Human Immunodeficiency virus (HIV)
CDNA national Guidelines for Public Health Units

1. Summary

This guideline outlines the public health aspects of management of a new HIV diagnosis. Clinical management of the person with HIV is the remit of the treating clinician. Responsibility for contact tracing and contact management varies between jurisdictions and may be undertaken by sexual health clinics, public health units, the diagnosing clinician and/or a specialist clinician to whom the patient has been referred. Detailed information regarding the operationalisation of contact tracing, including ways of notifying contacts and resources available to support this process, are available in the Australasian Contact Tracing Manual (1).

This document identifies priorities for the follow up of individual HIV notifications. Broader public health measures for the HIV epidemic response at a population level are detailed in the National HIV Strategy (2). The most important priorities identified in this guideline for HIV prevention and control are:

- Timely diagnosis of HIV, engagement in care and prevention of transmission risk (including treatment as indicated) in people with HIV
- Detection and prevention of transmission risk (including treatment as indicated) in contacts of people with HIV
- Targeted screening of high risk groups
- Education and support regarding preventive behaviours, namely condom use and safe injecting practices
- Increasing treatment uptake and support for people with HIV to achieve viral suppression through antiretroviral therapy, to both prevent HIV progression in the individual and to reduce the risk of transmission

Public health priority

High in the following special situations: where the case has donated or received blood or tissue products; cases in children, pregnant or breastfeeding women, healthcare workers or sex workers; suspected iatrogenic or nosocomial infection; and the uncommon occasions where the case may have been knowingly infected or the case is knowingly putting others at risk.

Routine priority for other cases.

Case management

- Confirm case
- Obtain a comprehensive history of sexual and/or injecting exposures and other risk factors including, as appropriate, relevant medical history such as blood transfusions and relevant demographic factors such as country of birth
- Undertake a risk assessment of exposure, time, place and other risk factors

- Confirm if/when last or any previous HIV testing was undertaken
- Education including information about HIV; jurisdiction-specific legal requirements and other issues regarding disclosure of HIV status; safe sex and safe injecting practices to minimise risks of HIV and STI transmission
- Counselling and support to adapt to a new diagnosis, education about the need for contact tracing and advice regarding the various strategies available
- Seek advice regarding restrictions in special circumstances as appropriate, such as if the case is a healthcare worker or sex worker
- Assessment of viral load, CD4 count and consideration of anti-retroviral therapy by the clinical team. Ensure referral to a HIV specialist service has been made.

Contact management

- If a contact has been exposed to HIV in the preceding 72 hours, refer to the local emergency department, sexual health clinic or s100 GP for assessment /discussion with a specialist physician regarding eligibility for post-exposure prophylaxis.
- Offer confidential HIV testing and obtain informed consent
- Advise about the need for safe sex and other preventive measures while HIV status is being ascertained.

As in all public health practice, due care must be paid to ensure that cases are not inadvertently identifiable. In jurisdictions where public health units are not routinely involved in follow-up of HIV cases, they should be consulted for advice and assistance as required.

2. The disease

Infectious agents

Human immunodeficiency virus (HIV) is a human retrovirus with two identified types (HIV-1 and HIV-2). HIV-1 is the most widely prevalent type and is the cause of the global HIV pandemic. HIV-2 occurs primarily in West Africa. Dual infection with both HIV-1 and HIV-2 may occur.

HIV-1 and HIV-2 differ. HIV-2 appears to have a slower immunological and clinical course, being less transmissible and less pathogenic than HIV-1.

Reservoir

Humans

Mode of transmission

For all modes of HIV transmission, viral load is the most important biological risk factor for onward transmission. That is, higher viral loads pose a higher risk of transmission, and an undetectable viral load is not associated with transmission unless exceptional circumstances apply (such as organ transplantation). Factors that may influence viral load are detailed under ***Infectious period***.

Behavioural risk factors, such as having unprotected sex and re-use of injecting drug equipment, increase risk of exposure.

Table 1: Modes of HIV transmission, transmission risks following exposure to a person with HIV and factors influencing HIV transmission risk.

Mode of Transmission	Potential Exposures from a known HIV positive person	Transmission Risk Following Exposure from a Person with HIV	Factors Influencing Transmission Risk*
Unprotected sexual contact	Infected semen, vaginal fluids, blood and other body fluids during unprotected anal or vaginal intercourse	Unprotected anal or vaginal sex: between approximately 0.1% - 2% (3). Higher with anal than vaginal intercourse Higher for receptive than insertive partner Insertive or receptive oral sex: negligible risk	Factors influencing local genital tract viral load and/or genital viral shedding: Co-infection of either partner with other STIs, especially those involving skin or mucosal ulceration Menstruation, pregnancy, cervical ectopy (3). Male circumcision status, which has a protective effect for heterosexual men, reducing risk of acquiring HIV from an infected female partner (4). has no demonstrated effect on reducing risk of HIV transmission from male to female. may have a protective effect among men who have sex with men who engage primarily in insertive anal intercourse, but overall there is still insufficient evidence regarding the effect of circumcision on risk of male to male sexual transmission (5).
Maternal to child transmission	During pregnancy, delivery or through breastfeeding, although most transmission globally occurs during delivery(6)	Low in women with undetectable viral load. Maternal to child transmission is rare in Australia	Factors that decrease transmission risk (10, 11): antiretroviral therapy during pregnancy and intrapartum in the presence of detectable viral load, delivery by caesarean section before the

