



**GUIDANCE AND
RECOMMENDATIONS ON
HEALTH CARE WORKERS
INFECTED WITH HIV, HEPATITIS B
OR HEPATITIS C**

**MINISTRY OF HEALTH
BRUNEI DARUSSALAM**

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SUMMARY

1. This guidance aims to reduce the risk of transmission of the blood borne viruses HIV, Hepatitis B and C from health care workers (HCW) to patients.
2. This guidance extends to any HCW infected with the abovementioned viruses working in any health facility in Brunei Darussalam. All HCW's who perform exposure prone procedures (EPP), as defined in this guidance, are required to know their blood borne virus status beforehand.
3. Recommendations are based on the following considerations:
 - Infected HCWs who adhere to universal precautions and who do not perform invasive procedures pose no risk for transmitting HIV, HBV or HCV to patients; and
 - Infected HCWs who adhere to universal precautions and who perform exposure prone procedures pose a small risk for transmitting blood-borne viruses.
4. A HCW who is either HCV PCR positive or HIV positive or HBeAg positive or HBV DNA positive (exceeding 10^3 genome equivalents per ml) must not perform EPPs.
5. The guidance also recommends carrying out additional testing of any hepatitis B infected HCW who are e-antigen (HBeAg) negative and performs EPP, and prohibiting those with higher viral loads from performing EPP.

Action

6. All health facilities and employers should ensure that there are arrangements in place:
 - to have all HCWs found positive for HCV to undergo for HCV PCR tests;
 - to have all hepatitis B infected HCWs, who are e-antigen negative and who performs EPPs or clinical duties in renal units, tested for viral load (hepatitis B virus DNA);
 - to prohibit those who have a hepatitis B viral load which exceeds 10^3 (i.e. 1000) genome equivalents per ml from performing EPPs. Subject to annual retesting, HCW whose viral load does not exceed 10^3 genome equivalents per ml need not have their working practices restricted;
 - to manage blood exposure incidents for both HCW and patients.

Other Information

7. To ensure consistency of results, arrangements have been made for a designated laboratory to undertake this. Employers will have to meet the costs of testing.

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GLOSSARY

EPPs Exposure prone procedures. EPPs are a subset of invasive procedures (see below). EPPs are those procedures where there is potential for contact between the skin (usually finger or thumb) of the HCW and sharp surgical instruments, needles or sharp tissues (splinters / pieces of bone / tooth) in body cavities or in poorly visualised or confined body sites including the mouth. Procedures which lack these characteristics are unlikely to pose a risk of transmission of blood borne viruses from infected HCW to patient.

.....**Provided** they are not conducted in poorly visualised or confined body sites and routine infection control procedures are adhered to at all times, the following procedures are **not** considered to be exposure prone –

- oral, vaginal or rectal examinations that do not involve sharp instruments;
- phlebotomy;
- administering intramuscular, intradermal or subcutaneous injections;
- needle biopsies and needle aspirations;
- lumbar punctures;
- venous cutdown and angiographic procedures;
- incision/excision of epidermal or dermal lesions or suturing of superficial skin lacerations;
- endoscopy;
- placing and maintaining peripheral and central intravascular lines, nasogastric tubes, rectal tubes and urinary catheters;
- acupuncture;
- other procedures that do not involve sharps; or
- procedures where the use of sharps is superficial, well visualised, and administered to compliant or anaesthetised patients where it is very unlikely that a HCW skin injury would result in exposure of a patient to the HCW's blood or body substances.

HBeAg Hepatitis B e antigen - marker of high level of infectiousness

HBsAg Hepatitis B surface antigen - indicates current infection with HBV with some potential to infect others.

HBV Hepatitis B virus

HBV DNA Hepatitis B virus genetic material - marker of high level of infectiousness

HCV Hepatitis C virus

HCV RNA Hepatitis C genetic material - marker of high level of infectiousness

HCW Health care worker. Persons, including students and trainees, whose activities involve direct contact with patients or with blood or body fluids from patients.

Health care facility Includes all hospitals, health centers and clinics, dental clinics, be it government, semi-government or privately owned.

HIV Human immunodeficiency virus

Invasive procedure Any procedure that pierces the skin or mucous membrane or enters a body cavity or organ. This includes surgical entry into tissues, cavities or organs or repair of traumatic injuries. Exposure prone procedures form a subset of invasive procedures.

PCR polymerase chain reaction

1 INTRODUCTION

The blood borne viruses HIV, HBV and HCV are of concern because of their potential for transmission during provision of health care, either from the healthcare worker to the patient or vice versa.

This guidance contains policy for use in relation to HCWs infected with HIV, HBV or HCV. It has been developed in accordance with the following principles:

- HCWs and employers have an obligation to care for the safety of others in the workplace (this includes other workers, patients and visitors) under the proposed Occupational Health and Safety Act and its Regulations; and
- individual HCWs and health care facilities owe a common duty of care to their patients.

It should be the goal of all employers and health care facilities to achieve the establishment and maintenance of an environment in which HCWs know their confidentiality will be protected and they will not suffer unlawful discrimination.

It is the responsibility of each health facility to ensure that this guidance is complied with and that this guidance is brought to the attention of relevant new and existing HCWs who perform EPPs - including employed staff, locums and other independent contractors (including agency staff).

