Procedure for Management of Needlestick Injury or Mucosal Contact with Blood or Body Fluids

- General Guidelines for Hepatitis B, C and HIV Prevention

Scientific Committee on AIDS
Scientific Working Group on Viral Hepatitis Prevention
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or Mucosal Contact with Blood or Body Fluids
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BACKGROUND

1. Hepatitis B virus (HBV) infection is endemic in Hong Kong. About half of the adult population above 40 years old 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 and cirrhosis. The estimated risk of contracting hepatitis B through needlestick injury involving HBV infected blood ranges from 6% to 30%.

2. Hepatitis C virus (HCV) infection results in chronic carriage in at least 50% of cases. A significant proportion of HCV carriers progress to cirrhosis and some may develop hepatocellular carcinoma. Screening tests for healthy blood donors indicate 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 ranges from 3-10%. The documented route of transmission is parenteral, through contaminated needle or blood/blood products transfusion. The role of sexual transmission is controversial at present.

3. HIV (Human Immunodeficiency Virus) 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 by exposure to contaminated blood through cutaneous injuries or mucous membranes. The estimated risk of contracting the virus after needlestick injuries with exposure to infected blood is about 0.4%, which is lower than that of HBV and HCV. The risk after mucosal contact is lower. In Hong Kong, the HIV prevalence has been estimated to be <0.1% in the adult population.

4. In a case-control study of the United States and Europe (MMWR 1995;44:929-33), use of zidovudine (AZT) after percutaneous exposure to HIV-infected blood in health care workers was found to be associated with an up to 79% decrease in risk of HIV transmission. The risk of HIV seroconversion was higher for exposures involving (a) deep injury, (b) visible blood on the device, (c) device previously placed in the source patient’s vein or artery, and (d) source patient with AIDS or advanced HIV infection.

5. The prevention of HBV, HCV and HIV transmission in the health care setting depends on the practice of infection control measures based on the principle of universal precaution (Readers may refer to Prevention of transmission of HIV in health care settings: guidelines and practices - Scientific Committee on AIDS 1995). Post exposure management involves provision of first aid, reporting and additional procedures specific to individual pathogens implicated. Counselling and consent from client for blood taking are crucial in such management. Health care workers responsible for post-exposure management should familiarize themselves with its principles and procedures.
FIRST AID

1. First aid is of importance after exposure to blood or body fluids.

2. In case of needlestick injury, wash the wound immediately and thoroughly with soap and water. The wound should then be disinfected and dressed.

3. In case of mucosal contact, such as spillage into the eyes, wash immediately and liberally with running water.

4. The injured person should seek medical advice for proper wound care and post exposure management.

REPORTING

1. The institution should ensure that a mechanism is in place to facilitate reporting and management of post occupational exposure.

POST-EXPOSURE PROPHYLAXIS AGAINST HEPATITIS B

1. The consulting doctor should assess the injury, the risk of hepatitis B infection, and decide whether post-exposure prophylaxis is required. (for ease of reference, see Annex I & II)

2. Blood shall be taken from the source patient (for HBsAg) and injured person (for HBsAg and anti-HBs) for serological tests when indicated.

3. Booster doses of hepatitis B vaccine are not necessary if a person has already developed positive antibody response previously after a full course of vaccination, or has developed immunity after natural infection.

4. For the best protection, all health care staff with possibility of exposure to blood and body fluids are advised to receive hepatitis B vaccination for their own safety.

POST-EXPOSURE MANAGEMENT AGAINST HEPATITIS C

1. There is no effective vaccine or chemoprophylactic agent for preventing HCV infection after accidental occupational exposure.

2. The procedures of administering first aid and reporting are the same as in the case of potential exposure to HBV and HIV. Medical advice should be sought if exposure to HCV is suspected.

3. To ascertain whether HCV infection occurs, 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. In this connection, it is useful to obtain blood from the source patient for anti-HCV testing if possible. Readers may refer to new recommendations of the US CDC for details of post-exposure
MANAGEMENT OF OCCUPATIONAL EXPOSURE TO HIV

1. Assessment of source patient for risk of HIV infection, if possible, should be made by the doctor in-charge. Counselling and HIV testing with consent should be offered where appropriate.