		(7). With appropriate interventions, transmission is less than 2% in developed countries (8, 9).	onset of labour and rupture of membranes avoidance of breastfeeding use of antiretroviral prophylaxis in infants exposed to HIV.
Exposure to blood, blood products or tissue from a person with HIV	Reuse of needles and syringes & other injecting equipment following their use by a person infected with HIV Percutaneous and mucous membrane occupational exposures including sharps injuries or other exposure to blood and body fluids (e.g. in the healthcare setting or in other settings where invasive procedures such as tattooing or body piercing are performed). Following transfusion of infected blood or blood products	Risk following percutaneous exposures depends on the nature of the injury and equipment involved: Very low risk for a superficial injury involving a solid needle (e.g. suturing needle) Very high risk for a deep wound involving a hollow-bore needle. Extremely high risk (close to 100%) following direct injection of contaminated blood. No documented reports of HIV seroconversion following sharps injuries in the community from publically discarded syringes (3). HIV survives poorly in	Steps taken to protect Australia's blood supply include: screening all donations for blood-borne viruses including HIV tests for the presence of antibody to HIV-1 and HIV-2, and nucleic acid testing for the presence of HIV-1 RNA (13). declaration statements required of donors prior to donation, stating that they do not have a history of factors that would increase their risk of having HIV or other blood-borne viruses. Serological and virological screening of donor organs and tissues for transplantation is critical to ensuring safety of the donor bank. Although this crucial step minimises risk of microbial transmission, risk is not reduced to zero because of the possibility that screening is conducted during the window period. In countries with high HIV prevalence, procedures such as tattooing, body piercing, medical, surgical or dental procedures, and transfusions have the risk of transmitting HIV if insufficient attention is paid to infection control and screening of donors and the blood supply. Risk of HIV will vary with the local seroprevalence.

Following transplantation of infected organs (e.g. kidneys, liver), or transplantation of tissues (e.g. bone grafts), or by artificial insemination with infected semen.	the environment and is rapidly inactivated by UV light, so community contacts should be counselled that their risk is statistically indistinguishable from zero. HIV transmission through the blood supply has been virtually eliminated in Australia and HIV prevalence among first-time blood donors is very low (2 per 100 000 donations) (12). Notably, this is NOT the prevalence in the blood supply as these cases are detected and excluded from donating.

* viral load is the most important biological factor influencing risk of onward transmission, for all modes of transmission.

Other uncommon modes of transmission have been described in a small number of cases, including pre-mastication of food for infants and from breastfeeding infants to women (14, 15). These are not considered major drivers of HIV transmission from a public health perspective. HIV is detectable at very low levels in other body fluids including saliva, tears, bronchial secretions and urine.(16-19) Although there may be a theoretical risk, for public health purposes it can be considered that these fluids do not pose a risk of HIV transmission. HIV infection is not transmitted by casual social or household contact with an HIV-positive person. There is no evidence of HIV transmission following insect bites (20).

Following exposure to a person whose HIV status is not known, the risk of HIV transmission depends on a) the risk that the exposure source is HIV positive and b) the type of exposure and associated risk (21). The risk of the exposure source being positive depends on the population prevalence of HIV. More detailed information about transmission risk, including HIV prevalence within various population subgroups and risk estimates by type of exposure, is available in the national guidelines for post-

exposure prophylaxis after occupational and non-occupational exposure to HIV, available online at ASHM (21).

Incubation period

The period from exposure to the primary seroconversion illness is usually one to four weeks. The period from exposure to development of detectable anti-HIV antibodies is usually less than one month and may be much shorter, but may be up to three months. This will vary with the type of test performed. The presence of the virus itself can be detected earlier (see section 8, Laboratory testing).

Infectious period

Infectivity is lifelong and is determined by the amount of virus in body fluids, particularly semen and vaginal secretions. Plasma viral load is a marker of infectivity and may be influenced by several factors:

- the stage of HIV infection (22).
  - higher in the initial stages of infection and in the seroconversion illness stage independent of treatment. Risk of transmission may be particularly high in early infection when people may not be aware that they have HIV (23), due to the combination of high viral loads and high risk behaviours.
  - Viral load and infectivity usually then fall to a lower level and stabilise several months after infection, even in the absence of treatment. This 'viral set point' and associated level of infectivity exhibit considerable inter-individual variation.
  - In the absence of treatment, infectivity then increases and is also elevated later in the disease course as characteristic clinical symptoms emerge.
- antiretroviral treatment status
  - can lower the viral load in blood and genital secretions to undetectable levels
  - Effective viral suppression, as measured by plasma viral load, has been shown to markedly reduce the risk of HIV transmission between sero-discordant heterosexual partners: a recent meta-analysis reported a pooled summary HIV transmission rate of 0 per 100 person years (95% CI 0-0.05) when viral suppression was confirmed (24).
  - The duration of antiretroviral therapy required before viral suppression occurs and HIV transmission is reduced is variable and may take several weeks; transmission may occur in this early treatment period (25).
  - Although there are fewer data specifically examining transmission risks in men who have sex with men with suppressed plasma viral load, it is plausible that risk is also reduced for this group, although there are case reports where transmission has occurred (26).
  - Notably, plasma viral load and genital tract viral load are not necessarily concordant, and there are several studies demonstrating persistent genital shedding of HIV-1 RNA despite undetectable plasma viral load (for example, 27, 28).
- presence of other sexually transmitted infections are important co-factors in Australia and increase risk of transmission through blood/genital fluid exposure rather than through an effect on viral load.

There are other infections which increase HIV viral load, such as HSV-2, malaria and active tuberculosis (29) although these are less prevalent in Australia REF.

- characteristics of the individual patient

Factors that may influence local genital tract viral load and therefore risk of sexual transmission are detailed in Table 1.

Clinical presentation and outcome

Typical stages of HIV infection:

- viral transmission
- acute infection: may be either asymptomatic or a self-limited seroconversion illness resembling glandular fever (when they occur, symptoms usually begin at 1-4 weeks post infection and usually persist for between a few days to a fortnight). Clinical features of the seroconversion illness are detailed in Appendix E.
- clinical latent period: viral load usually stabilises, may be asymptomatic for months or years
- After this clinical latent period, some may exhibit persistent generalised lymphadenopathy, develop mild to moderate cytopaenias or symptoms of opportunistic infections and are at increased risk of many chronic diseases.
- Untreated, viral load starts to increase and CD4 counts and immunity progressively wane.
- Acquired Immunodeficiency Syndrome (AIDS) represents the late stage of infection with HIV and is characterised by pronounced immunodeficiency predisposing to specific and severe opportunistic infection and malignancy. The presence of one or more such conditions in a person who is HIV seropositive are diagnostic of AIDS. The full list of AIDS-defining illnesses can be found at Acquired immunodeficiency syndrome (AIDS) case definition web page (30).

With effective treatment for HIV, the majority of people with HIV do not progress to AIDS and life expectancy now closely approaches that of the uninfected population in many developed world settings. As such, HIV is now a chronic condition requiring lifelong treatment. See Appendix E for further discussion of clinical features and outcomes.

People at increased risk of disease

In Australia, the following populations are at most risk:

- men who have sex with men (MSM): in Australia, prevalence is estimated to be in the range of 5-10%, with some geographic variation
- people who have unprotected heterosexual sex with a partner from a high prevalence country. See UNAIDS for a list of prevalence estimates by country.

Within these populations, those who engage in unprotected sex with partners with known HIV or with partners whose HIV status is not known are at greater risk of infection.

Outside Australia, other populations with high HIV prevalence are people who inject drugs and women involved in sex work. In Australia, these groups have low HIV prevalence, largely due to

effective prevention measures. Injecting drug use is associated with some risk in Australia (HIV prevalence is <1% among heterosexual people who inject drugs) although this risk is less than that associated with such activities elsewhere due to the provision of sterile injecting equipment and intensive health promotion activities through the Needle Syringe Program. The prevalence of HIV among women engaged in sex work in Australia is low (<0.1%) but this group are at high risk of HIV because of their high number of sexual contacts and potential exposures.

Disease occurrence and public health significance

Detailed and up to date statistics can be found on the UNAIDS and Kirby Institute websites (www.unaids.org/en/ and www.kirby.unsw.edu.au).

At the end of 2012 approximately 35.3 million people were living with HIV/AIDS across the world (31). There is marked geographic variation in HIV distribution, with 1 in 20 adults in sub-Saharan Africa infected. Disease burden is also particularly high throughout parts of Asia, with nearly 5 million people living with HIV/AIDS in South, South-East and East Asia (32). Worldwide, heterosexual transmission is the most common mode of HIV spread.

In Australia at the end of 2012 there were an estimated 25 708 people living with diagnosed HIV and an estimated 28 000 to 34 000 people if those with undiagnosed infection are included (7). Of the 1 253 people notified with HIV in 2012, approximately one third acquired the infection in the 12 months prior to their HIV diagnosis. **While the epidemiological pattern varies by jurisdiction, overall in Australia** men who have sex with men comprise around two-thirds of new HIV diagnoses and 88% of all diagnoses of newly acquired HIV infection. People who inject drugs account for 2% of all new HIV diagnoses. The number of new HIV diagnoses due to heterosexual transmission has increased over time, from 21% of all HIV diagnoses in 2003-2007 to 25% in 2008-2012. 40% of heterosexually transmitted cases were acquired in a high HIV prevalence country: sub-Saharan Africa (75%) or South East Asia (22%) (6).

