Management of unprotected sexual encounters

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ABSTRACT

- After "unprotected" sexual encounters, sexual history guides risk assessment and testing for sexually transmissible infections (STIs).
- *Chlamydia trachomatis* infection is the most prevalent bacterial STI.
- Sexually active young people (aged < 25 years) should have annual chlamydia testing.
- Opportunistic STI testing is indicated for population groups at increased risk of STI, including young people, gay and other homosexually active men, and Indigenous people.
- Gay and other homosexually active men should be regularly tested for HIV, syphilis, chlamydia and gonorrhoea.
- Indigenous people should be regularly tested for syphilis, chlamydia and gonorrhoea.
- Postexposure antiretroviral prophylaxis may be indicated after high-risk sexual encounters.

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Condom use during vaginal, anal or oral sex provides protection against many sexually transmissible infections (STIs). "Unprotected sex" (sexual intercourse without the use of a condom) may lead a person to seek medical advice and request testing for STIs. The risk of infection for an individual is assessed taking into account the number of partners and exposures, the transmission efficiency of each pathogen, and the estimated prevalence of each STI within a population defined by biological and/or behavioural risk factors. These factors include sex, age, the number and sex of sexual partners, and condom use. Transmission efficiency, which depends on both the likelihood of transmission for each intercourse episode and the duration of infectiousness for each organism,[1] is relatively high for gonorrhoea, chlamydia and early syphilis. As the infection status of a sexual partner is often unknown, clinical management of a patient after an unprotected sexual encounter usually involves estimating an individual's risk according to epidemiological information. Given that diagnosis of an STI may cause considerable distress, and that sexual contacts also need to be tested and treated in the case of a confirmed STI, accuracy of test results is important. No test is completely sensitive and specific: when testing is targeted at people at greatest risk, positive test results are likely to reflect true positive cases, but there is a significant risk of false-positive test results when low-prevalence populations are tested.

Population groups at increased risk of STIs include young people, gay and other homosexually active men, and Indigenous people.

Young people

Genital chlamydia is the most common notifiable infection in Australia, with 35 189 cases reported in 2004. From 2000 to 2004, overall population rates of reported diagnoses increased in all Australian states and territories, doubling from 91.4 to 186.1 cases per 100 000 population.[2] The highest and most rapidly increasing rates of infection were seen in the 15–19 years and 20–29 years age groups.[2]

Chlamydial infections in both men and women are commonly asymptomatic, and yet the majority of infections in men are detected in those presenting with urethral symptoms, suggesting that many infections remain undiagnosed.[3] Risk factors include, for both sexes, change in sexual partner, higher number of sexual partners and inconsistent condom use, and, for women, being under 25 years of age.[4]

In women, there is clear evidence that detection and treatment of chlamydial infection reduces sequelae of pelvic inflammatory disease, such as chronic pelvic pain, infertility and ectopic pregnancy.[5] Opportunistic chlamydia testing is therefore most important for young women, who experience the highest rates of infection, in order to protect their future reproductive health. In young men, there is little evidence of benefit from chlamydial screening, but this may be related to a lack of research in this area.[4] In addition, the strategy of opportunistic testing may be more difficult to apply to young men, who less frequently present to general practitioners for reproductive and sexual health problems than young women. However, a study of remote communities in Northern Canada showed that STI screening of both men and women in high-prevalence populations significantly reduced the incidence and prevalence of chlamydia, whereas screening of women only did not.[6]

Although teenage pregnancy rates have been falling since the 1970s, Australia still has much higher rates than many western European countries.[7] Unplanned pregnancy is particularly associated with adverse health outcomes for young women from socially disadvantaged backgrounds.[7,8] Condoms and the oral contraceptive pill are the most commonly used forms of contraception among teenage Australian women. However, for reasons that are unclear, contraceptive use among sexually active women in this age group remains inadequate.[9]

Practice points

- Take a sexual history (Box 1) from young men and women, and test those who are sexually active and have a new sexual partner.
- Test young women for chlamydia when they present for cervical screening or contraception.
- If chlamydia is detected, treat any sexual partner(s) the person has had within the previous 6 months, regardless of their chlamydia test results.
- Because of the risk of reinfection, repeat testing for chlamydia is recommended 3–6 months after a positive diagnosis and treatment.

