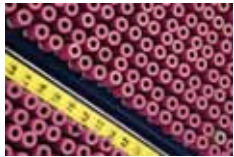


Management of
**Occupational Exposure
to Blood or Body Fluid**





Management of Occupational Exposure to Blood or Body Fluid

The blood borne viruses that pose a risk in the health care setting are Human Immunodeficiency virus (HIV), Hepatitis B virus (HBV) and Hepatitis C virus (HCV).

Exposures occur through needlesticks or cuts from other sharp contaminated instruments or through contact of the eye, nose, mouth or open skin with blood or body fluids.

Following exposure, and after consent has been obtained, blood from the **source person** should be examined for markers of infection: HIV antibody, Hepatitis B surface antigen and HCV antibody.

Blood from the **exposed worker** should be examined for markers of these infectious agents within a day or so of the exposure incident. These markers are: HIV antibody, HBV surface antigen, HBV surface antibody, and HCV antibody.

Occupational exposures must be fully documented * and the exposed worker must be counselled.

DOCUMENTATION

Documentation should be completed by the supervisor and should include;

- name and date of birth of the exposed worker;
- a description of how the incident occurred and immediate post-injury care;
- time and date of the incident and when the form was filled out;
- name and address of the source (if known);
- whether consent has been obtained from the source to be tested. Also any high risk factors that are known to be associated with the source. (This information is important for deciding if the exposed person needs to have post-exposure prophylaxis for HIV);
- whether blood from the source has been sent for tests;
- time and dates for follow-up tests for the exposed worker; and
- the Code name used for the source blood. The standard code consists of the first two letters of surname, first initial of given name, sex (M or F) and date of birth. If surname begins with Mac or Van der etc, then ignore these letters, e.g. John Brown 1/2/70 would be BRJM010270.

COUNSELLING

It is obligatory to offer counselling to the exposed worker. Counselling should include the reasons for, and importance of;

- having blood tests soon after the exposure and for follow-up tests;
- not donating blood until final tests are clear;
- practising safer sex until final tests are clear;
- reporting any glandular fever like illness within 6 months of exposure; and
- avoiding pregnancy until the final tests are clear.



PROCEDURE IMMEDIATELY AFTER AN EXPOSURE

The procedure immediately after an exposure is to;

- wash needlesticks and cuts with soap and water;
- flush splashes to the nose, mouth, or open skin with water;
- irrigate eyes with clean water, saline, or sterile irrigants;
- inform your supervisor who should **immediately** discuss all **significant** exposures with a pathologist;
- the supervisor should contact the source and explain what has happened and ask for consent to test the source's blood for HIV antibody, HBV surface antigen and HCV antibody. Arrange for source blood to be collected and labelled with the standard code;
- if the source is known to be HIV positive, or belongs to a group known to be at high risk, or if an HIV test has been ordered on the source person, then immediate action must be taken so that post-exposure prophylaxis can be discussed with a specialist and started within 1-2 hours of the exposure;
- arrange counselling;
- test blood from exposed worker for HIV antibody, HCV antibody, HBV surface antibody and HBV surface antigen. For privacy reasons, offer the standard code for the pathology request form and use it if the person so wishes;
- identify the cause of the injury and ensure that the risk factors are eliminated, or if that is not possible, that they are minimised; and
- document the tests that have been ordered for both the source and the exposed worker. If consent has been refused, document this fact and record the reasons for refusal.

HEPATITIS B VIRUS

Interpretation of results:

- If the source is HBV surface antigen (HBsAg) negative, no prophylaxis is required because the source patient is not infectious for HBV.
- If the source is HBsAg positive, or unknown, they are infectious, or potentially infectious and an exposed worker, who is not immune or already infected, requires prophylaxis.
- If the exposed worker is HBsAg positive they are already infected and prophylaxis has no place.
- If the exposed worker is anti-HBs positive ($>10\text{IU/L}$) they are immune and prophylaxis is unnecessary.
- If the exposed worker is HBsAg negative and has anti-HBs $<10\text{IU/L}$ they cannot be assumed to be immune. (Antibody levels $<10\text{IU/L}$ may indicate low levels of real antibody but may also reflect "background noise" in the test when there is, in fact no antibody).
- Non-immune exposed workers should be given a dose of HBV vaccine as soon as possible. In addition, if they have never been documented to have seroconverted following previous vaccination or exposure, they should be given 400IU of Hepatitis B Immunoglobulin (HBIG) within 7 days and preferably within 48 hours to provide immediate protection. In those who have previously seroconverted a single dose of vaccine will promptly boost antibody levels and HBIG is unnecessary.

Workers who have not been previously vaccinated with HBV vaccine should receive a full course of vaccine.

