

Middlesex-London Health Unit  
50 King St.  
London, Ontario  
N6H 5M3

Phone: 519-663-5317 X 2330  
After Hours: 519-675-7523  
Fax: 519-663-9581  
[www.healthunit.com](http://www.healthunit.com)

## POST EXPOSURE MANAGEMENT: HEPATITIS B, HEPATITIS C AND HIV

Document created by Simcoe Muskoka District Health Unit  
for the Middlesex-London Health Unit March, 2014



**ML** BUREAU DE SANTÉ DE  
MIDDLESEX-LONDON  
HEALTH UNIT  
[www.healthunit.com](http://www.healthunit.com)



## TABLE OF CONTENTS

<b>Table of Contents</b> .....	<b>1</b>
<b>Purpose</b> .....	<b>2</b>
<b>Introduction</b> .....	<b>2</b>
<b>Role of the Health Unit</b> .....	<b>2</b>
<b>Patient Management</b> .....	<b>3</b>
STEP 1 – Treat Exposure Site.....	3
STEP 2 – Assess the Exposure Risk.....	3
Significant Exposures.....	3
Risk of Transmission.....	4
Source Person.....	6
STEP 3 – Test the Source Person and the Exposed Person.....	7
Testing of the Source Person.....	7
Baseline Testing of the Exposed Person.....	8
STEP 4 – Post Exposure Management.....	11
Post Exposure Management HBV.....	11
Post Exposure Management HCV.....	16
Post Exposure Management HIV.....	16
Special Circumstances.....	22
STEP 5 – Counselling and Follow Up.....	24
<b>Mandatory Blood Testing Act</b> .....	<b>27</b>
<b>Resources and References</b> .....	<b>28</b>
<b>Appendices</b> .....	<b>32</b>
Appendix A: Documentation Form: Assessment of Potential Exposures to Bloodborne Infection.....	32
Appendix B: Post Exposure Instruction and Planning Sheet: Hepatitis B, Hepatitis C and HIV.....	35
Appendix C: Patient Factsheet: Exposure to Another Person’s Blood or Body Fluids.....	37

## Purpose

This document provides guidance to health care providers (HCPs) in Middlesex County and the City of London who are called upon to assess and manage incidents of exposures (percutaneous, mucosal or non-intact skin) to blood or body fluids that are capable of transmitting hepatitis B (HBV), hepatitis C (HCV), or human immunodeficiency virus (HIV).

## Introduction

Through a 5 step framework<sup>1</sup>, this document provides guidance in assessing and managing blood or body fluids exposures. General information is also provided regarding the Mandatory Blood Testing Act (MBTA).

Exposed individuals may include health care workers or emergency service providers, who in the course of their duties accidentally sustain an injury which could mean a potential exposure. Additionally, others from the community may seek help for exposures such as blood splashes, bites, sexual exposures, accidental needle sticks or exposures within health care settings. Official guidance for hospitals in designing their response protocols for internal occupational exposures remains with the OHA/OMA - MOHLTC protocol.<sup>2</sup>

Each instance of a possible exposure to HBV, HCV or HIV must be assessed carefully and quickly. In most instances this is best done in an emergency department or urgent care setting. Where an exposure is determined to be significant, treatment with post exposure prophylaxis (PEP) for HBV and/or HIV may be warranted, and if so, should be started as soon as possible (for HIV PEP this is ideally within 2 hours).

## Role Of The Health Unit

The role of the health unit (HU) is primarily a supportive one for any person who sustains an exposure that could result in the transmission of HBV, HCV or HIV. Those who contact the health unit receive counselling and recommendations for follow-up; these interactions have a strong preventive and educational focus.

Although HCPs are not required to report exposures to the health unit, health unit staff can provide support and information to health care providers around blood borne infection exposures and management. Public health personnel are available to help assess the risk of a source person which may include contacting the source to collect information about health status and risk factors, a request to provide a blood sample or evidence of recent testing. Recommendations for testing and care may also be made, however decisions related to care ultimately rest between the patient and their HCP.

Health unit staff who respond to telephone calls from the community and HCPs about exposures provide information, education and support in consultation with the Medical Officer of Health. Contact the health unit as follows:

- During regular office hours, Monday through Friday 8:30-4:30 call **519-663-5317 X 2330**
- After hours, on holidays and weekends, call **519-675-7523**

<sup>1</sup> Health unit staff who respond to telephone calls from the community and HCPs about exposures provide information, education and support in consultation with the Medical Officer of Health. Contact the health unit as follows:

- During regular office hours, Monday through Friday 8:30-4:30 call **519-663-5317 X 2330**
- After hours, on holidays and weekends, call **519-675-7523**

Step 1-5 framework adapted from St. Michael's Pocket PEP Tool, 2013

<sup>2</sup> Blood-Borne Diseases Surveillance Protocol for Ontario Hospitals, 2012

# Patient Management

## STEP 1 – Treat Exposure Site

Where relevant, perform initial response and first aid<sup>3</sup>:

1. Remove any contaminated clothing.
2. Immediately allow the wound to bleed freely.
3. Wash the wound and injured area well with soap and water. Apply an antiseptic if available (note – however, that there is no evidence that the use of antiseptic reduces risk of pathogen transmission). Application of caustic agents such as bleach or injection of antiseptics or disinfectants into the wound is not recommended.
4. If the eyes, nose or mouth are involved, flush well with large amounts of water or saline (at least 1000 ml).
5. Occupational exposures should be reported to an immediate supervisor, who should immediately implement agency policy
6. Seek immediate medical assistance, preferably at a hospital emergency department.

For wound management, consider the use of tetanus toxoid-containing vaccine, with or without tetanus immune globulin, based on the nature of the wound and the vaccination history.<sup>4</sup>

## STEP 2 – Assess the Exposure Risk

### Significant Exposures

Any person with significant recent exposures to blood or body fluids should be immediately referred to the nearest emergency department. The emergency room (ER) staff should be notified and made aware of the urgency of the situation and actions should be taken to avoid wait times for the patient.

Body fluids capable of transmitting HBV, HCV and HIV from an infected source include<sup>5</sup>:

- blood, serum, plasma and all biological fluids visibly contaminated with blood.
- laboratory specimens, samples or cultures that contain concentrated HBV, HCV, or HIV.
- semen and vaginal fluids (very low risk for HCV).
- amniotic, pleural, peritoneal, pericardial, synovial, and cerebrospinal fluids.
- breast milk (HIV only).
- saliva (HBV only, unless it is contaminated with blood).
- organs and tissues.

Note: Feces, nasal secretions, sweat, tears, urine and vomitus are not considered potentially infectious unless visibly contaminated with blood.

<sup>3</sup> Blood-Borne Diseases Surveillance Protocol for Ontario Hospitals, 2012

<sup>4</sup> Canadian Immunization Guide 7<sup>th</sup> Edition, 2012 (Internet)

<sup>5</sup> CDC MMWR Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Post exposure Prophylaxis, 2001

An exposure is considered significant if one of the aforementioned potentially infectious fluids comes into contact with the tissues of the exposed person in any of the following ways<sup>6</sup>:

- percutaneous exposure: e.g. a needle stick, puncture/cut with a sharp object, etc.
- contact with mucous membranes: e.g. a splash to eyes/nose/mouth, sexual contact, etc.
- contact with non-intact skin: skin lesion where there is a disruption of the epidermis and the injury to the skin is less than 3 days old<sup>7</sup>.
- biting or receiving a bite where blood is present<sup>8</sup>.

## Risk of Transmission

The risk of becoming infected with HBV, HCV or HIV depends on the type of injury and a number of other factors. An exposure risk is greater in these examples:

- when there is visible blood on the device that caused the injury and especially if the device has been in the vein or artery of the source person.
- when there is a deep injury.
- if the volume of blood or body fluid is very large.
- when a needle stick injury has been made with a large gauge needle.

In general, the risk of transmission is much greater for HBV than for HIV. Risk of transmission for each of the 3 pathogens is summarized here.

### HBV

The risk of transmission of HBV following a needle stick exposure from an infected source ranges from 6 to 30%<sup>9</sup>. Risk of transmission from bites where there is a break in the skin poses much less risk, since the concentration of HBV in saliva is between 1000 to 10,000 times lower than what is in blood<sup>10</sup>. Of the blood borne pathogens, HBV is considered to be the greatest risk following a community-acquired injury because the virus can survive in dried blood for 7 days or more on environmental surfaces<sup>11</sup>. Unprotected sex is considered high risk for the transmission of HBV.

### HCV

After a needle stick or sharps exposure with HCV-positive blood, the risk of HCV infection is approximately 1.8%<sup>12</sup>. Risk of transmission from a sexual contact is much lower. Although a few cases of HCV transmission via blood splash to the eye have been reported, the risk for such transmission is very low. HCV can survive in a dried state for at least 16 hours and possibly up to 4 days<sup>13</sup>.

### HIV

Risk of HIV transmission after an accidental percutaneous exposure to infected blood or body fluid is about 0.3%<sup>14</sup>. The risk of HIV transmission after a mucus membrane exposure is 0.09%<sup>15</sup>. HIV is believed to survive for only several hours after infected blood has dried on a surface, which makes the risk of HIV acquisition from a found (abandoned) needle to be very low. In many years of follow-up in Canada, the US and Europe, it appears no one has become infected with HIV from a found needle<sup>16</sup>. However, each situation must be assessed individually.

<sup>6</sup> CDC MMWR Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis, 2001

<sup>7</sup> BC Center for Excellence in HIV/AIDS Accidental Exposure Guidelines, 2009

<sup>8</sup> CDC MMWR Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis, 2001

A variety of factors can impact on the risk of HIV transmission from an infected source but the greatest estimated risk is associated with blood transfusions, needle sharing by injection-drug users, receptive anal intercourse, and percutaneous needle stick injuries<sup>17</sup>. In addition, a high viral load in the source (such as when the person is newly infected or in AIDS stage of the disease), will increase risk of transmission.