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1 Taking a sexual history

- Reassure the patient about confidentiality.
- Use simple language, a respectful, non-judgemental manner and avoid assumptions about sexual identity and practices.
- Use open-ended questions to start with. For example:
  - What has led you to come for a sexual health check today?
  - What has led you to be concerned about STDs* at this time?
- Normalise questions about sexual history. For example:
  - I need to ask some personal questions about your sexual activity to decide which tests you need.
  - These are some routine questions that I ask everyone who is having STD tests.
- Start with less confronting questions.
- Use direct closed-ended questions to elicit specific information about sexual behaviour. For example:
  - Do you have a regular sexual partner?
  - How long have you been together?
  - When is the last time you had sex with your regular partner?
  - When is the last time you had sex with someone other than your regular partner?
  - Is/are your sexual partner(s) male or female (or both)?
  - Did you have oral (vaginal, anal) sex?
  - Did you use a condom?
  - How many different sexual partners have you had in the past 3 (6, 12) months?
  - (For men): Have you ever had a male sexual partner?

* STD = sexually transmitted disease. * Patients are more familiar with the term "STDs" than "STIs". ◆

- Testing and treatment of chlamydial infection is also indicated for:
  - young women before termination of pregnancy (to reduce the risk of pelvic inflammatory disease);[10] and
  - pregnant young and/or Indigenous women before delivery (to prevent neonatal infection).
- Sexual health clinics (Box 2) and public health services can assist GPs with contact tracing.

Indigenous people

Very high rates of STIs — including gonorrhoea, genital chlamydia and syphilis — among Indigenous Australians are reflected in the high notification rates for these diseases in Australian states with large Indigenous populations.[2] Health outcomes are poor, with Indigenous women experiencing endemic rates of pelvic inflammatory disease and infertility.[11] Although rates of HIV among Indigenous people remain comparable to those of the general population, the much larger proportion of cases attributed to heterosexual transmission[2] prompts ongoing concern about the potential escalation of HIV infection among Indigenous people. More interventions are urgently needed, including community testing and treatment programs, which have demonstrated the ability to lower the prevalence of chlamydial and gonococcal infection.[12]

Practice point

- Annual syphilis serology and polymerase chain reaction (PCR) testing for chlamydia and gonorrhoea on a first-void urine sample are indicated for Indigenous people in all regions of Australia.

Gay and other homosexually active men

After a long period of decline, new diagnoses of HIV infection increased between 2000 and 2004, with 86% of newly acquired infections occurring among men who reported homosexual contact. The highest population rates of HIV diagnosis were recorded in New South Wales (5.9 per 100 000 population) and Victoria (4.3 per 100 000 population). Highest rates of diagnosis of newly acquired HIV infection also occurred in these states (1.7 and 1.3 per 100 000 population, respectively), and Queensland and South Australia recorded their highest rates over the past 10 years in 2004 (1.2 and 1.1 per 100 000 population, respectively).[2]

In the light of evidence of increased HIV transmission associated with concurrent STI infections,[13] the recent re-emergence of syphilis[2] and increased rates of other bacterial STIs[2,14] among gay men is of concern. Health in Men, a community-based cohort study of HIV-negative homosexual men in inner Sydney, is expected to provide information that will help determine the recommended frequency of testing for gay men. Findings to date strongly support the need for regular STI screening.[14] Current testing recommendations[15] are detailed in Box 3. Among gay Australian men, there is evidence that sexual risk decisions are significantly influenced by knowledge of HIV status,[16] and that men who are attached to gay communities are more likely to have had a recent HIV test.[17] Homosexually active men outside gay communities and in regional areas may be less able to exercise informed sexual choices.

Evidence to support the efficacy of antiretroviral postexposure prophylaxis (PEP) after sexual exposure to HIV is indirect. (This evidence includes studies of mother-to-child HIV transmission, observational studies of PEP after potential sexual exposure to HIV, and a case–control study of health care workers in which zidovudine treatment after percutaneous exposure to HIV reduced HIV seroconversion by 80%.)[18] Nevertheless, PEP has been found to be cost-effective when used after sexual exposures that carry a significant risk of HIV transmission.[19] A combination of two or more antiretroviral drugs commenced within 72 hours of exposure and continued for 28 days is likely to significantly reduce the risk of contracting HIV.[18] Australian guidelines[20] advocate the use of PEP after a sexual exposure that carries a substantial risk of

