

**Recommendations on the Management and Postexposure
Prophylaxis of Needlestick Injury or Mucosal Contact to
HBV, HCV and HIV**

Scientific Committee on AIDS
Scientific Working Group on Viral Hepatitis Prevention
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This document replaces the *Procedure for Management of Needlestick Injury or Mucosal Contact with Blood or Body Fluids – General Guidelines for Hepatitis B, C and HIV Prevention* published by the Scientific Committee of the Hong Kong Advisory Council on AIDS (SCA) and the Scientific Working Group on Viral Hepatitis Prevention (SWG VHP) of the Department of Health in September 1997. Comments and suggestions on the Recommendations are most welcome, and they can be addressed to:

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Recommendations on the Management and Postexposure Prophylaxis of Needlestick Injury or Mucosal Contact to HBV, HCV and HIV

Background

1. Due to its work nature, health care workers (HCW) are exposed to a variety of occupational hazards. Of these, the transmission of blood-borne infections is a major concern that has received much attention. Adherence to standard infection control practices and avoidance of exposure to blood or body fluids is the best way of preventing blood-borne infections in health care setting. However, accidental exposure still happens from time to time and poses risk to the HCW. Postexposure management comes into play when such incidents occur. Rarely, significant exposure with risk of contracting blood-borne infections may occur in community settings.
2. The Scientific Committee of the Hong Kong Advisory Council on AIDS (SCA) and the Scientific Working Group on Viral Hepatitis Prevention (SWGVP) of the Department of Health recognise the importance of occupational exposure in health care setting. On the prevention side, *Prevention of transmission of HIV in health care settings – guidelines and practices* was published by the SCA in 1992, and revised in 1995. Also, the *Procedures for management of needlestick injury or mucosal contact with blood or body fluids – recommended guidelines for HIV and hepatitis prevention* was first formulated by SCA and SWGVHP in 1992. The latter guidelines were revised in 1995 to incorporate hepatitis C, and further in 1997 to update on the postexposure management of HIV.
3. In the recent years, new findings and practices on the management of occupational exposure to HIV, especially on postexposure prophylaxis (PEP), have been published. The US Centers for Disease Control and Prevention (CDC) released the updated guidelines on management of occupational exposures to hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) in June 2001. Against these backgrounds, the SCA and SWGVHP jointly embark on a revision of the guidelines of 1997.

Guiding principles

4. This set of revised guidelines is recommended according to the following guiding principles:
 - (a) An integrated approach is taken by considering collectively the most important blood-borne infections to date, i.e. HBV, HCV and HIV .
 - (b) Risk assessment and counseling constitute the main emphasis of postexposure management, which lead to the specific option for PEP. As such, a case-by-case evaluation is crucial.
 - (c) Recommended practice has been put forth, based on evidence and scientific grounds where available and relevant; international developments and recommendations, as well as local perspectives have been taken into consideration.

Blood-borne infections and the transmission risk in health care setting

5. HBV infection is endemic in Hong Kong. About half of the adult population above 40 years of age have been infected with hepatitis B. About 8% of the population are carriers. Up to 25% of the carriers may eventually die of chronic liver diseases, principally hepatocellular carcinoma (HCC) and cirrhosis.¹ The estimated risk of contracting hepatitis B through needlestick injury involving HBV infected blood ranges from 2% to 40%.²
6. Between 70 to 80% of people infected with HCV results in chronicity. A significant proportion of chronic HCV infection has resulted in chronic hepatitis, cirrhosis and HCC in 10-30 years of time.³ Prevalence of anti-HCV positivity in new blood donors was 0.035-0.099% in the last decade⁴ and it was estimated that some 0.2-0.3% of the population have been infected with hepatitis C. The estimated risk of contracting hepatitis C through needlestick injury involving HCV infected blood is 3-10%.²
7. HIV causes AIDS (acquired immune deficiency syndrome), which is characterized by the development of opportunistic infections or tumors. HIV infection has been reported to occur in health care settings through exposure to contaminated blood from percutaneous injuries or mucosal contacts. The estimated risk of contracting the virus after needlestick injuries with exposure to infected blood is below 0.4%.² The risk after mucosal contact is even lower. In Hong Kong, the HIV prevalence has been estimated to be <0.1% in the adult population.
8. The prevention of HBV, HCV and HIV transmission in health care setting depends on the practice of infection control measures based on the principle of universal precaution. The details of infection control practice, however, falls outside the scope of this document. Postexposure management involves provision of first aid, reporting, risk assessment, counselling and additional procedures specific to individual pathogens implicated. (Annex I) It is important that health care workers responsible for postexposure management should familiarize themselves with the principles and procedures involved.