The following chart can be helpful in assessing risk of HIV transmission from a **known HIV positive source**<sup>18</sup>. The 'Risk percent' column can be interpreted as the risk of transmission per single exposure from an HIV positive source. When the source is not known HIV positive, these numbers must be considered along with the source's risk

Exposure (No condom used)	Risk per 10,000 acts	Risk percent
Hollow Bore Needle stick injury	30	0.3%
Needle sharing – injection drug use	67	0.67%
Penile-vaginal intercourse (risk to male)	5	0.05%
Penile-vaginal intercourse (risk to female)	10	0.1%
Anal intercourse (risk to insertive partner)	6.5	0.06%
Anal intercourse (risk to receptive partner)	50	0.5% - 3%
Oral intercourse (risk to insertive partner)	0.5	0.005%
Oral intercourse (risk to receptive partner)	1	0.01%

<sup>9</sup> Blood-Borne Diseases Surveillance Protocol for Ontario Hospitals, 2012

<sup>10</sup> Canadian Liver foundation, Hepatitis B (Internet)

<sup>11</sup> CDC MMWR Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis, 2001

<sup>12</sup> CDC, Hepatitis C Information for health professionals (Internet)

<sup>13</sup> Public Health Agency of Canada, Frequently Asked Questions About Hep C

<sup>14</sup> CDC MMWR Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HIV and Recommendations for Postexposure Prophylaxis, 2005

<sup>15</sup> Blood-Borne Diseases Surveillance Protocol for Ontario Hospitals, 2012

<sup>16</sup> BC Center for Excellence in HIV and AIDS, Accidental Exposure Guideline, 2009

## Source Person

When an exposure is determined to be significant, the source of the blood or body fluid must be considered to further determine risk of transmission of infections. Collect and document both **known** or **unknown** source information:

- Known Source:
  - name, date of birth (DOB), address and name of HCP
  - general health information
  - history of HBV, HCV or HIV infection or evidence of recent testing
  - immunization status for HBV (including date of last immunization and if done, immune titres for HBV)
  - risk factors for blood borne infection (history of injection drug use, needle sharing, men who have sex with men (MSM), multiple sexual partners, partners who have a blood borne infection, receipt of blood or blood products prior to 1990, etc.). See chart below for risk factors specific to each pathogen.
  - any other information pertinent to the exposure
- Unknown source:
  - collect as much information as possible. For example, a needle found in an area of high IDU (injection drug use) with reason to believe it was freshly used poses a greater risk than an old needle found in a backpack of a diabetic child.

Known SOURCE: Risk Factors for Transmission of Infection	
Pathogen	Risk Factors for Blood Borne Pathogen
<b>HBV</b>	<p><b>High risk if source :</b></p> <ul style="list-style-type: none"> <li>• Practices high-risk sexual behaviour (men who have sex with men, sexual partner who is an injection drug user (IDU), has multiple sexual partners).</li> <li>• Has an HBV infected sexual partner or a sexual partner (s) with high risk behaviours.</li> <li>• Has a history of injection drug use or sharing of drug-related equipment.</li> <li>• Has had a tattoo or piercing done with non-sterile equipment.</li> <li>• Is a person from a highly endemic region. HBV prevalence is highest in sub-Saharan Africa and East Asia, but other regions have high rates as well: <a href="http://www.who.int/mediacentre/factsheets/fs204/en/">http://www.who.int/mediacentre/factsheets/fs204/en/</a>.</li> </ul>
<b>HCV</b>	<p><b>High risk if source :</b></p> <ul style="list-style-type: none"> <li>• Has a history of injection drug use or sharing of drug-related equipment.</li> <li>• Has had a tattoo or piercing done with non-sterile equipment.</li> <li>• Has received blood or blood products before 1990<sup>19</sup>.</li> <li>• Practices high-risk sexual behaviour (has a sexual partner who is an IDU, has a long term sexual partner who is HCV infected).</li> </ul>
<b>HIV</b>	<p><b>High risk if source :</b></p> <ul style="list-style-type: none"> <li>• Has a history of injection drug use or sharing of drug-related equipment.</li> <li>• Practices high-risk sexual behavior (men who have sex with men, sexual partner who is an injection drug user (IDU), has multiple sexual partners).</li> <li>• Is a person who has had multiple transfusions of blood or blood products, e.g. hemophiliacs prior to November 1985.</li> <li>• Has a sexual partner(s) known to be HIV-positive.</li> <li>• Is an infant born to an HIV infected mother.</li> </ul>

## STEP 3 – Test the Source Person and the Exposed Person

### Testing of the Source Person

When the source person is known, they can be approached to provide information about health status, risk factors and to provide a blood sample for HBV, HCV, and HIV testing. Recommended tests are:

- **HBsAg**
- **Anti-HBs**
- **Anti-HBc**
- **Anti-HCV**
- **HIV<sup>20</sup>**

**Call the PHO London Laboratory to request these tests STAT, indicating they relate to a blood or body fluid exposure. Indicate the same on the requisition form.**

Depending on the time of arrival, results may be available within a few hours or less. Contact the lab at:

- Monday to Saturday, 8:00-5:00: **519-455-9310**, press “2” for customer service.
- Sunday: on call

Testing of blood or fluid from an unknown source such as a found needle is not recommended since testing can be inaccurate, take too long for results to be determined and may pose an unnecessary risk to a lab employee<sup>21</sup>.

It is always necessary to obtain consent for the testing and sharing of any health information and to provide pretest counselling. In some circumstances, staff at the health unit may assist with this process. Health Unit staff can contact the source, collect information, request health status information or coordinate their blood tests to assist with the treatment and follow-up of the exposed person. Health unit staff can also assist where consent has not been previously obtained from the source. Assessment of the source for risk factors should take into account situations where the source person will be testing in a window period.

Where a source person is known but refuses or is unable to provide information, processes legislated by the MBTA may be initiated by the exposed person, if eligible. The process is never a requirement in the management of an exposure, but rather an option that is available. The exposed person, if eligible, can submit an application requesting a source person provide a blood sample for testing for HBV, HCV and HIV. However, recommended testing and potential post-exposure treatment for the exposed person should not await the outcome of the MBTA application, as it may take days to weeks. See the MBTA section of this document for additional information.

<sup>17</sup> CDC MMWR Antiretroviral Postexposure Prophylaxis After Sexual, Injection-Drug Use, or Other Nonoccupational Exposure to HIV in the United States, 2005

<sup>18</sup> CDC MMWR Antiretroviral Postexposure Prophylaxis After Sexual, Injection-Drug Use, or Other Nonoccupational Exposure to HIV in the United States, 2

<sup>19</sup> Canadian Liver Foundation, Hepatitis C (Internet)

<sup>20</sup> CDC MMWR Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis, 2001

<sup>21</sup> CDC MMWR Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis, 2001

## Baseline Testing of the Exposed Person

Testing should be done at the time of the exposure, or as soon after as possible, to establish a baseline and generally again at 3 months post exposure. In some circumstances, retesting at 6 months may be indicated. Baseline testing of the exposed person should include:

- **Anti-HBs**
- **HBs Ag (if unvaccinated or if unknown response to vaccine)**
- **Anti-HCV**
- **HIV**

**When baseline results would be of value in determining immediate management plans, call the PHO London Laboratory to request these tests STAT, indicating they relate to a blood or body fluid exposure. Indicate the same on the requisition form.** Depending on the time of arrival, results may be available within a few hours or less. Contact the lab at:

- Monday to Saturday, 8:00-5:00: **519-455-9310**, press “2” for customer service.
- Sunday on call

Depending on the amount of time that has elapsed since the exposure and the anticipated lab turn-around time, it may be best to make a decision on PEP for HBV and/or HIV without awaiting baseline results. See [STEP 4](#) of this document for recommended timing for initiating PEP, for optimal effectiveness.

Exposure to the blood or body fluids of another person almost always produces significant anxiety in the patient, regardless of the type of injury. Counselling regarding testing and its implications, planning for preventive treatments as well as follow-up, is critical at the time of the assessment. A summary of recommended counseling points are provided in [STEP 5](#) of this document. [Appendix B](#) and [C](#) can also be used to assist with patient teaching and recommended follow up. If you do not have time to provide complete counseling, such as in the ER setting, encourage patients to follow up with the health unit or their HCP for additional information and counseling. At the Middlesex-London Health Unit:

Sexual Health:

- Monday, Wednesday and Friday, 8:30-4:30,  
and Tuesday and Thursday 8:30-7:00, **519-663-5446**, press “3” for customer service.

Infectious Disease:

- Monday to Friday 8:30-4:30, **519-663-5317 X 2330**  
or after hours **519-675-7523**.

Baseline testing may be refused in some instances by the exposed person. If so, counsel accordingly for health implications and potential for transmission to others. Additionally, when an exposure occurs within a work setting, failure to provide baseline testing information could result in jeopardized compensation claim should an infection be acquired. [A Mandatory Blood Testing](#) application cannot proceed if baseline testing and counselling have not been done.

## HBV

The usual baseline tests for HBV are anti-HBs (HBV surface antibodies) and, for patients who are unvaccinated or if their response to previous HBV vaccination is unknown, HBV antigen (HBs Ag)<sup>22</sup>. A positive antibody test at >10mIU/mL means the person is immune<sup>23</sup>, either because they have been immunized or because they were infected in the past. In the latter case, the person is not infectious. When the antibody test is negative or <10 mIU/mL, the exposed person is susceptible to infection and post-exposure prophylaxis may be warranted<sup>24</sup>.

Usual time frames for follow-up testing for HBV after an exposure are at 2 months (or follow-up can be 3 months to include the repeat test for HIV) and 6 months.