2 Sources of information

Sexual health clinic contact details

Register of public sexual health clinics in Australia and New Zealand

www.racp.edu.au/public/sh_contact.htm#register

Services providing PEP; PEP guidelines

Australasian Society for HIV Medicine

ASHM directory: HIV, hepatitis and related services

www.ashm.org.au

STI/HIV resources developed for Indigenous primary health care

Australian Government Department of Health and Ageing

www.health.gov.au/internet/wcms/publishing.nsf/Content/health-oatsih-pubs-sexhealth.htm

STI incubation periods, transmission rates, how far back to trace, and management of contacts

Australasian contact tracing manual

www.ashm.org.au

PEP = postexposure prophylaxis. STI = sexually transmissible infection. ◆

3 Testing recommendations for sexually transmissible infections (STIs) in asymptomatic gay and other homosexually active men[15]

All men who have had any form of sexual intercourse with another man in the previous year should be offered, at least once a year:

- HIV serology
- Syphilis serology (including TPHA, TPPA or EIA test)
- Pharyngeal culture for gonorrhoea
- Anal culture or polymerase chain reaction (PCR)* test for gonorrhoea, and anal PCR* test for chlamydia. Clinical indicators for anal tests include:
  - Any anal sex
  - Any anal symptoms (bleeding, itching, discharge, pain)
  - HIV positivity
  - History of gonorrhoea or chlamydia
  - Sexual contact with anyone having an STI
  - Request for a test
- PCR* test for chlamydia (on a first-void urine sample)
- Hepatitis A serology (if negative, offer vaccination)
- Hepatitis B serology (if negative, offer vaccination)

Additional comments

- More frequent testing may be indicated in men who have frequent changes of sexual partners, including men who attend "sex on premises" venues
- These recommendations apply whether or not condoms are used
- A regular partner, increasing age, or bisexuality are not necessarily protective against STIs

EIA = enzyme immunoassay. TPHA = *Treponema pallidum* haemagglutination assay. TPPA = *Treponema pallidum* particle agglutination test.
* Alternatives to PCR include other nucleic acid amplification tests such as ligase chain reaction or strand displacement amplification. ◆

4 Risk of HIV transmission for different types of exposure[20]

Population group	Type of exposure	Risk of HIV transmission per exposure*	
		HIV status of source unknown	Source known to be HIV positive
Homosexual men	Unprotected receptive anal intercourse	0.45%†	3.0%†
Homosexual men	Unprotected insertive anal intercourse	0.015%†	0.1%†
Heterosexual women	Unprotected receptive vaginal intercourse	0.0001%	0.1%†
Heterosexual men	Unprotected insertive vaginal intercourse	0.0001%	0.1%†

* Approximate risk of HIV transmission is calculated using the formula:
Risk of HIV transmission = risk carried per single exposure × risk of source being HIV positive
† Referral for assessment for postexposure prophylaxis is recommended for these exposures. ◆

transmission and involves a person known or likely to be infected with HIV (Box 4). Fears that availability of PEP for use after sexual exposures would lead to increased sexual risk behaviour have so far proved groundless.[18]

Presentation for PEP also provides an opportunity for STI testing: among men seen for PEP at a Sydney hospital between 2001 and 2004, rectal chlamydial and gonococcal infections were detected in 4.3% and 2.4%, respectively.[21] Although there is still uncertainty about the efficacy of antiretroviral PEP, the effectiveness of prophylaxis for hepatitis B virus (HBV) is well established.

Practice points

- Sexual history will identify homosexually active men who need annual STI testing (Box 3) and vaccination against hepatitis A and B viruses.
- Gay and other homosexually active men who present after having unprotected anal intercourse within the previous 72 hours should be referred to a sexual health clinic or hospital emergency department for assessment for PEP (see Box 2 for referral directory).
- In addition to commencing vaccination, non-immune individuals can be given HBV immune globulin for up to 14 days after a known sexual exposure to HBV.[22]

STI check-ups

STIs also affect the general population, and a wide variety of asymptomatic people may present to GPs requesting STI/HIV testing after unprotected intercourse[23] or condom failure. In this situation, clinicians should select tests for STIs that are significant or reasonably frequent in the population and are amenable to management.