First Aid

9. First aid is of importance after exposure to blood or body fluids. In case of needlestick injury, the wound should be washed immediately and thoroughly with soap and water. The wound should then be disinfected and dressed. For mucosal contact, e.g. spillage into the eyes, the exposed part should be washed immediately and liberally with running water. The exposed person should seek medical advice for proper wound care and postexposure management.

Reporting

10. The institution should ensure that a mechanism is in place to facilitate reporting and management

¹ Chu CM. Natural history of chronic hepatitis B virus infection in adults with emphasis on the occurrence of cirrhosis and hepatocellular carcinoma. *J Gastroenterol Hepatol.* 2000;15(Suppl):E25-30.

² Gerberding JL. Management of occupational exposures to blood-borne viruses. *N Engl J Med* 1995; 332:444-51

³ Yatsuhashi H, Yano M. Natural history of chronic hepatitis C. *J Gastroenterol Hepatol.* 2000;15(Suppl):E111-6.

⁴ Department of Health. Surveillance of viral hepatitis in Hong Kong – 2000 update report. 2001

of post occupational exposure.

Management of accidental exposure to HBV

11. The management of an incident of accidental exposure to HBV involves proper risk assessment, counselling tailored to the needs of individual client, and the prescription of postexposure prophylaxis as appropriate. As a rule, for the best protection, all health care staff with potential risk of exposure to blood and body fluids are advised to receive hepatitis B vaccination as soon as possible for their own safety.
12. The efficacy of hepatitis B immunoglobulin (HBIG) and HBV vaccine for postexposure protection in occupational exposure can be referenced from the scene in perinatal transmission. HBIG could lower the carrier rate of infants born to HBsAg positive mothers from 92% to 54% at 1 year.⁵ Multiple doses of HBIG is 70-75% effective in preventing perinatal transmission.⁶ The efficacy of protection could be increased to 85-95% by adding a standard HBV vaccination regimen to HBIG.^{7,8}
13. The need for HBIG administration and HBV vaccination depends on the exposure, and HBV status of the source and the exposed. (Annex II) Individuals who lack HBsAg and have not previously developed satisfactory immune response to the virus may be susceptible. They could be offered HBIG for immediate protection of significant exposure to HBV. An individualised approach founded on risk assessment is recommended for the management of a health care worker with unknown response to hepatitis B vaccination, one who has been exposed to an unknown source or a source with unknown hepatitis status. In such circumstances, the HBV status of the source and/or the exposed should be determined where appropriate. The exposed person may be managed as in the case of an injury involving an HBsAg positive source person if the HBV status of the latter cannot be ascertained.

Management of accidental exposure to HCV

14. To ascertain whether HCV infection has occurred from the exposure, health care personnel exposed to HCV should have blood taken as a baseline soon after exposure and again 6 months later for HCV antibody testing. The US CDC also recommends alanine aminotransferase testing for client exposed to known HCV-infected source.⁹
15. Currently, there is no effective vaccine or chemoprophylactic agent for preventing HCV

⁵ Beasley RP, Hwang LY, Lee GC, et al. Efficacy of hepatitis B immune globulin for prevention of perinatal transmission of the hepatitis B virus carrier state: final report of a randomized double-blind, placebo-controlled trial. *Hepatology* 1983;3:135-41.

⁶ CDC. Hepatitis B virus: a comprehensive strategy for eliminating transmission in the US through universal childhood vaccination: recommendation of the Immunization Practices Advisory Committee (ACIP). *MMWR* 1991;40(no. RR-13) 1-25.

⁷ Beasley RP, Hwang LY, Lee GC, et al. Prevention of perinatally transmitted hepatitis B virus infection with hepatitis B immune globulin and hepatitis B vaccine. *Lancet* 1983;2:1099-1102.

⁸ Wong VCW, Ip HMM, Reesink HW, et al. Prevention of the HBsAg carrier state in newborn infants of mothers who are chronic carriers of HBsAg and HBeAg by administration of hepatitis B vaccine and hepatitis immunoglobulin: double-blind randomized placebo-controlled study. *Lancet* 1984;1:921-6.

⁹ US CDC. Updated US Public health service guidelines for the management of occupational exposures to HBV, HCV, and HIV and recommendations for postexposure prophylaxis. *MMWR* 2001; 50(RR-11): 1-52.

infection after accidental occupational exposure. Limited data indicate that anti-HCV therapy, such as interferon α , might be beneficial when started early in the course of HCV infection, but no guidelines exist for guiding the administration of therapy during the acute phase of infection.¹⁰