If the exposed person is previously known to be immune to HBV (documented anti-HBs ≥ 10 IU/L at any time in the past) or is known HBs Ag positive, then HBV testing of the source and exposed person is unnecessary.

## HCV

There are 2 types of tests available for HCV: anti-HCV (HCV antibodies), and HCV-RNA (qualitative PCR) test which tests for the presence of the virus in the blood.

Anti-HCV:

- this is the only HCV test required at baseline
- a negative HCV antibody test means: no history of infection or the person is in the window for seroconversion, anywhere from 4-12 weeks<sup>25</sup> after exposure. As such, the exposed person should have a repeat antibody test in 3 months, and again at 6 months.
- a false negative antibody test may happen when the person is immunocompromised. This situation would warrant further testing with HCV-RNA to rule out the false negative or to look for presence of disease.
- a positive antibody test means: there has been prior exposure to HCV. To determine presence of active infection an HCV-RNA test is needed. A positive antibody test means it is still possible for the infection to clear on its own. Up to 20% of infected people will have the infection resolve spontaneously<sup>26</sup>.

<sup>22</sup> Alberta Government, Alberta Guidelines for Non-Occupational, Occupational and Mandatory Testing and Disclosure Act Post-Exposure Management and Prophylaxis: HIV, Hepatitis B, Hepatitis C and Sexually Transmitted Infections, 2013

<sup>23</sup> Canadian Immunization Guide, 7<sup>th</sup> Edition, 2012 (Internet)

<sup>24</sup> Canadian Immunization Guide, 7<sup>th</sup> Edition, 2012 (Internet)

<sup>25</sup> Canadian Liver Foundation, Primary Care Management of Chronic Hepatitis C, 2009 (Internet)

<sup>26</sup> Public Health Agency of Canada, Primary Care Management of Hepatitis C, 2009 (Internet)

#### HCV-RNA:

- commonly known as the PCR test or viral load test, HCV-RNA tests for the presence of active infection.
- the value in doing the PCR test means earlier detection, referral and treatment.
- HCV-RNA testing is usually done after a positive HCV antibody test but may be recommended following a potential high risk exposure such as a blood exposure involving the sharing of injection drug using (IDU) equipment or through blood exposure to person known to be HCV positive.
- HCV-RNA detection may be possible as early as 1-3 weeks post exposure, however the health unit recommends testing at 6 weeks since the likelihood of detecting HCV reaches 70% by that time<sup>27</sup>.
- if HCV-RNA is negative at 6 weeks, additional Anti-HCV tests are recommended at 3 and 6 months.

#### Understanding the results:

- when HCV-RNA testing detects the virus, it will give a number indicating viral load. This number will read >15 IU/ml, although lower viral loads can be detected.
- false positives for HCV-RNA testing are possible (if the specimen is contaminated) and false negatives are also possible (if the specimen was not rapidly frozen or transported under sub-optimal conditions) .
- positive Anti-HCV and negative HCV-RNA: unless this is a false negative it means there is a history of disease which has resolved on its own. The person is not infectious and all future Anti-HCV tests will be positive. However due to varying genotypes for HCV, a positive antibody test does not imply immunity to a future infection.
- positive Anti-HCV and positive HCV-RNA: this means the individual is infected, needs further assessment to determine progression of the disease and may be offered antiviral treatment, depending on genotype. This person is infectious and should be counselled to protect others.

\*When ordering an HCV-RNA test it requires a specific requisition and transport to the lab. A minimum 2.5 ml frozen serum or plasma is required; it must be centrifuged and separated within four hours of collection. When this is not possible at the site where the blood is drawn, the blood sample must be sent to the PHL lab within 4 hours for preparation. Life Labs are able to do this as well. The sample must be accompanied by a completed Hepatitis PCR Information Form F-C-HE-036-006 which is considered the requisition. The form is available at local labs and for download from [Public Health Ontario](#).

<sup>27</sup> Public Health Agency of Canada: Centre for Communicable Diseases and Infection Control, Canadian Guidelines on Sexually Transmitted Infections, January 2010 (Internet)

## **HIV**

HIV antibody is the baseline test done immediately after the exposure. From the time of infection to the development of measurable antibodies can take up to 12 weeks or 3 months for most people. This is known as the “window” or seroconversion period.

P24 Antigen is now included with every HIV antibody test in Ontario, with all HIV testing going through the Public Health Lab. P24 Antigen test can diagnose acute HIV infection, as P24 Ag can be detectable at 2-3 weeks after exposure and peaks at 3-4 weeks. P24 Ag will disappear as antibodies develop.

A positive HIV antibody or P24 Antigen should prompt confirmatory testing at the public health lab to confirm that the person is infected with HIV.

A negative test for the antibody and antigen means no infection is present or the person is in the window period. The exposed person should, at a minimum, have follow-up testing at 3 months following the exposure. If PEP for HIV is to begin, liver enzymes, creatinine and complete blood count should be done, as well as other blood work if indicated.

## **STEP 4 – Post Exposure Management**

### **Post Exposure Management HBV**

The management of a person at risk of HBV from an exposure is dependent on their susceptibility to the infection based on history of prior infection and/or vaccination together with consideration of the source as a high risk or low risk.

The HBV vaccination history and the vaccine-response status (anti-HBS, if known) of the exposed person should be reviewed and documented.

Any person who has had an exposure to HBV, and is not immune or has never been vaccinated for HBV should begin the HBV immunization series immediately.

Staff working in areas where they have a greater risk of infection through occupational exposures to blood and body fluids are encouraged to be immunized for HBV and have an anti-HBs test within 1 to 6 months of completion of the vaccine series to verify immunity. If the staff member has been immunized for HBV but an anti-HBs has never been done then one should be ordered <sup>28</sup>.

HBV vaccine and/or passive immunization with HBV immune globulin (HBIG) may be warranted. Refer to the [Canadian Immunization Guide](#) for complete directions, or refer to the summary of information from this guide on the following pages. Whenever possible, the source should be tested to help avoid unnecessary use of HBIG.

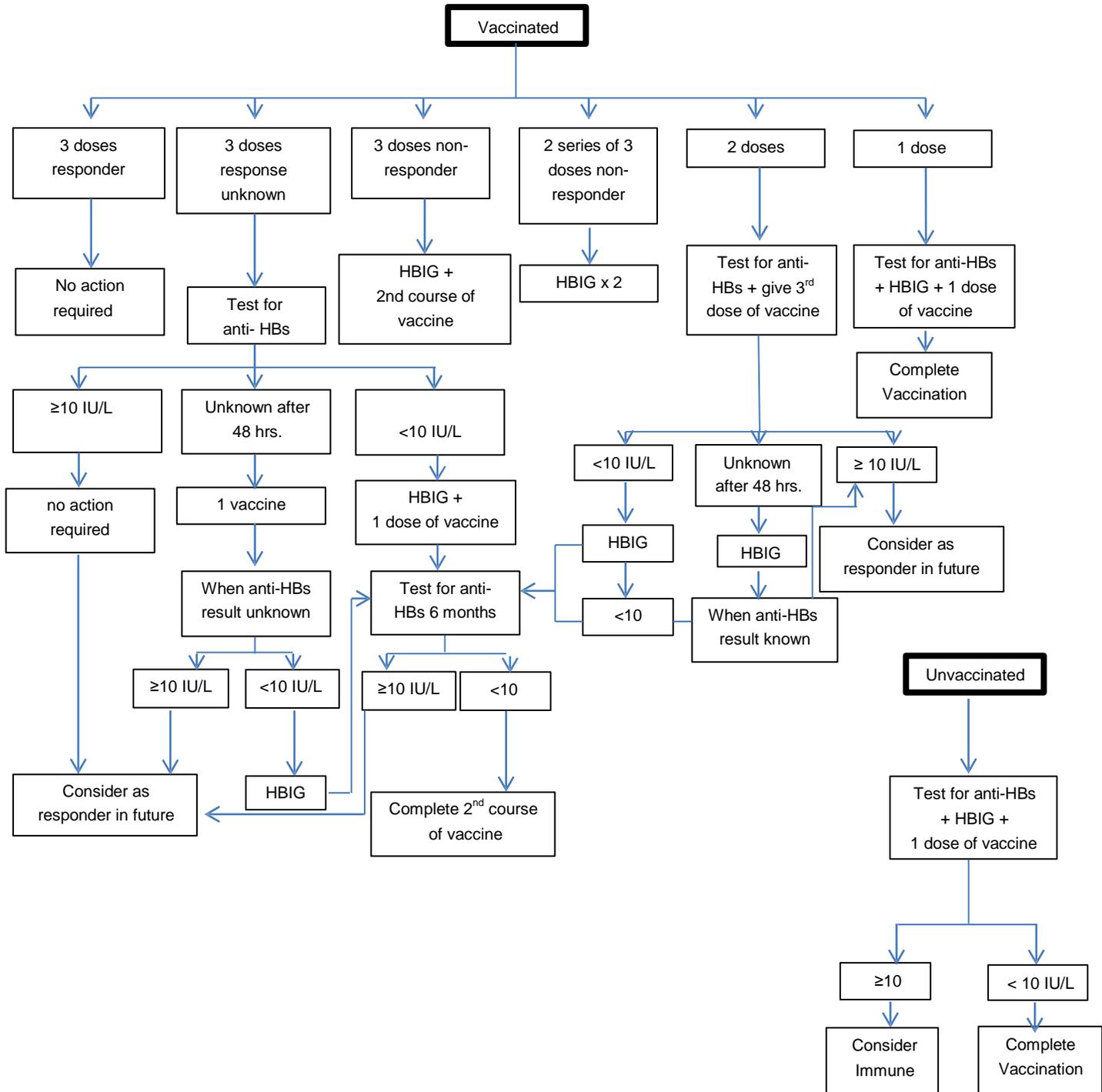
<sup>28</sup> Canadian Immunization Guide, 7<sup>th</sup> Edition, 2012 (Internet)

Where required, the recommended dose of HBIG for older children and adults is 0.06 mL/kg given intramuscularly (IM)<sup>29</sup>.