Tests may include serology for HIV, HBV and syphilis, as well as PCR testing for chlamydia on a first-void urine sample. Herpes simplex virus serology should be avoided, as it may be impossible to determine the clinical significance of a positive result in an asymptomatic person, leading to psychological distress without benefit.[24] PCR testing for gonorrhoea has a high false-positive rate outside high-prevalence populations, and a confirmatory test should be used in positive cases.[25] Gonococcal PCR testing can be confined to people with a clinical syndrome such as urethritis, cervicitis or pelvic pain; groups in which the prevalence of gonorrhoea is higher than average (including Indigenous people and gay men); and victims of sexual assault. After a specific risk exposure such as sexual assault, baseline and follow-up testing are indicated, taking into account varying incubation periods for each infection.[26]

Practice points

- Review condom technique with patients who present after condom breakage or slippage.
- For women who have just experienced a sexual assault or other specific sexual exposure and are not using adequate contraception, prescribe postcoital contraception. A single dose of 1.5 mg levonorgestrel has been shown to be effective in preventing a high proportion of pregnancies when taken within 72 hours of unprotected intercourse.[27] Continuing contraception needs should also be addressed.
- Tests for gonorrhoea and chlamydia can be performed 1–2 weeks after a specific exposure to a potentially infected person.[26]

- Commencing HBV vaccination provides some postexposure protection.[26] Serology for HBV can be performed 3 months after exposure in people who are not vaccinated.
- Serology for syphilis is generally performed 3 months after exposure.[26]
- New 4th generation HIV Ab/Ag tests can detect HIV infection within 6 weeks of exposure.

Conclusion

Choice of investigations after unprotected sex is guided by sexual history, with opportunistic STI testing indicated for population groups at increased risk. Condom use remains the most effective HIV prevention strategy,[28,29] but targeted use of PEP is considered to be a cost-effective biological adjunct to HIV prevention when its use is restricted to high-risk exposures. In Australia, HIV-infected people and their partners, as well as homosexually active men, should be informed about PEP. GPs are well placed to recognise patients at increased risk of STIs, perform appropriate STI testing and refer patients for postexposure HIV prophylaxis if appropriate.

Competing interests

None identified.

References

1 Blanchard JF. Populations, pathogens, and epidemic phases: closing the gap between theory and practice in the prevention of sexually transmitted diseases. *Sex Transm Infect* 2002; 78 (Suppl 1): i183-i188.

2 National Centre in HIV Epidemiology and Clinical Research. HIV/AIDS, viral hepatitis and sexually transmissible infections in Australia. Annual surveillance report 2004. Available at: http://web.med.unsw.edu.au/nchecr/Downloads/04ansurvrpt_2.pdf (accessed Sep 2005).

3 Counahan ML, Hocking JS, Fairley CK. Enhanced chlamydia surveillance indicates more screening needed [letter]. *Med J Aust* 2003; 178: 523.

4 Chen MY, Donovan B. Genital *Chlamydia trachomatis* infection in Australia: epidemiology and clinical implications. *Sex Health* 2004; 1: 189-196.

5 Scholes D, Stergachis A, Heidrich FE, et al. Prevention of pelvic inflammatory disease by screening for cervical chlamydial infection. *N Engl J Med* 1996; 334: 1362-1366.

6 Hodgins S, Peeling RW, Dery S, et al. The value of mass screening for chlamydia control in high prevalence communities. *Sex Transm Infect* 2002; 78 (Suppl 1); i64-i68.

7 van der Klis KA, Westenberg L, Chan A, et al. Teenage pregnancy: trends, characteristics and outcomes in South Australia and Australia. *Aust N Z J Public Health* 2002; 26: 125-131.

8 Coorey M. Trends in birth rates for teenagers in Queensland, 1988 to 1997: an analysis by economic disadvantage and geographic remoteness. *Aust N Z J Public Health* 2000; 24: 316-319.

9 Richters J, Grulich AE, de Visser RO, et al. Sex in Australia: contraceptive practices among a representative sample of women. *Aust N Z J Public Health* 2003; 27: 210-216.

10 Blackwell AL, Thomas PD, Wareham K, Emery SJ. Health gains from screening for infection of the lower genital tract in women attending for termination of pregnancy. *Lancet* 1993; 342: 206-210.

11 Kildea S, Bowden FJ. Reproductive health, infertility and sexually transmitted infections in indigenous women in a remote community in the Northern Territory. *Aust N Z J Public Health* 2000; 24: 382-386.