2 RATIONALE

There is a very low, but real, risk of transmission of blood borne viruses from an infected HCW to a patient in any health care setting. There is evidence that blood borne viruses can be transmitted from HCWs to patients during EPPs (see below). This evidence is the rationale for the exclusion of infectious HCWs from the performance of EPPs.

Please see **Appendix 1** for summary of HCWs status and suitability to perform EPPs.

2.1 HBV

HBV is the most readily transmitted of the blood borne viruses, and since the early 1970s when testing for HBV commenced, there have been many published reports of clusters of patients infected with HBV by HBV infected HCWs. HCWs infected with hepatitis B who carry the e-antigen, a marker indicating high infectivity, should not perform EPP.

Existing evidence demonstrates that prolonged knot tying or other shear injury may allow the surgeon's virus to be transmitted to the patient. There have also been several incidents in which hepatitis B infected HCW without the e-antigen have been associated with transmission of infection to their patients. It is now known that some hepatitis B infected individuals carry a genetic variant of the hepatitis B virus, which is unable to produce the e-antigen, but is still capable of assembling infectious viral particles. It is thus necessary to introduce further tests to assess infectivity.

It follows that HBV DNA testing is currently the most sensitive marker of the potential to transmit HBV infection in HCWs who are HBsAg positive and HBeAg negative. It is recommended that hepatitis B infected HCW who are e-antigen negative and who perform EPP's should have their viral loads measured, and that those with viral loads exceeding 10^3 genome equivalents per ml should not perform EPPs in future.

Hepatitis B infected HCWs who are e-antigen negative and whose viral loads do not exceed 10^3 need not be restricted from performing EPPs or from any other areas of work. However, these HCWs should have their viral loads re-tested regularly at 12 monthly intervals because research has shown that viral loads in some infected individuals may fluctuate over time. If their viral loads rise above 10^3 genome equivalents per ml, they should cease to perform EPPs. In addition, hepatitis B DNA testing should be carried out immediately if a HCW becomes immunosuppressed for any reason or has symptoms suggestive of a reactivation of their hepatitis B infection, or if investigation of a case of hepatitis B in a patient indicates the possibility of a transmission from a HCW.

An algorithm showing the sequence of testing of hepatitis B infected HCWs who perform EPPs is at **Appendix 2**.

2.2 HIV

There have been documented instances in published literatures of transmission of HIV from an infected HCW to patients. Despite an apparently low risk, it is considered that all HIV positive HCWs should be considered infectious.

2.3 HCV

There have also been reports of HCV transmission from surgeons to patients. A review of the role of PCR testing in defining infectiousness among people infected with HCV indicates extremely low probability of transmission if the person is HCV PCR negative. On this basis, HCV PCR positive HCWs are regarded as infectious.

3 SEROLOGICAL TESTING FOR HIV, HBV AND HCV

It is in the interests of all HCWs to know their HIV, HBV and HCV status so that they may take steps to seek appropriate treatment, modify lifestyle if relevant, and avoid occupationally acquired infections that might exacerbate any existing infection.

3.1 Employer responsibility

Employers must ensure that options are available for employees who perform EPPs to obtain confidential testing and counselling for HIV, HBV and HCV. Testing may be provided by employers via the occupational health service or another appropriate government health facility. Arrangements should be in place to allow for infected HCWs to obtain the results of testing for markers of their infectious status as soon as possible after a positive test result for HBV or HCV.

3.2 HCWs who do not perform EPPs

For HCWs who do not perform EPPs, a baseline monitoring is only required; regular testing for blood borne viruses is not justified due to the very low risk of occupational transmission if standard infection control precautions are applied. These HCWs may however consider seeking testing if other risk factors are present or they are contemplating on embarking in placement or training involving EPPs.

3.3 HCWs who perform EPPs

HCWs who perform EPPs must be aware of their HIV, HBV and HCV status by seeking serologic testing:

- if untested and currently performing EPPs;
- if about to commence performing EPPs;
- if it is 36 months or longer since their last tests;
- following any significant occupational exposure; and
- immediately on recognition of a non-occupational exposure, including needle sharing with a person infected with or at increased risk of HIV, HBV, or HCV; and unprotected sexual intercourse with a person infected with or at increased risk of HIV or HBV. The risk of sexual transmission of HCV is at present believed to be low.

3.4 HCWs who have taken interferon or antiviral drugs

HCWs infected with Hepatitis B or C who are supplying a blood sample for testing should be asked if they are currently being treated or have been treated within the last 12 months with interferon or antiviral therapy.

Hepatitis B or C infected HCWs should not continue to perform EPPs whilst on interferon or antiviral therapy. Those who have undergone a course of such treatment need to show that they have a hep B viral load that does not exceed 10^3 genome equivalents per ml or is hepatitis C RNA negative for one year after cessation of treatment before a return to unrestricted working practices can be considered.

Treatment with alpha interferon may reverse the infectious carrier state in a proportion of cases. In those where conversion from HBeAg positive to anti-HBe positive or hep C virus RNA positive to hep C virus RNA negative is maintained for 12 months after cessation of treatment, consideration may be given to a return to EPPs. However, they will still be subjected to annual testing for hep B viral load or hep C RNA serological status.

Rarely, hepatitis B infected HCWs may lose the hepatitis B surface antigen (HBsAg) spontaneously. These HCW returning to unrestricted working practices would be subject to the annual re-testing as recommended for other unrestricted hepatitis B infected HCWs without the e-antigen

3.5. Designated laboratory

Arrangements have been made for a designated laboratory to undertake the testing of hepatitis B viral load. At present, only test results from the designated laboratory should be used to determine whether a hepatitis B infected HCW who is e-antigen negative is to be allowed to perform EPP. (please see **Appendix 3**).

