions of TD*/FTC are the recommended medications that should be prescribed for PrEP for MSM, transgender and gender-diverse people, heterosexuals and PWID who meet recommended criteria. TDF alone has been proven effective in trials with people who inject drugs and heterosexuals (with efficacy comparable to TDF/FTC) (19). As a result, WHO recommends that TDF alone can be considered as an alternative regimen in these specific populations. TDF alone is not recommended as PrEP for MSM, because no trials have been performed to assess the efficacy of this regimen in MSM.

There have been some overseas reports of HIV seroconversion in MSM taking unprescribed antiretroviral medication for PrEP (20).

What not to use for PrEP

DO NOT use any HIV antiretroviral medications, either in place of, or in addition to TD* or FTC.

Do not provide PrEP as expedited partner therapy (i.e. do not prescribe for a person who is not in your care).

PrEP dosing schedule

A daily PrEP regimen involves the person taking a single daily tablet at approximately the same time each day. Taking the tablet some hours earlier or later than usual will not adversely influence the levels of the drug. If the person forgets to take a tablet for one day, there is no need to take two tablets the next day.

The on-demand PrEP regimen, which is recommended for MSM only, involves the person taking a loading dose of PrEP where two tablets of PrEP are taken together as early as 24 hours before sex, or as late as 2 hours before sex. After sex, another PrEP tablet is taken 24 hours after the loading dose and then a final PrEP tablet is taken 48 hours after the loading dose. This 2+1+1 method for the use of on-demand PrEP for an isolated act of sex was recently endorsed by WHO (6).

People who have more than one episode of at-risk sex over a period of days should keep taking a single PrEP tablet every day that they are having sex until the last day that at-risk sex occurs, then they should take a single daily PrEP tablet for 2 days after the last at-risk sex act.

PrEP medication side effects

Patients taking PrEP should be informed of TD*/FTC side-effects experienced by participants in PrEP trials. These include headache, nausea, flatulence and the potential for renal injury or hepatotoxicity. In these trials, side-effects were uncommon and usually resolved within the first month of taking PrEP (known as 'start-up syndrome'). Clinicians should discuss the use of over-the-counter medications for headache, nausea and flatulence should they occur. Patients should also be counselled about symptoms that indicate a need for urgent evaluation (e.g. those suggesting possible acute renal injury or acute HIV infection). See [Clinical assessment before starting PrEP](#) for a review of the signs and symptoms of acute HIV infection.

PrEP medication drug interactions

In addition to the safety data obtained in PrEP clinical trials, data on drug-drug interactions and longer-term toxicities have been obtained by studying the component drugs individually for their use in treatment of people with HIV infection. Studies have also been performed in small numbers of healthy adults without HIV infection. No significant effect was seen, and no dosage adjustment was necessary for TD*, but there are no data on FTC ([21](#), [22](#)).

FTC and TD* are primarily excreted by the kidneys by a combination of glomerular filtration and active tubular secretion. Since both drugs are primarily eliminated by the kidneys, co-administration of TD*/FTC with drugs that reduce renal function or compete for active tubular secretion may increase serum concentrations of TD*, FTC and other renally eliminated drugs including (but not limited to) cidofovir, aciclovir, valaciclovir, ganciclovir, valganciclovir, aminoglycosides and high-dose or multiple non-steroidal anti-inflammatory drugs ([21](#)).

Cocaine, methamphetamine and alcohol use were not seen to influence the concentrations of PrEP drugs ([23](#)) but use of these drugs may have an effect on the person's ability to maintain full adherence to PrEP.

Time to achieving and maintaining protection

The pharmacokinetics of TD* and FTC vary by tissue ([24](#)). Data from exploratory pharmacokinetic studies conducted with men and women without HIV infection suggest that maximum intracellular concentrations of tenofovir diphosphate are reached in blood after approximately 20 days of daily oral dosing ([25](#), [26](#)). Current evidence suggests that for both rectal and vaginal exposure, high protection is achieved after 7 days of daily dosing ([27](#)). Women need to maintain high adherence to daily dosing of TD*/FTC to maintain adequate drug levels in vaginal/cervical tissues ([27](#)). No data are yet available about intracellular drug concentrations in penile tissues susceptible to HIV infection to inform considerations of protection for male insertive sex partners. Limited data exist for transgender and gender-diverse people therefore extra attention to daily dosing is recommended.

Recently WHO recommended that because MSM achieve highly protective levels of PrEP medications with a single loading dose of two PrEP tablets ([28](#), [29](#)), they can take this PrEP loading dose whether they intend to commence daily, or on-demand PrEP ([6](#)). **The ASHM PrEP Guidelines Panel agrees with this recommendation on PrEP dosing initiation for MSM whether they are commencing daily or on-demand PrEP.**

PrEP and travel

PrEP can play an important role in preventing HIV infection in people travelling outside of Australia, along with other measures to reduce HIV and STIs (30). If an MSM patient wants to take daily PrEP while on an overseas trip, he can commence two tablets on the day of departure and cease PrEP once it is no longer needed (see section below on ceasing PrEP). Alternatively, the MSM patient can take a double-dose 2-24 hours before sex and then use the on-demand regimen outlined above during the overseas trip. Cis- and transgender heterosexual men and women including those who inject drugs who want to take PrEP while on an overseas trip should commence PrEP 7 days before their departure.

nPEP use and PrEP

If a person is not taking PrEP but presents within 72 hours of a potential HIV exposure, they should be assessed for non-occupational post-exposure prophylaxis (nPEP) as a matter of urgency and should be offered nPEP immediately according to current [nPEP guidelines](#) if appropriate if HIV acquisition risk is likely to continue into the future, PrEP should be offered.

Discontinuing PrEP

Clinicians should regularly advise people using PrEP about how to discontinue PrEP. The need for PrEP may end when a partner with HIV achieves sustained HIV viral suppression after at least 6 months of antiretroviral therapy, when a patient enters a mutually monogamous relationship with a seroconcordant partner, or when other social circumstances change.

Discontinuing daily PrEP in MSM

There is now substantial clinical evidence that cis-gender MSM can safely cease on-demand PrEP by taking a dose of PrEP 24 and 48 hours after their last at-risk sexual exposure (9-11). Recently WHO recommended that MSM who take either daily or on-demand PrEP can safely cease PrEP by taking a dose of PrEP 24 and 48 hours after their last at-risk sexual exposure (6). **The ASHM PrEP Guidelines Panel agrees with this recommendation.**

Discontinuing daily PrEP for other populations

One US study recommends that PrEP should be continued for 28 days after the last at-risk sexual exposure (31). The ASHM PrEP Guidelines Panel recommends that clinicians should offer this advice for all people other than cis-gender MSM using daily PrEP until more information is available.

Discontinuing on-demand PrEP

On-demand PrEP can be ceased by taking a single daily PrEP tablet for 2 days after the last sex act, as described above.

Upon discontinuation for any reason, the following should be documented in the health record:

- HIV status at the time of discontinuation
- Reasons for PrEP discontinuation
- Recent medication adherence and reported sexual risk behaviour.

Recommencing PrEP

Clinicians should advise any patient who has discontinued PrEP on how to safely recommence PrEP. Clinicians should advise that if and when a patient decides to recommence PrEP that they must first have repeat HIV testing in case they have acquired HIV infection during the time that they were not taking PrEP. All other baseline clinical and laboratory evaluations need to be repeated also when a patient recommences PrEP and quarterly visits for PrEP scripts and ongoing evaluations must follow thereafter.

Patients may want to recommence PrEP when:

- entering a period of engaging in condomless sex
- leaving a long-term relationship
- starting a new relationship with an HIV-positive partner who is not on antiretroviral treatment, or a partner whose HIV status is unknown
- travelling to or moving to a new region or country with high or unknown prevalence of HIV during which time they anticipate that they will be having condomless sex with casual partners, or using injectable drugs
- commencing, or recommencing sex work
- returning home to an overseas country which has a high HIV prevalence during which time they anticipate that they may have condomless sex, or injecting drug use with HIV-positive partners not on antiretroviral treatment or partners whose HIV status is unknown
- entering, or leaving institutional or correctional facilities with the anticipation that they may have condomless sex, or injecting use with HIV-positive partners not on antiretroviral treatment or partners whose HIV status is unknown.

References

1. Grant RM, Lama JR, Anderson PL, et al; iPrEx Study Team. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med* 2010;363:2587-99.
2. McCormack S, Dunn DT, Desai M, et al. Pre-exposure prophylaxis to prevent the acquisition of HIV-1 infection (PROUD): effectiveness results from the pilot phase of a pragmatic open-label randomised trial. *Lancet* 2016;387:53-60.
3. Thigpen MC, Kebaabetswe PM, Paxton LA, et al. Antiretroviral preexposure prophylaxis for heterosexual HIV transmission in Botswana. *N Engl J Med* 2012;367:423-34.
4. Deutsch MB, Glidden DV, Sevelius J, et al; iPrEx investigators. HIV pre-exposure prophylaxis in transgender women: a subgroup analysis of the iPrEx trial. *Lancet HIV* 2015;2:e512-9.
5. Choopanya K, Martin M, Suntharasamai P, et al; Bangkok Tenofovir Study Group. Antiretroviral prophylaxis for HIV infection in injecting drug users in Bangkok, Thailand (the Bangkok Tenofovir study): a randomised, double-blind, placebo-controlled phase 3 trial. *Lancet* 2013;381:2083-90.
6. World Health Organization. Technical brief. What's the 2+1+1? Event-driven oral pre-exposure prophylaxis to prevent HIV for men who have sex with men: update to WHO's recommendation on oral PrEP. July 2019. Available at: <https://apps.who.int/iris/bitstream/handle/10665/325955/WHO-CDS-HIV-19.8-eng.pdf?ua=1> (last accessed 3 September 2019).
7. Hosek SG, Rudy B, Landovitz R, et al; Adolescent Trials Network (ATN) for HIV/AIDS Interventions. An HIV preexposure prophylaxis demonstration project and safety study for young MSM. *J Acquir Immune Defic Syndr* 2017;74:21-9.
8. Hosek SG, Landovitz RJ, Kapogiannis B, et al. Safety and feasibility of antiretroviral preexposure prophylaxis for adolescent men who have sex with men aged 15 to 17 years in the United States. *JAMA Pediatr* 2017;171:1063-71.
9. Noret M, Balavoine S, Pintado C, et al. Daily or on-demand oral tenofovir disoproxil fumarate/emtricitabine for HIV pre-exposure prophylaxis: experience from a hospital-based clinic in France. *AIDS* 2018;32:2161-9.
10. Molina JM, Charreau I, Spire B, et al; ANRS IPERGAY Study Group. Efficacy, safety, and effect on sexual behaviour of on-demand pre-exposure prophylaxis for HIV in men who have sex with men: an observational cohort study. *Lancet HIV* 2017;4:e402-10.
11. Molina JM, Ghosn J, Algarte-Génin M, et al; ANRS Study Group. Incidence of HIV-infection with daily or on-demand PrEP with TDF/FTC in Paris area. Update from the ANRS Prévenir Study. Abstract TUAC0202. Oral abstracts of the 10th IAS Conference on HIV Science, 21-24 July 2019, Mexico City, Mexico. *J Int AIDS Soc* 2019;22 Suppl 5:e25327.
12. Molina JM, Capitán C, Spire B, et al; ANRS IPERGAY Study Group. On-demand preexposure prophylaxis in men at high risk for HIV-1 infection. *N Engl J Med* 2015;373:2237-46.
13. Antoni G, Tremblay C, Charreau I, et al. On-demand PrEP with TDF/FTC remains highly effective among MSM with infrequent sexual intercourse: a sub-study of the ANRS IPERGAY trial. Abstract TUAC0102. International AIDS Society (IAS) Conference on HIV Science. July 2017; Paris, France.
14. Liegeon G, Antoni G, Pialoux G, et al. Changes in kidney function among MSM initiation on-demand TDF/FTC for HIV PrEP. Abstract Number: 960. Conference on Retroviruses and Opportunistic Infections (CROI); 4-7 March 2019; Seattle, Washington.

15. Grant RM, Mannheimer S, Hughes JP, et al. Daily and nondaily oral preexposure prophylaxis in men and transgender women who have sex with men: The Human Immunodeficiency Virus Prevention Trials Network 067/ADAPT Study. *Clin Infect Dis* 2018;66:1712–21.
16. PrEP in Europe [website]. Intermittent PrEP. Available at: www.prepineurope.org/en/faqs/does-prep-work/intermittent-prep/ (last accessed 3 September 2019).
17. Vaccher SJ, Gianacas C, Templeton DJ, et al; PRELUDE Study Team. Baseline preferences for daily, event-driven, or periodic HIV pre-exposure prophylaxis among gay and bisexual men in the PRELUDE Demonstration Project. *Front Public Health* 2017;5:341.
18. Cornelisse VJ, Lal L, Price B, et al. Interest in switching to on-demand pre-exposure prophylaxis (PrEP) among Australian users of daily PrEP: an online survey. *Open Forum Infect Dis* 2019;6:ofz287.
19. Fonner VA, Dalglis SL, Kennedy CE, et al. Effectiveness and safety of oral HIV preexposure prophylaxis for all populations. *AIDS* 2016;30:1973–83.
20. Buttram ME, Kurtz SP. Preliminary evidence of HIV seroconversion among HIV-negative men who have sex with men taking non-prescribed antiretroviral medication for HIV prevention in Miami, Florida, USA. *Sex Health* 2017;14:193-5.
21. Gilead Sciences. Full prescribing information. Issued June 2013. Available at: www.accessdata.fda.gov/drugsatfda_docs/label/2013/021752s035lbl.pdf (last accessed 4 September 2019).
22. Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the use of antiretroviral agents in adults and adolescents with HIV. Department of Health and Human Services. Last updated 10 July 2019. Available at: <http://www.aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf> (last accessed 4 September 2019).
23. Grant RM, Anderson PL, McMahan V, et al. Uptake of pre-exposure prophylaxis, sexual practices, and HIV incidence in men and transgender women who have sex with men: a cohort study. *Lancet Infect Dis* 2014;14:820–9.
24. Patterson KB, Prince HA, Kraft E, et al. Penetration of tenofovir and emtricitabine in mucosal tissues: implications for prevention of HIV-1 transmission. *Sci Transl Med* 2011;3:112re4.
25. Anderson PL. Pharmacology considerations for HIV prevention [presentation]. 13th International Workshop on Clinical Pharmacology of HIV. Barcelona, Spain; April 2012. Available at: http://regist2.virology-education.com/2012/13hivpk/docs/16_Anderson.pdf (last accessed 4 September 2019).
26. Anderson PL, Kiser JJ, Gardner EM, et al. Pharmacological considerations for tenofovir and emtricitabine to prevent HIV infection. *J Antimicrob Chemother* 2011;66:240-50.
27. Cottrell ML, Yang KH, Prince HM, et al. A translational pharmacology approach to predicting outcomes of preexposure prophylaxis against HIV in men and women using tenofovir disoproxil fumarate with or without emtricitabine. *J Infect Dis* 2016;214:55-64.
28. Cottrell L, Yang KH, Prince HMA, et al; A Translational Pharmacology Approach to Predicting Outcomes of Preexposure Prophylaxis Against HIV in Men and Women Using Tenofovir Disoproxil Fumarate With or Without Emtricitabine. *The Journal of Infectious Diseases* 2016;214:55–64
29. Glidden DV, Anderson PL, Grant RM. Pharmacology supports “on-demand” PrEP. *Lancet HIV*. 2016; 3(9):e405-e406
30. Cornelisse VJ, Wright EJ, Fairley CK, McGuinness SL. Sexual safety and HIV prevention in travel medicine: Practical considerations and new approaches. *Travel Med Infect Dis* 2019;28:68-73.
31. Seifert SM, Glidden DV, Meditz AL, et al. Dose response for starting and stopping HIV preexposure prophylaxis for men who have sex with men. *Clin Infect Dis* 2015;60:804-10.