12 Miller PJ, Torzillo PJ, Hateley W. Impact of improved diagnosis and treatment on prevalence of gonorrhoea and chlamydial infection in remote Aboriginal communities on Anangu Pitjantjatjara lands. *Med J Aust* 1999; 170: 429-432.

13 Centers for Disease Control and Prevention. HIV prevention through early detection and treatment of other sexually transmitted diseases – United States. Recommendations of the Advisory Committee for HIV and STD Prevention. *MMWR Morb Mortal Wkly Rep* 1998; 47: 1-24.

14 Jin F, Prestage G, Van de Ven P, et al. Prevalence and risk factors for gonorrhoea and chlamydia in the Health in Men (HIM) cohort [abstract]. 16th Annual Conference of the Australasian Society for HIV Medicine; 2004 Sep 2–4; Canberra, Australia.

15 Royal Australasian College of Physicians Australasian Chapter of Sexual Health Medicine. Sexually transmitted infection testing guidelines for men who have sex with men. Available at: http://www.ashm.org.au/uploadFile/MSM_STI_Guidelines_PrintQualFinal%202005.pdf (accessed Sep 2005).

16 Van de Ven P, Mao L, Fogarty A, et al. Undetectable viral load is associated with sexual risk taking in HIV serodiscordant gay couples in Sydney. *AIDS* 2005; 19: 179-184.

17 Jin FY, Prestage G, Law MG, et al. Predictors of recent HIV testing in homosexual men in Australia. *HIV Med* 2002; 3: 271-276.

18 Smith DK, Grohskopf LA, Black RJ, et al; US Department of Health and Human Services. Antiretroviral postexposure prophylaxis after sexual, injection-drug use, or other nonoccupational exposure to HIV in the United States: recommendations from the US Department of Health and Human Services. *MMWR Recomm Rep* 2005; 54(RR-2): 1-20.

19 Pinkerton SD, Martin JN, Roland ME, et al. Cost-effectiveness of postexposure prophylaxis after sexual or injection-drug exposure to human immunodeficiency virus. *Arch Intern Med* 2004; 164: 46-54.

20 Australian National Council on AIDS, Hepatitis C and Related Diseases. Guidelines for the management and post exposure prophylaxis of individuals who sustain nonoccupational exposure to HIV. ANCAHRD Bulletin No 28, July 2001. Available at: http://www.ancahrd.org/pubs/bulletins/01/28_hiv_guidelines.pdf (accessed Sep 2005).

21 Hamlyn E, McAllister J, Winston A, et al. Screening for sexually transmitted infections in individuals receiving non-occupational post exposure prophylaxis [abstract]. 16th Annual Conference of the Australasian Society for HIV Medicine; 2004 Sep 2–4; Canberra, Australia.

22 National Health and Medical Research Council. Australian immunisation handbook. 8th ed. Canberra: AGPS, 2003.

23 Grulich A, Visser R, Smith A, et al. Sexually transmissible disease and blood borne virus history in a representative sample of adults. *Aust N Z J Public Health* 2003; 27: 234-241.

24 Munday PE, Vuddamalay J, Slomka MJ, Brown DW. The role of type-specific herpes simplex serology in the diagnosis and management of genital herpes. *Sex Transm Infect* 1998; 74: 175-178.

25 Tabrizi SN, Chen S, Cohenford MA, et al. Evaluation of real time polymerase chain reaction assays for confirmation of *Neisseria gonorrhoeae* in clinical samples tested positive in the Roche Cobas Amplicor assay. *Sex Transm Infect* 2004; 80: 68-71.

26 Sexually transmitted diseases treatment guidelines 2002. Centers for Disease Control and Prevention. *MMWR Recomm Rep* 2002; 51(RR-6): 1-78.

27 Von Hertzen H, Piaggio G, Ding J, et al. Low dose mifepristone and two regimens of levonorgestrel for emergency contraception: a WHO multicentre randomised trial. *Lancet* 2002; 360: 1803-1810.

28 Weller S, Davis K. Condom effectiveness in reducing heterosexual HIV transmission. *Cochrane Database Syst Rev* 2002; (1): CD003255.

29 Johnson WD, Hedges LV, Diaz RM. Interventions to modify sexual risk behaviours for preventing HIV infection in men who have sex with men. *Cochrane Database Syst Rev* 2002; (4): CD001230.

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