3.6 Health care workers who refuse to be tested

Hepatitis B infected HCWs without the e-antigen who refuse to have their viral load tested or those who refuse to have an HIV or HCV PCR test **should not be allowed** to carry out EPPs in future or start their training involving EPPs.

4 SECURITY OF SAMPLES

It is important that those conducting tests for hepatitis B viral loads, HCV PCR or HIV tests should ensure that samples tested are from the HCW in question. Where feasible, samples should be taken by or in the presence of the occupational health doctor or nurse. Where this is not feasible, samples should be taken by a person expressly acting on behalf of occupational health. HCWs should never provide their own specimens.

On request, occupational health service may wish to arrange testing for hepatitis B infected HCW without the e-antigen or those awaiting for HCV PCR or HIV testing who are currently not employed. These HCWs who are currently not employed will need to be cleared for the performance of EPPs before applying for daily paid work, locum work or other substantive posts.

5 CONFIDENTIALITY

It is essential that confidentiality of testing arrangements for HCWs infected with HIV, HBV and HCV be strictly maintained. Maintenance of confidentiality will also encourage HCWs to seek appropriate testing, counselling and treatment.

6 IMPLEMENTATION

Initial implementation phase

Initial assessments of the viral load should be completed by end 2005 at the latest for all hepatitis B infected HCWs who are e-antigen negative and who perform EPPs. During this initial implementation phase, these HCWs should not be restricted from carrying out EPPs whilst awaiting viral load test results.

Ongoing implementation

After the initial implementation phase, HCWs previously tested and found to have viral loads which do not exceed 10^3 genome equivalents per ml, need not be restricted from carrying out EPPs whilst awaiting subsequent viral load test results, provided samples have been taken and despatched for repeat testing within 12 months from the date on which the first of the samples was taken for the preceding test. In all other circumstances, hepatitis B infected HCWs without the e-antigen should not perform EPPs until satisfactory test results have been provided.

7 OCCUPATIONAL HEALTH ASSESSMENTS

7.1 Pre-employment assessments

All HCWs must have pre-employment assessments done by medical practitioners of the occupational health service before being accepted.

If the HCW is an expatriate or recruited from overseas, they must submit a certificate of fitness together with results of investigations, to work in the proposed employment issued by an occupational health physician or a medical practitioner prior to accepting the post offered. The HCW must also bear in mind that they may be subject to repeat investigations on arrival in Brunei Darussalam.

7.2 Periodic assessments

The occupational health service may from time to time wish to arrange testing of HCW particularly those who conduct EPPs to ensure that their serological status are still negative or does not differ from the previous assessment.

7.3 HCWs intending to begin professional training in career relying on performance of exposure prone procedures

HCWs intending to embark on careers that rely upon the performance of EPPs should be tested for HIV, Hep B and C serology. Those found to be HIV positive or HBsAg positive with high viral loads or hep C virus RNA positive should not commence on training for such careers unless they have a sustained virological response to treatment (for the latter two cases).

It will be to the advantage of the HCWs to establish their serological status early before they make career choices. The time for testing may vary depending upon the particular chosen career, but the following are considered appropriate:

- junior doctors coming to Brunei Darussalam entering or are put on rotation in all surgical specialities, including obstetrics and gynaecology and accident and emergency.
- prospective dental students
- prospective midwifery students-they should only be allowed to proceed with training on the condition that they will not be able to perform EPPs
- nurses on internship or moving onto specialized areas requiring to perform EPPs e.g. operating theatre and accident and emergency nursing;
- ambulance staff before they embark on training as paramedics
- podiatrists before they commence training in podiatric surgery.

8 INFECTED HCWs

8.1 Informing patients of HCW status

Patients, like HCWs, are best protected from exposure to HIV, HBV and HCV by adoption of appropriate infection control practices. In the absence of any significant exposure to blood or other body fluids, patients are at an extremely low risk of acquiring blood borne infections. It is not recommended that HCWs be required to disclose their HIV, HBV or HCV status to patients. The reasons for this are:

- infectious HCWs shall no longer undertake EPPs;
- there is no onus of confidentiality on the part of patients once they have been informed of a HCW's infection status; and
- a policy of providing a right for a patient to be informed of the HCWs HIV, HBV and HCV status would send an erroneous message to the public concerning the risk of transmission between HCW and patient.

8.2 Informing employers of HIV/HBV/HCV status

It is essential that HCWs practising EPPs inform their employer of infectious status regarding HIV, HBV and HCV, if they are positive, so that:

- their welfare and safety in the workplace can be maximised; and
- they fulfill their ethical duty of care and take all reasonable steps to safeguard patients/clients.

HCWs have a responsibility to advise either their employer, professional organization (e.g. Brunei Medical Board) or advisory panel (see **Appendix 4**) if they are either HIV antibody positive or HBeAg positive or HBV DNA positive or HCV PCR positive and are or have been performing EPPs. If it is likely that patients have been exposed to risk of infection during EPPs, HCWs have a responsibility to inform their employer. Advice should be sought so that a confidential investigation of patients can be arranged.

Where a HCW does disclose his or her HIV, HBV or HCV status to an employer, the disclosure must be treated with due regard to the HCW's right to confidentiality.