HBIG can be accessed at all hospitals throughout Middlesex County and the City of London, generally through their blood bank/lab. Middlesex-London Health Unit does not carry HBIG and patients should not be referred to the health unit for this. Hepatitis B vaccine is also available at all hospitals, generally in the emergency room or through the hospital pharmacy.

If Hepatitis B vaccine is initiated in the ER following an exposure, dose 2 and 3 can be obtained through the health unit, Vaccine Preventable Disease (VPD) program. The vaccine can be released to the patient's HCP or the patient can book an appointment with the VPD program at a community clinic. Contact the VPD program at: **519-663-5317 X 2330**. Employees exposed as a result of a work related incident should follow up with their employers Occupational Health and Safety Department.

**Management of individuals with percutaneous or mucosal exposure to an infected (HBsAg +) or high risk source\*<sup>30</sup>**



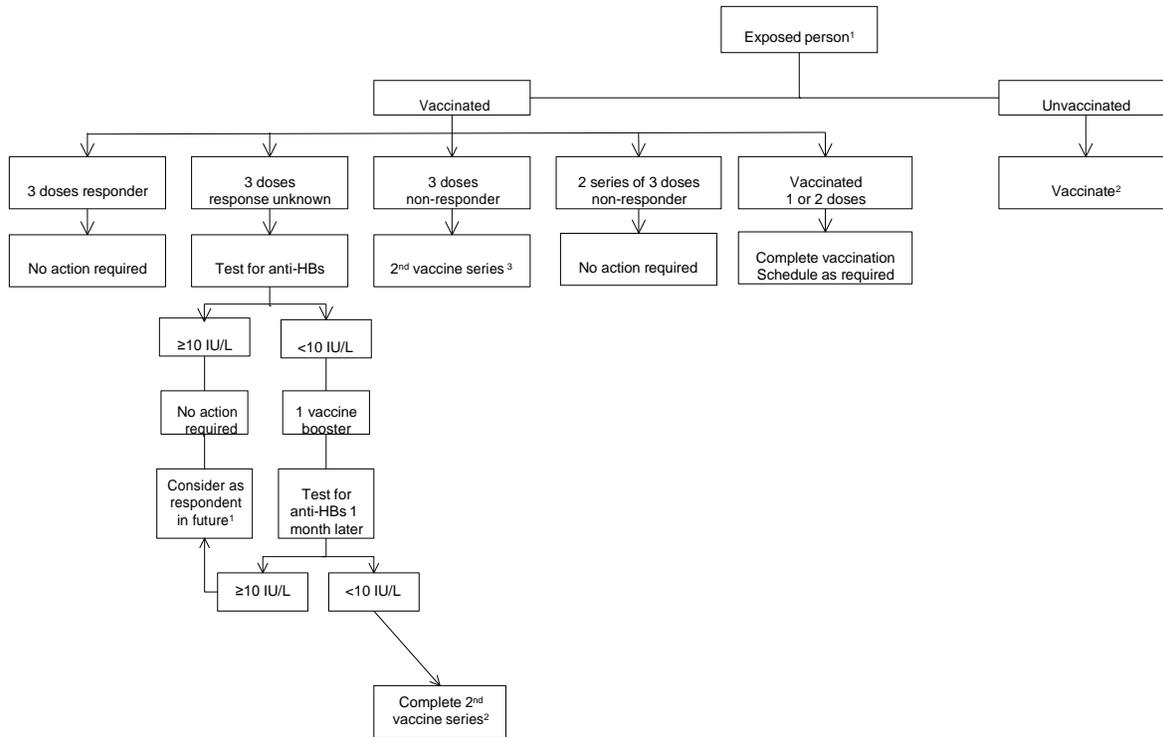
\* A known source is high risk if the person comes from a region highly endemic for HBV; has sexual relations with multiple partners; has a partner infected with HBV or at high risk of being so; is in close family contact with an infected person; uses injection drugs; or received blood or blood products prior to 1970. Wherever possible, the source should be tested. In the case of an unknown source, background circumstances may provide some indication of the degree of risk.

<sup>30</sup> Canadian Immunization Guide, 7<sup>th</sup> Edition, 2012 (Internet)

Summary of high risk chart:

- If the exposed person is immunized with documented immunity to HBV (anti-HBs >10mIU/ml) at any time, or is documented as immune from previous natural infection, no further action is required.
- If the exposed is a known non-responder to 2 courses of HBV vaccine, administer HBIG and repeat it in one month.
- If the exposed is a non-responder to 1 course of HBV vaccine, administer HBIG and second course of vaccine (3 doses).
- If the exposed person has received 2 doses of vaccine, test for anti-HBs and give one dose of vaccine. If anti-HBs is negative or unknown at 48 hours, give HBIG. If anti-HBs show adequate immunity, consider the person as a responder in the future.
- If the exposed person has received 3 doses of vaccine but the immune response is unknown, test for anti-HBs. If anti-HBs shows adequate immunity (anti-HBs >10mIU/ml), no action is required; consider as responder in future. If anti-HBs shows inadequate response (anti-HBs <10mIU/ml), give HBIG and 1 dose of vaccine; test for anti-HBs at 6 months. If result unknown at 48 hours, give 1 dose of vaccine; when result known, if adequate immunity, consider as responder in future; if inadequate immunity, give HBIG; test for anti-HBs at 6 months.
- If the exposed has not received vaccine or just one dose of vaccine, test for anti-HBs, give HBIG and a course of vaccine starting immediately.
- When HBIG is indicated, it should be administered as soon as possible after exposure (preferably within 24 hours). The effectiveness of HBIG when administered >7 days after exposure is unknown. (Note that the Canadian Immunization Guide suggests HBIG may be given up to 2 weeks following sexual exposure)
- When HBV vaccine is indicated, it should also be administered as soon as possible (preferably within 24 hours) and can be administered simultaneously with HBIG at a separate site (vaccine should always be administered in the deltoid muscle).

## Management of individuals with percutaneous or mucosal exposure to an uninfected or low risk source <sup>31</sup>



### Summary of low risk chart:

- If the exposed person is vaccinated and is known to be immune to HBV (anti-HBs >10mIU/ml), no action is required.
- If the exposed person has received three doses of vaccine but response unknown, then test for anti-HBs. If immunity is adequate (anti-HBs >10mIU/ml), no action is needed. If immunity is inadequate give 1 vaccine booster and re-test for anti-HBs 1 month later. If response is adequate, consider the person as immune for the future. If the retest shows inadequate response (anti-HBs <10mIU/ml) complete the course of vaccine, then test again for immunity at 1-6 months after vaccination is finished.
- If the exposed has had 3 doses and is a known non-responder, give 2<sup>nd</sup> course of vaccine.
- If the exposed has had 2 series of 3 doses and is a non-responder, no action needed.
- If the exposed has been vaccinated with 1 or 2 doses only, then complete vaccination schedule.
- If the exposed person has never been vaccinated, vaccinate.

<sup>31</sup> Canadian Immunization Guide, 7<sup>th</sup> Edition, 2012 (Internet)

## Post Exposure Management HCV

There is no specific intervention available to prevent transmission of HCV following an exposure. Immune serum globulin should not be given, as there is no demonstrated benefit. There is no evidence for use of anti-viral agents in the HCV post-exposure setting and such treatment is not recommended<sup>32</sup>.

However, there are now effective anti-viral treatment regimens for the early treatment of acute HCV infection to prevent chronic infection. Persons experiencing a needle stick injury from a known or high-risk HCV source should be monitored closely for symptoms of acute infection.

When HCV transmission occurs, a person may have no symptoms, or they may become symptomatic and experience jaundice, feel unwell and may display evidence of abnormal liver biochemistry. Up to 20% of infected people will clear the infection. The remaining 80% will go on to become chronically infected with HCV<sup>33</sup>.

Therapy for HCV can cure HCV infection in 40-90% of cases, depending on the HCV genotype<sup>34</sup>. Treatment duration is dependent on the genotype and can vary from 24 to 72 weeks<sup>35</sup>.

After a positive HCV-RNA test, the RNA test should be repeated at 12 weeks post exposure to confirm the presence of infection. This is the marker that determines the start point for treatment.

For an individual recently exposed, it is especially important to diagnose HCV early so that referral to a specialist and treatment can occur.

## Post Exposure Management HIV

Guidelines in the U.S. and a number of Canadian provinces recommend HIV PEP following high risk exposures, to reduce the likelihood of HIV transmission. The decision to treat with HIV PEP rests with the physician and the exposed person at the time of the assessment of the exposure and should take into account the facts collected about the exposure and the source, as described in [STEP 2](#).

The provision of treatment should never be based solely on the anxiety of the person exposed, as the drugs pose some risk of toxicity and may result in side effects. As described by the BC Centre for Excellence in HIV/AIDS, "The treatment of a high anxiety level in the exposed person is reassurance counseling and education. It is not antiretroviral therapy. Antiretroviral therapy may be toxic and should be provided for medical indications only"<sup>36</sup>.

<sup>32</sup> CDC MMWR Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis, 2001

<sup>33</sup> Public Health Agency of Canada, Primary Care Management of Hepatitis C, 2009

<sup>34</sup> Public Health Agency of Canada, Primary Care Management of Hepatitis C, 2009

<sup>35</sup> CDC, Hepatitis C Information for Health Professionals, 2013 (Internet)

The following information may be helpful in decision making regarding PEP. When there is doubt about initiating HIV PEP, treatment in consultation with an infectious disease specialist is advised.

