

Preventing Hepatitis B Transmission in Health Care Settings

-Recommended Guidelines-

**Scientific Working Group on Viral Hepatitis Prevention
Department of Health
First published May 1995
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This guidance is designed to prevent the transmission of hepatitis B from health care workers to their patients and vice versa. Health care workers are defined as *persons, including students and trainees, whose activities involve contact with patients or with blood or other body fluids from patients in a health care setting.*

1. Background

1.1 Hepatitis B virus (HBV) infection is an important public health problem globally, especially in Asian countries. It is estimated that 300 million people worldwide are hepatitis B carriers, and 75% of these individuals reside in Asia. Hong Kong, being an endemic area, has a hepatitis B carrier rate of about 10%. Up to 25% of the carriers may eventually die of chronic liver diseases, principally hepatocellular carcinoma (HCC) and cirrhosis.

1.2 As a blood-borne pathogen, HBV is known to be transmitted in the following ways:-

- (1) perinatal transmission from a carrier mother to her baby;
- (2) sexual contact with a carrier;
- (3) exposure to contaminated blood or body fluids, including the risk of intrafamilial and lateral transmission.

2. Risk of Transmission in Health Care Settings

2.1 Risk to health care workers

Any health care worker who comes in contact with the blood or body fluids of a HBV carrier through mucosal contact or injuries is at risk. The chance of infection is considerably higher if the contact fluid is HBeAg positive. Because of the long incubation period, it may be difficult to trace the source of infection. Moreover, the majority of HBV infections are subclinical. Studies overseas showed that up to 30% of health care workers may contract hepatitis B after a needle-stick injury contaminated by an HBV carrier's blood. In Hong Kong, as is the case for other endemic countries, documentation of such incidents is difficult since many health care workers have already been infected by the virus before entering the health care profession.

2.2 Risk to patients

There have been reports of HBV transmission from health care workers to their patients. This can occur if a hepatitis B carrier health care worker sustains injury during a procedure resulting in blood contaminating the patient's open tissues. Transmission can also occur through contaminated instruments. Nevertheless, there is no accurate data which can be quoted to estimate the actual incidence. With strict adherence to universal precautions, the risk of HBV transmission in the health care setting is minimal.

3. General Principles

- 3.1** Prevention of HBV transmission in the health care setting is the responsibility of health care workers, their unit heads/supervisors, professional bodies (associations, colleges and councils), infection control committees as well as the administration. The system of practice should be based on scientific evidence, and should be reviewed from time to time.
- 3.2** The most effective means of preventing transmission of blood-borne pathogens (including HBV) in the health care setting is through adherence to universal precautions, thereby decreasing the risk of direct contact with blood or body fluids.
- 3.3** Health care workers are strongly advised to have their hepatitis B markers checked and receive vaccination where appropriate, since vaccination prior to exposure is more effective than post-exposure prophylaxis. In the case of sharps injury or mucosal contact with blood or body fluids, prophylaxis against HBV infection should be given in accordance with institution policy established.
- 3.4** There is an absolute obligation on the part of health care workers who know that they are HBV carriers to act safely towards their patients.
- 3.5** Health care workers should not be discriminated because of their HBV status. Information regarding a health care worker's HBV status, like other medical information, shall be kept confidential. Job restriction or alteration of clinical duties, if necessary, should be considered on individual basis.

4. Guidelines

4.1 Infection control

The best way of preventing blood-borne diseases is to treat all blood and body fluids as potentially infectious and that they are handled with the same precautions. Some of the essential guidance are as follows:-

- (a) Adopt good hygiene practices with regular hand washing.
- (b) Cover wounds or skin lesions with dressings.
- (c) Wear protective device when anticipating contact with blood or other body fluids.
- (d) Institute safe procedures for handling and disposal of needles and other sharps.
- (e) Institute proper procedures for sterilization and disinfection of instruments and equipment in accordance with policy established in the institution.
- (f) Wipe down spillages of blood and other body fluids promptly with disposable towels soaked in household bleach (hypochlorite) diluted 1 in 5 with water and clean surfaces thoroughly.
- (g) Institute a procedure for the safe disposal of contaminated waste.

Sound infection control practice with appropriate quality assurance should be implemented at all levels, taking into consideration factors unique to individual setting.

4.1.1 *Infection control committee*

Since there is rapid advancement in medicine and technology, it is essential to keep updated information on issues relating to infection control practice. Infection control committees should efficiently serve the functions of developing, promulgating, updating and overseeing infection control policies in each institution and for each clinical specialty.

4.1.2 *Written infection control guidelines*

Written infection control guidelines on universal blood or body fluid precautions should be developed and periodically updated in all health care settings by infection control committees or equivalents and by professional bodies for health care professionals in private and solo practice.

4.1.3 *Infection control training*

The subject of infection control should be made an integral part of undergraduate, pre-employment, and in-service training for all health care workers. Regular courses tailored to the infection control needs of individual specialties should be organized.