8.3 Management of infected HCWs

All HCWs who are HIV antibody positive, HBeAg positive or HBV DNA positive or HCV PCR positive should seek:

- expert medical advice;
- expert occupational health and safety advice; and
- expert counseling.

Employers should ensure that appropriate expert advice is available without any cost for employees. HCWs who are HCV antibody positive and HCV PCR negative and HCWs who are HBsAg positive are to be provided with access to ongoing expert clinical advice regarding their potential infectiousness, the appropriateness of their continued performance of EPPs and treatment.

8.3.1 Medical care

In the interest of their own health, HCWs infected with HIV, HBV or HCV should be followed up by a medical practitioner who is expert and experienced in the management of these conditions. This medical expert will also have a role in advising the infected HCW about continued involvement in direct patient care.

8.3.2 Occupational health and safety

Infected HCWs should seek confidential advice on infection control procedures, continued involvement in patient care, matters of confidentiality and other issues from an expert medical practitioner. The medical practitioner may be the person who provides medical care as recommended in 8.3.1, however additional advice may also be sought from an occupational health physician, a clinical microbiologist, an epidemiologist or a medical practitioner with relevant expertise (eg immunologist, infectious diseases physician). Further confidential advice may be sought from the relevant professional body or the Blood Borne Viruses Advisory Panel (see **Appendix 5**).

8.3.3 Counseling

Counselling and contact screening activities are carried out by an Epidemiologist of the Disease Control Division on all working Tuesdays at 2.00pm at the Health Screening Centre, Berakas.

8.3.4 Exclusion of HCWs from performance of exposure prone procedures

The categories of infected HCWs excluded from the performance of EPPs are:

1. HIV antibody positive, irrespective of levels of viremia.
2. HCV antibody positive and HCV RNA is positive by PCR or in whom HCV RNA PCR status is yet to be determined.
3. HBsAg positive in whom HBeAg or HBV DNA is positive or in whom HBeAg or HBV DNA status is yet to be determined.

Under these guidelines HCWs who are:

1. HCV antibody positive, but HCV RNA negative; and/or
2. HBsAg positive but HBeAg negative and HBV DNA negative
.....may continue to perform EPPs provided they remain negative for the infectious genetic material of the virus. Such HCWs are obliged to have regular virological monitoring to ensure that their practice reflects their virological status.

HCWs who are HIV positive, HBV positive and HCV positive should use double glove for all invasive procedures, including those which are not considered to be exposure prone.

9 MODIFICATION OR TRANSFER FROM DUTIES

All HCWs - including those infected with HIV, HBV or HCV - should be assessed to determine that they are capable of performing their tasks adequately to the accepted professional standard, that they practise recommended techniques, that they comply with standard infection control precautions and that they adhere to approved guidelines for sterilisation and disinfection.

The work practices of HIV, HBV or HCV infected HCWs who are not permitted to perform EPPs may need to be modified. Any modification should provide infected employees with opportunities to continue their chosen work, where practical, or to pursue alternative career training.

Modifications to work practices should be determined according to the following criteria:

- fitness for work, mental and physical capabilities;
- training and expertise of the infected employee;
- ability to perform routine duties;
- competence and compliance with established guidelines and procedures; and
- risk of contracting/transmitting other infections.

Where there is uncertainty as to whether to exclude a HCW from performing EPPs, their treating medical practitioner or their employer should refer the matter to the Advisory Panel.

HCWs who know or have good reason to believe (having taken steps to confirm the facts as far as practicable), that an HIV positive or hepatitis B infected or HCV PCR positive HCW has not followed advice to modify their practice, should inform an appropriate person in the health care worker's employing or contracting authority or where appropriate, the relevant regulatory body.

It must be emphasized that **on no grounds** should a HCW found to be infected with the above infections be dismissed or retired on the basis of infection with any of the above viruses nor they may be given unfair treatment because of their status.

10 REHABILITATION POLICY FOR HIV, HBV or HCV INFECTED HCWs

Employers are encouraged to have rehabilitation programs in place to manage employees with work-related functional impairment including infectious diseases. This includes the requirement that those affected are to be provided with suitable alternate duties or employment where practical, including redeployment.

Where natural resolution or treatment renders a HCW non-viremic (ie HBV DNA test negative or HCV PCR test negative), resumption of the performance of EPPs can be considered, conditional on continued monitoring of infectious status.

11 RESOLUTION OF DISPUTES

Where there is a dispute over the ability of an HIV antibody positive, HBeAg positive, HBV DNA positive or HCV PCR positive HCW to continue with all or part of his/her employment responsibilities, the matter should be referred to the Advisory Panel (**Appendix 6**). The HCW should discontinue performance of the duties in question pending resolution of the dispute.

In those cases where an HIV, HBV or HCV infected HCW refuses to accept the advice of the Advisory Panel, and the HCW's medical adviser and/or the health care facility believes that the infected HCW's continued practice constitutes a risk to public health, the doctor or health care facility should notify the Director-Generals of the relevant departments.

12 STRATEGIES FOR THE PREVENTION OF TRANSMISSION OF BLOOD BORNE VIRUSES IN THE HEALTH CARE SETTING

12.1 Infection Control

Employers and HCWs should have access to and comply with the *Manual for Infection Control in Clinical Practices* and the *Guidelines on Health and Safety at Workplace for Healthcare Personnel*, which is available at the Infection Control Unit of each government hospital and the Occupational Health Division respectively. Compliance with standard infection control precautions and adoption of recommended procedures for sterilisation and disinfection of equipment, as outlined in the manual and guideline, minimises the risk of transmission of blood borne viruses in the health care setting.