The rate of HIV diagnosis in Aboriginal and Torres Strait Islander people is similar to that of non-indigenous Australians from non-high prevalence countries, but a higher proportion of infections in Aboriginal and Torres Strait Islander people were due to injecting drug use compared with infections in the non-indigenous population and a higher proportion of infections occurred in women.

3. Routine prevention activities

Use of a combination of prevention strategies is more effective than use of a single strategy in isolation. Prevention strategies are comprehensively described in the National HIV Strategy, and include:

a. Education strategies and awareness campaigns
b. Modification of sexual behaviours, including condom use and safe sex practices
c. Risk reduction strategies for people who inject drugs, including access to and use of needle and syringe programs (12).
d. HIV testing among people at high risk (33) including universal offer of HIV testing to pregnant women and access to point-of-care testing to maximise accessibility to HIV testing.

e. Identifying and treating other sexually transmitted infections that may increase risk of HIV transmission and acquisition. Recommendations for testing of men who have sex with men can be found at nswsti web site. The Australian STI Management Guidelines also provide recommendations for HIV and other STI testing of priority groups (33).

f. Institutional and systematic strategies including education and use of appropriate infection control measures by all healthcare and emergency workers and education and use of appropriate infection control measures in all premises where skin penetration procedures are conducted (e.g. electrolysis, tattooing, body piercing) and screening of the blood supply and testing of semen and tissue donors

g. Treatment as prevention: antiretroviral treatment of an HIV-positive person leading to suppression of viral replication is associated with reduced risk of transmission to HIV negative heterosexual partners (34). Safe sex practices, particularly condom use, should still be maintained

Status of other prevention strategies:

- The Royal Australasian College of Physicians does not recommend routine male infant circumcision as an HIV prevention measure in the Australian context (35).
- In some settings and in some circumstances, use of anti-retroviral therapy as pre-exposure prophylaxis by the uninfected partner in sero-discordant partnerships may be considered as a possible additional preventive intervention (36). Antiretroviral drugs are not yet licensed for use as pre-exposure prophylaxis in Australia. Pre-exposure prophylaxis demonstration projects are currently being conducted in several Australian jurisdictions to understand the effectiveness in the local context.
- Vaginal microbicides have shown promise in one clinical trial for HIV prevention but lack sufficient evidence to recommend routine use (37).

4. Surveillance objectives

- To detect all HIV cases and facilitate control of disease transmission
- To monitor the epidemiology of HIV to better inform prevention strategies

Enhanced surveillance could include monitoring testing uptake, treatment uptake and community viral load to assess the implementation of HIV control strategies.

5. Data management

All cases fulfilling the HIV case definition are to be reported to the local jurisdictional health department according to local legislative requirements. See Section 15: Jurisdiction Specific Requirements as some states and territories can collect only a four letter (two by two) name-code rather than full name.

Attachment A contains an example data collection form for use by public health units. This comprises the minimum data set that should be collected for each new HIV notification.

Name-coded (first two letters of first and last names) data for confirmed and probable cases are routinely sent from jurisdictions to the National HIV Registry, maintained by The Kirby Institute at the

University of New South Wales. Australia participates in global HIV surveillance efforts and regularly provides updates on the national epidemiology of HIV to the United Nations (UNAIDS).

6. Communications

- Advise the Director of Communicable Diseases or equivalent about cases occurring in special situations, in keeping with jurisdictional processes (insert link to this section below).
- Reporting of cases and follow up should be undertaken in a confidential manner. In some instances, extra precaution may be required, such as when a case occurs in a small population, for example in a small town, in rural and remote settings, in an Aboriginal or Torres Strait Islander community or in a culturally and linguistically diverse group, or when cases occur in healthcare workers or sex workers.
- Media announcements made with the intention to encourage contacts to self-identify and present for testing are rarely useful and may be detrimental by discouraging others to test. In rare circumstances, it may be relevant to make a public statement about a case, for example in instances where incorrect information may be circulating or when there is a need to restore public confidence.
- Social media as a potential avenue to alert contacts may be useful in some rare circumstances

7. Case definition

The current national HIV surveillance definitions are outlined below.

HIV (newly acquired) case definition

Newly acquired HIV infection may be diagnosed in individuals aged 18 months or older at the time of blood sample collection. A diagnosis of newly acquired HIV infection excludes a diagnosis of HIV infection (unspecified).

Reporting

Both **confirmed cases** and **probable cases** should be notified.

Confirmed case

A confirmed case requires **laboratory definitive evidence** only.

Laboratory definitive evidence

1. Repeatedly reactive result on a screening test for HIV antibody followed by a positive result on a western blot AND laboratory evidence of a negative or indeterminate HIV antibody result in the 12 months prior to blood sample collection

OR

2. A group IV indeterminate western blot AND detection of HIV by at least one of the following virologic assays (nucleic acid testing for proviral DNA; HIV p24 antigen, with neutralisation; virus isolation). A group IV indeterminate western blot is defined by the presence of a glycoprotein band (gp41, gp120 or gp160) and one or two other HIV specific bands.