- HBIG is available on prescription from the NZ Blood Transfusion Service. In Auckland this is located at 71 Great South Road, Newmarket, phone 523 5733



HEPATITIS C VIRUS

- No effective prophylaxis is available.
- If the source is HCV antibody negative, then the exposed worker is not at risk.
- If the source is HCV antibody positive, and the exposed worker is HCV antibody negative. The source should be tested for HCV RNA by PCR. This will identify the degree of infectivity. If the source is HCV RNA positive the exposed worker should have HCV RNA testing at 4 weeks. All exposed persons should have serology at 3 and 6 months or if symptoms of hepatitis occur.
- If acute infection occurs refer for interferon treatment (NEJM 2001;345: 1452-1457).
- If the exposed worker seroconverts, then consider informing ACC in case of future problems.
- If the exposed worker is HCV antibody positive at the time of the exposure, the infection is not a result of the exposure, because antibodies do not become detectable for at least a month following exposure. In this instance, follow-up may be required and the worker should be referred to their own doctor. For example, additional testing such as PCR for HCV may be indicated.

Exposed Person	Source Person *	Action for exposed person
HBsAg +ve OR HCV antibody +ve OR HIV antibody +ve	* Viral infection in the source person requires management by their regular medical practitioner	Exposed person is referred to their regular medical practitioner for management of their pre-existing viral infection.
HBsAg	HBsAg	
Anti-HBs	Anti-HBs	
HBsAg -ve	HBsAg -ve	Consider HBV vaccination (vaccination not needed for this exposure but would provide future protection.)
Anti-HBs -ve	Anti-HBs -ve	Consider HBV vaccination (vaccination not needed for this exposure but would provide future protection.)
HBsAg -ve	HBsAg -ve	Consider booster dose of HBV vaccine for future protection.
Anti-HBs past +ve now -ve	HBsAg -ve	Recommend booster dose of HBV vaccine.
Anti-HBs past +ve now -ve	HBsAg +ve	No action. Exposed person is immune.
HBsAg -ve	HBsAg -ve	No action. Exposed person is immune.
Anti-HBs +ve	Anti-HBs -ve	No action. Exposed person is immune.
Anti-HBs +ve	Anti-HBs +ve	No action. Exposed person is immune.
HBsAg -ve	HBsAg +ve	Recommend Hepatitis B Immune Globulin (HBIG), 400 IU IM, and HBV vaccination schedule. Known non-responder to HBV vaccine have 2 doses of HBIG. Test exposed person for HBsAg and HBsAb at 3, 6, 12 months.
Anti-HBs -ve	Anti-HBs -ve	No action. Exposed person is immune.
Anti-HBs +ve	Anti-HBs -ve	No action. Exposed person is immune.
Anti-HBs +ve	HBsAg +ve	Consider Hepatitis B Immune Globulin (HBIG), 400 IU IM, and HBV vaccination schedule. Test exposed person for HBsAg and HBsAb at 3,6,12 months.
Anti-HBs -ve	HBsAg unknown	No action. Exposed person is immune.
Anti-HBs +ve	HBsAg unknown	No action. Exposed person is immune.
	HCV antibody -ve	No action usually necessary. If there is a concern that the source could be incubating HCV then do HCV at 3, 6, 12 months.
	HCV antibody unknown	No action usually necessary. If there is a concern that the source could be incubating HCV then do HCV at 3, 6, 12 months.
HCV	HCV antibody +ve	<ol style="list-style-type: none"> 1. Consider HCV PCR for source person as an index of their infectivity. 2. Test exposed person at 3, 6, 12 months. If source is PCR positive, test exposed person at 1 month as well. 3. Test exposed person for HCV if any signs or symptoms of hepatitis. 4. Immune globulin has not been shown to be of value for prophylaxis. 5. If acute HCV infection occurs refer for interferon treatment (NEJM 2001;345:1452-1457).
	HIV antibody -ve	No action usually necessary. If there is a concern that the source could be incubating HIV then do HIV antibody at 3, 6, 12 months.
	HIV antibody unknown	No action usually necessary. If there is a concern that the source could be incubating HIV then do HIV antibody at 3, 6, 12 months.
HIV	HIV antibody +ve	<ol style="list-style-type: none"> 1. Immediately inform Clinical Microbiologist who will refer to an infectious disease consultant for HIV chemoprophylaxis. 2. Do HIV serology at 3, 6, 12 months.



HUMAN IMMUNODEFICIENCY VIRUS (HIV)

If the source is HIV antibody negative, and a reliable history is available to exclude any significant risk that the source has acquired HIV infection in the last 3 months, then no action needs to be taken by the exposed worker.