Registered HCWs (which includes medical practitioners, nurses, physiotherapists, dentists, podiatrists and dental prosthetists) have an individual responsibility to comply with the standards (infection control).

Health care facilities must ensure:

- that HCWs (including those with HIV, HBV or HCV infection) are fully informed about the infection risks involved in undertaking procedures;
- that HCWs are fully informed about and comply with recommended infection control procedures (incorporating principles of universal precautions i.e. appropriate use of hand washing, protective barriers, and care in the use and disposal of sharps); and
- that HCWs comply with current guidelines for disinfection and sterilisation of reusable devices.

12.2 Immunisation of HCWs

HBV is currently the only blood borne virus for which a vaccine is available. Successful HBV vaccination prevents a person from acquiring HBV, thus eliminating the possibility that they may become infected and transmit the infection to others. It is strongly recommended that all nonimmune HCWs who may be exposed to HBV in the course of their work be immunised against HBV for their own protection, preferably as early as during the period of professional training and before any occupational exposures occur.

In the light of increased likelihood of fulminant hepatitis and death as a result of co-infection with HCV and Hepatitis A, consideration should be given to offering hepatitis A vaccination to HCWs who are HCV positive. The vaccine may also be offered to hepatitis B infected HCWs.

There is no immunoprophylaxis and vaccination for HCV infection at present.

Please see **Appendix 7** for FAQ's on hepatitis B immunization and the HCW.

12.3 Exclusion of infectious HCWs from practising EPPs

HCWs who perform EPPs must know their HIV, HBV and HCV status. Medical practitioners should note that if they perform, or could reasonably be anticipated to perform EPPs, must know their infectious status. Infectious HCWs (ie those who are either HCV PCR positive or HBV DNA positive or HBeAg positive or HIV positive) **must not perform EPPs**.

13 MANAGEMENT OF BLOOD EXPOSURE INCIDENTS

There may be occasions when a patient may accidentally be exposed to the blood of a HIV/hepatitis B/hepatitis C infected HCW in circumstances which may or may not involve EPP. Appropriate and timely management of such potential exposure incidents will further reduce the risk of HIV, hepatitis B or C infection for patients.

HCWs are under ethical and legal obligations to take all proper steps to safeguard the interests of their patients. This would include ensuring that in the event of a patient being exposed to the infected HCWs blood, information about the latter's status must be reported to the appropriate person to consider what action might be necessary to protect the patient from transmission of infection. The policy must specify who will be responsible for provision of postexposure prophylaxis and for the follow up of any staff or patients who have been exposed.

Patient notification, with the offer of serological testing, should be undertaken only if there is evidence to suggest that transmission of infection from a HCW to a patient may have taken place, and should be considered if a review of surveillance data or other local information, points to this possibility.

Please see **Appendix 8** for recommended postexposure prophylaxis for exposure to hepatitis B virus (updated to replace "Management of Exposure to Hepatitis B in *Guidelines on Health and Safety at Workplace for Health Care Personnel*) and **Appendix 9** for management of exposure to hepatitis C virus. Persons who have been previously infected with HBV are immune to reinfection and do not require post exposure prophylaxis.