7. Clinical follow-up and monitoring of patients on PrEP

Recommended schedule of testing and follow-up for people on PrEP

Once pre-exposure prophylaxis (PrEP) is initiated, patients should return for follow-up every 3 months. Clinicians may wish to see patients more frequently in the period after PrEP initiation (e.g. 1 month after initiation) to:

- assess and re-confirm human immunodeficiency virus (HIV)-negative test status in patients with a recent pre-PrEP HIV exposure
- assess side effects
- monitor renal function in patients at particular renal risk
- assess adherence
- answer questions.

Some jurisdictions recommend a visit at month one. The [Table 7.1](#) and [Box 7.1](#) set out the recommended schedule of testing and follow-up for people who are prescribed PrEP.

Table 7.1

Laboratory evaluation and clinical follow-up of individuals who are prescribed PrEP

Test	Baseline (Week 0)	About day 30 after initiating PrEP (optional but recommended in some jurisdictions)	90 days after initiating PrEP	Every subsequent 90 days on PrEP	Other frequency
HIV testing and assessment for signs or symptoms of acute infection	Y	Y	Y	Y	N
Assess side effects	N	Y	Y	Y	N
Hepatitis B serology Vaccinate if non-immune	Y	N	N	N	Y If patient required hepatitis B vaccine at baseline, confirm immune response to vaccination 1 month after last vaccine dose
Hepatitis C serology	Y	N	N	N	12 monthly but, more frequently if ongoing risk e.g. non-sterile injection drug use and MSM with sexual practices that pre-dispose to anal trauma
STI (i.e. syphilis, gonorrhoea, chlamydia) as per Australian STI Management Guidelines *	Y	N	Y	Y	N
eGFR at 3 months and then every 6 months	Y	N	Y	N	At least every 6 months or according to risk of CKD
Urine protein creatinine ratio (PCR) baseline	Y	N	Y	N	Every 6 months
Pregnancy test (for women of child-bearing age)	Y	Y	Y	Y	N

CKD: chronic kidney disease; **eGFR:** estimated glomerular filtration rate;

PrEP: pre-exposure prophylaxis; **PWID:** people who inject drugs

STI: sexually transmissible infection

* <http://www.sti.guidelines.org.au/>

Box 7.1 PrEP follow-up procedures**At least every 3 months:**

- Repeat HIV testing and assess for signs or symptoms of acute infection to document that patients are still HIV negative. Rapid point-of-care tests (POCTs) are not recommended for monitoring patients receiving PrEP
- Test for sexually transmissible infections (STIs). This involves PCR tests for chlamydia (first-pass urine, pharyngeal swab and anal swab) and *Neisseria gonorrhoea*, (pharyngeal swab and anal swab) and a blood test for syphilis serology (1)
- Assess side-effects, PrEP adherence and ongoing PrEP suitability
- Provide an authority streamlined (PBS) prescription or a private prescription of daily TD*/FTC for 90 days (see [Providing PrEP](#) for exceptions to this script duration)
- Respond to questions and provide any new information about PrEP use
- Provide support for medication adherence and risk-reduction behaviours.

In addition:

- Repeat pregnancy testing for women of child bearing age
- Test for hepatitis C virus (HCV) in people who inject drugs (PWID) who report continued sharing of injecting equipment and men who have sex with men (MSM) with elevated risk of HCV acquisition (e.g. sexual practices that pre-dispose to anal trauma).

At least every 6 months:

- Monitor estimated glomerular filtration rate (eGFR), creatinine and urine protein/creatinine ratio
- If the patient has risk factors for renal impairment (e.g. hypertension, diabetes), renal function may require more frequent monitoring and/or may need to include additional tests (e.g. urine protein/creatinine ratio)
- A rise in serum creatinine is not always a reason to withhold treatment if the eGFR remains at or above 60 mL/min/1.73 m² but an acute rise in the serum creatinine in a patient on PrEP would need full clinical evaluation and sometimes a review by a renal specialist
- If eGFR is declining steadily (but still at or above 60 mL/min/1.73 m²), consultation with a renal specialist or other evaluations of possible causes for declining renal function may be indicated.

At least every 12 months:

- Test for hepatitis C
- Test for hepatitis B serology if the patient has not been vaccinated.

Patients who access PrEP through the Personal Importation Scheme of the Therapeutic Goods Administration (TGA) should allow a lead time of 2–6 weeks for the drug to arrive in Australia and pass customs clearance.

Testing for HIV

HIV testing should be repeated every 3 months using a fourth generation HIV antibody and antigen test via a venous blood draw. Rapid point-of-care tests, including the recently approved home testing HIV diagnostic kit, the Atomo HIV Self Test, should not be used for monitoring patients receiving PrEP.

A patient's ongoing HIV risk and adherence to PrEP should be established when requesting the patient presents for their quarterly clinical visit including the HIV test and PrEP script (see [Improving medication adherence](#)). Patients should be familiar from their baseline visit with the requirement for quarterly clinical visits to obtain ongoing PrEP prescriptions. Clinicians should consider writing on ongoing PrEP prescriptions a date past which dispensing the script should not occur without the pharmacist talking to both the patient and the prescribing doctor about the reasons for the delay in filling the script. This approach may help ensure that patients who have had intermittent PrEP adherence and who have unknowingly acquired HIV infection do not receive 3 months of suboptimal antiretroviral treatment.

See [Appendix 2](#) for up-to-date HIV tests approved in Australia (K Wilson, National Serum Reference Library, personal communication) and time to detection of HIV infection (2).

A positive HIV test result

Any positive HIV test result should be managed urgently by appropriate counselling and referral to an HIV prescriber. Assistance can be sought via telephone from a local sexual health clinic. It is very important for the clinician to recognise that HIV acquisition in a person who is using PrEP is a highly significant event and that the emphasis should be on supporting the person initially rather than focusing on how the infection occurred. If a patient is diagnosed with HIV infection while taking PrEP, their current health and wellbeing should be the chief immediate priority as opposed to enquiries about their adherence to PrEP.

Acute HIV infection should be suspected in people at risk for HIV who were not taking PrEP at the time that they were recently exposed to HIV (e.g. no condom, or a condom broke during sex with an HIV-positive partner who was not on antiretroviral treatment, or has a detectable HIV viral load; condomless anal sex with a casual partner; recent injecting drug use with shared injection equipment with an HIV-positive partner). Also, infection with tenofovir disoproxil* (TD*)- and/or emtricitabine (FTC)-resistant HIV is possible, however, it is very uncommon while on PrEP, with only a few cases reported internationally (3). Therefore, in addition to sexual behaviour and injecting drug use, clinicians should elicit a history of any signs and symptoms of viral infection during the preceding month, including the day of PrEP evaluation. See the Table for clinical symptoms and abnormalities of acute (primary) HIV infection.

In this setting HIV drug resistance testing should be performed in all cases and if the patient reports high PrEP adherence they may agree to have their blood, and hair tested for tenofovir and emtricitabine drug levels. In this setting urgent referral to an HIV specialist is recommended. If urgent review by an HIV specialist is not possible, then the diagnosing clinician may wish to phone ASHM who will be able to help coordinate the patient and a clinical advisor.

Indeterminate HIV test results in the first 3 months on PrEP

There is a potential for PrEP to delay or attenuate seroconversion in people who may have been exposed to HIV just before starting PrEP, or who acquire HIV infection while taking PrEP (e.g. due to poor adherence or transmitted drug resistant virus) (4-6). There is not a broad international agreement on how to manage these patients. Patients who have an indeterminate HIV test result while on PrEP (particularly, those with repeated indeterminate test results) should be closely monitored in conjunction with an HIV specialist and in consultation with a diagnostic laboratory scientist who should be informed that the patient is taking PrEP. The ASHM PrEP Guidelines Panel will continue to monitor this issue with a view to providing further guidance.

A recent high-risk exposure (within 72 hours)

A course of non-occupational post exposure prophylaxis (nPEP) may be required if a patient is on daily PrEP, or on-demand PrEP and had a recent high-risk exposure (within 72 hours) but only if they did not take PrEP during those days. This nPEP may need to consist of a three-drug regimen, depending on the nature of the exposure. See section on [nPEP and PrEP](#) for management of such cases.

Monitoring of renal function

Renal function should be monitored at 3 months and 6 months thereafter, or more frequently in certain populations (see [Assessment of renal function at baseline](#)). The management of people with high and ongoing risk of HIV infection, but whose eGFR has declined below or around 60 mL/min/1.73 m² since commencing TD*/FTC, is challenging. This situation typically requires consultation with a physician who is expert in PrEP. Cessation of TD*/FTC for 1 month may restore eGFR to above 60 mL/min/1.73 m², following which TD*/FTC may be recommenced with cautious monitoring. In these circumstances, consideration should be given to using on-demand TD*/FTC, or possibly second-daily TD*/FTC. However, there are no data to show that either of these options will stabilise the eGFR above 60 mL/min/1.73 m².

Testing for STIs

As PrEP users are at increased risk for STIs (7) clinicians should screen for STIs (specifically gonorrhoea, chlamydia and infectious syphilis) every 3 months using the standard-of-care tests and procedures, and manage any detected STI as recommended by the Australian STI Management Guidelines (1). Partner notification should be undertaken using the most appropriate available resources.

It is important to note, that for MSM and other groups where relevant, STI tests must include a throat swab and anal swab for chlamydia and gonorrhoea and vaginal swab should also be taken.

At each follow-up visit, patients taking PrEP should be reminded about:

- prevention of STI acquisition and transmission
- the need for quarterly STI testing
- the need to present for testing and treatment whenever signs or symptoms of an STI appear.

Clinicians should ensure that the pathology service provider that they use has these swabs available.

The presence of an STI at follow-up testing does not prevent the ongoing prescription of PrEP.

Monitoring HBV Hepatitis B and HCV Hepatitis C virus infections

Hepatitis B virus monitoring

For people who are hepatitis B virus (HBV) non-immune at baseline, clinicians should provide hepatitis B vaccination and confirm their immune response 1 month after the last vaccine dose.

For people who state that they have been vaccinated for hepatitis B at baseline, clinicians should test for hepatitis B surface antibody; if their hepatitis B surface antibody is below 10 IU/mL, they should be vaccinated with one dose of hepatitis B vaccine and their hepatitis B surface antibody titre should be checked 1 month later. If their titre does not rise above 10 IU/mL their hepatitis B vaccination should then be completed.

Both TD* and FTC are active against HBV (8). If people living with chronic HBV infection stop taking these medications, hepatic flares can occur, which can be severe (8). Patients with chronic HBV need to be counselled regarding the risks of poor adherence and the risks of self-ceasing PrEP medication. Patients

who are known to have chronic HBV and are already taking treatment for this condition should consult their liver specialist before commencing PrEP. A person taking PrEP who has chronic HBV infection should be assessed by a clinician experienced in the management of hepatitis B before ceasing PrEP. If PrEP is discontinued, close monitoring is strongly advised.

Only daily PrEP should be offered to people with chronic HBV. For additional guidance about the management of PrEP in people with chronic hepatitis B, see [Special clinical considerations](#).

Hepatitis C virus monitoring

All people who inject drugs including MSM, trans and gender diverse and heterosexual people should be monitored for Hepatitis C virus (HCV), as should MSM and trans and gender diverse people who engage in sexual contact that may pre-dispose to anal trauma. The incidence of HCV has currently been low at approximately 1% per annum in PrEP studies of MSM (9, 10), and higher in HIV-positive MSM (11, 12). However, there is concern that HCV incidence may increase following changes in sexual and sero-sorting behaviour in the era of PrEP. In this context, HCV can be sexually acquired and is considered as an STI. It should be tested at least annually, and more frequently if necessary, following sexual history taking and review of injecting practices (13).

Managing side-effects

Patients taking PrEP should be assessed for side-effects associated with TD*/FTC use, most importantly those suggesting possible acute renal injury. A review of symptoms experienced in the iPrEx (Iniciativa Profilaxis Pre-Exposición) study showed that potential PrEP-associated symptoms peaked at 1 month, when 39% of participants reported symptoms, compared with 22% at baseline. Gastrointestinal (GI) symptoms occurred in a median of 28% of participants across study sites (range 11–70%) and non-GI symptoms occurred in a median of 24% of participants (range 3–59%). The odds of GI symptoms were higher in those with evidence of high adherence to PrEP. By 3 months, symptoms had returned to pre-PrEP levels (14).

Bodybuilding increases muscle mass, which may result in increased creatinine levels in blood. When evaluating and managing PrEP users with creatinine clearance changes, clinicians should take into consideration the history of steroid, protein, creatine powder use (which also increases blood creatinine levels) and bodybuilding. A wash-out period of 14 days cessation of creatine before renal function assessment may be recommended.

The ASHM PrEP Guidelines Panel will monitor evidence in this area and update the guidelines as appropriate.

Optional assessments

Therapeutic drug monitoring

Initial demonstration projects in Australia conducted therapeutic drug monitoring as part of research protocols to evaluate medication adherence and HIV seroconversions among study participants. Their results revealed a high correlation between self-reports of tablet taking and blood concentrations of TD* and FTC, and high adherence to PrEP (over 90%) (15, 16). However, in Australia there are no clinical laboratories that quantify TD*/FTC concentrations in plasma, cells or urine for therapeutic drug monitoring (TDM) in the setting of PrEP (17) and it is likely that therapeutic drug monitoring is likely to be used primarily for research including evaluations of people who acquire HIV infection while taking PrEP.