Probable case

A probable case requires **Laboratory suggestive evidence** and **clinical evidence.**

Laboratory suggestive evidence

1. Detection of HIV by at least one of the following virologic assays (nucleic acid testing for proviral DNA; HIV p24 antigen, with neutralisation; virus isolation)

OR

2. Repeatedly reactive result on a screening test for HIV antibody followed by a positive result on a western blot.

Clinical evidence

HIV seroconversion illness within the 12 months prior to blood sample collection.

HIV (unspecified) case definition

HIV infection (unspecified) is diagnosed in individuals aged 18 months or older at the time of blood sample collection, who do not have evidence of HIV acquisition in the previous 12 months. A diagnosis of HIV infection (unspecified) excludes a diagnosis of newly acquired HIV infection.

Reporting

Both **confirmed cases** and **probable cases** should be notified.

Confirmed case

A confirmed case requires **laboratory definitive evidence** only AND that the case does not meet any of the criteria for a newly acquired case.

Laboratory definitive evidence

1. Repeatedly reactive result on a screening test for HIV antibody followed by a positive result on a western blot. A positive result on a western blot is defined by the presence of a glycoprotein band (gp41, gp120 or gp160) and at least three other HIV-specific bands

OR

2. Detection of HIV by at least two virologic assays (nucleic acid testing for proviral DNA; HIV p24 antigen, with neutralisation; virus isolation) performed on at least two separate blood samples.

Probable case

A probable case requires **Laboratory suggestive evidence** only.

Laboratory suggestive evidence

Detection of HIV by at least one of the following virologic assays (nucleic acid testing for proviral DNA; HIV p24 antigen, with neutralisation; virus isolation) in one blood sample.

HIV case definition (child aged less than 18 months at the time of blood sample collection)

Reporting

Both **confirmed cases** and **probable cases** should be notified.

Confirmed case

A confirmed case requires **laboratory definitive evidence** only.

Laboratory definitive evidence

Detection of HIV by at least two virologic assays (nucleic acid testing for proviral DNA; HIV p24 antigen, with neutralisation; virus isolation) on at least two separate blood samples (excluding cord blood).

Probable case

A probable case requires **Laboratory suggestive evidence** only.

Laboratory suggestive evidence

Detection of HIV by one of the following virologic assays (nucleic acid testing for proviral DNA; HIV p24 antigen, with neutralisation; virus isolation) in one blood sample (excluding cord blood) and no subsequent negative HIV virologic or antibody tests.

8. Laboratory testing

Detailed information regarding the HIV testing process and special considerations are outlined in the National HIV Testing Policy 2011v1.3 (38).

Laboratory testing for HIV screening and diagnosis

The 'window period' describes the period from infection to its detection, during which time the individual has the virus (and is therefore capable of transmitting HIV) but tests for HIV are negative because antigen and antibody are present at low undetectable levels or are yet to be produced. The window period will vary with the type of HIV test being performed. With improved screening and diagnostic assays, the HIV window period has gradually shortened. If the requesting clinician is uncertain as to the type of test performed or how soon after infection a given test will yield a positive result, a window period of three months should be used (38).

Combination HIV antibody/antigen tests (4th generation) are widely used in Australia as the initial screening test for HIV (39). These tests become positive in the presence of either antigen or antibody (but will not differentiate between the two). Other initial screening tests (3rd generation) are based on

the detection of HIV antibodies only. Positive screening tests must be confirmed with a definitive diagnostic assay such as a Western blot test as false positive tests occur. Notably, detection of antibodies via a diagnostic Western blot test lags behind that of the immunoassays used as screening tests. Consequently, it is possible that in the early stages of infection, both screening and Western blot results may be negative, or that screening tests may be positive but Western blot results negative or indeterminate. Indeterminate or negative results require repeat testing on another blood sample obtained in 1 - 2 weeks.

As HIV is elevated and detectable in the early stages of infection, before the appearance of antibodies, virological assays such as nucleic acid testing for HIV-1 proviral DNA or viral RNA, or ultrasensitive HIV-1 p24 antigen may yield positive results sooner after infection. In children of HIV-1 positive mothers, passive transfer and persistence of HIV maternal antibody to the infant render antibody tests of little value in the first 18 months of life. Therefore, virological assays for HIV-1 are the investigations of choice.

HIV screening may also be performed using rapid point-of-care testing:

- provide results within 30 minutes.
- test for presence of HIV antibodies or combination antigen/antibody.
- have a longer window period than laboratory-based assays.
- are screening tools only and positive results must be followed up with definitive diagnostic testing using laboratory-based assays

may be considered for screening of:

- high risk populations such as men who have sex with men
- populations that are difficult to reach
- individuals who might not otherwise access HIV testing or return for results.

Point-of-care tests are not recommended for use in populations or settings with very low HIV prevalence such as remote Aboriginal communities (38).