Management of accidental exposure to HIV

16. Assessment of source patient for risk of HIV infection, if possible, should be made. Counselling and HIV testing with consent should be offered where appropriate. If the source patient is HIV antibody positive, suspected to be positive or is of unknown status, the exposed person should be encouraged to have blood taken for HIV antibody as a baseline. Counselling and consent are again important in this situation.
17. Assessment of potential risk of HIV infection from the exposure is of paramount importance in deciding on the need for chemoprophylaxis. The risk depends on the setting, type and severity of exposure, type and amount of fluid/tissue exposed/transferred, HIV status of source, and susceptibility of the injured. It has been shown that some factors of the accident itself were associated with a higher potential of seroconversion after percutaneous exposure to HIV-infected blood: (a) injury with a device visibly contaminated with the patient's blood, (b) a procedure that involved a needle directly placed in a vein or artery, (c) deep injury, and (d) exposure to source patients with AIDS or high plasma viral burden.¹¹
18. Though the disease stage of a known HIV-infected source impacts on the risk of transmission, it is not uncommon that HIV status of the source is unknown. In such case, the likelihood of HIV infection in the source could be assessed by clues such as (a) HIV-related illnesses, e.g. *Pneumocystis carinii* pneumonia, oral thrush, (b) HIV-related risk behaviors, e.g. unprotected sex, multiple sex partners, needle-sharing for drug injection, and (c) HIV prevalence of the community group which the source belongs to.
19. Antiretroviral prophylaxis should be offered to the injured if the exposure is assessed to constitute significant risk of HIV infection. (Annex III) Pros and cons of antiretroviral chemoprophylaxis should be adequately explained. Prophylaxis should be initiated as soon as possible, preferably within 1-2 hours postexposure, after the decision is made; however, delayed initiation may still be indicated on a case-by-case consideration. Even though zidovudine is the only drug with proven efficacy for postexposure chemoprophylaxis, combination antiretroviral prophylaxis is recommended based on their observed benefits in other clinical situations as well as scientific researches.
20. A basic two-drug regimen of AZT/3TC can be considered if high risk factors are not present. Otherwise, the addition of a protease inhibitor (PI), e.g. indinavir, nelfinavir, is indicated. The use of nevirapine to spare PI has caused severe morbidity and even deaths, which is thus contraindicated in PEP.¹² Usage of efavirenz for PEP has not been well studied.

¹⁰ US CDC. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR 1998;47(RR19):1-39.

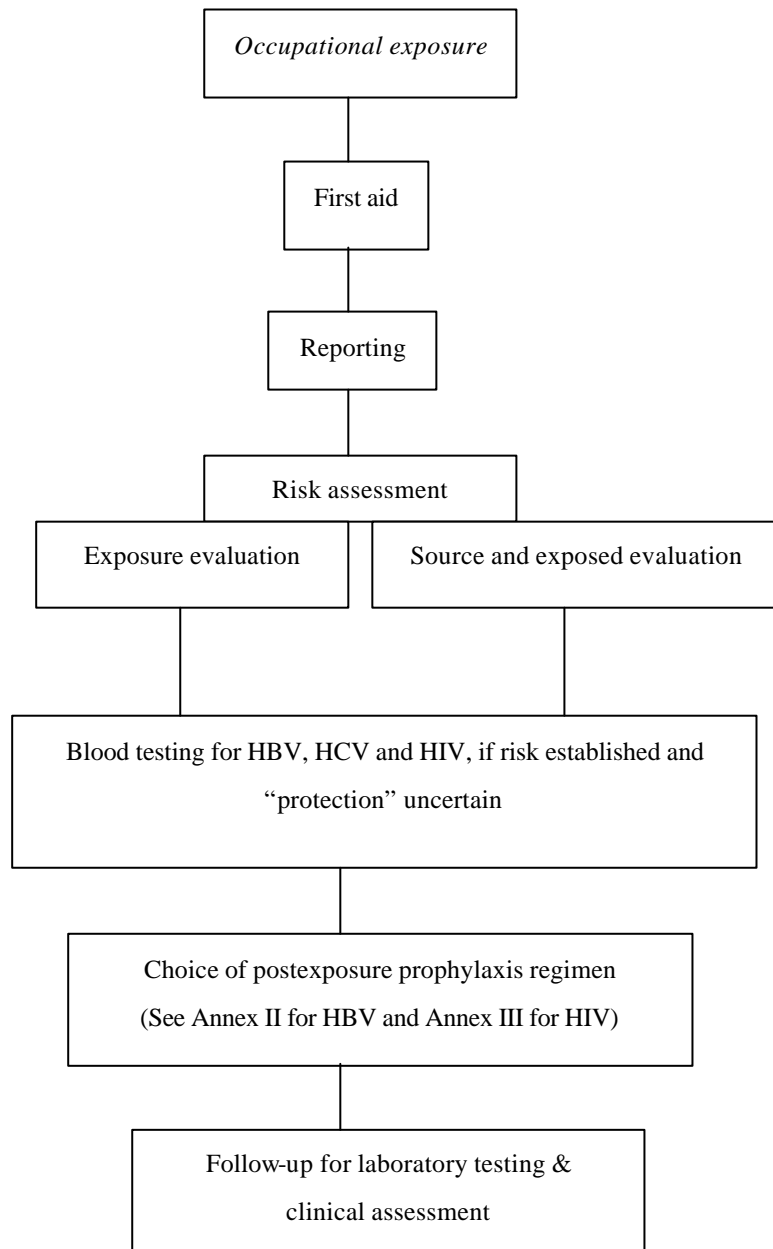
¹¹ Cardo DM, Culver DH, Ciesielski CA et al. A case-control study of HIV seroconversion in health-care workers after percutaneous exposure. N Engl J Med 1997; 337: 1485-90