References

1. Australasian Sexual Health Alliance (ASHA). Australian STI management guidelines for use in primary care [internet]. Last updated December 2018. Available at: <http://www.sti.guidelines.org.au/> (last accessed 30 August 2019).
2. Masciotra S, McDougal JS, Feldman J, Sprinkle P, Wesolowski L, Owen SM. Evaluation of an alternative HIV diagnostic algorithm using specimens from seroconversion panels and persons with established HIV infections. *J Clin Virol* 2011 52:S17-22.
3. Gibas KM, van den Berg P, Powell VE, Krakower DS. Drug resistance during HIV pre exposure prophylaxis. *Drugs* 2019;79:609–19.
4. Souza MS, Pinyakorn S, Akapirat S, et al. Initiation of antiretroviral therapy during acute HIV-1 infection leads to a high rate of nonreactive HIV serology. *Clin Infect Dis* 2016;63:555-61.
5. Laeyendecker O, Redd AD, Nason M, et al. Antibody maturation in women who acquire HIV infection while using antiretroviral preexposure prophylaxis. *J Infect Dis* 2015;212:754-9.
6. Donnell D, Ramos E, Celum C, et al; Partners PrEP Study Team. The effect of oral preexposure prophylaxis on the progression of HIV-1 seroconversion. *AIDS* 2017;31:2007-16.
7. Traeger MW, Cornelisse VJ, Asselin J, et al; PrEPX Study Team. Association of HIV preexposure prophylaxis with incidence of sexually transmitted infections among individuals at high risk of HIV infection. *JAMA* 2019;321:1380-90.
8. Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM). B positive: all you wanted to know about hepatitis B. A guide for primary care. 3rd ed. 2018. Available at: <http://hepatitisb.org.au/> (last accessed 30 August 2019).
9. Vaccher SJ, Gianacas C, Templeton DJ, et al; PRELUDE Study Team. Baseline preferences for daily, event-driven, or periodic HIV pre-exposure prophylaxis among gay and bisexual men in the PRELUDE Demonstration Project. *Front Public Health* 2017;5:341.
10. Grant RM, Lama JR, Anderson PL, et al; iPrEx Study Team. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med* 2010;363:2587-99.
11. Danta M, Brown D, Bhagani S, et al; HIV and Acute HCV (HAAC) group. Recent epidemic of acute hepatitis C virus in HIV-positive men who have sex with men linked to high-risk sexual behaviours. *AIDS* 2007;21:983- 91.
12. Rauch A, Rickenbach M, Weber R, et al; Swiss HIV Cohort Study. Unsafe sex and increased incidence of hepatitis C virus infection among HIV-infected men who have sex with men: the Swiss HIV Cohort Study. *Clin Infect Dis* 2005;41:395-402.
13. Hoornenborg E, Achterbergh RCA, Schim van der Loeff MF, et al; Amsterdam PrEP Project team in the HIV Transmission Elimination AMsterdam Initiative, MOSAIC study group. MSM starting preexposure prophylaxis are at risk of hepatitis C virus infection. *AIDS* 2017;31:1603-10.
14. Glidden DV, Amico KR, Liu AY, et al. Symptoms, side effects and adherence in the iPrEx open-label extension. *Clin Infect Dis* 2016;62:1172-7.
15. Lal L, Audsley J, Murphy D, et al; VicPrEP Study Team. Medication adherence, condom use and sexually transmitted infections in Australian PrEP users. *AIDS* 2017;31:1709-14.

16. Grulich AE, Guy R, Amin J, et al; Expanded PrEP Implementation in Communities New South Wales (EPIC-NSW) research group. Population-level effectiveness of rapid, targeted, high-coverage roll-out of HIV pre-exposure prophylaxis in men who have sex with men: the EPIC-NSW prospective cohort study. *Lancet HIV* 2018;5:e629-37
17. Spinelli MA, Glidden DV, Rodrigues WC, et al. Low tenofovir level in urine by a novel immunoassay is associated with seroconversion in a preexposure prophylaxis demonstration project. *AIDS* 2019;33:867-72.



8. Special clinical considerations

Aboriginal and Torres Strait Islander people

The rate of human immunodeficiency virus (HIV) infection is rising in Aboriginal and Torres Strait Islanders (hereafter referred to as Indigenous) Australians. Between 2013-2017, the age standardised rate of HIV notifications increased by 41% in Indigenous populations, compared to a 12% decline in Australian-born non-Indigenous people (1). Furthermore, a greater proportion of HIV notifications during 2015-2017 in Indigenous populations was ascribed to heterosexual sex (21%) and injecting drug use (18%), compared to Australian-born non-Indigenous populations (18% and 3%, respectively) (1).

There are few data currently available regarding pre-exposure prophylaxis (PrEP) knowledge, acceptability and use in Indigenous populations. Notably, 2.1% of participants in the Expanded PrEP Implementation in Communities New South Wales (EPIC-NSW) study identified as Indigenous (2) as did 2.94% in the QPrEPd study in Queensland (3). A recent qualitative analysis examined the obstacles to PrEP use faced by Indigenous men who have sex with men (MSM) (4). These obstacles included individual barriers, such as unwillingness for Indigenous MSM to identify with mainstream gay communities, stigma towards HIV and MSM within Indigenous communities and attitudinal differences towards the use of Western medicine (4). Provider barriers that were identified include overburdened and under-resourced Aboriginal medical services, a perceived lack of confidentiality in these services and a lack of government leadership and funding. Regarding the way forward, many respondents felt community involvement was essential for effective PrEP promotion and that sexual health and PrEP promotion should be better funded and driven by the community. Respondents felt that both mainstream sexual health clinics and Aboriginal Community Controlled Health Organisations can provide appropriate services, although general practitioners, nurses and indigenous health workers need to improve HIV and sexual literacy (4). Healthcare practitioners must provide an environment that does not stigmatise Indigenous patients. Health-care practitioners must take a careful and culturally appropriate history to ascertain risk factors for HIV infection and PrEP suitability and must provide appropriate treatment and referral to support people who inject drugs.

In 2017, the notification rate of newly diagnosed hepatitis B infection in Indigenous populations was more than double that of non-Indigenous population (45.1 per 100,000 versus 19.2 per 100,000) (5). Given the higher rates of hepatitis B infection in Indigenous versus non-Indigenous people, clinicians caring for Indigenous patients must carefully follow these ASHM PrEP guidelines and screen for hepatitis B infection and, as required, provide hepatitis B vaccinations. Note that people with chronic hepatitis B should only be offered daily PrEP to maintain sustained virological suppression of hepatitis B.

People ineligible for Medicare including newly-arrived Asian-born men who have sex with men

Reports during 2013-2017 from a large, sentinel sexual health service in Victoria showed that the proportion of newly-arrived Asian-born MSM with incident HIV infection did not decline whereas the proportion of all other MSM attending the clinic with incident HIV infection declined by 45% (6). At the same clinic during 2017, newly-arrived Asian-born versus all other MSM were less likely to report use of PrEP.

In Australia, access to Medicare is required to receive subsidised PrEP and HIV antiretroviral therapy. People who come to Australia to study who are ineligible for Medicare are required to have Overseas Student Health Cover, however anecdotal reports suggest that some students are reticent to use their private health cover for sexual health testing, prevention and treatment because of concerns about data privacy. People who come to Australia on a Working Holiday Visa (417) may be eligible for Medicare if they come from countries with reciprocal health cover arrangements, although none of these countries is within Asia (7).

In New South Wales, PrEP is offered free to people who are ineligible for Medicare. In other jurisdictions, clinicians should refer people who are ineligible for Medicare or who are unable or unwilling to use private health-care cover to public sexual health clinics that offer free HIV and sexually transmissible infection (STI) testing and provide PrEP prescriptions. These PrEP prescriptions can be filled by paying the full, unsubsidised amount for a private script, or by personal importation of PrEP through online pharmacies.

Transgender women

Transgender women have a high prevalence of HIV infection (8) and experience high HIV incidence rates compared to non-transgender men and women (9). Furthermore, transgender women have represented less than 1% of study participants in PrEP trials (10) and this paucity of data may help explain the overall low uptake of PrEP by transgender women (11).

The Iniciativa Profilaxis Pre-Exposición (iPrEX) clinical trial enrolled the highest number of transgender women to date and found that compared to MSM, transgender women were more likely to report transactional sex, condomless anal intercourse and more recent sexual partners (12). In iPrEX, no HIV infections were observed in transgender women whose blood levels were compatible with taking four or more doses of PrEP weekly. However, using stratified analyses, PrEP did not provide a benefit for transgender women in the iPrEX study [hazard ratio 1.1, 95% confidence interval (CI): (0.5 to 2.7) compared to the overall 44% reduced HIV incidence in the active study arm (12).

A recent retrospective analysis of the iPrEX study sought to determine whether the differential efficacy of PrEP in MSM versus transgender women was a result of different baseline clinical and behavioural factors that could make PrEP less efficacious in transgender women (10). The authors found that baseline characteristics between MSM and transgender women explained almost 100% of the difference in PrEP's efficacy during the iPrEX study (11). However, the authors were not able to comment on whether the use of gender-affirming hormone therapy (GAHT) (13) may have contributed to PrEP being less effective in the transgender women study participants (11).

Oestrogen, which is used as part of GAHT, increases the activity of 5'-nucleotidase enzymes and can decrease the active metabolites of tenofovir and emtricitabine, or increase the nucleotides that compete against the active metabolites of tenofovir and emtricitabine within cells. Therefore, oestrogen could plausibly reduce cellular levels of tenofovir and emtricitabine in transgender women, making PrEP less efficacious. There have been some small studies in transgender women taking GAHT and PrEP. One study of 20 Thai transgender women commencing GAHT and PrEP showed a 12% reduction in plasma tenofovir levels in the presence of GAHT (14), although PrEP did not reduce oestrogen levels. In another study, 31% lower levels of plasma tenofovir were observed in eight transgender women taking GAHT compared to eight cis-gender men; plasma emtricitabine was also significantly lower in the transgender

study participants (13). A further study compared the rectal tissue levels of the active metabolites of tenofovir and emtricitabine in four HIV-positive transgender women taking GAHT versus four HIV-positive post-menopausal cis-gender women. This study reported that there was a significantly lower ratio of the active metabolite of tenofovir diphosphate to its competing nucleotide dATP in the rectal tissue of the trans-gender versus cis-gender participants (15). However, this study did not find a decrease in the ratio of the active metabolite emtricitabine triphosphate to its competing nucleotide, dCTP. Further larger pharmacological studies are needed urgently to determine whether GAHT reduces the levels of tenofovir disoproxil* and emtricitabine (TD*/FTC), or vice versa in transgender women.

The ASHM PrEP Guidelines Panel will continue to monitor the data on potential drug-drug interactions between GAHT and TD*/FTC.

As noted, in a post-hoc analysis of transgender women in the iPrEX study, no HIV infections were observed in transgender women whose blood levels were compatible with taking four or more doses of PrEP weekly (12). Therefore, supporting transgender women to optimise their PrEP adherence is important until larger studies have determined whether GAHT reduces levels of TD*/FTC in transgender women taking GAHT. To help support transgender women to optimise their PrEP use and adherence, it is recommended that health practitioners provide gender-affirming care (16). Such clinical care includes appropriate use of preferred pronouns and names, safe access to bathrooms of choice and appropriate treatment and referral for hormone therapy and surgery (16).

Transgender men

There are very few data regarding PrEP knowledge, acceptability and use in transgender men. Nor are there data regarding whether GAHT influences PrEP drug levels or vice versa in transgender men. A 2016 review of HIV and STI research undertaken in transgender men was unable to find any data on the use of PrEP in transgender men (17). In a 2017 study of 181 transgender youth from the USA, of 42 people identifying as transgender men (23.2%), only 16 had ever used HIV prevention services and none had ever used PrEP (18). Transgender men were significantly less likely to have ever used PrEP than transgender women (18). To optimise HIV prevention and PrEP use, clinicians caring for transgender men need to actively raise PrEP as an HIV prevention option for them and take a sensitive and detailed sexual behaviour history bearing in mind that transgender men may be sexually active with male and female partners. Gender-affirming care should be provided to transgender men by health practitioners. For more information see: a language guide: [Trans and gender diverse inclusion](#)

Women taking PrEP during conception, pregnancy and breastfeeding

Conception in serodiscordant couples

Women without HIV infection who have sexual partners with documented HIV infection are at risk of HIV acquisition during natural attempts to conceive (i.e. without a condom) if their HIV-positive partner has a detectable or variably detectable plasma viral load. Providers should discuss with their patients the available information about the potential risks and benefits of PrEP in these circumstances (19). For women wanting to conceive where their HIV-positive male partner is stably virologically suppressed on combination antiretroviral therapy (cART), PrEP should still be offered to the woman if she expresses concerns about the risk of acquiring HIV in this setting.

Pregnancy

Among women without HIV infection, the risk of acquiring HIV increases by approximately two-fold during pregnancy (20). In addition, if a woman acquires HIV infection during pregnancy there is a higher risk of HIV transmission to the infant than if the woman were to become pregnant during chronic HIV infection because the HIV viral load is much higher during acute HIV infection.

The current evidence suggests that PrEP can be used safely during pregnancy and breastfeeding (21).

The use of TD*-containing regimens by HIV positive women throughout pregnancy has not been associated with adverse pregnancy outcomes, but lowered BMD has been observed in newborns exposed to TD* in utero (22) as has a lower length and head circumference at 1 year of age (23).

In the Partners PrEP study, which compared the efficacy of tenofovir disoproxil fumarate / emtricitabine (TDF/FTC) versus TDF versus placebo to reduce HIV transmission in African heterosexual HIV-serodifferent couples, 431 pregnancies occurred; the average duration of in utero PrEP exposure was 5 weeks (24). There was no difference in the incidence of pregnancy, birth outcomes or infant growth in women who received TDF or TDF/FTC versus placebo PrEP (24). However, the authors noted that the confidence intervals for these findings were wide and therefore definitive statements about the safety of TDF/FTC as PrEP during pregnancy could not be made based on this study's findings. A subsequent study from this group examined the pregnancy outcomes of 30 women who continued to use PrEP during pregnancy compared to 96 pregnancies without PrEP exposure. The authors found that there was no increase in adverse pregnancy outcomes, or restrictions in infant growth between the two groups (25).

The World Health Organization has included PrEP as an HIV prevention strategy during pregnancy (26) and a number of other jurisdictions recommend PrEP for safe conception and for use during pregnancy and breastfeeding (27).

Some women with HIV-positive partners may prefer to continue PrEP while pregnant, due to the increased risk of acquisition of HIV if their partners are not reliably virologically suppressed during pregnancy, or due to high levels of anxiety (27).

Providers should discuss with their patients available information on potential adverse pregnancy outcomes when beginning or continuing PrEP during pregnancy so that they can make an informed decision. It should be noted that TD* is classified as category B3 by the Australian Therapeutic Goods Administration (TGA) (29), meaning that, to date, tenofovir has been taken by only a limited number of pregnant women and women of childbearing age, without an increase in the frequency of malformation or other direct or indirect harmful effects on the human foetus having been observed. However, studies in animals have shown evidence of an increased occurrence of foetal damage, the significance of which is considered uncertain in humans.

Therefore, the ASHM PrEP Guidelines Panel's recommendation is that PrEP may be continued during pregnancy in women at risk for HIV acquisition, or who are unduly affected by anxiety about HIV acquisition.