A combination antigen/antibody rapid point-of-care HIV test was approved by the Therapeutic Goods Administration for use in Australia in November 2012.

Self-test kits for HIV cannot be supplied for use in Australia but some patients import these from overseas. Such individuals should be made aware that these tests have a lower sensitivity and specificity than licensed tests and not be stigmatised if they present for care following self-testing.

Obtaining informed consent is a fundamental component of the HIV testing pathway and is requirement for testing in Australia, except in the rare instances where compulsory testing is initiated following a legal order or in emergency situations (38). Informed consent means that the person being tested agrees to the test on the basis of understanding to the level to which they desire the indications for testing, the testing procedure and the potential implications of results (40).

Laboratory testing to guide clinical management and follow-up

Measurement of viral load and CD4 counts are important for staging of infection and to guide management – these tests are essential aspects of the initial evaluation of a patient with HIV and of their ongoing monitoring (11).

9. Case management

Public health activities intersect with the primary care response and in several jurisdictions this occurs through formal programs: public health support is available to treating clinicians and may be particularly useful for those who do not frequently diagnose or manage HIV. The roles and responsibilities of clinicians and public health authorities in the investigation of cases and identification and management of contacts vary by jurisdiction. This section details the factors requiring consideration by those managing the follow-up of a person with newly diagnosed HIV, regardless of who is leading this process.

In jurisdictions where public health units are not required to routinely follow up HIV or AIDS cases, a public health response may be required to investigate cases in special circumstances, or if the patient or treating doctor requests further investigation.

Response times

As per jurisdiction-specific requirements

Response procedure

Case investigation

Ensure diagnosis is confirmed by an HIV reference laboratory.

A thorough and sensitively conducted sexual and risk factor history should be obtained to help identify likely modes of transmission and inform contact tracing. A history of blood donation or receipt of blood or blood products should also be elicited. If the individual with HIV has donated or received blood, the blood bank and communicable diseases unit of the Department of Health must be contacted immediately.

Exposure investigation/contact identification may be an iterative process, with additional information being obtained over time as trust develops between the newly diagnosed individual and the managing team. See section 11 for detailed discussion of the process of notifying and managing contacts identified through the exposure investigation.

Consideration of HIV genotyping by sequencing to demonstrate matching of case and transmission may be necessary. Notably, apart from its use for research purposes, using genotyping to match cases and confirm the source of transmission is an extensive and expensive exercise unless disparity can be confirmed by simple subtyping. Expert advice should be sought.

Case treatment

Antiretroviral therapy is used to treat established HIV infection and is prescribed only by those clinicians specifically trained to do so. The viral suppression achieved with effective use of

antiretroviral therapy is important for the individual patient, by preventing HIV progression, and for public health control measures, by reducing the risk of viral transmission. Measuring and monitoring viral load and CD4 counts are important components of both initial assessment and ongoing monitoring, as results help guide management decisions and monitor treatment efficacy. Several other haematological and biochemical parameters are also routinely measured to monitor for adverse effects of antiretroviral therapy. Current Australian HIV management guidelines can be found at the ASHM website. Notably, for some people there may be complex psychosocial issues to be addressed, and psychological and social factors also warrant consideration in deciding whether to start treatment.

HIV management may also include specific treatment or prophylaxis for the opportunistic infectious diseases that result from immunodeficiency. All HIV positive persons should be evaluated for the presence of latent or active tuberculosis due to the risk for progression of untreated TB infection. As effective antiretroviral therapy has resulted in a shift in the burden of disease from HIV/AIDS related conditions to other causes, management of non-AIDS and non-infectious comorbidities is also important.

Education

People living with HIV should be provided with access to information about the risks of transmission to others and of strategies to mitigate such risks, including the need to practice safe sex and issues of informing sexual partners of their infection. Individuals may require significant psychosocial support to enable them to ensure use of condoms with/by their sexual partners. Similarly, some people may require psychosocial support and counselling to enable them to disclose their HIV status to sexual partners. There may be particular sensitivities associated with stigma and disclosing HIV status in some settings and within some population groups. Legislation surrounding mandatory disclosure of HIV status to sexual partners varies by jurisdiction (41) and jurisdiction-specific educational materials have been produced for people living with HIV, which outline their rights and responsibilities (for example, 42, 43). The HIV/AIDS Legal Centre also has produced a range of other reference materials that may be useful resources for people newly diagnosed with HIV.

People with HIV should be informed that they are not to donate blood, semen or any body tissues/organs. They should be advised of the need to identify and contact people from whom the infection may have been acquired and also those who may have been placed at risk of infection.

There should also be discussion about management of HIV including the role of, indications for, and timing of treatment. The risks and benefits of treatment for individual health and in reducing transmission risk should be discussed. The decision to commence treatment is one made by the person with HIV and their clinicians. It is critical to link the person newly diagnosed with HIV to relevant support services such as community-based organisations of people living with HIV or relevant community upport services such as Ethnic Community Councils or "AIDS Councils". Referral to appropriate counselling/psychology services as required is important.