14 COMPENSATION

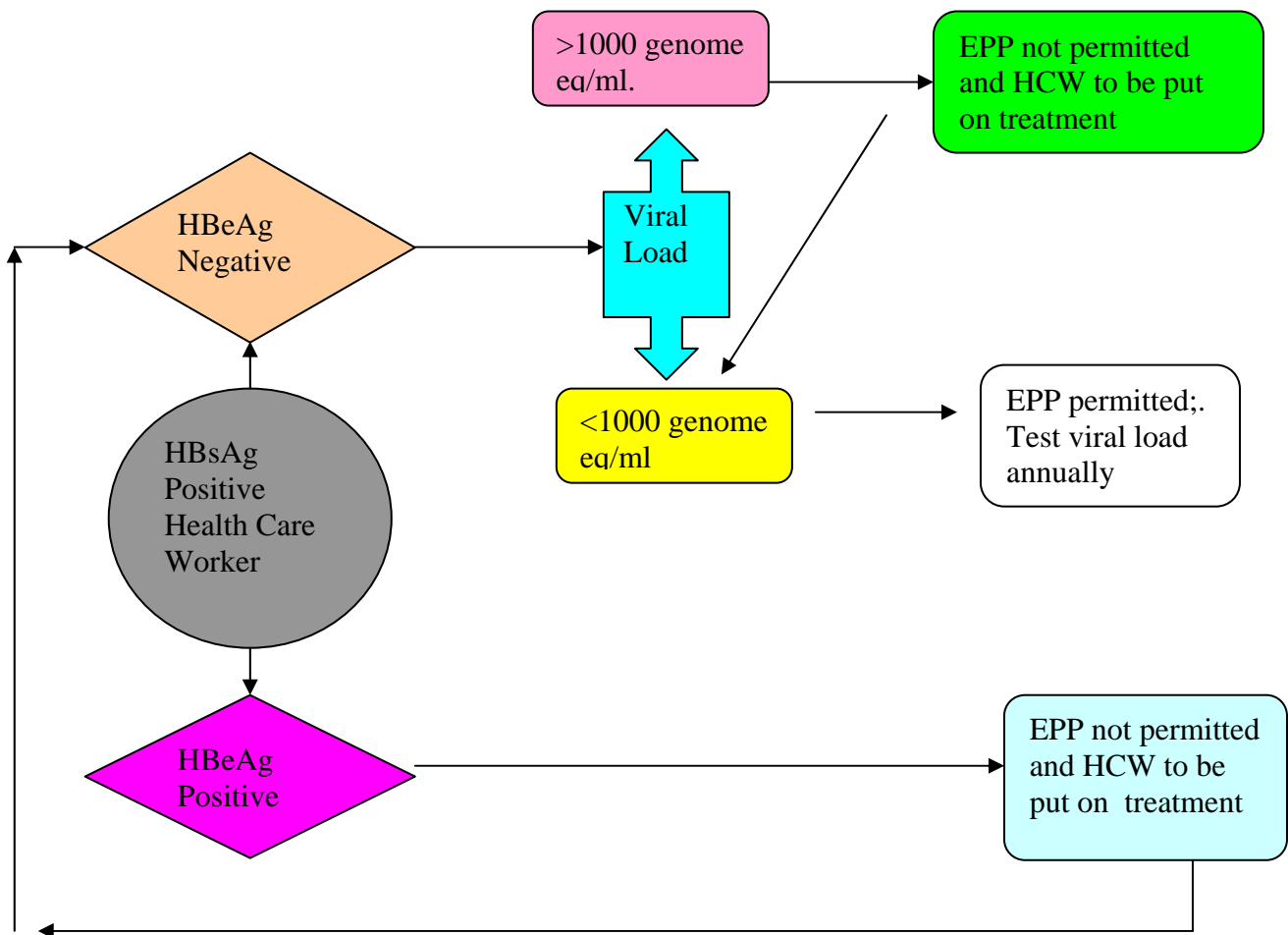
The Department of Labor is the appropriate authority to address compensation issues for employees who acquire an illness or injury in the course of their work. For current information about workers compensation and rehabilitation matters, employees are advised to contact the above department.

**TABLE SUMMARISING THE SEROLOGICAL STATUS OF HEALTH CARE WORKERS
AGAINST SUITABILITY TO PERFORM EXPOSURE PRONE PROCEDURES**

No	Antigen Serology	Antibody Serology	Interpretation	Action	Exposure Prone Procedure(EPP)
1.	HBsAg Negative	Anti-HBs Negative	Not infected	Hepatitis B Vaccination	EPP permitted
2.	HBsAg Negative	Anti-HBs Positive	Protected	No action	EPP permitted
3.	HBsAg Positive	Anti-HBs Negative	Infected	Further testing for e- Antigen	EPP not permitted
4.	HBeAg Negative	Anti-HBe Positive	Infected with good clinical prognosis	Further testing for viral load (HBV DNA)	EPP not permitted
5.	HBeAg Negative	Anti-HBe Positive	Infected with good clinical prognosis	Viral load <1000 genome eq/ml	EPP*-Permitted with annual viral load testing
6.	HBeAg Negative	Anti-HBe Positive	Infected with good clinical prognosis	Viral load >1000 genome eq/ml	EPP not permitted -put on treatment
7.	HBeAg Positive	Anti-HBe Negative	Highly Infectious	Liver Funtion Tests, ALT	EPP not permitted -put on treatment
8.	HCV IgM Positive		Infected	Further testing for HCV PCR	EPP not permitted pending PCR- RNA testing
9.	HCV PCR- RNA Positive		Highly infectious	Genotyping	EPP not permitted -put on treatment
10.	HCV PCR- RNA Negative				EPP permitted with annual follow up
11.	HIV Antibodies Positive				EPP not permitted.

* All HCWs who are HBV, HCV should use double gloves for all invasive procedures including those not considered to be exposure prone.

INVESTIGATION OF HEPATITIS B INFECTED HEALTH CARE WORKERS
(HEPATITIS B SURFACE ANTIGEN (HBsAg) POSITIVE)
WHO PERFORM EXPOSURE PRONE PROCEDURES



Any hepatitis B infected HCW associated with transmission of infection to a patient should cease performing exposure prone procedures.

TESTING ARRANGEMENTS FOR INFECTED HEALTH CARE WORKERS WHO PERFORM EXPOSURE PRONE PROCEDURES

Designated laboratory

1. The National University Hospital in Singapore has been assigned as the designated laboratory to conduct hepatitis B viral load tests.

Specimens

2. HCWs should not provide their own specimens. The HCW should also show their proof of identity when taking the specimen e.g. identity card.

3. A sample of a minimum of 10ml of clotted blood should be taken from the HCW, and should be sent separately as soon as possible after sampling to the designated laboratory. The sample should be sent together along with standard laboratory request form. The sample should be packaged and dispatched as per laboratory procedure.

Testing

4. The sample will be tested for the relevant assay. The designated laboratory will provide results to the laboratory in Brunei Darussalam who in turn will provide the results to the Occupational Health Division.

5. Only test results from the designated laboratory will be used to determine whether a HCW who is hepatitis B e-antigen negative or HCV positive can continue to perform EPPs.