Breastfeeding

Although experience with PrEP during breastfeeding is lacking, there is substantial experience with the use of TD*/FTC during the breastfeeding period by HIV-positive women taking TD*/FTC based antiretroviral therapy. TD* and FTC are secreted in breast milk, although at much lower concentrations (0.3 and 2%, respectively), of the levels achieved with the doses recommended for the treatment of infants with HIV infection (30). In the PrEP setting, a study evaluating antiretroviral excretion in breast milk and infant absorption suggests PrEP can be safely used during breastfeeding with minimal infant drug exposure (28).

If a woman acquires HIV infection during breastfeeding, the risk of transmission to her infant is higher than in an established infection, because of high viral load soon after seroconversion. Therefore, PrEP can be continued during breastfeeding in women at risk of HIV acquisition.

The ASHM PrEP Guidelines Panel will continue to monitor the safety of TD*/FTC PrEP regimens when used during pregnancy and breastfeeding.

Patients with chronic active HBV infection

Both TD* and FTC are active against HIV and hepatitis B virus (HBV) infections. They may prevent the development of significant liver disease by suppressing HBV replication. Only TD*, however, is currently approved for this use in Australia. Therefore, ongoing treatment with TD*/FTC may be especially indicated in people with active HBV infection who are also at risk of HIV acquisition.

Of note there are two case reports of patients who were receiving TD* for treatment of hepatitis B and who acquired HIV infection (31). Plasma levels of tenofovir and prescription refills suggested that the patients' medication adherence was good. These guidelines recommend that people with established hepatitis B infection who require treatment for hepatitis B infection receive combined TD*/FTC and have ongoing monitoring for HIV PrEP and hepatitis B infection.

All people who test positive for hepatitis B surface antigen (HBsAg) should be evaluated by a clinician experienced in the treatment of HBV infection. For clinicians without this experience, co-management with an infectious disease or liver specialist should be considered.

People living with chronic HBV infection should be tested for HBV DNA by the use of a quantitative assay to determine the level of HBV replication before PrEP is prescribed, and at regular intervals (e.g. every 3–6 months) while taking PrEP (32). TD* presents a very high barrier to the development of HBV resistance. However, it is important to reinforce the need for consistent adherence to the daily doses of TD*/FTC to prevent reactivation of HBV infection with the attendant risk of hepatic injury, and to minimise the possible risk of developing TD*-resistant HBV infection (33). For these reasons, on-demand PrEP is contraindicated in patients with chronic hepatitis B infection.

If PrEP is no longer needed to prevent HIV infection in a patient with chronic hepatitis B, a separate determination should be made about whether the patient requires ongoing treatment for HBV infection. Acute flares resulting from the reactivation of HBV infection have been seen in those with and without HIV infection after stopping TD* and other medications used to treat HBV infection. When people living with chronic hepatitis B elect to discontinue PrEP, they should first be evaluated by a clinician experienced in the

management of HBV infection to ascertain their need for ongoing HBV treatment, and to monitor for any hepatic flares that occur if PrEP is ceased.

Patients with chronic renal failure

Patients without HIV infection and with established chronic renal failure, e.g. with estimated glomerular filtration rate (eGFR) that is stably less than 60 mL/min/1.73 m² should not be prescribed PrEP. The only PrEP regimen proven effective to date and approved by the TGA is TD*/FTC, which is not indicated for those with chronic renal failure (34). However, if a patient with chronic renal failure is at substantial risk of HIV, their condition should be discussed with specialists in the management of HIV and renal disease.

Adolescent minors

As a part of primary health care, HIV screening should be discussed with all adolescents who are sexually active, or have a history of injecting drug use. Parental or guardian involvement in an adolescent's health care is often desirable, but is sometimes contraindicated for the safety of the adolescent, and can compromise full disclosure.

Clinicians should carefully consider the data discussed below on the safety and efficacy of daily PrEP taken by persons under 18 years of age, including the possibility of loss of bone mineral density, and other toxicities among youth who are still growing. Data are also available about the safety of TD*/FTC when used in treatment regimens for young people with HIV infection (35). The clinician and the patient may conclude that the short-term, proximal risk of acquiring HIV infection greatly outweighs any short-term, or as yet undetermined, long-term risk of PrEP toxicity. Clinicians are encouraged to seek expert advice in complex situations.

Adherence to PrEP in adolescents may be suboptimal: a PrEP demonstration program involving daily PrEP use for 18–22-year-old HIV-negative MSM reported that tenofovir diphosphate intracellular levels, a marker of cumulative TD* adherence, were consistent with good adherence peaking at 56% at month, but declining thereafter (36). In another open-label 48-week study of 78 adolescent MSM commencing PrEP, Project PrEPare, highly protective levels of PrEP were observed in 54% of adolescents at week 4 but declined thereafter (37).

Following this finding that PrEP levels declined markedly in these adolescent participants after the first week 4 visit, the authors recommended that adolescents should be offered more frequent clinical monitoring to enhance their PrEP adherence. **The ASHM PrEP Guidelines Panel endorses this approach and encourages clinicians to work with adolescents taking PrEP to design an augmented clinical review schedule.**

In the Project PrEPare study, there was no observed elevation in serum creatinine levels and significant increases were observed in bone mineral density for the spine, hip and total body between baseline and week 48 (37). However, there was a slight but statistically significant decline in the total body Z-score during this time (37), suggesting that bone growth may have been suboptimal in the study participants. Although not observed in this study, higher levels of PrEP adherence as measured by red blood cells levels of tenofovir diphosphate have been associated with lower hip bone mineral density in adolescents (38). Further research is needed to determine whether there is a long-term increased risk of bone fractures in young MSM who have had PrEP.

Globally until recently, regulatory approval of Truvada (tenofovir disoproxil fumarate (TDF (FTC)) PrEP was limited to adults over 18 years of age. However, on 15 May 2018, the US Food and Drug Administration (FDA), based on data from the Project PrEPare study discussed above, expanded its approval of Truvada as PrEP against HIV to include adolescents at risk weighing at least 35 kg.

PrEP use for prevention of HIV in adolescents has not been approved by the TGA in Australia. However, clinicians are able to prescribe PrEP off-label for adolescents. In this setting, a decision to prescribe PrEP for a person under 18 years of age should be made at the discretion of the prescriber who is responsible for obtaining informed consent from their patient. Informed consent should take into account the risks and benefits of that treatment versus other available treatments or no treatment at all based on the individual circumstances. Of note, the TGA does not regulate health professionals or clinical practice. Medical practitioners are required to prescribe in accordance with [Good Medical Practice](#), the code of conduct published by the [Medical Board of Australia](#) – this code highlights the importance of informed consent.

Adolescents may obtain PrEP via the Personal Importation Scheme of the TGA once they have received an off-label prescription from their clinician.

References

1. Kirby Institute. HIV in Australia: annual surveillance short report 2018. Sydney: Kirby Institute, UNSW Sydney; 2018.
2. NSW Ministry of Health. NSW HIV Strategy 2016–2020 Quarter 1 2019. Data Report. Available at: <https://www.health.nsw.gov.au/endinghiv/Publications/q1-2019-nsw-hiv-data-report.pdf> (last accessed 2 September 2019).
3. Queensland Pre-exposure Prophylaxis Demonstration Project Expansion (QPrEPd) Monitoring and Evaluation Annual Report Number 1 2017. Available at: <https://www.comeprepd.info/wp-content/uploads/2018/04/qprepd-first-report.pdf> accessed September 10th 2019 (last accessed 11 September 2019).
4. Hope A, Haire B. No-one's driving this bus – qualitative analysis of PrEP health promotion for Aboriginal and Torres Strait Islander gay and bisexual men. *Aust N Z J Public Health* 2019 Feb;43:18-23.
5. Kirby Institute. HIV, viral hepatitis and sexually transmissible infections in Australia: annual surveillance report 2018. Sydney: Kirby Institute, UNSW Sydney; 2018. Available at: <https://kirby.unsw.edu.au/report/hiv-viral-hepatitis-and-sexually-transmissible-infections-australia-annual-surveillance> (last accessed 2 September 2019).
6. Medland NA, Chow EPF, Read THR, et al. Incident HIV infection has fallen rapidly in men who have sex with men in Melbourne, Australia (2013–2017) but not in the newly arrived Asian-born. *BMC Infect Dis* 2018;18:410.
7. Australian Government. Department of Human Services. Enrolling in Medicare. Available at: <https://www.humanservices.gov.au/individuals/subjects/how-enrol-and-get-started-medicare/enrolling-medicare#whocan> (last accessed 2 September 2019).
8. Herbst JH, Jacobs ED, Finlayson TJ, McKleroy VS, Neumann MS, Crepaz N; HIV/AIDS Prevention Research Synthesis Team. Estimating HIV prevalence and risk behaviors of transgender persons in the United States: a systematic review. *AIDS Behav* 2008;12:1-17.
9. Centers for Disease Control and Prevention. HIV Surveillance Reports. 2011; volume 23. Published February 2013. Available at: <https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-report-2011-vol-23.pdf> (last accessed 2 September 2019).
10. Escudero DJ, Kerr T, Operario D, Socías ME, Sued O, Marshall BD. Inclusion of trans women in pre-exposure prophylaxis trials: a review. *AIDS Care* 2015;27:637-41.
11. Mehrotra ML, Westreich D, McMahan VM, et al. Baseline characteristics explain differences in effectiveness of randomization to daily oral TDF/FTC PrEP between transgender women and cisgender men who have sex with men in the iPrEx Trial. *J Acquir Immune Defic Syndr* 2019; 81:e94-8.
12. Deutsch MB, Glidden DV, Sevelius J, et al; iPrEx investigators. HIV pre-exposure prophylaxis in transgender women: a subgroup analysis of the iPrEx trial. *Lancet HIV* 2015;2:e512–9.
13. Shieh E, Marzinke M, Fuchs E, et al (presenter Hendrix C). Transgender women on estrogen have significantly lower tenofovir/emtricitabine concentrations during directly observed dosing when compared to cis men. Abstract OA23.03. HIV Research for Prevention conference (HIVR4P); 21-25 October 2018; Madrid, Spain. Available at: <http://www.professionalabstracts.com/hivr4p2018/iPlanner/#/presentation/205> (last accessed 2 September 2019).

14. Hiransuthikul A, Janamnuaysook R, Himmad K, et al; iFACT Study Team. Drug-drug interactions between feminizing hormone therapy and pre-exposure prophylaxis among transgender women: the iFACT study. *J Int AIDS Soc* 2019;22:e25338
15. Cottrell ML, Prince HMA, Schauer AP, et al. Decreased tenofovir diphosphate concentrations in a transgender female cohort: Implications for HIV pre-exposure prophylaxis (PrEP). *Clin Infect Dis* 2019 Apr 9. pii: ciz290 [Epub ahead of print].
16. Grant RM, Sevelius JM, Guanira JV, Aguilar JV, Chariyalertsak S, Deutsch MB. Transgender women in clinical trials of pre-exposure prophylaxis. *J Acquir Immune Defic Syndr* 2016;72 Suppl 3:S226-9.
17. Reisner SL, Murchison GR. A global research synthesis of HIV and STI biobehavioural risks in female-to-male transgender adults. *Glob Public Health* 2016;11:866-87.
18. Reisner SL, Jadwin-Cakmak L, White Hughto JM, Martinez M, Salomon L, Harper GW. Characterizing the HIV prevention and care continua in a sample of transgender youth in the U.S. *AIDS Behav* 2017;21:3312–27.
19. World Health Organization (WHO). WHO Technical brief: preventing HIV during pregnancy and breastfeeding in the context of pre-exposure prophylaxis (PrEP). Geneva: World Health Organization; 2017. Licence: CC BY-NC-SA 3.0 IGO.
Available at: <https://apps.who.int/iris/bitstream/handle/10665/255866/WHO-HIV-2017.09eng.pdf;jsessionid=2033F808E98CC3BE9143A7D9AB4D6EEA?sequence=1>
(last accessed 2 September 2019).
20. Mugo NR, Heffron R, Donnell D, et al; Partners in Prevention HSV/HIV Transmission Study Team. Increased risk of HIV-1 transmission in pregnancy: a prospective study among African HIV-1 serodiscordant couples. *AIDS* 2011;25:1887–95.
21. Horgan L, Blyth CC, Bowen AC, Nolan DA, McLean-Tooke AP. Pre-exposure prophylaxis for HIV prevention during pregnancy and lactation: forget not the women and children. *Med J Aust* 2019;210:281-4.
22. Siberry GK, Jacobson DL, Kalkwarf HJ, et al. Lower newborn bone mineral content associated with maternal use of tenofovir disoproxil fumarate during pregnancy. *Clin Infect Dis* 2015;61:996-1003.
23. Van Dyke RB, Chadwick EG, Hazra R, Williams PL, Seage GR 3rd. The PHACS SMARTT study: assessment of the safety of in utero exposure to antiretroviral drugs. *Front Immunol* 2016;7:199.
24. Mugo NR, Hong T, Celum C, et al; Partners PrEP Study Team. Pregnancy incidence and outcomes among women receiving preexposure prophylaxis for HIV prevention: a randomised clinical trial. *JAMA* 2014;312:362–71.
25. Heffron R, Mugo N, Hong T, et al; Partners Demonstration Project and the Partners PrEP Study Teams. Pregnancy outcomes and infant growth among babies with in utero exposure to tenofovir-based preexposure prophylaxis for HIV prevention. *AIDS* 2018;32:1707-13.
26. World Health Organization (WHO). Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection. Recommendations for a public health approach. Second edition 2016. Available at: https://apps.who.int/iris/bitstream/handle/10665/208825/9789241549684_eng.pdf;jsessionid=D9DE8E4B08AE7817BDF0A3439A6F90B6?sequence=1
(last accessed 2 September 2019).
27. Davies N, Heffron R. Global and national guidance for the use of pre-exposure prophylaxis during peri-conception, pregnancy and breastfeeding. *Sex Health* 2018;15:501–12.