Isolation and restriction

Under anti-discrimination legislation, it is illegal to discriminate against an individual on the basis of their HIV status. Restrictions and limitations on the behaviour of a person with HIV can only be imposed in order to protect the health of others (39).

There may be work restrictions if a case occurs in some occupational groups (see 'special cases' and Jurisdictional Specific Requirements sections below). For example, the legality of sex work and legislation regarding sex workers with sexually transmitted infections including HIV varies between jurisdictions (41).

Isolation and restrictions are otherwise generally not required. As per nationally agreed guidelines, special measures may be adopted in instances where an individual continues to knowingly put others at risk of infection. This is uncommon and is not thought to be a major driver of HIV transmission in Australia (44).

Active case finding

Guidelines on whom to screen can be found in the National HIV testing policy and include people in high risk groups as detailed in section 2 and all pregnant women as part of routine antenatal care (45).

10. Environmental Evaluation

Not applicable

11. Contact management

The aim of contact tracing is to identify people potentially exposed to and at risk of HIV, to enable counselling, early testing, management as required and education regarding behavioural risk factor modification. As noted above, the responsibilities for contact tracing and management vary between jurisdictions, and may include clinicians, sexual health centres and/or public health units/Department of Health. Even in settings where contact tracing is driven by clinicians or sexual health centres, there are some situations in which it is important that relevant state health authorities are informed (refer to Section 12 – Special Situations).

The process undertaken for partner notification depends on the specific circumstances of each case: there is wide variation in practice and the contact tracing and management process will vary depending on the individual and the environment in which an individual is diagnosed. HIV contact tracing and management is complex. Considerable judgement is required by those undertaking contact tracing, and the agencies or individuals doing so should have a low threshold for seeking advice or assistance from their public health unit/health department if there are barriers to contact tracing. There are various supports available for healthcare providers to undertake contact tracing.

Contact definition

A contact is a person who has been exposed to HIV as a result of unprotected vaginal or anal sexual contact, sharing injecting equipment, childbirth, breastfeeding, transfusion of blood or blood products, transplantation of tissues or organs, or occupational exposure. The likely timeframe of HIV infection in the person with HIV will determine who is a relevant contact that may have been potentially exposed.

Identification of contacts

Contact tracing efforts should aim to identify all contacts in the relevant timeframe and not just the most recent partner. It is recommended that contact tracing efforts are initially focussed on recent sexual or needle-sharing partners and other potential contacts, and then proceed backwards to the onset of risk behaviour or, if known, to the time of the last known negative HIV test result (1), noting that this test may have been negative due to the patient being in the HIV window period at the time. The time period for which contact tracing is required will vary from case to case depending on such factors as the individual history, patterns of risk behaviour and availability of any previous test results.

While the initial responsibility for contact tracing may be that of the diagnosing practitioner, sexual health clinics and public health units/health departments are often involved in and can provide significant assistance with contact tracing. There are several contact tracing strategies available, including patient referral, whereby the person with HIV notifies their contacts themselves, and provider referral, whereby the clinician/sexual health unit/ public health unit notifies contacts of their potential exposure. Contact tracing options should be discussed with the person diagnosed with HIV, and advantages and disadvantages to both methods explored. When contact tracing is undertaken by the person with HIV, they should be provided with information to convey to their contacts, transmission risks, how far back to trace, possible serious complications if partners are not notified and potential confidentiality issues. The person with HIV should identify all contacts and provide information on whether or not each contact had an HIV test.

Provider or agency-led contact tracing is most effective when performed with the permission of the person with HIV. Benefits of provider or agency-led contact tracing include:

- knowing that the contact tracing has been done
- increased confidentiality for the person with HIV and increased safety if there is a risk of violence
- allows the opportunity to provide targeted education to the person with HIV and their contacts
- facilitates referral
- allows identification of clusters of cases or public health risks
- allows collection of enhanced surveillance data.

Additional details about contact tracing can be found in the Australasian Contact Tracing Manual **(1).**

Maintaining confidentiality of the case is important and their identity should not be disclosed unless the case has given their express permission to be identified by name to contacts. In some instances, such as if the contact has only had one sexual partner or possible source of exposure, the identity of the case may be apparent to the contact and sensitivity is required. Efforts to not disclose the identity of the case are important in all instances, and particularly when cases occur in small populations where cases may be more easily identifiable. Attention should also be paid to ensuring that communication during the contact identification and notification process is culturally appropriate and sensitive.

If a clinician commences contact tracing but follow up is not possible or not successful, details of the case and attempts at contact tracing should be provided to the relevant state or territory health department to consider further action.

Whilst every effort should be made to identify and notify contacts, in some instances this may not be possible or feasible (for example, if contacts are anonymous sexual partners encountered at sex-on-premises venues or are anonymous clients of sex workers). In some circumstances, use of social media as a potential avenue to alert contacts may be considered. Public announcements to encourage contacts to self-identify and present for testing are rarely useful.