2. If the source patient is HIV antibody positive or is of unknown status, the injured person should be encouraged to have blood taken for HIV antibody as a baseline. Counselling and consent are again important in this situation.

3. Assessment of potential risk of HIV infection from the exposure is of paramount importance in deciding on the need for chemoprophylaxis. The risk of HIV transmission is highest for percutaneous exposure to infected blood with (a) larger volume of blood (e.g. deep injury with a large diameter hollow needle and with injection of source patient’s blood), and (b) blood containing a high titre of HIV (e.g. source with acute HIV seroconversion illness or late stage disease). Antiretroviral prophylaxis should be recommended when one or both of the above factors are present. The prophylaxis should be offered for other situations, with a lower but genuine risk of HIV transmission, that involve contact with blood or other potentially infectious body fluid/tissue.

4. The recommended protocol in the local setting is shown in Annex III. The following factors should be considered: (a) zidovudine is the only drug with proven efficacy for post-exposure chemoprophylaxis; recommendations for the use of lamivudine (3TC) and indinavir are only based on their observed benefits in other clinical situations as well as scientific research, (b) prophylaxis should be initiated as soon as possible, preferably within 1-2 hours post-exposure, after the decision is made; however, delayed initiation (e.g. 1-2 weeks) may still be considered for high risk exposure.

5. If the source patient or the patient’s HIV status is unknown, initiating post-exposure prophylaxis should be decided on a case-by case basis depending on (a) the exposure risk and (b) the likelihood of HIV infection in known or possible source patient.

6. The injured person should be assessed for risk of transmission and counselled on the pros and cons of antiretroviral chemoprophylaxis as appropriate. He/she 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.

7. Strict confidentiality of the HIV status of source patient and injured person must be observed.
**RECOMMENDED GUIDELINES FOR POST-EXPOSURE PROPHYLAXIS AGAINST HEPATITIS B INFECTION**

### POST-EXPOSURE PROPHYLAXIS

<table>
<thead>
<tr>
<th>I. SOURCE KNOWN</th>
<th>Previously Vaccinated</th>
<th>Unvaccinated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Known Responders</strong></td>
<td><strong>Known Non-responders</strong></td>
<td><strong>Unknown Response</strong></td>
</tr>
<tr>
<td>(a) HBsAg + ve</td>
<td>Nil</td>
<td>HBIG within 24 h repeat after 1 month</td>
</tr>
<tr>
<td>(b) HBsAg – ve</td>
<td>Nil</td>
<td>HBIG + HB Vac</td>
</tr>
<tr>
<td>(c) HBsAg unknown</td>
<td>Nil</td>
<td>HBIG + HB Vac or HB Vac, depending on source HBsAg status</td>
</tr>
</tbody>
</table>

| 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, particularly if the latter has not received hepatitis B vaccination before.
2. Where indicated, one dose of HBIG (0.06 ml/Kg BW) 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. If HBIG has been given, the first dose of vaccine can be delayed for up to 1 week after exposure pending results of serological tests. In these cases the injured person can be referred to the Viral Hepatitis Preventive Service of the Department of Health (Tel:2780 4987) for the vaccination.
4. Hepatitis B vaccination (HB Vac) is given IM into the deltoid at a dose of 10ug (B-Hepavac II) or 20ug (Engerix-B). The second and third doses are to be given one and six months afterwards.

HBIG can be given together but at a different site.

* For a previously vaccinated person with unknown response, he/she should be tested for anti-HBs
  (a) no treatment is required if anti-HBs is positive;
  (b) HBIG and HB Vac can be offered if anti-HBs is negative.