28. Mugwanya KK, Hendrix CW, Mugo NR, et al. Pre-exposure prophylaxis use by breastfeeding HIV-uninfected women: a prospective short-term study of antiretroviral excretion in breast milk and infant absorption. *PLoS Med* 2016;13:e1002132.
29. The Royal Women's Hospital Victoria Australia. Pregnancy and Breastfeeding Medicines Guide [internet]. Tenofovir. Available at: <https://thewomenspbmg.org.au/medicines/tenofovir> (last accessed 2 September 2019).
30. Benaboud S, Pruvost A, Coffie PA, et al. Concentrations of tenofovir and emtricitabine in breast milk of HIV-1-infected women in Abidjan, Cote d'Ivoire, in the ANRS 12109 TEmAA Study, Step 2. *Antimicrob Agents Chemother* 2011;55:1315-7.
31. Fox J, Brady M, Alexander H, et al. Tenofovir disoproxil fumarate fails to prevent HIV acquisition or the establishment of a viral reservoir: two case reports. *Infect Dis Ther* 2016;5:65-71.
32. Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM). B Positive. Hepatitis B for primary care. Clinical assessment of patients with hepatitis B virus infection [internet]. 2018 update. Available at: <http://www.hepatitisb.org.au/clinical-assessment-of-patients-with-hepatitis-b-virus-infection/> (last accessed 2 September 2019).
33. Hongthanakorn C, Chotiyaputta W, Oberhelman K, et al. Virological breakthrough and resistance in patients with chronic hepatitis B receiving nucleos(t)ide analogues in clinical practice. *Hepatology* 2011;53:1854-63.
34. Gilead Sciences. Full prescribing information. Issued June 2013. Available at: www.accessdata.fda.gov/drugsatfda_docs/label/2013/021752s035lbl.pdf (last accessed 2 September 2019).
35. Purswani M, Patel K, Kopp JB, et al. Tenofovir treatment duration predicts proteinuria in a multiethnic United States Cohort of children and adolescents with perinatal HIV-1 infection. *Pediatr Infect Dis J* 2013;32:495-500.
36. Hosek SG, Rudy B, Landovitz R, et al; Adolescent Trials Network (ATN) for HIV/AIDS Interventions. An HIV preexposure prophylaxis demonstration project and safety study for young MSM. *J Acquir Immune Defic Syndr* 2017;74:21-9.
37. Hosek SG, Landovitz RJ, Kapogiannis B, et al. Safety and feasibility of antiretroviral preexposure prophylaxis for adolescent men who have sex with men aged 15 to 17 years in the United States. *JAMA Pediatr* 2017;171:1063-71.
38. Havens PL, Stephensen CB, Van Loan MD, et al; Adolescent Medicine Trials Network for HIV/AIDS Interventions 117 study team. Decline in bone mass with tenofovir disoproxil fumarate/emtricitabine is associated with hormonal changes in the absence of renal impairment when used by HIV-uninfected adolescent boys and young men for HIV preexposure prophylaxis. *Clin Infect Dis* 2017;64:317-25.



9. HIV non-occupational post-exposure prophylaxis and pre-exposure prophylaxis

People not receiving human immunodeficiency virus (HIV) pre-exposure prophylaxis (PrEP) who seek care within 72 hours after an isolated sexual or injection-related HIV exposure should be evaluated for the need for non-occupational post-exposure prophylaxis (nPEP) (1). nPEP may also be considered where an individual receiving PrEP reports being poorly adherent and seeks care within 72 hours after an HIV exposure. The clinician should take a sexual history to differentiate isolated exposures from ongoing exposure. If the exposure is isolated (e.g. an isolated condom failure, sexual assault), nPEP should be prescribed, but ongoing antiretroviral medication is not indicated after completion of the 28-day nPEP course.

If exposures are not isolated but ongoing, clinicians should consider offering PrEP immediately. If the person needs a three-drug nPEP regimen, the nPEP should be prescribed initially and then the individual should be supported to transition to PrEP.

The decision to commence nPEP should be made according to local nPEP guidelines (1). The decision to transition to PrEP is dependant upon suitability for PrEP (including a confirmatory negative HIV test result) and the individual's willingness to continue taking daily tenofovir disoproxil* and emtricitabine (TD*/FTC) and to attending quarterly clinic visits whilst on PrEP.

For a person already using PrEP, a course of nPEP may be required if the PrEP user had a recent high-risk exposure (within 72 hours) and did not take PrEP during the period that the high-risk exposure occurred. The decision to recommence PrEP following a course of nPEP is dependent upon the individual's ongoing eligibility for PrEP (including a negative HIV test result) and their willingness to continue taking daily TD*/FTC.

Reference

1. Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM). Post-exposure prophylaxis after non-occupational and occupational exposure to HIV: Australian National Guidelines (Second edition). August 2016. Available at: <https://www.ashm.org.au/HIV/PEP/> (last accessed 18 July 2019).



10. Improving medication adherence

Medication adherence is critical to achieving the maximum prevention benefit of pre-exposure prophylaxis (PrEP) and reducing the risk of selecting for a drug-resistant virus in the event of human immunodeficiency virus (HIV) acquisition (1, 2). In randomised, blinded, placebo-controlled trials of PrEP, adherence varied (1) and was lower among cis-gender women in some studies (3, 4), in transgender women (5) and young PrEP users (6-8). PrEP adherence has generally been higher in more recent trials, open-label extensions and demonstration projects, particularly among men who have sex with men (MSM). These better adherence rates have been due to increasing knowledge about PrEP's efficacy and differing motivations for taking PrEP (1, 9-12).

Common reasons for non-adherence include a perceived low risk of acquiring HIV (3, 4, 13), start-up symptoms (3, 14-16) and concerns regarding long-term side-effects (13, 17), factors of daily life such as medication management (18, 19), perceived and enacted stigma due to being eligible for PrEP (19-22) and lack of social support from partners, family and friends (19). Common challenges to PrEP adherence, particularly for MSM, are party drug and alcohol use (18). Party drug use (at the event level) is known to increase the likelihood of missing a dose on the same as well as the next day, thus potentially impacting on the efficacy of event-driven PrEP (23). People with mental health disorders are also more likely to self-discontinue the use of PrEP (24). Studies of adolescent MSM using PrEP have shown that approximately 55% of participants have evidence of high adherence at week 4, but adherence declines markedly after the first month (7, 8).

Patient education and adherence counselling focused on medication self-management are needed to support ongoing daily PrEP use (Box 10.1).

Box 10.1 Key components of medication-adherence counselling

Establish trust and bidirectional communication

Provide simple explanations and education on the following issues:

- Relationship of adherence to the efficacy of PrEP
- Medication dosage and schedule
- Management of common side-effects
- Signs and symptoms of acute HIV infection and recommended actions.

Support adherence:

- Tailor daily dose taking to patient's daily routine (e.g. with tooth brushing, before bed)
- Identify reminders and devices (e.g. beepers, alarms widely available over the counter) to minimise forgotten doses
- Identify and address potential barriers to adherence.

Monitor medication adherence in a non-judgmental manner:

- Normalise occasional missed doses while ensuring patient understands importance of daily dosing for optimal protection
- Reinforce success
- Identify factors interfering with adherence and plan with patient to address these factors
- Assess side-effects and provide advice on how to manage them.

Various approaches can be used to effectively support medication adherence (25). These include:

- educating patients (including population groups other than MSM particularly women who may be considering PrEP) about the medications
- helping patients anticipate and manage side-effects
- helping patients establish dosing routines that fit with their work and social schedules
- providing reminder systems and tools such as pill boxes and electronic reminders
- addressing substance abuse or mental-health needs that may impede adherence
- arranging more frequent clinic visits for adolescents to enhance their adherence
- facilitating social and peer support, especially for women.

When initiating a PrEP regimen, clinicians need to educate patients about medication schedules (for daily or on-demand PrEP, that is, the use of PrEP before and after potential HIV exposures), how to commence taking PrEP and how to cease taking PrEP and what to do if they experience problems such as side-effects or missed doses. See section [Providing PrEP](#) regarding specific recommendations about dealing with missed doses.

Medication adherence should be discussed at each visit when the PrEP script is provided to identify barriers to optimal PrEP adherence and develop appropriate management plans.

Emerging evidence that different dosing strategies can be effective provides an opportunity to offer flexibility, choice and convenience to patients who are benefiting from PrEP. On-demand PrEP is now an option for cis-gender MSM in these revised ASHM PrEP guidelines and was recently endorsed in guidance from the World Health Organization (26) (see [Providing PrEP](#)). If patients choose to take on-demand PrEP, their behaviour and PrEP pill use patterns should be discussed at each visit, to help determine if they should perhaps switch to daily PrEP.

Side-effects can lead to non-adherence. Clinicians should inform patients about the most common side-effects and should work with patients to develop a specific plan for handling them, including the use of specific over-the-counter medications that can mitigate symptoms.

In the context of discussing PrEP adherence, patients should be reminded about the need to be tested for HIV and sexually transmissible infections (STIs) every 3 months or earlier if required, due to perceived risks or symptoms.

The importance of using condoms to prevent STIs, or to help prevent HIV if PrEP adherence has been sub-optimal should be discussed with patients. To improve adherence and effectiveness of PrEP, patients should also be informed about, how to stop taking PrEP and re-start it, so that they are prepared to these changes in advance. See section [providing PrEP regarding specific recommendations on starting and ceasing PrEP](#).

Clinicians may wish to explore and address other potential barriers to optimised PrEP use such as misconceptions about PrEP, behavioural factors (e.g. substance use), depression, partner violence and unstable housing. To improve adherence to their PrEP medication, some patients may need referral to mental health or social services, or peer-based support services provided by various organisations (e.g. services provided by Living Positive Victoria and Positive Women Victoria, or similar groups in other Australian jurisdictions to support families and serodiscordant couples).

References

1. Fonner VA, Dalglish SL, Kennedy CE, et al. Effectiveness and safety of oral HIV preexposure prophylaxis for all populations. *AIDS* 2016; 30:1973-83.
2. Haberer JE. Current concepts for PrEP adherence in the PrEP revolution: from clinical trials to routine practice. *Curr Opin HIV AIDS* 2016;11:10-7.
3. Van Damme L, Corneli A, Ahmed K, et al. Preexposure prophylaxis for HIV infection among African women. *N Engl J Med* 2012;367:411–22.
4. Marrazzo JM, Ramjee G, Richardson BA, et al. Tenofovir-based preexposure prophylaxis for HIV infection among African women. *N Engl J Med* 2010;362:257–69.
5. Deutsch MB, Glidden DV, Sevelius J, et al; iPrEx investigators. HIV pre-exposure prophylaxis in transgender women: a subgroup analysis of the iPrEx trial. *Lancet HIV* 2015;2:e512-9.
6. Yun K, Xu JJ, Zhang J, et al. Female and younger subjects have lower adherence in PrEP trials: a meta-analysis with implications for the uptake of PrEP service to prevent HIV. *Sex Transm Infect* 2018;94:163-8.
7. Hosek SG, Rudy B, Landovitz R, et al; Adolescent Trials Network (ATN) for HIV/AIDS Interventions. An HIV preexposure prophylaxis demonstration project and safety study for young MSM. *J Acquir Immune Defic Syndr* 2017;74:21-9.
8. Hosek SG, Landovitz RJ, Kapogiannis B, et al. Safety and feasibility of antiretroviral preexposure prophylaxis for adolescent men who have sex with men aged 15 to 17 years in the United States. *JAMA Pediatr* 2017;171:1063-71.
9. Zablotska IB, Vaccher SJ, Bloch M, et al; PrELUDE Study Group. High Adherence to HIV pre-exposure prophylaxis and no HIV seroconversions despite high levels of risk behaviour and STIs: the Australian Demonstration Study PrELUDE. *AIDS Behav* 2019;23:1780-9.
10. Grulich AE, Guy R, Amin J, et al; Expanded PrEP Implementation in Communities New South Wales (EPIC-NSW) research group. Population-level effectiveness of rapid, targeted, high-coverage roll-out of HIV pre-exposure prophylaxis in men who have sex with men: the EPIC-NSW prospective cohort study. *Lancet HIV* 2018;5:e629-37.
11. Lal L, Audsley J, Murphy DA, et al; VicPrEP Study Team. Medication adherence, condom use and sexually transmitted infections in Australian preexposure prophylaxis users. *AIDS* 2017;31:1709-14.
12. Traeger MW, Cornelisse VJ, Asselin J, et al; PrEPX Study Team. Association of HIV preexposure prophylaxis with incidence of sexually transmitted infections among individuals at high risk of HIV infection. *JAMA* 2019;321:1380-90.
13. Kesler MA, Kaul R, Myers T, et al. Perceived HIV risk, actual sexual HIV risk and willingness to take pre-exposure prophylaxis among men who have sex with men in Toronto, Canada. *AIDS Care* 2016;28:1–8.
14. Grant RM, Lama JR, Anderson PL, et al. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med* 2010;363:2587–99.
15. Thigpen MC, Kebaabetswe PM, Paxton LA, et al. Antiretroviral preexposure prophylaxis for heterosexual HIV transmission in Botswana. *N Engl J Med* 2012;367:423–34.
16. Choopanya K, Martin M, Suntharasamai P, et al; Bangkok Tenofovir Study Group. Antiretroviral prophylaxis for HIV infection in injecting drug users in Bangkok, Thailand (the Bangkok Tenofovir study): a randomised, double-blind, placebo-controlled phase 3 trial. *Lancet* 2013;381:2083–90.

17. King HL, Keller SB, Giancola MA, et al. Pre-exposure prophylaxis accessibility research and evaluation (PrEPARE study). *AIDS Behav* 2014;18:1722–5.
18. Amico KR, Miller J, Balthazar C, et al. Integrated next step counseling (iNSC) for sexual health and PrEP use among young men who have sex with men: implementation and observations from ATN110/113. *AIDS Behav* 2019;23:1812-23.
19. Sidebottom D, Ekström AM, Strömdahl S. A systematic review of adherence to oral pre-exposure prophylaxis for HIV - how can we improve uptake and adherence? *BMC Infect Dis* 2018;18:581.
20. Bradley E, Forsberg K, Betts JE, et al. Factors affecting pre-exposure prophylaxis implementation for women in the United States: a systematic review. *J Womens Health (Larchmt)* 2019 Jun 10. [Epub ahead of print]
21. Haberer JE, Baeten JM, Campbell J, et al. Adherence to antiretroviral prophylaxis for HIV prevention: a substudy cohort within a clinical trial of serodiscordant couples in East Africa. *PLoS Med* 2013;10:e1001511.
22. Mutua G, Sanders E, Mugo P, et al. Safety and adherence to intermittent pre-exposure prophylaxis (PrEP) for HIV-1 in African men who have sex with men and female sex workers. *PLoS One* 2012;7:e33103.
23. Grov C, Rendina HJ, John SA, Parsons JT. Determining the roles that club drugs, marijuana, and heavy drinking play in PrEP medication adherence among gay and bisexual men: implications for treatment and research. *AIDS Behav* 2019;23:1277-86.
24. Krakower D, Maloney KM, Powell VE, et al. Patterns and clinical consequences of discontinuing HIV preexposure prophylaxis during primary care. *J Int AIDS Soc* 2019;22:e25250.
25. Marcus JL, Buisker T, Horvath T, et al. Helping our patients take HIV pre-exposure prophylaxis (PrEP): a systematic review of adherence interventions. *HIV Med* 2014;15:385-95.
26. World Health Organization. Technical brief. What's the 2+1+1? Event-driven oral pre-exposure prophylaxis to prevent HIV for men who have sex with men: update to WHO's recommendation on oral PrEP. July 2019. Available at: <https://apps.who.int/iris/bitstream/handle/10665/325955/WHO-CDS-HIV-19.8-eng.pdf?ua=1> (last accessed 24 August 2019).