### Occupational Exposures<sup>37</sup>

The following guidelines apply to health care workers who have had an occupational exposure:

**TABLE 1. Recommended HIV postexposure prophylaxis (PEP) for percutaneous injuries**

Exposure type	Infection status of source				
	HIV-positive, class 1*	HIV-positive, class 2*	Source of unknown HIV status†	Unknown source§	HIV-negative
Less severe <sup>¶</sup>	Recommend basic 2-drug PEP	Recommend expanded ≥3-drug PEP	Generally, no PEP warranted; however, consider basic 2-drug PEP** for source with HIV risk factors††	Generally, no PEP warranted; however, consider basic 2-drug PEP** in settings in which exposure to HIV-infected persons is likely	No PEP warranted
More severe <sup>§§</sup>	Recommend expanded 3-drug PEP	Recommend expanded ≥3-drug PEP	Generally, no PEP warranted; however, consider basic 2-drug PEP** for source with HIV risk factors††	Generally, no PEP warranted; however, consider basic 2-drug PEP** in settings in which exposure to HIV-infected persons is likely	No PEP warranted

\* HIV-positive, class 1 — asymptomatic HIV infection or known low viral load (e.g., <1,500 ribonucleic acid copies/mL). HIV-positive, class 2 — symptomatic HIV infection, acquired immunodeficiency syndrome, acute seroconversion, or known high viral load. If drug resistance is a concern, obtain expert consultation. Initiation of PEP should not be delayed pending expert consultation, and, because expert consultation alone cannot substitute for face-to-face counseling, resources should be available to provide immediate evaluation and follow-up care for all exposures.

† For example, deceased source person with no samples available for HIV testing.

§ For example, a needle from a sharps disposal container.

¶ For example, solid needle or superficial injury.

\*\* The recommendation "consider PEP" indicates that PEP is optional; a decision to initiate PEP should be based on a discussion between the exposed person and the treating clinician regarding the risks versus benefits of PEP.

†† If PEP is offered and administered and the source is later determined to be HIV-negative, PEP should be discontinued.

§§ For example, large-bore hollow needle, deep puncture, visible blood on device, or needle used in patient's artery or vein.

<sup>36</sup> BC Center for Excellence in HIV/AIDS Accidental Exposure Guidelines, 2009

<sup>37</sup> MMWR Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HIV and Recommendations for Postexposure Prophylaxis, 2005

**TABLE 2. Recommended HIV postexposure prophylaxis (PEP) for mucous membrane exposures and nonintact skin\* exposures**

Exposure type	Infection status of source				
	HIV-positive, class 1†	HIV-positive, class 2†	Source of unknown HIV status§	Unknown source¶	HIV-negative
Small volume**	Consider basic 2-drug PEP††	Recommend basic 2-drug PEP	Generally, no PEP warranted§§	Generally, no PEP warranted	No PEP warranted
Large volume¶¶	Recommend basic 2-drug PEP	Recommend expanded ≥3-drug PEP	Generally, no PEP warranted; however, consider basic 2-drug PEP†† for source with HIV risk factors§§	Generally, no PEP warranted; however, consider basic 2-drug PEP†† in settings in which exposure to HIV-infected persons is likely	No PEP warranted

\* For skin exposures, follow-up is indicated only if evidence exists of compromised skin integrity (e.g., dermatitis, abrasion, or open wound).

† HIV-positive, class 1 — asymptomatic HIV infection or known low viral load (e.g., <1,500 ribonucleic acid copies/mL). HIV-positive, class 2 — symptomatic HIV infection, AIDS, acute seroconversion, or known high viral load. If drug resistance is a concern, obtain expert consultation. Initiation of PEP should not be delayed pending expert consultation, and, because expert consultation alone cannot substitute for face-to-face counseling, resources should be available to provide immediate evaluation and follow-up care for all exposures.

§ For example, deceased source person with no samples available for HIV testing.

¶ For example, splash from inappropriately disposed blood.

\*\* For example, a few drops.

†† The recommendation “consider PEP” indicates that PEP is optional; a decision to initiate PEP should be based on a discussion between the exposed person and the treating clinician regarding the risks versus benefits of PEP.

§§ If PEP is offered and administered and the source is later determined to be HIV-negative, PEP should be discontinued.

¶¶ For example, a major blood splash.

The official guidance for Ontario hospitals for managing occupational exposures in their own staff is the OHA/OMA - MOHLTC protocol.<sup>38</sup>

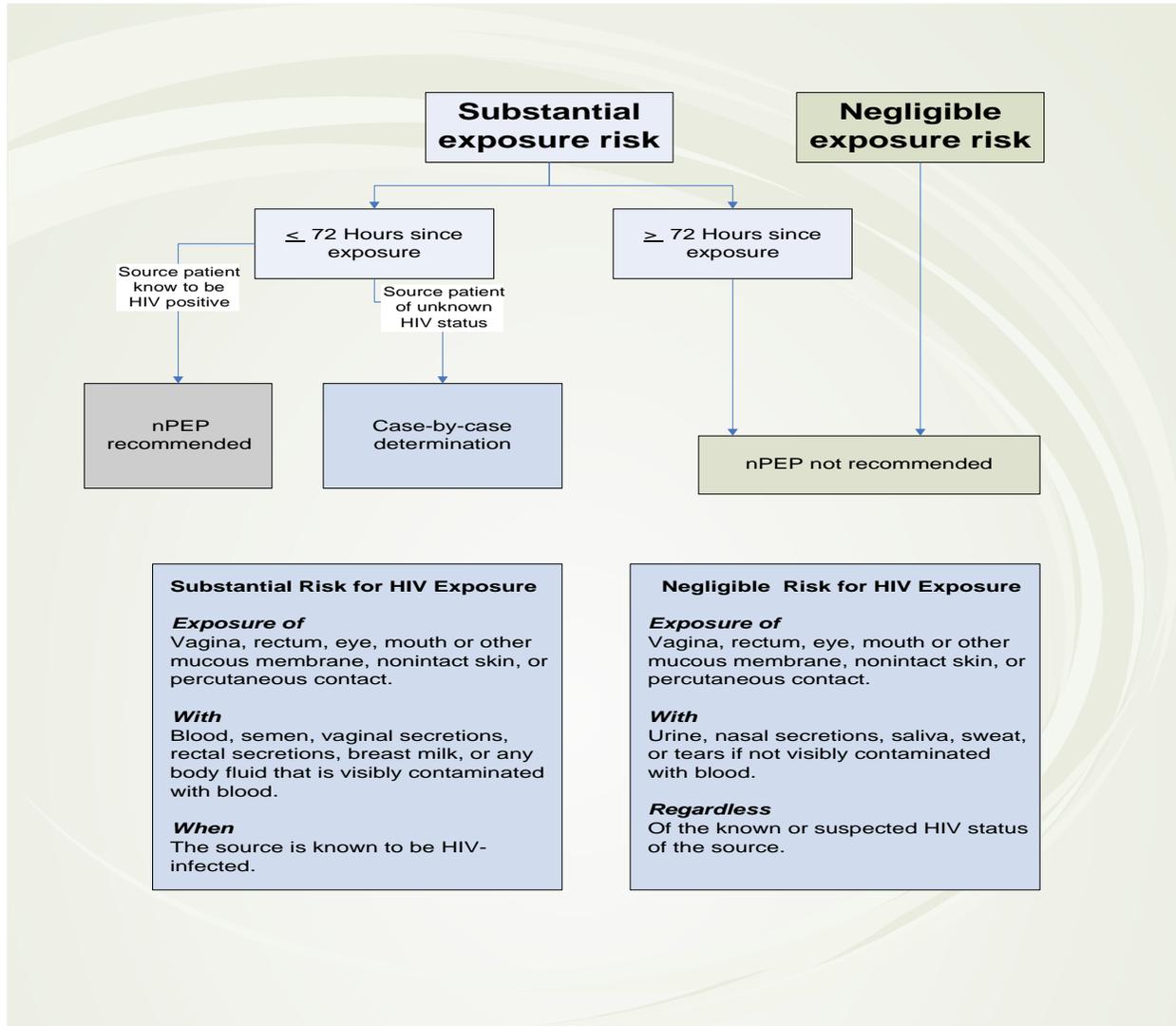
### Non-occupational Exposures<sup>39</sup>

The following guidelines apply to a range of exposures and settings - other than health care workers exposed in occupational settings - and commonly include sexual and injection-drug use exposures:

<sup>38</sup> Blood-Borne Diseases Surveillance Protocol for Ontario Hospitals, 2012

<sup>39</sup> CDC MMWR Antiretroviral Post exposure Prophylaxis After Sexual, Injection-Drug Use, or Other Nonoccupational Exposure to HIV in the United States 2005

FIGURE 1. Algorithm for evaluation and treatment of possible non-occupational HIV exposures



*Note on Figure 1: Clinicians might consider prescribing non-occupational PEP (nPEP) for exposures conferring a serious risk for transmission even if the person seeks care >72 hours after exposure if, in their judgment, the diminished potential benefit of nPEP outweighs the risks for transmission and adverse events.*

In addition to non-occupational exposures through sexual and injection-drug-use situations, percutaneous injuries from needles discarded in public settings (e.g., parks and buses) sometimes result in requests for HIV PEP. Although no HIV infections from such injuries have been documented in Canada, the US, or Europe, concern exists that syringes discarded by injection drug users - who have a higher rate of HIV than the general public - might pose a risk. However, these injuries typically involve small bore needles that contain only limited amounts of blood, and the viability of any virus present is limited<sup>40</sup>.