Results

6. The designated laboratory will be able to provide test results within four weeks of receipt of sample.

Re-testing

7. HCWs whose hepatitis B viral load is less than 10^3 genome equivalents per ml or those infected with hepatitis B or C who have been treated on alpha interferon or ribavarin therapy will be recalled for re-testing within 12 months from the date on which the first of the samples was taken for the preceding test. These HCWs should not be allowed to perform exposure prone procedures until satisfactory test results have been provided. HCWs should be advised when their next test is due so that those who move jobs can approach their new department to arrange further testing.

Testing costs and payment

8. For government employed workers, the cost of testing, treatment and follow up will be free as it exists at present. For private workers this will be borne by the employer.

BLOOD BORNE VIRUSES ADVISORY PANEL MEMBERSHIP

Membership in relation to infected health care workers

The panel is chaired by representative from the Department of Policy and Planning, Ministry of Health.

Membership may include:

- Representative from the appropriate departments/employer
- Infectious Diseases Physician
- Epidemiologist
- Virologist
- A member of the professional group, with expertise in the procedures performed by the HCW eg gynaecologist
- Occupational Health Physician
- Infection Control Practitioner
- Legal Officer

These members shall form part of any Panel constituted to provide advice on modification of work practices of an infected health care worker.

BLOOD BORNE VIRUSES ADVISORY PANEL

Terms of reference in relation to infected health care workers

1. To provide on a case by case basis advice on modifying work practices of infected health care workers.
2. To provide supplementary specialist occupational advice to physicians of health care workers infected with blood borne viruses, occupational physicians and professional bodies.
3. To advise individual health care workers, or their advocates, how to obtain guidance on work practices.
4. To advise on look back exercises in respect of patients treated by HIV positive, HBeAg positive, HBV DNA positive and HCV PCR positive health care workers.
5. To keep under review the literature on occupational transmission of blood borne viruses and refer any changes relevant to the current guide.
6. To report to the relevant Director-Generals/employer.

**PROTOCOL FOR ACCESSING ADVISORY PANEL IN RELATION TO
INFECTED HEALTH CARE WORKERS**

Who may consult the Panel?

The following parties may require specific advice:

- the infected HCW;
- the supervisor, or employer, of the infected HCW;
- the treating doctor of the infected HCW;
- occupational health staff; and
- infection control staff.

Confidentiality

It is recommended that the name of the infected HCW be disclosed only to the Chair when consulting the Advisory Panel. In situations where the referral is made by the treating doctor of an infected HCW, it is not necessary to disclose the identity of the HCW to the Chair as it is expected that the treating doctor will monitor the extent to which the HCW complies with the advice of the Advisory Panel.

In what circumstances

Advice may be sought on the following issues:

- EPP, where there is some uncertainty about the definition in any given circumstance;
- disclosure of the HCW's status, to whom and when;
- management of the infected HCW;
- infection control procedures;
- modification or transfer from duties;
- management of patient exposure to the blood of an infected HCW;
- situations where an infected HCW has been involved in the performance of EPPs; and
- follow up of an HIV, HBV or HCV infected patient where there is a possibility that the infection was acquired nosocomially.

In situations where there is a dispute regarding the management of an infected HCW the matter should be referred to the Advisory Panel for resolution.

How to access the Advisory Panel

Matters to be referred to the Advisory Panel should be directed to the Occupational Health Division of the Department of Health Services.

Advisory Panel Advice

Where the Advisory Panel advises that a HCW should modify or restrict his/her practices or be transferred to other duties in accordance with this Guide and it is informed that the HCW does not follow this advice, the matter will be referred to the respective Director-General.

FAQ's ON HEPATITIS B IMMUNISATION AND THE HEALTH CARE WORKER**? What category of HCW needs Hepatitis B vaccine?**

HCW who have a reasonable expectation of being exposed to blood on the job should be offered Hepatitis B vaccine.

? What is the dosage and vaccination schedule for Hepatitis B vaccination?

The adult dosage is 20 microgrammes given intramuscularly. Recommended schedules are at 0,1 and 6 months or at 0, 1 and 2 months (with a booster vaccination at 12 months for the latter), but if a rapid vaccination is required, it can be given at 0,7 and 21 days with a booster vaccination at 12 months.

? If the HCW missed the second dose of vaccine by a few weeks or months, should the HCW restart the series?

No. The vaccine series should not be restarted when doses are delayed; rather, the series should be continued where it left off ie. the HCW must receive the second dose now and the third dose 5 months later.

? Is it safe for pregnant HCWs to receive the vaccine?

Yes. The vaccine does not contain any component shown to pose a risk to the fetus at any time during gestation. However, vaccination should only be offered if job modification still poses a significant risk of exposure or no suitable job reassignment is available. In all other cases, vaccination can be offered post delivery.

? When does serologic testing post vaccination be done?

Serologic testing should be done 1-2 months post completion of the final 3rd dose of the vaccine series. An anti-HBs serologic test result of more than or equal to 10 mIU/mL indicates immunity. No further routine doses or testing are required.

? What should be done if the serological test (anti HBs) is negative 1-2 months after the last dose of vaccine ie. a non responder?

The 3 dose series should be repeated and serologic testing done again 1-2 months after the last dose of vaccine. If the HCW is still negative or the anti HBs serologic result is less than 10 mIU/mL after the second vaccine series, the HCW is considered a non-responder to hepatitis B vaccination.

The HCW should be counseled that the HCW is susceptible to HBV infection and what steps should be taken in the future to protect the HCW health.