11. Behavioural strategies to reduce risk

In the era of human immunodeficiency virus (HIV) pre-exposure prophylaxis (PrEP) and treatment as prevention, behavioural methods of risk reduction – including condom use, clean injecting equipment, HIV serosorting, strategic positioning, and negotiated safe practices with sexual partners– retain their importance in preventing HIV transmission ([Box 11.1](#)). However, some vulnerable individuals, particularly some cis-gender and transgender women, may be unable to effectively negotiate use of these prevention strategies, especially condoms, with their regular, or casual partners. The initiation of PrEP is straightforward, but on occasion it may be appropriate to refer some particularly vulnerable people with complex needs to health professionals with expertise in HIV prevention and sexual health.

PrEP's efficacy relates directly to the patient's adherence to PrEP medication not to whether the patient is using condoms in tandem with PrEP ([1,2](#)). Individuals should be supported with ongoing information about the role that condoms and other practices play in preventing HIV when PrEP adherence is sub-optimal as well as the role that condoms play in sexually transmissible infection (STI) prevention.

Box 11.1 Discussion points on behavioural reduction of HIV and STI risk.

Provide feedback on HIV risk factors identified during sexual and substance use history taking:

- Elicit barriers to, and facilitators of consistent condom use and other safer sex and substance use practices
- Elicit barriers to, and facilitators of, reducing injecting drug use
- Discuss with patients the barriers to, and facilitators of, evidence-based drug treatment where indicated and requested.

Support risk-reduction efforts:

- Help patients identify one or two feasible, acceptable, incremental steps toward risk reduction
- Identify and address anticipated barriers to accomplishing planned actions to reduce risk.

Monitor medication adherence in a non-judgmental manner:

- Acknowledge the effort required for behavioural change
- Reinforce success.

If not fully successful, assess factors interfering with completion of planned actions and help patient identify the next steps (including consideration of commencing PrEP).

References

1. de Visser RO, Badcock PB, Rissel C, et al. Safer sex and condom use: findings from the Second Australian Study of Health and Relationships. *Sex Health* 2014;11:495-504.
2. Nasrullah M, Oraka E, Chavez PR, Johnson CH, DiNenno E. Factors associated with condom use among sexually active US adults, National Survey of Family Growth, 2006-2010 and 2011-2013. *J Sex Med* 2017;14:541-50.



12. How to access PrEP in Australia

There are three ways to access HIV pre-exposure prophylaxis (PrEP) in Australia:

1. Through the Australian health-care system

For an Australian resident with a current Medicare card, PrEP can be accessed through the Pharmaceutical Benefits Scheme (PBS) at a subsidised cost. As PrEP is listed as a Schedule 85 (s85) drug, any doctor can write a script for PrEP which can be taken to any pharmacy for dispensing. If PrEP is accessed in this way, a PBS co-payment at the pharmacy will need to be made.

2. Private script for supply from Australian pharmaceutical manufacturer

Any doctor can write a private script for PrEP and they have three brands to choose from (currently Gilead Sciences Pty Ltd, Generic Health Pty Ltd, Apotex Pty Ltd and Alphapharm Pty Ltd). Patients can have this script dispensed at a community pharmacy. The cost for a private script is higher than for PBS-subsidised medicines. This option is generally used by people who are not eligible for Medicare and who do not feel comfortable using the Personal Importation Scheme described below.

3. Through personal importation or purchase

If a person is not eligible to access PrEP through Medicare, or finds the cost of purchasing PrEP locally too high, then another option is to purchase a generic version of the drug online from a reliable overseas supplier using the Therapeutic Goods Administration's Personal Importation Scheme. A script from a doctor is still required before ordering online. There are multiple overseas suppliers who will supply PrEP for import into Australia at a range of costs. The [PrEP Access Now](#) website has more information on personal importation.



13. Models of PrEP delivery in clinical practice

Since 2016, many accredited prescribers of s100 HIV medication, sexual health specialists, general practitioners (GPs) and nurses in New South Wales, Queensland, Victoria, South Australia, Tasmania, Western Australia and the Australian Capital Territory have been involved in making pre-exposure prophylaxis (PrEP) available through clinical PrEP implementation trials and people self-importing PrEP. Since 1 April 2018, tenofovir disoproxil* and emtricitabine (TD*/FTC) and its generic versions have been available in Australia for human immunodeficiency virus (HIV) PrEP at subsidised cost and can be prescribed through the Pharmaceutical Benefits Scheme (PBS) by any GP or specialist (1).

Making PrEP easily accessible to all Australians where they live requires local medical providers to be aware of, and comfortable with prescribing, PrEP. Therefore, GPs' knowledge, acceptance and ability to provide PrEP are instrumental to optimising PrEP access and use.

ASHM's [Online Learning Module PrEP in practice: Guidance for GPs](#) as well as other PrEP resources for clinicians are designed to upscale their knowledge and skills: PrEP resources.

The prescription and provision of PrEP clinical and laboratory monitoring are straightforward for GPs and other clinicians. However some providers who are less experienced in serving populations at high risk of acquiring HIV and sexually transmissible infections (STIs) (e.g. men who have sex with men, transgender and gender-diverse people, Indigenous Australians, women involved in sex work, people whose partners are at high risk for HIV/STI, and people who inject drugs) may wish to consider establishing relationships with experienced and accredited HIV s100 prescribers, HIV clinics and sexual health centres, that can provide information and support if required and may be able to do so via Telehealth. Initiatives such as telementoring (2) and innovative Information and Communication Technology (ICT) solutions offered by eHealth NSW (3) are good examples of how communication technologies can support new PrEP prescribers in remote areas where traditional sexual health services may be limited.

When starting PrEP services, providers should also establish:

- appropriate referral pathways to ensure that specific needs of PrEP users are adequately provided (e.g. regular HIV and STI testing, the management of chronic hepatitis B infection, treatment of hepatitis C and possible abnormal liver and kidney function - see [Clinical Assessment](#) for more details).
- communication with local pharmacies to ensure uninterrupted refills of PrEP scripts. In rural and remote Australia, clinicians are advised to establish pathways with clinicians and pharmacies in metropolitan areas to help provide clinical support and provide an uninterrupted postal supply of PrEP medications.

An important approach to successful PrEP implementation is to engage representatives from HIV community-based organisations working with relevant populations in the delivery of PrEP (see Resources page for Australia's State and Territory-based AIDS Councils). AIDS Councils can assist with PrEP promotion

and education and, depending on their capacity, may also be able to assist with behavioural screening and adherence support. Similarly, support can be useful from community-based organisations working with culturally diverse communities, to ensure equality of access to PrEP.

When embarking on PrEP prescribing, providers should also consider the capacity of their practices to accommodate new patients and maintain follow-up every 3 months while taking PrEP. Several approaches may be helpful in dealing with these changes to practice:

- Careful planning of clinic appointments to allow sufficient space for PrEP initiation and regular follow-up visits
- Where resources allow, automating most steps in the patient pathway, to reduce the patient registration-to-PrEP prescription time
- Task shifting including having clinical nurse specialists, or trained nurses with clinician supervision in charge of PrEP-related services where possible
- Developing systems and procedures for recording and monitoring PrEP use.

Finally, clinical practices that are planning to build up their PrEP patient population can consider developing a customised communications plan for PrEP demand creation, including media channels and communication strategy which will be used to drive local PrEP awareness and use, with input from relevant local community-based organisations and sexual health services.

References

1. Australian Government Department of Health. The Pharmaceutical Benefits Scheme. Recommendations made by the PBAC - December 2017. Positive recommendations. Available at: <http://www.pbs.gov.au/info/industry/listing/elements/pbac-meetings/pbac-outcomes/recommendations-pbac-december-2017> (last accessed 24 August 2019).
2. Wood BR, Mann MS, Martinez-Paz N, et al. Project ECHO: telementoring to educate and support prescribing of HIV pre-exposure prophylaxis by community medical providers. *Sex Health* 2018;15:601-5.
3. NSW Government eHealth. Rural eHealth Strategy. Available at: <http://www.ehealth.nsw.gov.au/programs/clinical/rural> (last accessed 24 August 2019).



14. Suitability for PrEP - Parallel of Chapter 4

The guidance on PrEP suitability in this chapter is identical to the guidance provided in Chapter 4 on PrEP suitability. However this chapter is written for clinicians who prefer to and are skilled in evaluating people's suitability for PrEP according to how the person reports their gender identity and sexuality. For example a person assigned female at birth (cis-female) may identify their gender as male (trans-male) and their sexuality as a man who has sex with men (MSM). In this setting, the clinician would know to evaluate the person's suitability for PrEP based on the possibility that the person may practice both vaginal and anal sex. Alternatively a person assigned male at birth (cis-male) may identify their gender as female (trans-female) and their sexuality as heterosexual. If this person has undertaken gender-affirming surgery the clinician would then know to evaluate the person's suitability for PrEP based on the possibility that the person may practice both vaginal and anal sex. This Parallel of Chapter 4 foreshadows a future where all clinicians will be able to skilfully and comfortably evaluate the sexual health of their patients based on how their patients identify their gender and sexuality. For more information see: [a language guide: Trans and gender diverse inclusion](#).

Pre-exposure prophylaxis (PrEP) medications are registered in Australia with the Therapeutic Goods Administration (TGA) and they are subsidised by the Australian Pharmaceutical Benefits Scheme (PBS). All general practitioners and other medical specialists can prescribe PrEP using a PBS streamlined authority arrangement. No specialist training is required to prescribe PrEP, however resources and training guidance are available for clinicians who are new to prescribing PrEP.

People presenting for PrEP are typically at high risk of human immunodeficiency virus (HIV) infection and they should not be dissuaded from using PrEP. To do so is to deny a person access to one of the most effective HIV prevention tools currently available. Doctors who are not comfortable prescribing PrEP should refer the patient immediately to a colleague, or another service that does provide PrEP.

It should also be highlighted that sexual history taking is a necessary and routine part of medical practice, and when this process identifies that a patient may be at risk of HIV, clinicians should proactively offer these patients PrEP. Furthermore clinicians are encouraged to raise PrEP as an HIV prevention strategy with

patients whom they perceive to be at risk of HIV infection, even if the purpose of the patient's visit is not related to sexual health, sexually transmissible infections (STIs) or drug use.

These ASHM 2019 PrEP guidelines recommend daily PrEP for all people at risk of HIV infection. In addition, these guidelines also recommend that on-demand PrEP should be offered as an alternative option to cis-gender men who have sex with men (MSM). Please refer to section [Providing PrEP](#) for further information on initiating PrEP.

PrEP providers need to obtain a thorough sexual and drug-use history at baseline to determine a person's suitability for PrEP and to review their ongoing need for PrEP at each 3-monthly clinical review. It is important to acknowledge that a person's behaviour may change over time, and that a person may wish to continue PrEP even if their current HIV acquisition risk is not high.

These guidelines acknowledge that PrEP should be recommended as an HIV prevention strategy for people who have been at risk of HIV infection during the previous 3 months and who foresee having similar risks in the next 3 months. These guidelines also recommend PrEP for people who have not been at risk of HIV infection during the previous 3 months, but whose circumstances have changed, and they foresee HIV risk occurring in the next 3 months.

Please note that people who are eligible for PrEP based on their sexual behaviour may be simultaneously eligible for PrEP based on their injecting and other drug use behaviour and vice versa.

The following suitability criteria can be used to help structure a discussion with a patient about their sexual health and behaviour. Guidance on how to initiate and guide a discussion about a person's sexual and drug using behaviour in primary practice is available ([1](#)).

Only a small proportion of participants in PrEP studies have been transgender (trans) or gender diverse people ([2](#), [3](#), [4](#)). As a result, limited data are available for these populations. Incorrect assumptions can be made about trans people and their sexual practices, as they may practice vaginal/neovaginal and anal intercourse, both insertive and receptive. Trans and gender-diverse people who are at risk of acquiring HIV on the basis of their sexual history are eligible to access PrEP. It is essential for clinicians to take a sexual history using appropriate and sensitive language to assess risk.

Clinicians who have limited experience with prescribing PrEP are encouraged to discuss with a PrEP experienced clinician those patients whose PrEP suitability is unclear.

PrEP suitability criteria for men who have sex with men

This section addresses PrEP suitability for MSM. This section is relevant to people who were assigned male at birth and identify as male, known as cis-men. This section is also relevant to people who were assigned female at birth but identify as male, known as trans-men. Of note, trans-men who have sex with men may practice both anal and vaginal sex.

Box 14.1 PrEP suitability criteria for men who have sex with men**HIV risk in the previous 3 months and the future 3 months**

The clinician should prescribe PrEP if the patient describes a history of any of the following HIV acquisition risks in the previous 3 months and if the patient foresees that there are likely to be similar acquisition risks in the next 3 months:

- At least one episode of condomless anal intercourse (insertive or receptive) with a regular HIV-positive partner who is either not on treatment, or who is on treatment but has a detectable HIV viral load
- At least one episode of receptive condomless anal intercourse with any casual male partner
- At least one episode of condomless receptive vaginal sex with a regular HIV+ partner who is either not on treatment, or who is on treatment but has a detectable HIV viral load
- At least one episode of receptive condomless vaginal sex with any casual HIV+ male partner, or a male partner whose HIV status is unknown
- More than one episode of vaginal sex where a condom slipped off or broke where the HIV serostatus of the partner was not known, or where the partner was HIV+ and not on treatment or had a detectable viral load on treatment
- One or more episodes of engaging in sexualised drug use, sometimes referred to as 'chemsex'. In the Australian context this typically involves the use of crystal methamphetamine (Ice), but can also include the use of gamma hydroxybutyrate (GHB)
- One or more episodes of rectal/vaginal gonorrhoea, rectal/vaginal chlamydia, or infectious syphilis, including any STIs diagnosed at screening for PrEP
- More than one episode of anal intercourse where a condom slipped off or broke where the HIV serostatus of the partner was not known, or where the partner was HIV positive and not on treatment or had a detectable viral load on treatment.

HIV risk in the future 3 months

The clinician should prescribe PrEP if the patient foresees that they will have HIV acquisition risk in the upcoming 3 months, despite not having had HIV acquisition risk in the previous 3 months.

Note: The following list is not exhaustive and there are likely to be many other scenarios where PrEP could be suitably offered for people whose HIV risk acquisition is exclusively in the future:

- When a person plans to travel during which time they anticipate that they will be having condomless sex with casual partners
- When a person plans to return home to an overseas country which has a high HIV prevalence during which time they anticipate that they will be having condomless sex with casual partners
- When a person reports that they have recently left a monogamous relationship and will be having condomless sex with casual partners in the future
- When a person reports that they will be entering or leaving institutional or correctional facilities in the near future where they may have condomless sex with casual partners in the future
- When a person presents with concerns of deteriorating mental health and a history of having previously increased their HIV acquisition risk behaviour in this setting
- When a person presents with a history of intermittent binge drinking of alcohol or recreational drug use and a history of having had increased their HIV acquisition risk behaviour in this setting.