When the HIV status of the source material is unknown, initiating post-exposure prophylaxis (PEP) should be decided on a case by case basis, based on exposure risk and the source material. If additional information becomes available, e.g. the HIV status of the source individual, the need for PEP can be reconsidered.

Chemoprophylaxis has been shown to be of value in reducing the risk of HIV infection following an occupational exposure to HIV infected material.

A decrease of approximately 80% in the risk of HIV infection after percutaneous exposure to HIV infected blood was demonstrated in a case control study of PEP following occupational exposure to HIV (MMWR 1995; 44: 929-933).

If no PEP is used, the average risk for HIV infection from all types of reported percutaneous exposure to HIV infected blood is 0.3% (Tokars et al., Ann. Int. Med. 1993; 118: 913-919). For mucous membrane exposure the risk is approximately 0.1% (Gerberding, NEJM 1995; 332: 444-451).

The recommendations for PEP are outlined in a document published by the US Department of Health (MMWR 2001; 50, RR-11 : 1-42).

The recommendations are based on the type of exposure and the source material.

PEP should be initiated **promptly**, preferably within 1-2 hours. It is generally recommended that PEP not be given if more than 72 hours have elapsed since the exposure. The need for PEP after this time should be discussed with a specialist.

PEP is currently recommended for 4 weeks. PEP should be initiated and supervised by a person familiar with prescribing anti-HIV medications. Monitoring for toxicity should include baseline blood count, renal and hepatic tests. These should be repeated 2 weeks after starting PEP.

PEP should be **recommended** following any exposure associated with a high risk of HIV transmission. PEP should be **offered** when there is a lower, but not negligible risk. PEP is **not justified** for exposures with a negligible risk.

Counselling must occur after all exposures to blood or body fluids. Information regarding the prevention of secondary transmission is important, e.g. practising safer sex.

The following PEP regimens are recommended. **Because of rapidly changing knowledge in this area, specialist advice should always be sought before initiating any specific measure. Any specific advice will be influenced by the antiviral agents the source patient has received. Many consider that at least two anti-HIV agents should always be used.**

PERCUTANEOUS EXPOSURE

The highest risk exposure is from a deep injury with a large diameter hollow needle containing blood with a high titre of HIV. If the titre of HIV in the source patient is not known, it is reasonable to assume a high titre in a source who has acute HIV infection or has end stage AIDS. The **recommended** regimen is: zidovudine (AZT) plus lamivudine (3TC) plus indinavir (IDV).**

Injury with a solid suture needle from an asymptomatic HIV infected patient suggests that the exposure does not involve a large amount of blood and that the source may not have a high titre of HIV. PEP with AZT plus 3TC may be **offered**.**

Percutaneous injury with fluids containing visible blood or other potentially infectious fluid, e.g. semen, vaginal secretions, and amniotic, cerebrospinal, synovial, pleural, pericardial or peritoneal fluids constitute a lesser risk and PEP with AZT plus 3TC may be **offered**.**



MUCOUS MEMBRANE EXPOSURE

For blood exposure PEP with AZT and 3TC may be **offered** and use of IDV may be considered.**

Fluid containing visible blood and other potentially infectious fluids, e.g. semen, vaginal secretions and cerebrospinal, synovial, pleural, peritoneal, pericardial or amniotic fluids, and tissue pose a lesser risk of HIV infection. PEP with AZT may be **offered** and use of 3TC may be considered.**

Others consider that at least two agents should always be used.

For other body fluids, e.g. urine, tears, vomit, faeces, sweat, do not offer prophylaxis.

SKIN EXPOSURE

The risk when blood or body fluids are splashed onto skin is increased if the blood or body fluid has a high titre of HIV, if there has been prolonged contact, if there is an extensive area of exposure, and especially if exposure involves an area of damaged skin.

When there is increased risk PEP with AZT may be **offered**.**

For skin exposures without increased risk, the risk for drug toxicity outweighs the benefit of PEP.

GUIDELINES FOR OCCUPATIONAL EXPOSURE TO HBV, HCV, HIV

The United States Public Health Service has updated its previous guidelines for the management of occupational exposures to HBV, HCV, and HIV. The 2001 guidelines are available at www.cdc.gov/mmwr

- * The Health and Safety in Employment Act 1992 requires employers to record in an accident register events that harm or might have harmed employees and other people in the employer's place of work. Section 25 states that this must be "in the prescribed form". Prescribed forms are available from any Department of Labour, local Occupational Safety and Health office. The act also states (6.e) that employers must develop procedures for dealing with emergencies that may arise while employees are at work.
- ** These regimens may be offered when the source patient is known to not have been treated with any of these anti-viral agents.



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