It is also possible that the non-responder is chronically infected with HBV and HBsAg and anti HBc testing may be done (if this was not done previously).

? How often do HCWs who've received the vaccine should be tested serologically to make sure they are protected?

Post vaccination testing should be done 1-2 months after completion of the series. If adequate anti HBs is present (more than or equal to 10 mIU/mL), nothing more needs to be done. Periodic testing or boosting is not needed.

If post vaccination test is less than 10 mIU/mL, a second series of vaccination should be given and post vaccination testing again done after 1-2 months of completion.

? Should a HCW who once had a recorded positive anti HBs but had it rechecked and found it to be less than 10 mIU/mL be revaccinated?

No. Post vaccination testing only needs to be done once ie. 1-2 months after completion of the series and the result recorded. Data showed that adequate response to the 3 dose series of hepatitis B vaccination provides long term immunologic memory that gives long term protection.

Only immunocompromised patients e.g. haemodialysis patients or HIV positive persons need to have anti-HBs testing and booster doses of vaccine to maintain their anti-HBs concentrations of at least 10mIU/mL to be protected.

? A HCW claims to have received the complete 3 dose series of hepatitis B vaccination but there is no documentation to prove this.

Serologic testing should be done and if there is inadequate concentration or negative anti HBs, a repeat second series of vaccination should be administered and post vaccination testing done.

? A HCW demonstrated a positive response after only one dose of vaccination. Should the second and third doses be not administered?

No. The three doses of the vaccination series must be administered. Although 30% of previously unvaccinated healthy individuals will have a protective antibody response after only one dose of vaccine, these individuals will not have the long term protection afforded by the three-dose series.

? A HCW who had received the vaccine and had a positive titer a few years back but now the titer is negative. What should be done?

Nothing needs to be done. Vaccine induced anti HBs levels may decline over time; however, immune memory remains intact indefinitely following immunization.

N.B. Current hepatitis B vaccine used by the Ministry of Health is EngerixTM-B

**RECOMMENDED POSTEXPOSURE PROPHYLAXIS FOR OCCUPATIONAL
EXPOSURE TO HEPATITIS B VIRUS***

Vaccination and antibody response status of exposed workers	Treatment		
	Source HBsAg positive	Source HBsAg negative	Source unknown
Unvaccinated	HBIG** X 1 and initiate Hep B vaccine series	Initiate Hep B vaccine series	Initiate Hep B vaccine series
Previously vaccinated • Known responder (documented evidence of adequate levels of anti HBs > or equal to 10 mIU/mL)	No treatment	No treatment	No treatment
• Known non responder (no or inadequate response to vaccination i.e. anti HBs level of < 10mIU/mL)	HBIG X 1 and initiate revaccination (if HCW have not receive the second 3-dose series) or HBIG X 2 (for HCW who have received the second 3 dose-series and failed to respond)	No treatment	If known high risk source, treat as if source were HBsAg positive
• Antibody response unknown	Test exposed person for anti HBs: 1. If adequate (i.e. anti HBs > or equal to 10 mIU/mL), no treatment is necessary or 2. If inadequate (anti HBs < 10 mIU/mL), administer HBIG X 1 and vaccine booster	No treatment	Test exposed person for anti HBs: 1. If adequate(i.e. anti HBs > or equal to 10 mIU/mL), no treatment is necessary or 2. If inadequate(anti HBs < 10 mIU/mL), administer vaccine booster and recheck titer in 1-2 months

***Persons who have been previously infected with HBV are immune to reinfection and do not require post exposure prophylaxis.**

****HBIG** Hepatitis B immunoglobulin; dose is 0.06 mL/kg intramuscularly

**RECOMMENDED MANAGEMENT FOR OCCUPATIONAL EXPOSURE TO
HEPATITIS C VIRUS**

Known hepatitis C infected source

- Obtain baseline serum for storage from health care worker
- Obtain serum/EDTA for HCV RNA testing at 6 and 12 weeks
- Obtain serum for anti-HCV testing at 12 and 24 weeks

Source known not to be infected with hepatitis C

- Obtain baseline serum for storage from health care worker
- Obtain follow up serum if symptoms or signs of liver disease develop

Hepatitis C status of source unknown or unavailable

- Obtain baseline serum for storage from health care worker

High risk

- Manage as known infected source

Low risk

- Obtain serum for anti-HCV testing at 24 weeks

There is currently no post-exposure prophylaxis for hepatitis C.

Health care workers found to have acquired hepatitis C infection following occupational exposure should be referred as soon as possible for specialist assessment.

References

- *Protecting Health Care Workers and Patients From Hepatitis B* (August 1993) and its Addendum (issued under cover of MEL (1996) 93 (November 1996));
- *Guidance for Clinical Health Care Workers: Protection Against Infection With Blood-borne Viruses* (issued under cover of SODH/CMO(98)12, May 1998);
- *Guidance on the Management of AIDS/HIV Infected Health Care Workers and Patient Notification* (issued under cover of MEL(1999)29, March 1999).
- *CDC-MMWR Recommendations and Report, Jul 12,1991/40/(RR)*:1-9*
- *The New England Journal of Medicine-178-january 16,1997.*
- *Hepatitis B and the Health Care Worker*; Immunization Action Coalition
- *Guidelines on Health and Safety at Workplace for Health Care Personnel*; Ministry of Health publication
- *Hepatitis C Infected Health Care Workers*; HSC document