The clinician should consider prescribing PrEP also in the following circumstances:

- When an HIV serodiscordant couple experience undue suffering and anxiety about inter-couple HIV transmission despite the positive partner being virologically suppressed on treatment
- When a person reports being so anxious about HIV infection that it may prevent them from having regular HIV testing, or engaging in any form of anal sex
- When a person presents with a history of recurrent genital ulceration or dermatoses (e.g. psoriasis), as this may increase the risk of HIV transmission.

PrEP suitability criteria for heterosexuals

This section addresses PrEP suitability for heterosexuals. This section is relevant to the following populations: (i) people who were assigned female at birth (cis-female), identify as female and as heterosexual; (ii) people who were assigned male at birth (cis-male), identify as male and identify as heterosexual; (iii) people who were assigned male at birth (cis-male), identify as female (trans-female) and identify as heterosexual and (iv) people who were assigned female at birth (cis-female), identify as male (trans-male) and identify as heterosexual.

Box 14.2 PrEP suitability criteria for heterosexuals

HIV risk in the previous 3 months and the future 3 months

The clinician should prescribe PrEP if the patient describes a history of any of the following HIV acquisition risks in the previous 3 months and if the patient foresees that there are likely to be similar acquisition risks in the next 3 months.

- At least one episode of condomless anal or vaginal intercourse (insertive or receptive) with a regular HIV-positive partner who is either not on treatment, or who is on treatment but has a detectable HIV viral load
- At least one episode of receptive anal or vaginal condomless intercourse with any casual HIV-positive partner or a male bisexual partner of unknown status
- Episodes of planned condomless insertive or receptive vaginal sex in an effort to conceive with an HIV-positive partner, regardless of the HIV-positive partner's viral load.

HIV risk in the future 3 months

The clinician should prescribe PrEP if the patient foresees that they will have HIV acquisition risk in the upcoming 3 months, despite not having had HIV acquisition risk in the previous 3 months:

- Future episodes of planned condomless insertive or receptive vaginal sex in an effort to conceive with an HIV-positive partner, regardless of the HIV-positive partner's viral load
- When a person plans to travel to countries with high HIV prevalence during which time they anticipate having condomless sex with casual partners who are HIV positive or of unknown HIV serostatus
- When a person plans to return home to an overseas country which has a high HIV prevalence during which time they anticipate that they will be having condomless sex with casual partners
- When a person reports that they have recently left a monogamous relationship and will be having condomless sex with a casual HIV-positive partner, or a male or female partner of unknown HIV serostatus from a country with high HIV prevalence, or a male partner who is thought to have sex with men
- When an individual reports that they will be entering, or leaving institutional or correctional facilities in the near future where they may have condomless sex with HIV+ or gay or bisexual male casual partners in the future
- When a person presents with concerns of deteriorating mental health and a history of having had increased their HIV acquisition risk behaviour in this setting
- When a person presents with a history of intermittent binge drinking of alcohol or recreational drug use and a history of having had increased their HIV acquisition risk behaviour in this setting.

The clinician should consider prescribing PrEP also in the following circumstances:

- When an HIV serodiscordant couple experience undue suffering and anxiety about inter-couple HIV transmission despite the positive partner being virologically suppressed on treatment.

PrEP suitability criteria for people who inject drugs

In the first instance, people who inject drugs (PWID) should be advised of and provided with options for using sterile needles, syringes and other injecting equipment, and offered opioid substitution therapy for those who use opioids. People who inject drugs can be referred to local needle and syringe programs, or the [Australian Injecting and Illicit Drug Users League](#) affiliates in their state or territory.

Because PWID are susceptible to a range of infections and injuries, PrEP and other HIV-prevention interventions should be integrated into prevention and clinical care services for hepatitis A, B and C infection and other infectious diseases, and overdose prevention. These interventions include screening for hepatitis A, B and C viruses and providing incentivised vaccination for hepatitis A and B where clinically indicated, as well as screening for injection-related injuries and infections including abscesses, septicaemia and endocarditis (5).

The ASHM PrEP Guidelines Panel is cognisant of the concerns of the International Network of People who Use Drugs. The Network cautions against prioritising PrEP at the expense of other proven interventions as the prime HIV-prevention strategy for people who inject drugs, and emphasises that access to harm-reduction services remains a critical component of HIV prevention in people who inject drugs (6). This approach is particularly relevant in Australia where sterile needle and syringe coverage is high and HIV prevalence and incidence among people who inject drugs remains low and stable (7, 8).

A recent systematic review of HIV-treatment adherence among PWID in the United States and Canada, undertaken to inform potential PrEP adherence interventions for people who inject drugs, found that younger age, female sex, homelessness and incarceration were obstacles to HIV treatment adherence (9). By comparison, self-sufficiency, use of opioid substitution therapy, and high quality patient-provider relationships were facilitators for adherence (9). Self-reports from HIV-negative people who inject drugs were that HIV-related stigma in social networks, negative experiences with health-care providers, lack of money, homelessness and the criminal justice system were likely barriers to PrEP access (10). These factors should be considered when providing support to people commencing PrEP when they are at risk of HIV through injecting drug use.

The ASHM PrEP Guidelines Panel will continue to monitor the outcomes of the few ongoing studies of HIV PrEP in PWID.

Box 14.3 PrEP suitability criteria for people who inject drugs

HIV risk in the previous 3 months and the future 3 months

The clinician should prescribe PrEP if the patient describes a history of any of the following HIV acquisition risks in the previous 3 months and if the patient foresees that there are likely to be similar acquisition risks in the next 3 months:

- Shared injecting equipment with an HIV-positive person or with a gay or bisexual man of unknown HIV status
- At least one episode of condomless anal or vaginal intercourse (insertive or receptive) with a regular HIV-positive partner who is either not on treatment, or who is on treatment but has a detectable HIV viral load
- At least one episode of receptive anal or vaginal condomless intercourse with any casual HIV-positive partner or a male homosexual or bisexual partner of unknown status.

HIV risk in the future 3 months

The clinician should prescribe PrEP if the patient foresees that they will have HIV acquisition risk in the upcoming 3 months, despite not having had HIV acquisition risk in the previous 3 months.

- A person has recently (re)commenced injecting drugs and is injecting with a person who is HIV positive, or with a gay or bisexual man whose HIV status is unknown
- When a person plans to travel to countries with high HIV prevalence during which time they anticipate injecting drugs with other people who are HIV positive or of unknown HIV serostatus
- When a person reports that they will be entering, or leaving institutional or correctional facilities in the near future during which time they may inject drugs with people who are HIV positive or of unknown HIV serostatus

References

1. Australasian Sexual Health Alliance (ASHA). Australian STI management guidelines for use in primary care [internet]. Taking a sexual history and contact tracing. Updated December 2018. Available at: <http://www.sti.guidelines.org.au/resources/how-to-take-a-sexual-history#how-to-take-a-sexual-history> (last accessed 3 September 2019).
2. Grant RM, Sevelius JM, Guanira JV, Aguilar JV, Chariyalertsak S, Deutsch MB. Transgender women in clinical trials of pre-exposure prophylaxis. *J Acquir Immune Defic Syndr* 2016;72 Suppl 3:S226-9.
3. Grant RM, Lama JR, Anderson PL, et al; iPrEx Study Team. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med* 2010;363:2587-99.
4. Mehrotra ML, Westreich D, McMahan VM, et al. Baseline characteristics explain differences in effectiveness of randomization to daily oral TDF/FTC PrEP between transgender women and cisgender men who have sex with men in the iPrEx Trial. *J Acquir Immune Defic Syndr* 2019; 81:e94-8
5. Centers for Disease Control and Prevention (CDC). Integrated prevention services for HIV infection, viral hepatitis, sexually transmitted diseases, and tuberculosis for persons who use drugs illicitly: summary guidance from CDC and the U.S. Department of Health and Human Services. *MMWR Recomm Rep* 2012;61(RR-5):1–40.
6. International Network of People who Use Drugs (INPUD). Position paper: pre-exposure prophylaxis (PrEP) for people who inject drugs. April 2015. Available at: www.inpud.net/INPUD_PositionPaper_Pre-exposure_prophylaxis_PrEP_April15.pdf (last accessed 3 September 2019).
7. Wodak A, Maher L. The effectiveness of harm reduction in preventing HIV among injecting drug users. *NSW Public Health Bulletin* 2010;21(3–4):69-73.
8. Kwon JA, Iversen J, Law M, Dolan K, Wand H, Maher L. Estimating the number of people who inject drugs and syringe coverage in Australia, 2005-2016. *Drug Alcohol Depend* 2019;197:108-14.
9. Bazzi AR, Drainoni ML, Biancarelli DL, et al. Systematic review of HIV treatment adherence research among people who inject drugs in the United States and Canada: evidence to inform pre-exposure prophylaxis (PrEP) adherence interventions. *BMC Public Health* 2019;19:31.
10. Biello KB, Bazzi AR, Mimiaga MJ, et al. Perspectives on HIV pre-exposure prophylaxis (PrEP) utilization and related intervention needs among people who inject drugs. *Harm Reduct J* 2018;15:55.

Appendix 1

Cockcroft–Gault formula

Basic formula [1]

$$eCrCl_{CG} = \left[\frac{[(140 - \text{age}) \times \text{IBW} \times 0.85 \text{ for females}]}{\text{serum creatinine} \times 72} \right]$$

IBW=ideal body weight

Males: IBW=50 kg+2.3 kg for each inch over 5 feet

Females: IBW=45.5 kg+2.3 kg for each inch over 5 feet, age in years, weight in kg, and serum creatinine in mg/100 mL

Optional adjustment for low actual body weight [2]

If the actual body weight is less than the IBW use the actual body weight for calculating the eCrCl.

Optional adjustment of high actual body weight [2]

Used only if the actual body weight is 30% greater than the IBW. Otherwise, the IBW is used. $eCrCl = \left[\frac{[(140 - \text{age}) \times \text{AjBW}]}{\text{serum creatinine} \times 72} \right] (\times 0.85 \text{ for females})$

$$\text{AjBW} = \text{IBW} + 0.3(\text{ABW} - \text{IBW})$$

AjBW=adjusted body weight; ABW=actual body weight

Optional adjustment for body surface area (BSA) [3]

Can be used if actual body weight is greater or less than IBW

$$eCrCl_{BSAadj} = 1.73 \text{ m}^2 \times eCrCl_{CG} \text{ (mL/min)} \div \text{BSA of the patient (m}^2\text{)}$$

$$\text{BSA (DuBois and DuBois formula [4])} = (\text{height (m)} \times 0.725 \times \text{weight (kg)} \times 0.425) \div 139.2$$

REFERENCES

1. Cockcroft DW , Gault MH. ,
Prediction of creatinine clearance from serum creatinine.
Nephron 1976; 16: 31- 41.
2. Wargo KA , Eiland EH , Hamm W , et al.
Comparison of the modification of diet in renal disease and Cockcroft-
Gault equations for antimicrobial dosage adjustments.
Ann Pharmacother 2006; 40: 1248- 1253.
3. Rostoker G , Andrivet P , Pham I , et al.
Accuracy and limitations of equations for predicting the glomerular
filtration rate during follow-up of patients with non-diabetic nephropathies.
BMC Nephrol 2009; 10: 16-
4. Du Bois D , Du Bois EF. ,
A formula to estimate the approximate surface area if height and
weight beknown. 1916.
Nutrition 1989; 5: 303- 311. discussion 312–303

Appendix 2

Current list of TGA Approved HIV diagnostic and monitoring tests on the Australian Register of Therapeutic Goods (as of May 2019)

1. [Roche Diagnostics Australia Pty Limited - cobas HIV-1/HIV-2...](#)
ARTG ID: 313870
Product name: cobas HIV-1/HIV-2 Qualitative - HIV1/HIV2 nucleic acid IVD, kit, nucleic acid technique (NAT)
Sponsor: Roche Diagnostics Australia Pty Limited
Manufacturer: Roche Molecular Systems Inc
2. [Atomo Diagnostics Pty Ltd - Atomo HIV self test -HIV1/HIV2 antibody...](#)
ARTG ID: 311989
Product name: Atomo HIV self test - HIV1/HIV2 antibody IVD, kit, immunochromatographic test (ICT), rapid
Sponsor: Atomo Diagnostics Pty Ltd
Manufacturer: Atomo Diagnostics Pty Ltd
3. [Abbott Australasia Pty Ltd Diagnostic Division - Alinity s HIV Ag/Ab...](#)
ARTG ID: 311748
Product name: Alinity s HIV Ag/Ab Combo Assay - HIV1/HIV2 antigen/ antibody IVD, kit, chemiluminescent immunoassay
Sponsor: Abbott Australasia Pty Ltd Diagnostic Division
Manufacturer: Abbott GmbH & Co KG
4. [Roche Diagnostics Australia Pty Limited - PreciControl HIV;...](#)
ARTG ID: 303171
Product name: PreciControl HIV; HIV-2+GrpO - HIV1/HIV2 antigen/ antibody IVD, control
Sponsor: Roche Diagnostics Australia Pty Limited
Manufacturer: Roche Diagnostics GmbH
5. [Roche Diagnostics Australia Pty Limited - PreciControl HIV Gen II -...](#)
ARTG ID: 303170
Product name: PreciControl HIV Gen II - HIV1/HIV2 antigen/antibody IVD, control
Sponsor: Roche Diagnostics Australia Pty Limited
Manufacturer: Roche Diagnostics GmbH
6. [Roche Diagnostics Australia Pty Limited - Elecsys HIV Duo - HIV1/HIV2...](#)
ARTG ID: 303169
Product name: Elecsys HIV Duo - HIV1/HIV2 antigen/antibody IVD, kit, chemiluminescent immunoassay
Sponsor: Roche Diagnostics Australia Pty Limited
Manufacturer: Roche Diagnostics GmbH
7. [Abbott Australasia Pty Ltd Diagnostic Division - Alinity i HIV Ag/Ab...](#)
ARTG ID: 299664
Product name: Alinity i HIV Ag/Ab Combo - HIV1/HIV2 antigen/antibody IVD, kit, chemiluminescent immunoassay
Sponsor: Abbott Australasia Pty Ltd Diagnostic Division
Manufacturer: Abbott GmbH & Co KG
8. [Ortho-Clinical Diagnostics Australia Pty Ltd - VITROS...](#)
ARTG ID: 299339
Product name: VITROS Immunodiagnostic Products HIV Combo - HIV1/ HIV2 antigen/antibody IVD, kit, chemiluminescent immunoassay
Sponsor: Ortho-Clinical Diagnostics Australia Pty Ltd
Manufacturer: Ortho-Clinical Diagnostics
9. [Roche Diagnostics Australia Pty Limited - cobas HIV-1 for use on the...](#)
ARTG ID: 294066
Product name: cobas HIV-1 for use on the cobas 6800/8800 Systems - HIV1 nucleic acid IVD, kit, nucleic acid technique (NAT)
Sponsor: Roche Diagnostics Australia Pty Limited
Manufacturer: Roche Diagnostics GmbH
10. [Roche Diagnostics Australia Pty Limited - cobas HBV/HCV/HIV-1 Control...](#)
ARTG ID: 294020
Product name: cobas HBV/HCV/HIV-1 Control Kit for use on the cobas 4800 System - HIV1/Hepatitis C virus/Hepatitis B virus nucleic acid IVD, control
Sponsor: Roche Diagnostics Australia Pty Limited
Manufacturer: Roche Diagnostics GmbH
11. [Roche Diagnostics Australia Pty Limited - cobas HIV-1 for use on the...](#)
ARTG ID: 294019
Product name: cobas HIV-1 for use on the cobas 4800 System - HIV1 nucleic acid IVD, kit, nucleic acid technique (NAT)
Sponsor: Roche Diagnostics Australia Pty Limited
Manufacturer: Roche Diagnostics GmbH
12. [Roche Diagnostics Australia Pty Limited - cobas HBV/HCV/HIV-1 Control...](#)
ARTG ID: 294018
Product name: cobas HBV/HCV/HIV-1 Control Kit for use on the cobas 6800/8800 Systems - HIV1/Hepatitis C virus/Hepatitis B virus nucleic acid IVD, control
Sponsor: Roche Diagnostics Australia Pty Limited
Manufacturer: Roche Diagnostics GmbH
13. [Vela Diagnostics Australia Pty Ltd - Human immunodeficiency virus...](#)
ARTG ID: 291546
Product name: Human immunodeficiency virus (HIV) IVDs
Sponsor: Vela Diagnostics Australia Pty Ltd
Manufacturer: Vela Operations Singapore Pte Ltd
14. [Bio-Rad Laboratories Pty Ltd - Access HIV Combo QC4 & QC5 -...](#)
ARTG ID: 289821
Product name: Access HIV Combo QC4 & QC5 - HIV1/HIV2 antigen/ antibody IVD, control
Sponsor: Bio-Rad Laboratories Pty Ltd
Manufacturer: Bio-Rad
15. [Abbott Australasia Pty Ltd Molecular Division - Human...](#)
ARTG ID: 286713
Product name: Human immunodeficiency virus (HIV) IVDs
Sponsor: Abbott Australasia Pty Ltd Molecular Division
Manufacturer: Abbott Molecular Inc
16. [DiaSorin Australia Pty Ltd - LIAISON XL MUREX HIV Ab/Ag HT -...](#)
ARTG ID: 279803
Product name: LIAISON XL MUREX HIV Ab/Ag HT - HIV1/HIV2 antigen/ antibody IVD, kit, chemiluminescent immunoassay
Sponsor: DiaSorin Australia Pty Ltd
Manufacturer: DiaSorin Spa