φ means HBsAg -ve AND anti-HBs -ve
ψ means HBsAg +ve OR anti-HBs +ve
Management Flowchart for Post-exposure Prophylaxis against Hepatitis B Infection

Needlestick injury or mucosal contact with blood or body fluid

Check vaccination history of injured Staff

- Previously Vaccinated
- Not previously Vaccinated

Post-vaccination Immunity

- Checked
- Not checked

Immune to HBV [anti-HBs +ve]
- Non-responder
- Unknown Response
- Unknown HBV status

Known HBV carrier or Immune to HBV after natural infection
- No further action

*Check HBV status of injured staff

No immunity (HBsAg & anti-HBs -ve)

Unknown HBV status or results unavailable within 48 hours

HBsAg +ve or anti-HBs +ve

*Check HBV status of source person (As soon as possible after exposure)

Source is not HBV carrier (HBsAg -ve)

- No further action if injured staff is a non-responder.
- For those not vaccinated, start vaccination.
  - B-Hepavac II 10ug or Engerix-B 20ug IMI at deltoid
  - 2nd dose one month later
  - 3rd dose six months later

Source is a carrier (HBsAg +ve) or of unknown status

- If injured staff is a non-responder, give one dose of HBIG within 24 hours (preferably within 7 days if not possible within 24 hours) and repeat another dose one month later.
- For those not vaccinated, give one dose of HBIG, followed by a full course of vaccination.
- For those vaccinated but with unknown response, give one dose of HBIG and wait for blood results before deciding on further management.

HBV Hepatitis B virus
HBsAg Hepatitis B surface antigen
Anti-HBs Antibody against hepatitis B surface antigen
HBIG Hepatitis B immunoglobulin

*Action should be taken promptly
Annex III

Recommendations for chemoprophylaxis after occupational exposure to HIV, by type of exposure and source material (adapted from the *Update: Provisional Public Health service Recommendations for Chemoprophylaxis after Occupational Exposure to HIV* MMWR 1996;45(22):468-472)

<table>
<thead>
<tr>
<th>Type of Exposure</th>
<th>Source material</th>
<th>Antiretroviral prophylaxis*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percutaneous</td>
<td>③ Blood</td>
<td>Recommend/offer</td>
</tr>
<tr>
<td></td>
<td>③ Fluid containing visible blood, other potentially infectious fluid® or tissue</td>
<td>Offer</td>
</tr>
<tr>
<td></td>
<td>③ Other body fluid (e.g. urine)</td>
<td>Not offer</td>
</tr>
<tr>
<td>Mucous membrane</td>
<td>③ Blood</td>
<td>Offer</td>
</tr>
<tr>
<td></td>
<td>③ Fluid containing visible blood, other potentially infectious fluid® or tissue</td>
<td>Offer</td>
</tr>
<tr>
<td></td>
<td>③ Other body fluid (e.g. urine)</td>
<td>Not offer</td>
</tr>
<tr>
<td>Skin, with visibly compromised integrity</td>
<td>③ Blood</td>
<td>Offer</td>
</tr>
<tr>
<td></td>
<td>③ Fluid containing visible blood, other potentially infectious fluid® or tissue</td>
<td>Offer</td>
</tr>
<tr>
<td></td>
<td>③ Other body fluid (e.g. urine)</td>
<td>Not offer</td>
</tr>
</tbody>
</table>

*Regimen may include 1 drug or combination of 2 to 3 drugs: reverse transcriptase inhibitors (e.g. zidovudine and lamivudine) with or without a protease inhibitor (PI), e.g. indinavir. More antiviral agents, including PI may be considered for cases with a high-risk exposure. When zidovudine-resistant strains are suspected, agents other than zidovudine, e.g. lamivudine, should be added/prescribed and PI considered.

®Includes semen, vaginal secretions, cerebrospinal, synovial, pleural, pericardial, and amniotic fluids.
ERRATUM

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MANAGEMENT OF OCCUPATIONAL EXPOSURE TO HIV
5. If the source patient or the patient's HIV status is unknown, initiating post-exposure prophylaxis should be decided on a case-by-case basis …

Annex I

N.B. 3. If HBIG has been given, the first dose of the hepatitis B vaccine (HB Vac) may be delayed up to 1 week after exposure, pending results of serologic tests. In these cases the injured person can be referred to the Viral Hepatitis Preventive Service of the Department of Health (Tel: 2780 4987) for the vaccination.