<sup>40</sup> CDC MMWR Antiretroviral Postexposure Prophylaxis After Sexual, Injection-Drug Use, or Other Nonoccupational Exposure to HIV in the United States, 2005

## Consider Risks of HIV Transmission versus Risks of HIV PEP

When the decision to initiate HIV PEP for occupational or non-occupational exposures is unclear (i.e. Recommended as 'consider' or 'case by case determination' in Tables 1 and 2 and Figure 1), it is important to weigh the potential for HIV transmission against the potential for toxicity from antiretrovirals. The factors to consider in the potential for HIV transmission were discussed in [STEP 2](#), which included numerical estimates of transmission risk for various routes of exposure from a *known HIV positive source*. The potential for toxicity from a complete course of HIV PEP has been less well studied, but the following summary is provided by the BC Centre for Excellence in HIV/AIDS<sup>41</sup>:

### POTENTIAL ADVERSE EFFECTS OF ONE MONTH OF ANTIRETROVIRAL THERAPY

These estimates are based on the experience of the BC Centre in the use of HIV prophylaxis and also use in the treatment of HIV infection. In most cases, the estimates are based on the use of two drugs and the adverse effects of three drugs may be higher.

- Minor adverse reactions, e.g. nausea, fatigue, etc. (70% of patients).
- Serious reactions, e.g. unable to work for the month of therapy (30 – 60% of patients). This risk is probably lower with newer drugs.
- Long term adverse effects (poorly defined) 1:5,000
- Risk of death is unknown but we would estimate that the risk of dying is 1:15,000 to 1:150,000. With three drugs without good follow-up, it may actually be much higher.

With the exception of the minor adverse reactions, these risks are not based on solid data and are provided only to guide physicians and exposed persons with a crude estimate of the hazards.

## Prescribing HIV PEP

**When HIV PEP is used in the context of an occupational or non-occupational exposure, PEP needs to begin as soon as possible - ideally within 2 hours - in order to be most effective at preventing HIV transmission.** HIV PEP can be effective up to 36-72 hours after an exposure but has unknown efficacy if started later than this<sup>42, 43</sup>.

<sup>41</sup> BC Center for Excellence in HIV/AIDS Accidental Exposure Guidelines, 2009

<sup>42</sup> BC Center for Excellence in HIV and AIDS, Accidental Exposure Guidelines, 2009

<sup>43</sup> CDC MMWR Antiretroviral Post exposure Prophylaxis After Sexual, Injection-Drug Use, or Other Nonoccupational Exposure to HIV in the United States 2005

Sexual Assault centers will provide HIV PEP up to 72 hours after a sexual assault. See the [Sexual Assault](#) section.

Treatment regimens are either a basic regimen of 2 antiretrovirals or an expanded regimen of 3 antiretrovirals, depending on the nature of the exposure and degree of risk involved.

As recommendations for specific antiretrovirals change over time, health care providers are encouraged to consult with current guidelines and/or infectious disease practitioners and pharmacists in selecting PEP regimens. There are currently no specific guidelines in Ontario or for Canada as a whole. The [BC Center for Excellence in HIV/AIDS](#) does provide comprehensive and current information.

As well, most hospitals stock HIV PEP starter kits for use in occupational exposures of their own staff, and in some cases for sexual assault exposures. To facilitate the initiation of HIV PEP within 2 hours of any relevant occupational or non-occupational exposure, **hospitals are encouraged to have HIV PEP starter kits for patient use available on site.** The HIV PEP starter kit – for 1 or more days - can be given along with a prescription for additional days. Hospitals are also encouraged to have a list of local pharmacies that stock HIV PEP medications so that patients can be referred there to fill the prescription.

For the pregnant or breastfeeding patient, the CDC recommends where possible that consultation take place with a person who has expertise in antiretroviral therapy and HIV transmission. PEP should not be denied solely on the basis of pregnancy or breastfeeding<sup>44</sup>.

Expert consultation is also recommended if the source patient is known to be HIV positive and may have taken antiretroviral therapy in the past, as there is a potential for drug resistance. If such consultation is not immediately available, begin PEP and change the regimen later if necessary.

A full course of HIV PEP is 28 days. The approximate cost of HIV PEP in Ontario for 28 days in 2013 is \$1,700.00, depending on the combination of medications used. Currently, the individual is responsible for the cost of the medications as it is not publicly funded. If relevant, they can then seek recovery of the cost from the Workplace Safety and Insurance Board, or a private insurance plan. Individuals without a private insurance plan may be eligible for assistance through the Trillium Drug Plan (1-800-575-5386) if a large part of their household income is spent on prescription medication. Applications for the Trillium Drug Plan are available at most pharmacies and online at the [Trillium Drug Program](#) website.

<sup>44</sup> CDC MMWR Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HIV and Recommendations for Postexposure, 2005

**A prescription for HIV PEP should be accompanied by counselling** regarding the potential for drug toxicity, possible drug interactions, and the importance of initiating the prescribed regimen immediately as well as adhering to the full course. Side effects frequently reported during HIV PEP include nausea, malaise, and fatigue. Symptoms may be manageable with antiemetic or antimotility agents<sup>45</sup>.

Baseline blood work should be drawn for liver enzymes, creatinine and complete blood count, as well as other blood work if indicated.

Follow up with a primary health care provider or specialist is recommended within several days (e.g. 5 days) of initiating PEP, to discuss new information on the source or exposure, assessment of PEP side effects, and planning for follow-up blood work to monitor for toxicity. It may be appropriate for the client to fill the prescription only for the days until the first follow-up appointment, at which time a decision can be made on whether or not PEP should continue for the full 28 days. For example, if the source is determined to be HIV negative, PEP should be discontinued<sup>46</sup>.

## **Special Circumstances**

### **Human Bites**

The risk of transmission of infection from a bite is generally low.

HBV can be transmitted when a person infected with HBV bites another and breaks the skin, as saliva is considered an infectious fluid for HBV. Transmission is also possible if infected blood from an HBV positive person who has been bitten enters the mouth of the biter. In most biting situations, assessment should be made for both parties. Saliva alone poses a potential, albeit lower risk. In situations where the skin has been broken, consider HBV vaccination for both the biter and the bitten.

HCV is rarely passed from one to another via a bite, but should be considered a significant risk when a large volume of blood is involved.

HIV is unlikely to be transmitted from a bite unless a large volume of blood enters the mouth of the biter.

Bites occurring in children are rarely a concern for the transmission of blood borne pathogens. Assessment of both parties should be considered, first aid measures taken and tetanus and HBV immunizations offered.

<sup>45</sup> CDC MMWR Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HIV and Recommendations for Postexposure Prophylaxis, 2005

<sup>46</sup> BC Center for Excellence in HIV/AIDS, Accidental Exposure Guidelines, 2009

## Sexual Exposures

Individuals with recent sexual exposures should be assessed and managed with respect to HBV, HCV and HIV as described in this document. Additional testing and counselling may be warranted for other sexually transmitted infections (STIs) like chlamydia, gonorrhoea and syphilis. Consult the [Canadian Guidelines on Sexually Transmitted Infections](#)<sup>47</sup> for direction or refer to the Middlesex-London Health Unit's Sexual Health program at **519-663-5446**, press "3" for customer service.

## Sexual Assault

Risk of transmission of blood borne infections is greater following a sexual assault compared to consensual sex because there is often bleeding and trauma to tissues, as well as the possibility of exposure at more than one site. Fear and anxiety related to possible transmission of infection is very high for the sexual assault victim and this adds to the complexity of care.

Staff at sexual assault programs have expertise in managing the assessment and treatment of those sexually assaulted and in addressing their legal needs, providing counselling and follow-up support. Wherever possible it is recommended that these patients be referred to a sexual assault program (SAP). In Middlesex London, the SAP operates from St. Joseph's Health Care London to service both adults and children. Services are provided 24/7, and nurses are on call after regular hours. The local SAP follows guidelines and protocols established by the Ontario Network of Sexual Assault/Domestic Violence Treatment Centers whose mandate is to address the medical, emotional, social, forensic, and legal needs of women, men and children.

When a patient is referred from an emergency department or clinic to SAP, they should be medically stabilized, and consent obtained. A call should then be placed to a registered nurse at SAP to inform them of the referral. This call will allow the nurse time to arrive at the hospital to meet the patient without delays. Where a patient will not be transferred, but is cared for at their local hospital, staff at the SAP will welcome calls from HCPs to answer any questions, and provide support and advice about assessment and management of medical or emotional care. In some circumstances, care may be initiated at the local hospital, with additional care and follow-up administered at the SAP.

Although HIV PEP, if warranted, should ideally be started within 72 hours of an assault, assessment and care can be provided if the patient presents after 72 hours as well.

Children who are victims of sexual assault should be referred to the SAP within 24 hours of an abusive incident to enable appropriate and timely forensic testing. If a child presents later than 24 hours, SAP should be contacted to arrange for the child to be seen.

<sup>47</sup> Public Health Agency of Canada: Centre for Communicable Diseases and Infection Control, Canadian Guidelines on Sexually Transmitted Infections, January 2010

The Ontario Network of Sexual Assault/Domestic Violence Treatment Centers [website](#) provides extensive information to assist any practitioner with a patient who declines referral and includes guidelines for assessment and treatment, specific treatment information and algorithms as well as patient follow-up and fact sheets.

## STEP 5 – Counselling and Follow Up

Below is a summary of counselling points for anyone with an exposure where transmission is possible. It is also helpful to reinforce the transmission risks – which are often low - for HBV, HCV and HIV, as described in STEP 2. In general, precautions should be followed for a period of 6 months, though a longer period may be warranted in some circumstances.

### HBV

- Recommend follow-up and retesting at 2 or 3 months, and 6 months.
- The exposed person should be considered potentially infectious until tests are complete and results known. Precautions should be taken, usually for a 6 month period.
- Encourage safer sex practices and informing sexual partner(s) of risk until tests are complete and results known, usually for a 6 month period.
- Do not share personal items like toothbrushes, razors that might hold even small amounts of blood which can pose a risk to others.
- Do not share needles or other drug equipment.
- Cover cuts or abrasions on the skin.
- Do not donate blood, semen, organs or tissues for 6 months.
- HBV is not spread through food and water.
- Delay pregnancy until final blood work is done at 6 months. Babies born to HBV positive mothers are at greater risk of becoming HBV positive<sup>48</sup>.
- Of those infected with Hepatitis B as adults, less than 5% develop chronic hepatitis<sup>49</sup>.
- If infected, symptoms of acute HBV begin on average 90 days after exposure, with a range of 60 to 150 days<sup>50</sup>.
- Symptoms can include fever, fatigue, loss of appetite, nausea and vomiting, abdominal pain, jaundice.
- If symptoms occur, report as soon as possible to a HCP.
- If the exposed person has an occupational risk (e.g. health care worker) and was vaccinated as part of treatment, encourage post vaccination testing to determine and document immunity.