17. [Inverness Medical Innovations Australia Pty Ltd T/A Alere - Alere HIV ...](#)
ARTG ID: 276049
Product name: Alere HIV Combo - HIV1/HIV2 antigen/antibody IVD, kit, immunochromatographic test (ICT), rapid
Sponsor: Inverness Medical Innovations Australia Pty Ltd T/A Alere
Manufacturer: Alere Medical Co Ltd
18. [Hologic Australia Pty Ltd - Aptima HIV-1 Quant Dx Calibrator Kit...](#)
ARTG ID: 269682
Product name: Aptima HIV-1 Quant Dx Calibrator Kit, PRD-03001 - HIV1 nucleic acid IVD, calibrator
Sponsor: Hologic Australia Pty Ltd
Manufacturer: Hologic Inc
19. [Hologic Australia Pty Ltd - Aptima HIV-1 Quant Dx Controls Kit...](#)
ARTG ID: 269681
Product name: Aptima HIV-1 Quant Dx Controls Kit, PRD-03002 - HIV1 nucleic acid IVD, control
Sponsor: Hologic Australia Pty Ltd
Manufacturer: Hologic Inc
20. [Hologic Australia Pty Ltd - Aptima HIV-1 Quant DX Assay Kit...](#)
ARTG ID: 269680
Product name: Aptima HIV-1 Quant DX Assay Kit, PRD-03000 - HIV1 nucleic acid IVD, kit, nucleic acid technique (NAT)
Sponsor: Hologic Australia Pty Ltd
Manufacturer: Hologic Inc
21. [DiaSorin Australia Pty Ltd - Murex HIV-1.2.0 - HIV1/HIV2 antibody...](#)
ARTG ID: 264533
Product name: Murex HIV-1.2.0 - HIV1/HIV2 antibody IVD, kit, enzyme immunoassay (EIA)
Sponsor: DiaSorin Australia Pty Ltd
Manufacturer: DiaSorin Spa UK Branch
22. [Cepheid Holdings Pty Ltd - Human immunodeficiency virus \(HIV\) IVDs](#)
ARTG ID: 259967
Product name: Human immunodeficiency virus (HIV) IVDs
Sponsor: Cepheid Holdings Pty Ltd
Manufacturer: Cepheid AB
23. [Abbott Australasia Pty Ltd Molecular Division - Human...](#)
ARTG ID: 258054
Product name: Human immunodeficiency virus (HIV) IVDs
Sponsor: Abbott Australasia Pty Ltd Molecular Division
Manufacturer: Celera Corporation
24. [Ortho-Clinical Diagnostics Australia Pty Ltd - VITROS Anti-HIV.1 + 2...](#)
ARTG ID: 251957
Product name: VITROS Anti-HIV 1 + 2 - HIV1/HIV2 antibody IVD, kit, chemiluminescent immunoassay
Sponsor: Ortho-Clinical Diagnostics Australia Pty Ltd
Manufacturer: Ortho-Clinical Diagnostics
25. [Immuno Pty Ltd - Uni-Gold HIV - HIV1/HIV2 antibody IVD, kit...](#)
ARTG ID: 240814
Product name: Uni-Gold HIV - HIV1/HIV2 antibody IVD, kit, immunochromatographic test (ICT), rapid
Sponsor: Immuno Pty Ltd
Manufacturer: Trinity Biotech Plc
26. [Integrated Sciences Pty Ltd - OraQuick ADVANCE® Rapid HIV-1/2...](#)
ARTG ID: 240813
Product name: OraQuick ADVANCE® Rapid HIV-1/2 Antibody Test and Kit Controls - HIV1/HIV2 antibody IVD, kit, immunochromatographic test (ICT), rapid
Sponsor: Integrated Sciences Pty Ltd
Manufacturer: Orasure Technologies Inc
27. [Siemens Healthcare Pty Ltd - ADVIA Centaur HIV 1/0/2 Enhanced \(EHIV\)...](#)
ARTG ID: 239117
Product name: ADVIA Centaur HIV 1/0/2 Enhanced (EHIV) - HIV1/HIV2 antibody IVD, kit, chemiluminescent immunoassay
Sponsor: Siemens Healthcare Pty Ltd
Manufacturer: Siemens Healthcare Diagnostics Inc
28. [Bio-Rad Laboratories Pty Ltd - Access HIV Combo QC - HIV1/HIV2...](#)
ARTG ID: 237303
Product name: Access HIV Combo QC - HIV1/HIV2 antigen/antibody IVD, control
Sponsor: Bio-Rad Laboratories Pty Ltd
Manufacturer: Bio-Rad
29. [Bio-Rad Laboratories Pty Ltd - Access HIV Combo Calibrators ...](#)
ARTG ID: 237302
Product name: Access HIV Combo Calibrators - HIV1/HIV2 antigen/antibody IVD, calibrator
Sponsor: Bio-Rad Laboratories Pty Ltd
Manufacturer: Bio-Rad
30. [Biomerieux Australia Pty Ltd - bioMerieux SA VIDAS HIV DUO Ultra ...](#)
ARTG ID: 233218
Product name: bioMerieux SA VIDAS HIV DUO Ultra - HIV1/HIV2 antigen/antibody IVD, kit, enzyme immunoassay (EIA)
Sponsor: Biomerieux Australia Pty Ltd
Manufacturer: Biomerieux SA
31. [Inverness Medical Innovations Australia Pty Ltd T/A Alere - Determine...](#)
ARTG ID: 232594
Product name: Determine HIV-1/2 - HIV1/HIV2 antibody IVD, kit, immunochromatographic test (ICT), rapid
Sponsor: Inverness Medical Innovations Australia Pty Ltd T/A Alere
Manufacturer: Alere Medical Co Ltd
32. [Bio-Rad Laboratories Pty Ltd - Geenius™ HIV 1/2 Confirmatory Controls...](#)
ARTG ID: 229652
Product name: Geenius™ HIV 1/2 Confirmatory Controls - HIV1/HIV2 antibody IVD, control
Sponsor: Bio-Rad Laboratories Pty Ltd
Manufacturer: Bio-Rad
33. [Bio-Rad Laboratories Pty Ltd - Geenius™ HIV 1/2 Confirmatory Assay ...](#)
ARTG ID: 229064
Product name: Geenius™ HIV 1/2 Confirmatory Assay - HIV1/HIV2 antibody IVD, kit, immunochromatographic test (ICT), rapid
Sponsor: Bio-Rad Laboratories Pty Ltd
Manufacturer: Bio-Rad
34. [Roche Diagnostics Australia Pty Limited - PreciControl HIV 1, 2, 3 ...](#)
ARTG ID: 226161
Product name: PreciControl HIV 1, 2, 3 - HIV1 antigen/antibody IVD, control
Sponsor: Roche Diagnostics Australia Pty Limited
Manufacturer: Roche Diagnostics GmbH
35. [Roche Diagnostics Australia Pty Limited - Elecsys HIV Combi PT ...](#)
ARTG ID: 226069
Product name: Elecsys HIV combi PT (Modular Analytics E170, cobas e 411/601/602) - HIV1/HIV2 antigen/antibody IVD, kit, chemiluminescent immunoassay
Sponsor: Roche Diagnostics Australia Pty Limited
Manufacturer: Roche Diagnostics GmbH
36. [Bio-Rad Laboratories Pty Ltd - Genscreen ULTRA HIV Ag-Ab - HIV1/HIV2...](#)
ARTG ID: 220632
Product name: Genscreen ULTRA HIV Ag-Ab - HIV1/HIV2 antigen/antibody IVD, kit, enzyme immunoassay (EIA)
Sponsor: Bio-Rad Laboratories Pty Ltd
Manufacturer: Bio-Rad

[37. Bio-Rad Laboratories Pty Ltd - Genscreen HIV-1 Ag Confirmatory Assay...](#)

ARTG ID: 220068

Product name: Genscreen HIV-1 Ag Confirmatory Assay - HIV1 antigen neutralization IVD, kit, enzyme immunoassay (EIA)

Sponsor: Bio-Rad Laboratories Pty Ltd

Manufacturer: Bio-Rad

[38. Bio-Rad Laboratories Pty Ltd - Genscreen HIV-1 Antigen Assay - HIV...](#)

ARTG ID: 220067

Product name: Genscreen HIV-1 Antigen Assay - HIV1 antigen IVD, kit, enzyme immunoassay (EIA)

Sponsor: Bio-Rad Laboratories Pty Ltd

Manufacturer: Bio-Rad

[39. Bio-Rad Laboratories Pty Ltd - Genscreen™ HIV-1/2 Version 2 -...](#)

ARTG ID: 220061

Product name: Genscreen™ HIV-1/2 Version 2 - HIV1/HIV2 antibody IVD, kit, enzyme immunoassay (EIA)

Sponsor: Bio-Rad Laboratories Pty Ltd

Manufacturer: Bio-Rad

[40. Abbott Australasia Pty Ltd Molecular Division - Human...](#)

ARTG ID: 217841

Product name: Human immunodeficiency virus (HIV) IVDs

Sponsor: Abbott Australasia Pty Ltd Molecular Division

Manufacturer: Abbott Molecular Inc

[41. Abbott Australasia Pty Ltd Diagnostic Division - ARCHITECT HIV Ag/Ab...](#)

ARTG ID: 213306

Product name: ARCHITECT HIV Ag/Ab Combo assay - HIV1/HIV2 antigen/antibody IVD, kit, chemiluminescent immunoassay

Sponsor: Abbott Australasia Pty Ltd Diagnostic Division

Manufacturer: Abbott GmbH & Co KG

[42. Abbott Australasia Pty Ltd Diagnostic Division - PRISM HIV Ag/Ab...](#)

ARTG ID: 212528

Product name: PRISM HIV Ag/Ab combo assay - HIV1/HIV2 antigen/antibody IVD, kit, chemiluminescent immunoassay

Sponsor: Abbott Australasia Pty Ltd Diagnostic Division

Manufacturer: Abbott GmbH & Co KG

[43. MP Biomedicals Australasia Pty Ltd - MP Diagnostics HIV Blot 2.2...](#)

ARTG ID: 212462

Product name: MP Diagnostics HIV Blot 2.2 assay - HIV1/HIV2 antibody IVD, kit, immunoblot

Sponsor: MP Biomedicals Australasia Pty Ltd

Manufacturer: MP Biomedicals Asia Pacific Pte Ltd

[44. DiaSorin Australia Pty Ltd - LIAISON XL MUREX HIV Ab / Ag - HIV1/HIV2...](#)

ARTG ID: 212434

Product name: LIAISON XL MUREX HIV Ab / Ag - HIV1/HIV2 antigen/antibody IVD, kit, chemiluminescent immunoassay

Sponsor: DiaSorin Australia Pty Ltd

Manufacturer: DiaSorin SpA

[45. Qiagen Pty Ltd - Human immunodeficiency virus \(HIV\) IVDs](#)

ARTG ID: 210376

Product name: Human immunodeficiency virus (HIV) IVDs

Sponsor: Qiagen Pty Ltd

Manufacturer: Qiagen GmbH

[46. Bio-Rad Laboratories Pty Ltd - Access HIV Combo - HIV1/HIV2...](#)

ARTG ID: 207994

Product name: Access HIV Combo - HIV1/HIV2 antigen/antibody IVD, kit, chemiluminescent immunoassay

Sponsor: Bio-Rad Laboratories Pty Ltd

Manufacturer: Bio-Rad

[47. Siemens Healthcare Pty Ltd - ADVIA Centaur HIV Ag/Ab Combo \(CHIV\) -...](#)

ARTG ID: 205090

Product name: ADVIA Centaur HIV Ag/Ab Combo (CHIV) - HIV1/HIV2 antigen/antibody IVD, kit, chemiluminescent immunoassay

Sponsor: Siemens Healthcare Pty Ltd

Manufacturer: Siemens Healthcare Diagnostics Inc

[48. Siemens Healthcare Pty Ltd - Human immunodeficiency virus \(HIV\) IVDs](#)

ARTG ID: 185755

Product name: Human immunodeficiency virus (HIV) IVDs

Sponsor: Siemens Healthcare Pty Ltd

Manufacturer: Siemens Healthcare Diagnostics Inc

[49. Roche Diagnostics Australia Pty Limited - Human immunodeficiency...](#)

ARTG ID: 180220

Product name: Human immunodeficiency virus (HIV) IVDs - Human immunodeficiency virus (HIV) IVDs

Sponsor: Roche Diagnostics Australia Pty Limited

Manufacturer: Roche Molecular Systems Inc



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