4.2 **Immunization of health care workers**

Every effort should be made to inform health care workers of the benefits of immunization and the importance of post-immunization serological testing to determine the response. Individual unit/institution should make arrangement for vaccination of the staff as

appropriate.

4.2.1 *Pre-vaccination blood tests*

Health care workers are encouraged to have blood screening for hepatitis B markers prior to vaccination. In Hong Kong about half of the adult population above the age of 40 have already been infected with hepatitis B in the past. They would have either developed protective antibodies or become hepatitis B carriers. For such persons, vaccination is not necessary. The hepatitis B carriers should be counselled appropriately. (refer to section 5.2)

4.2.2 *Vaccination regimen*

Three doses of hepatitis B vaccine should be administered via intramuscular injection at month 0,1,6.

4.2.3 *Checking response to the vaccine*

Blood for hepatitis B markers should be checked 1-4 months after completion of the primary course. An anti-HBs level of 10 mIU/ml is considered to reflect an adequate response to the vaccine and to confer protective immunity. Levels of anti-HBs below 10 mIU/ml indicate a suboptimal response to the vaccine, which may not necessarily confer long-lasting immunity and may require boosting. If there is a delay in checking the response, a booster dose should be given before anti-HBs titres are measured as levels of antibody gradually fall after vaccination.

4.2.4 *Hyporesponders and non-responders*

For those with anti-HBs levels below 10 mIU/ml after a primary course of vaccination, booster doses may improve the response. A repeated course (another 3 doses of vaccine) is recommended and blood is rechecked 1-4 months later.

Those with anti-HBs levels of 0 or between 0 and 10 mIU/ml despite a second course of vaccination are declared non-responders and hyporesponders respectively. They should be informed of the importance of receiving post-exposure prophylaxis with HBIG in the case of occupational exposure to HBsAg +ve blood or body fluid.

4.3 Post-exposure prophylaxis for hepatitis B

In the course of their work, health care workers may experience accidental sharps injuries, or mucosal contact with blood or body fluids, such as spillage into the eyes. This may expose them to the danger of hepatitis B. A study of biochemical specimens in hospitals showed that 10-20% of them were HBsAg positive and could transmit the hepatitis B virus.

In view of the risk, procedures for management of sharps injuries or mucosal contact with blood or blood fluids are recommended for general guidance.

4.3.1 First aid

- (a) First aid is of the utmost importance for lowering the risk of infection.
- (b) In case of sharps injury with blood/body fluids, express blood from wound and wash immediately and thoroughly with soap and water. The wound should then be disinfected and dressed.
- (c) In the case of mucosal contact with blood/body fluids, such as spillage into the eyes, wash immediately and liberally with running water.
- (d) The injured person should seek medical advice immediately.

4.3.2 Reporting

The injured staff should report the incident to his supervisor or unit head and notify the Infection Control Team wherever appropriate.

4.3.3 Post-exposure prophylaxis

- (a) The consulted doctor should assess the injury and its risk of hepatitis B infection, and decide on whether post-exposure prophylaxis is required. Guidelines are at Annex I and II for reference.
- (b) Booster doses of hepatitis B vaccines are not necessary if a person has already developed adequate antibody response previously after a full course of vaccination.
- (c) No prophylaxis is needed for those who have natural immunity against HBV.

5. Hepatitis B Infected Health Care Workers

5.1 Advice to unit/specialty heads and the administration

Unit/specialty heads should look into the infection control practice of their respective specialties in relation to the risk of HBV transmission, and ensure that their staff adhere to it. If the need arises, individual health care workers should be referred to the relevant specialists for occupational counselling and advice on clinical management.

The hepatitis B status of individual staff should be kept confidential. No health care worker should be discriminated because of the hepatitis B status. Job restriction or alteration of the clinical duties of infected workers, if required, should be considered on an individual basis.

5.2 Advice to HBsAg positive health care workers

Although many clinical procedures are considered to pose no risk of transmission of HBV from an infected health care worker to the patient, there are certain "exposure prone procedures" where injury to the worker may result in blood contaminating the patient's open wound or mucosal surfaces, thus causing transmission. All HBsAg positive health care workers have the responsibility to take precautions in order to avoid transmitting the infection to others. They are encouraged to seek medical advice before enrolment in a health care field, as well as from their supervisors during employment or upon joining the respective specialty. For those in solo practice or who are self-employed, advice from relevant professional bodies should be sought.

5.3 Compensation for occupationally acquired viral hepatitis

In the revised *Second Schedule of the Employees' Compensation Ordinance Cap 282*, parenterally contracted viral hepatitis is prescribed as an occupational disease. Any health care staff whose occupation involves contact with (a) human blood or human blood products; or (b) a source of viral hepatitis within 6 months prior to the occurrence of the disease is eligible for claiming compensation.