¹² US CDC. Serious adverse events attributed to nevirapine regimens for postexposure prophylaxis after HIV exposures – Worldwide, 1997-2000. MMWR 2001; 49: 1153-56

21. The optimal duration of PEP is unknown but a complete course is normally 4 weeks. Many HCWs who took PEP experienced one or more symptoms and a substantial proportion could not complete the course.¹³ Pretreatment counseling on all potential side effects might improve the compliance of PEP.
22. The exposed person should be followed up for at least 6 months and be asked to report signs/symptoms of acute HIV seroconversion. Blood taking should be performed soon after injury, at 3-6 months after exposure and when there is suggestion of seroconversion. Individuals started on chemoprophylaxis should also be monitored for drug toxicity and tolerance.
23. Strict confidentiality of the HIV status of source patient and injured person must be observed.

¹³ Parin JM, Murphy M, Anderson J et al. Tolerability and side-effects of post-exposure prophylaxis for HIV infection. *Lancet* 2000; 355: 722-23

**Flow chart for the management of occupational exposure to
HBV, HCV and HIV**



Postexposure prophylaxis against HBV infection

	POSTEXPOSURE PROPHYLAXIS				
	Previously Vaccinated			Unvaccinated	
	<i>Known Responders</i>	<i>Known Hypo/Non-responders</i>	<i>Unknown Response</i>	<i>HBsAg -ve AND anti-HBs -ve</i>	<i>HBsAg +ve OR anti-HBs +ve</i>
I. SOURCE KNOWN					
(a) HBsAg + ve	Nil	HBIG within 24 hours repeat after 1 month	Dependent on anti-HBs* status of exposed person	HBIG + HB Vac	Nil
(b) HBsAg – ve	Nil	Nil	Nil	HB Vac	Nil
(c) HBsAg unknown	Nil	Dependent on source HBsAg status	Dependent on anti-HBs* status of exposed person	HBIG + HB Vac, or HB Vac; depending on source HBsAg status	Nil
II. SOURCE UNKNOWN	Nil	as in I(a)	as in I(a)	as in I(a)	Nil

N.B.

1. Blood should be taken from the source and the exposed person whenever possible and indicated, particularly if the latter has not received hepatitis B vaccination before.
2. Where indicated, one dose of HBIG (dosage as recommended by the manufacturer) should be given within 24 hours of exposure, and preferably within 7 days. Attention is drawn to the need of blood taking before administering HBIG.
3. Hepatitis B vaccination (HB Vac) may be offered for (a) health care workers (HCW) who have not received HBV vaccination before, and (b) HCW who are hypo-/non-responder to one previous course of HBV vaccine. HB Vac is given IM into the deltoid at a dose of 10ug (B-Hepavac II) or 20ug (Engerix-B). The second and the third doses are to be given one and six months afterwards.
4. HBIG and HBV vaccine can be given together but at different sites. If HBIG has been given, the first dose of vaccine can be delayed for up to 1 week after exposure, pending results of serological test. If HB Vac is given, the second dose of HBIG can be omitted if the HCW is not a known hypo-/non-responder.

*For a previously vaccinated person with unknown response, he/she should be tested for anti-HBs

- no treatment is required if anti-HBs is positive
- HBIG ± HBV vaccine can be offered if anti-HBs is negative

Postexposure prophylaxis against HIV

Regimen	Dosage	*Indications
Expanded regimen	<ul style="list-style-type: none">• Zidovudine (200mg tid/300mg bid) + lamivudine (150mg bid) + indinavir (800mg q8h)/nelfinavir (750mg tid/1250mg bid)	<ul style="list-style-type: none">• Substantiated risk of HIV infection from an exposure with presence of high risk factors
Basic regimen	<ul style="list-style-type: none">• Zidovudine (200mg tid/300mg bid) + lamivudine (150mg bid)	<ul style="list-style-type: none">• substantiated risk of HIV infection from an exposure without high risk factors
No PEP	<ul style="list-style-type: none">• no antiretroviral drugs	<ul style="list-style-type: none">• risk not substantiated or patient declined PEP

*dependent on risk assessment regarding the setting, type and severity of exposure, type and amount of fluid/tissue exposed/transferred, HIV status of source, and susceptibility of the injured