<sup>48</sup> Public Health Agency of Canada, Hepatitis B- Get the Facts, 2010 (Internet)

<sup>49</sup> Canadian Liver Foundation, Hepatitis B, (Internet)

<sup>50</sup> CDC, Hepatitis B Information for health professionals, 2013 (Internet)

## HCV

- Recommend follow up and retesting at 3 months and 6 months.
- If exposure is high risk, also recommend HCV RNA testing at 6 weeks.
- The exposed person should be considered potentially infectious until tests are complete and results known. Precautions should be taken usually for a 6 month period.
- Risk of transmission to sexual partners is low, but present. Advise partners of potential risk.
- Do not share personal items like toothbrushes, razors that might hold even small amounts of blood, which can pose a risk to others.
- Do not share needles or other drug equipment.
- Cover cuts or abrasions on the skin.
- Do not donate blood, organs, tissues or semen for 6 months.
- Reassure that hugging; kissing holding hands, coughing, sharing eating utensils will not spread HCV, and HCV is not spread through food or water.
- Transmission from mother to unborn infant is rare.
- When HCV transmission occurs, a person may have no symptoms, or become symptomatic, including jaundice and feeling unwell.
- If any symptoms occur, report as soon as possible to a HCP.
- In those persons who do develop symptoms, the average time period from exposure to symptom onset is 4–12 weeks, but could range from 2-24 weeks<sup>51</sup>.
- Approximately 20% of infected people will clear the infection and the remaining 80% will go on to become chronically infected with HCV<sup>52</sup>.
- Therapy for HCV can cure HCV infection in 40-90% of cases, depending on the HCV genotype<sup>53</sup>.

<sup>51</sup> CDC, Hepatitis C Information for health professionals, 2013 (Internet)

<sup>52</sup> Public Health Agency of Canada, Primary Care Management of Hepatitis C, 2009

<sup>53</sup> Public Health Agency of Canada, Primary Care Management of Hepatitis C, 2009

## HIV

- Recommend follow up and retesting at 3 months and 6 months.
- The exposed person should be considered potentially infectious until tests are complete and results known. Precautions should be taken, usually for a 6 month period.
- Abstain from sexual intercourse or use a latex condom with a water-based lubricant at all times during intercourse.
- Do not donate blood, plasma, organs, tissue or sperm.
- Do not share personal items like toothbrushes, razors that might hold even small amounts of blood, which can pose a risk to others.
- Do not share needles or other drug equipment.
- Delay pregnancy until final blood work is done at 6 months. Babies born to HIV positive mothers are at greater risk of becoming HIV positive.
- It is acceptable to continue breastfeeding, while waiting for the source's test results. The issue of continuing breastfeeding should be decided when results are available<sup>54</sup>.
- Flu-like symptoms occurring within weeks of exposure such as unexplained weight loss, chronic diarrhea, swollen lymph nodes, fever, fatigue or opportunistic infections should be reported as soon as possible to the HCP.
- When HIV PEP has been prescribed, ensure counselling related to medication use, risks and benefits, side effects, drug interactions and monitoring has been provided. Recommend follow-up assessment within several days (e.g. 5 days) of initiating PEP.

### Follow-up and Additional Counselling

Many patients who experience an exposure will require some follow-up, which may simply be a review or reinforcement of information already provided. Some may require additional testing. [Appendix B and C](#) can be used to support the sharing of information and reinforce further recommendations. The anxiety resulting from the event as well as the complexity surrounding assessment and treatment may leave patients unable to process all of the information provided to them at the initial visit.

Planning for follow-up and/or additional counselling is an essential part of each patient's care. Consider referring the patient to their primary health care provider or other HCP if available. Public health nurses can assist in providing supportive counselling following an exposure to reinforce follow-up measures, assist with access to testing if needed and to help the exposed person understand how to keep others safe until transmission of infection can be ruled out. Counselling will address the inherent anxiety associated with an exposure.

To contact a public health nurse in the sexual health program during regular office hours, Monday through Friday 8:30-4:30, patients or HCPs can call **519-663-5446**, press "3" for customer service.

After hours and on holidays and weekends, patients or HCPs can call

<sup>54</sup> BC Center for Excellence in HIV/AIDS, Accidental Exposure Guidelines, 2009

# MANDATORY BLOOD TESTING ACT

The MBTA is a law that enables specific individuals to request a source person be tested for HBV, HCV and HIV. The legislation is implemented by the Ministry of Community Safety and Correctional Services. There is no requirement to submit an application when an exposure has occurred; this is the person's personal decision. In the MBTA, the person making the request is known as the applicant, and the person who is required to respond is known as the respondent.

To be eligible to apply, the applicant must have come into contact with the respondents body fluids:

- while providing emergency health care,
- giving emergency first aid,
- as a victim of a crime, or
- persons belonging to a prescribed class and who, in the course of duty become exposed. These include:
  - persons who are employed in a correctional institution, place of open custody or place of secure custody
  - police officers, civilian employees of a police service, First Nations constables and auxiliary members of a police service
  - firefighters (including volunteer firefighters)
  - paramedics and emergency medical attendants and paramedic students on field placement
  - members of the College of Nurses of Ontario
  - members of the College of Physicians and Surgeons of Ontario
  - medical students engaged in training.

Applications must be received by the health unit no more than 7 days after the date of the occurrence (however, if the deadline falls on a Saturday, Sunday or other holiday, it is extended by one day). The health unit reviews applications for validity and then contacts the respondent who can either voluntarily provide their blood for testing, or submit to testing as ordered under the MBTA. Under the MBTA, blood is tested for HIV, HBV and HCV only.

Detailed information regarding MBTA, and application forms for completion by the physician and applicant, are available at the [Ministry of Community Safety and Correctional Services](#) website.

## Resources and References

### Resources

- **SMDHU resources:** SMDHU's Post Exposure Management: Hepatitis B, Hepatitis C, and HIV document and individual appendices are available at:  
[www.simcoemuskokahealth.org](http://www.simcoemuskokahealth.org). Links to key external resources are also provided.
- **Quick medical reference:** Pocket P.E.P.: Clinical management of non-occupational and occupational exposure to blood borne pathogens. Available online at [St. Michaels Hospital](#). Hard copies can be ordered via the [Canadian AIDS Treatment Information Exchange \(CATIE\)](#)
- **Health personnel booklet:** Exposure to Blood: What Health Personnel Need to Know (booklet) Information from the Centers for Disease Control and Prevention, National Center for Infectious Diseases Division of Healthcare Quality Promotion and Division of Viral Hepatitis. To purchase brochures contact: The [Public Health Foundation](#), or 1-877-252-1200 (toll free)
- **Patient fact sheet on HIV PEP:** Post Exposure Prophylaxis Fact Sheet, [CATIE](#)

### References

Alberta Government. Alberta Guidelines for Non-Occupational, Occupational and Mandatory Testing and Disclosure Act Post-Exposure Management and Prophylaxis: HIV, Hepatitis B, Hepatitis C and Sexually Transmitted Infections. January 2013 [Internet] Available from <http://www.health.alberta.ca/documents/PEP-Guidelines-2013.pdf>

BC Center for Excellence in HIV/AIDS. Accidental Exposure Guidelines. 2009 [Internet] Available from <http://www.cfenet.ubc.ca/therapeutic-guidelines/accidental-exposure>

BC Center for Excellence in HIV/AIDS. Non-Occupational Post Exposure Prophylaxis Pilot Project Guidelines. June 2012 [Internet] Available from [http://www.cfenet.ubc.ca/sites/default/files/uploads/NPEP%20Guidelines\\_0.pdf](http://www.cfenet.ubc.ca/sites/default/files/uploads/NPEP%20Guidelines_0.pdf)

Canadian Pediatric Society. Biting in child care: What are the risks? Updated March 2013 [Internet] Available from [http://www.caringforkids.cps.ca/handouts/biting\\_in\\_child\\_care](http://www.caringforkids.cps.ca/handouts/biting_in_child_care)

Centers for Disease Control and Prevention (CDC). Hepatitis B Information for health professionals. 2012 [Internet] Available from <http://www.cdc.gov/hepatitis/HBV/HBVfaq.htm>

Centers for Disease Control and Prevention (CDC). Hepatitis C Information for health professionals. 2013 [Internet] Available from <http://www.cdc.gov/hepatitis/HCV/HCVfaq.htm#section2>

Centers for Disease Control and Prevention (CDC). MMWR Antiretroviral Postexposure Prophylaxis After Sexual, Injection-Drug Use, or Other Nonoccupational Exposure to HIV in the United States. January 2005 [Internet] Available from <http://aidsinfo.nih.gov/contentfiles/NonOccupationalExposureGL.pdf>

Centers for Disease Control and Prevention (CDC). MMWR Appendix B Postexposure Prophylaxis to Prevent Hepatitis B Virus Infection. December 8, 2006 /55(RR16); 30-31[Internet] Available from [http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5516a3.htm?s\\_cid=rr5516a3\\_e](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5516a3.htm?s_cid=rr5516a3_e)

Centers for Disease Control and Prevention (CDC). MMWR Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis. June 29, 2001 [Internet] Available from <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5011a1.htm>