RECOMMENDED GUIDELINES FOR POST-EXPOSURE PROPHYLAXIS AGAINST HEPATITIS B INFECTION

	POST-EXPOSURE PROPHYLAXIS				
	Previously Vaccinated			Unvaccinated	
	<i>Known Responders</i>	<i>Known Non-responders</i>	<i>Unknown Response</i>	<i>HBV markers -ve^φ</i>	<i>HBV markers +ve^ψ</i>
I. SOURCE KNOWN					
(a) HBsAg + ve	Nil	HBIG within 24 h 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, 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. 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. HB vaccination is provided for health care workers in public service. Referrals to the Viral Hepatitis Preventive Service of the Department of Health may also be made (Tel:2780 4987, during office hours).
 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

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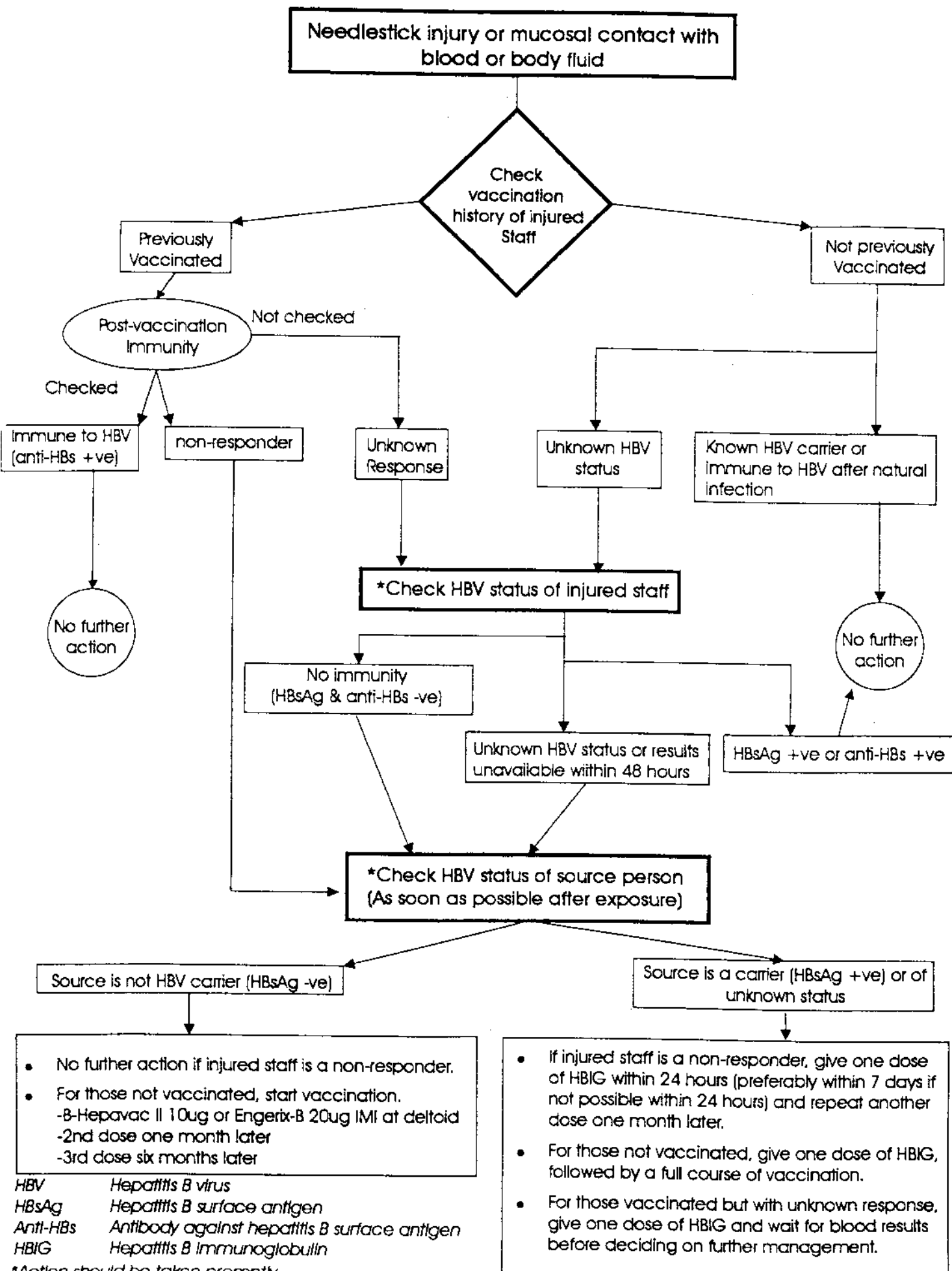
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1. Blood should be taken from the source and the exposed person whenever possible, particularly if the latter has not received hepatitis B vaccination before.
 2. Where indicated, one dose of HBIG (0.06 ml/Kg BW) should be given within 24 hours of 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.
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Management Flowchart for Post-exposure Prophylaxis against Hepatitis B Infection



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

ERRATUM

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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. Vaccination is provided in public service by the individual institution. Referrals to the Viral Hepatitis Preventive Service may also be made (Tel:2780 4987, during office hours).