

Occupational post-exposure HIV prophylaxis

Gary Maartens

HIV and other bloodborne infectious agents, such as hepatitis B or C, can be transmitted to health care workers during occupational exposure. In all occupational exposure incidents proper documentation is essential in order to claim compensation at a later date. This article is limited to a brief overview of the medical management of occupational exposure to HIV only.

The risk of a health care worker acquiring HIV following percutaneous occupational exposure is 0.3%.¹ The risk following mucous membrane exposure is 0.09%.¹ Zidovudine post-exposure reduces the risk of acquiring HIV by about 80%.² The current approach to post-exposure prophylaxis (PEP) is to stratify the exposures by risk and to treat accordingly. In many instances PEP is not indicated.

When is PEP not indicated?

In instances where the risk of infection is extremely low or non-existent, PEP is not indicated, as the risks of PEP will far outweigh the benefits. PEP is not indicated when:

1. The material the health care worker was exposed to is not infectious for HIV in the occupational setting, e.g. vomitus, urine, faeces or saliva (unless these are blood-stained).

2. The exposure was on intact skin.

3. The source patient is HIV-negative (unless there are clinical features to suggest seroconversion illness, in which case PEP should be commenced until further tests are done — consult with a virologist or infectious diseases specialist).

4. The health care worker is HIV-positive.

High- versus low-risk exposures

The risk of acquiring HIV following occupational exposure is determined by the nature of the exposure or by the infectiousness of the source patient. High-risk exposures involve exposure to a larger quantity of blood from the source patient. The following are associated with an increased risk of HIV transmission^{1,2} and are high-risk exposures:

1. Deep percutaneous sharps injuries.

2. Percutaneous exposure involving a hollow needle that was used in a vein or an artery.

3. Visible blood on the sharp instrument involved in a percutaneous injury.

4. The source patient has terminal AIDS. It is likely that patients with a high viral load (e.g. $\geq 100\,000$ copies/ml) will also be more infectious.

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Gary Maartens is an infectious disease physician and head of the Division of Clinical Pharmacology, University of Cape Town.



Table I. Recommendations for post-exposure prophylaxis (PEP) after occupational exposure to infectious material (including blood, cerebrospinal fluid, semen, vaginal secretions and synovial/pleural/ pericardial/peritoneal/amniotic fluid) from HIV-seropositive patients

Exposure	HIV status of source patient		
	Unknown	Positive	High risk*
Intact skin	No PEP	No PEP	No PEP
Mucosal splash/non-intact skin	Consider 2-drug regimen	Recommend 2-drug regimen	Recommend 2-drug regimen
Percutaneous (sharps)	Recommend 2-drug regimen	Recommend 2-drug regimen	Recommend 3-drug regimen
Percutaneous (needle in vessel or deep injury)	Recommend 2-drug regimen	Recommend 3-drug regimen	Recommend 3-drug regimen

* Source patient has terminal AIDS or a high viral load.

PEP regimens

When PEP is indicated two regimens are recommended — a basic two-drug regimen (zidovudine 300 mg plus lamivudine 150 mg, both given 12-hourly for 4 weeks) and an expanded three-drug regimen (adding a protease inhibitor to the basic regimen) for high-risk exposure. Guidelines for when to use the basic or expanded regimens are given in Table I. The choice of protease inhibitor should be based on cost and tolerability. The Centers for Disease Control (CDC) recommend efavirenz as an alternative to a protease inhibitor,¹ but in my view the neuropsychiatric side-effects of efavirenz are likely to be troublesome in PEP as occupational HIV exposure is often a very stressful event. Nevirapine should not be used in PEP as it has been associated with severe hepatotoxicity in this setting.¹ It is important to realise that all current guidelines on PEP are empirical and not based on evidence from randomised controlled trials — the only evidence of efficacy is from a retrospective case control study showing the benefit of zidovudine PEP.²

PEP is not well tolerated. Adverse events occur in about half and therapy is discontinued in about one-third of patients¹ — the highest rates of adverse events occur with three-drug regimens. Most of the adverse events are not life-threatening. Headache, nausea and malaise are the commonest adverse events.

Alternative antiretrovirals may be necessary because of intolerance or resistance. For intolerance stavudine can be substituted for zidovudine and efavirenz for a protease inhibitor (lamivudine is generally well tolerated and substitution is rarely necessary). In South Africa the proportion of HIV-infected patients exposed to antiretroviral therapy is expanding dramatically. Thus the chance of being exposed to drug-resistant HIV will increase. If the source patient is receiving antiretroviral therapy then assessment for potential resistance is important. This should include a recent quantitative plasma HIV RNA test (viral load) — if this is not suppressed then resistance is possible. In cases where resistance is suspected, consultation with an infectious diseases specialist or expert HIV treater is advised.

PEP should be commenced as soon as possible after the injury. PEP was commenced within 4 hours of exposure in 89% of health care workers in the only study showing the benefit of PEP.² Animal data suggest that prophylaxis after 24 hours is ineffective.

However it is unknown whether humans benefit after delays longer than 24 hours, so current national³ and CDC¹ recommendations advise prophylaxis up to 7 days after exposure, but the risks of prophylaxis in this setting are likely to outweigh the benefits so this should be reserved for high-risk cases. Beyond 7 days prophylaxis should generally not be considered.

Monitoring after occupational exposure

Following HIV exposure there is a need for psychosocial support — this is beyond the scope of this article. Laboratory monitoring is done to exclude acquisition of HIV infection and, for those given PEP, to monitor toxicity. Health care workers should be tested for HIV infection at the time of the exposure and again at 6 weeks, 3 months and 6 months after exposure. Full blood count should be done at baseline and 2 weeks as zidovudine can cause anaemia and neutropenia. The test of choice is the HIV antibody test, which should be done in a laboratory (usually an enzyme immunoassay or enzyme-linked immunosorbent assay (ELISA) rather than with a clinic-based rapid test in order to ensure adequate documentation. Health care workers should be instructed to practice safer sex until their HIV test is negative 6 months following exposure. Nucleic acid amplification tests (e.g. polymerase chain reaction or quantitative viral load) should not be done serially to assess whether HIV was acquired as these tests have a significant false-positive rate,⁴ which causes unnecessary stress, and they are expensive. The only place for such tests is in consultation with a virologist or infectious diseases specialist when seroconversion illness is suspected. The laboratory assessment of toxicity is limited to screening and monitoring for the haematological toxicity of zidovudine — full blood count should be performed at baseline, and after 2 and 4 weeks on antiretroviral therapy.

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