Prophylaxis

Post-exposure prophylaxis (PEP) should be considered for people who have had sex with or exposure to the blood of a person with HIV in the past three days. PEP comprises treatment with two or three antiretroviral agents, usually for a period of 28 days. Eligibility and the type of regime prescribed is individualised and determined by numerous factors, including the transmission risk associated with the exposure. People assessed as eligible for PEP and who receive treatment need to be advised of the uncertain efficacy of the treatment, the importance of complying with the prescribed regime, and of the potential side-effects of therapy (21). Assessment of the need for and provision of PEP should be done by or in conjunction with advice from a specialist clinician. Further information can be found in the national guidelines for post-exposure prophylaxis after non-occupational and occupational exposure to HIV, located online at the ASHM website.

Education

Discussions with contacts should include education regarding window periods and strategies to minimise risk of infection and transmission. Possible symptoms of the seroconversion illness should also be explained, noting that not everyone who goes on to develop HIV has a symptomatic seroconversion. Risk communication to people with HIV and their contacts can be difficult and assistance from public health units/health department and/or clinical specialists in this area should be sought when required. Estimates to help quantify and communicate risk are available (17). Contacts should be made aware of the benefits of knowing their HIV status, as if they are infected treatment can prevent the impacts of HIV on their health.

Cases and contacts may also be advised that there are HIV community-based organisations that can provide support and services, with whom they may wish to engage. Appendix D lists the peak national HIV bodies in Australia.

Isolation and restriction

Contacts should be advised of the need to practice safe sex and other behavioural modifications to minimise risk of acquiring or transmitting infection.

12. Special situations

There are particular circumstances in which the diagnosis of HIV may require additional actions.

Health care workers

If a healthcare worker is diagnosed with HIV, blood-borne virus policy divisions of the jurisdictional health department should be consulted. The policies of registration boards regarding health care

workers with blood-borne viruses will need to be consulted. For example, the Medical Board of Australia has a policy on medical practitioners and medical students who have a blood-borne virus infection. Recommendations are also included in the ***'Australian Guidelines for the Prevention and Control of Infection in Healthcare'*** issued by the National Health and Medical Research Council (NHMRC) and the Communicable Diseases Network of Australia's *'Australian National Guidelines for* ***the Management of Health Care Workers known to be Infected with Blood-****Borne Viruses'.*

Antenatal care

If a woman is found to be HIV positive through antenatal screening she should be referred to a clinician experienced in HIV management who can both manage HIV in the mother and implement a pathway to prevent transmission to the newborn.

Suspected iatrogenic or nosocomial infection

The local health department should be notified immediately of a diagnosis of a person in whom it is suspected that transmission occurred through a healthcare procedure.

If exposure assessment indicates that transfused blood or blood products are a possible source of infection, the Australian Red Cross Blood Service should also be notified immediately, and if a case occurs in a recipient of a tissue or organ transplant, the relevant transplant unit should be immediately informed.

Cases among recent blood donors

If exposure assessment indicates that the person with HIV has donated blood during a period when they may have been infectious, the blood bank and jurisdictional health department should be notified immediately.

Cases in sex workers

As noted in the 6th National HIV Strategy, HIV rates in sex workers in Australia are amongst the lowest in the world due to widespread practice of safe sex.(2). When cases are identified sensitivity is required and it is important to develop trust between the treatment and contact tracing service and the HIV positive sex worker. As sex workers and their clients are often anonymous contact tracing may not be feasible. As with all HIV contact tracing, the confidentiality of the infected person should be maintained.

Cases in children

Maternal to child transmission of HIV has always been uncommon in Australia. Cases of HIV occurring in children outside the maternal transmission setting raise the possibility of sexual abuse (1). Specialist medical and public health assistance should be sought.

Cases requiring contact tracing of a large number of contacts

In some instances, following up a HIV notification may generate a considerable workload due to involvement of a high number of contacts. The approach adopted will differ depending on the specific

details of the case. Sensitivity is required in all approaches. These exercises are major public health investigations that require planning and staff training. Quality control over the contact tracing exercise is also required if many staff are involved in the response.

Cases in people with no apparent exposures

It may be that after thorough exposure assessment and history taking, no apparent route of transmission is identified. It is possible that the patient may not be willing to reveal behaviours linked to transmission. This information may subsequently emerge and such cases should never be considered closed. Despite their extreme rarity, some cases appear to have no apparent route of transmission (46) and may require extensive input from clinicians, laboratories and public health authorities to resolve.

People with HIV who put others at risk

In instances where people with HIV have been counselled regarding the risks of and need to prevent transmission yet continue to engage in behaviours that place others at risk of infection, clinical and public health staff should notify the relevant state health authority and refer to state case management programs for consideration of the need for additional measures, as per the ***National guidelines for the management of people with HIV who put others at risk*** (44) and jurisdictional guidelines on this matter.

Cases of HIV-2

As HIV-2 is not endemic in Australia, expert specialist advice should be sought if there is a possibility of a locally acquired case of HIV-2 infection.

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