Centers for Disease Control and Prevention (CDC). MMWR Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HIV and Recommendations for Postexposure Prophylaxis. September 30, 2005 [Internet] Available from <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5409a1.htm>

Leeds Grenville Lanark District Health Unit. Guidelines for Managing Exposure to Blood and Body Fluids. May 2010 [Internet] Available from [http://www.healthunit.org/professionals/exposure\\_blood/blood.html](http://www.healthunit.org/professionals/exposure_blood/blood.html)

Ministry of Community Safety and Correctional Services. Mandatory Blood Testing, Information about the Act. [Internet] Available from [http://www.mcscs.jus.gov.on.ca/english/LinksResources/MandatoryBloodTesting/blood\\_testing.html](http://www.mcscs.jus.gov.on.ca/english/LinksResources/MandatoryBloodTesting/blood_testing.html)

New York State Department of Health. UPDATE: HIV Prophylaxis Following Occupational Exposure. October 2012. [Internet] Available from <http://www.hivguidelines.org/clinical-guidelines/post-exposure-prophylaxis/hiv-prophylaxis-following-occupational-exposure/>

Ontario Hospital Association and the Ontario Medical Association Joint Communicable Diseases Surveillance Protocols Committee in collaboration with the Ministry of Health and Long-Term Care. Blood-Borne Diseases Surveillance Protocol for Ontario Hospitals. Reviewed and Revised November 2012 [Internet] Available from <http://www.oha.com/Services/HealthSafety/Documents/Blood%20Borne%20Diseases%20Protocol%20-%20Reviewed%20and%20Revised%20November%202012.pdf>

Ontario Sexual Assault/ Domestic Violence Treatment Centers (SATCS) Medical Guidelines for HIV Post-Exposure Prophylaxis (HIV PEP) For Sexual Assault Victims/Survivors. 2011 [Internet] Available from <http://www.sadvreatmentcentres.ca/en/view.php?key=62&lang=en>

Public Health Agency of Canada. Canadian Guidelines on Sexually Transmitted Infections. Updated January 2010. Ottawa, ON [Internet] Available from <http://www.phac-aspc.gc.ca/std-mts/sti-its/cgsti-ldcits/index-eng.php>.

Public Health Agency of Canada. Canadian Immunization Guide. 7<sup>th</sup> ed. 2006 and 2012. [Internet] Available from <http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php>

Public Health Agency of Canada. Health Canada An Integrated Protocol to Manage Health Care Workers Exposed To Bloodborne Pathogens. Canada Communicable Disease Report, Supplement 23S2, 1-16. March 13, 1997

Public Health Agency of Canada. HIV Transmission Risk: A Summary of the Evidence. 2012 [Internet] Available from <http://www.phac-aspc.gc.ca/aids-sida/publication/hivtr-rtvih-eng.php>

Public Health Agency of Canada. Primary Care Management of Chronic Hepatitis C. 2009 [Internet] Available from [http://www.liver.ca/files/PDF/HEP\\_C\\_Guide%28eng%29.pdf](http://www.liver.ca/files/PDF/HEP_C_Guide%28eng%29.pdf)

Public Health Agency of Canada. Surveillance of Healthcare Workers Exposed to Blood/Body Fluids and Bloodborne Pathogens: 1 April, 2000 to 31 March, 2001. CCDR, Vol. 27-24. December 15, 2001

Public Health Ontario. Laboratories Specimen Collection Guide. September 2012 [Internet] Available from

[http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/Index.a\\_spx](http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/Index.a_spx)

Trillium Drug Plan. [Internet] Available from <http://benefitsontario.com/ontario-trillium-drug-program/>

World Health Organization. Infectious Diseases. 2012 [Internet] Available from [http://www.who.int/topics/infectious\\_diseases/en/](http://www.who.int/topics/infectious_diseases/en/)

# APPENDICES

## Appendix A



### Assessment of Potential Exposures to Bloodborne Infection Documentation Form

*For use by health care professionals in collecting and documenting information related to potential exposures to HBV, HCV, and HIV*

Section A Intake					
Date & time of assessment					
Assessed by:				Title:	
Information about the person providing the assessment information if different from the exposed person: (name, address, phone number, designation, etc.)					
Section B Assessment of the Exposed Person					
Last Name:		First Name:		DOB	
Address:					
Phone number:		Gender: Male <input type="checkbox"/> Female <input type="checkbox"/>		Health Care Provider	
Date, time and place exposure occurred:					
Nature of exposure and how the exposure occurred: (e.g. needle stick, splash, sexual, etc. and describe how it happened e.g. while providing emergency health care or first aid, during the commission of a crime, consensual, etc.)					
Description of the injury/exposure: (e.g. where on the body, nature of wound, fluid volume, etc.)					
Action taken prior to this assessment (first aid measures or other actions, if relevant)					
Immunization history: Tetanus: Hepatitis B vaccine: Hepatitis B titre (antiHBS): documented response				History of prior testing for HBV, HCV or HIV? (If yes, obtain date and results)	
General health history: (e.g. well, immune compromised, degree of anxiety related to the exposure, pregnancy etc.)					

Notes:

Appendix A - Page 1 of 3

<b>Section C Assessment of the Source</b>	
Source known: <input type="checkbox"/> Yes <input type="checkbox"/> No (if source is unknown, skip this section)	
Name of source:	DOB:
Address:	
General health information:	
Health Care Provider:	Immunization status Hep B #1 <input type="checkbox"/> #2 <input type="checkbox"/> #3 <input type="checkbox"/>
History of blood borne disease or evidence of prior testing:	
Risk factors: from endemic country, high risk sexual behaviour, injection drug user, received blood products prior to 1990, etc.	
Source person tested ( if applicable):	Date and Time HBV <input type="checkbox"/> Date and Time HCV <input type="checkbox"/> Date and Time HIV <input type="checkbox"/>
Consent to share test results: <input type="checkbox"/> Yes Who? _____ No <input type="checkbox"/>	
Other (if occupational exposure, ensure appropriate documentation to include incident reporting and WSIB reports.)	
<b>Section D Actions/Interventions: Testing and Treatment of the Exposed Person</b>	
<b>Baseline Testing of the Exposed Person</b> <input type="checkbox"/> anti-HBs <input type="checkbox"/> HBsAg <input type="checkbox"/> HCV (anti-HCV) <input type="checkbox"/> HIV	<b>Other Tests</b>  <input type="checkbox"/> pre-test counselling <input type="checkbox"/> consent to share results, if required
Summary of assessed significance of the exposure:	
<b>Treatment</b>	
<b>Treatment and Counselling Provided</b> <input type="checkbox"/> First Aid Measures <input type="checkbox"/> Tetanus (Td <input type="checkbox"/> or Tdap <input type="checkbox"/> <input type="checkbox"/> Hepatitis B vaccine <input type="checkbox"/> HBIG <input type="checkbox"/> HIV PEP (antiretrovirals) Counselling: post exposure, protecting others, f/u if required Notes:	

<b>Section E: Planned Follow-up</b>		
<b>Recommended follow-up</b>	<b>Location &amp; who will provide</b>	<b>When/Date</b>
<input type="checkbox"/> Anti HBs		
<input type="checkbox"/> Additional Hepatitis B vaccine		
<input type="checkbox"/> HBIG		
<input type="checkbox"/> anti- HCV		
<input type="checkbox"/> HCV RNA PCR		
<input type="checkbox"/> HIV antibodies		
<input type="checkbox"/> HIV PEP Follow-up		
<input type="checkbox"/> Additional counselling		
<input type="checkbox"/> Other W SIB, Results from baseline testing		
Notes:		
<b>Resources Provided</b>		
<input type="checkbox"/> Instruction Sheet	<input type="checkbox"/> MBTA information	
<input type="checkbox"/> Fact sheet	<input type="checkbox"/> other	
Date and Time	Signature	

### POST EXPOSURE INSTRUCTION AND PLANNING SHEET HEPATITIS B, HEPATITIS C AND HIV

You have had an exposure to the blood or body fluid of another person. It is normal to feel anxious about what has happened and even overwhelmed by the amount of information received during the assessment. This sheet will review the main points about your exposure and assessment and will provide you with a record of what follow-up is recommended. If an appointment with another health care provider is advised, you may find it helpful to take this sheet with you.

_____	_____	was seen at _____
<i>Name</i>	<i>Date of Birth</i>	<i>Name of Health Care Facility</i>
on _____ following an exposure to blood or body fluids.		
<i>Date</i>		
Initial assessment done by _____		The exposure occurred on _____
<i>Name of Health Care Provider</i>		<i>Date</i>

The infections of concern following an exposure to another person’s blood or body fluids are hepatitis B, hepatitis C and HIV (human immunodeficiency virus).

#### **Tests and Treatments**

Your health care provider has assessed your risk and together you have decided on the best course of action. You have had the following blood tests and treatments:

##### *Blood Tests*

- HIV
- hepatitis C
- hepatitis B antigen
- hepatitis B antibodies

##### *Treatments*

- hepatitis B vaccine
- hepatitis B immune globulin
- HIV antiretroviral medication (PEP)

List medications, dose & instructions and any other recommendations.

---



---



---

## POST EXPOSURE INSTRUCTION AND PLANNING SHEET HEPATITIS B, HEPATITIS C AND HIV

Your health care provider has suggested you go for follow-up blood testing or treatment:

<i>Follow up is recommended for</i>	<i>Location for follow-up</i>	<i>Date</i>
<input type="checkbox"/> Hepatitis B (blood test)		
<input type="checkbox"/> Additional Hepatitis B vaccine		
<input type="checkbox"/> Hepatitis B Immune Globulin		
<input type="checkbox"/> Hepatitis C (blood test)		
<input type="checkbox"/> HIV (blood test)		
<input type="checkbox"/> Additional assessment if you have been started on HIV antiretroviral medications		
<input type="checkbox"/> Other		

If you become ill with any of the following symptoms, see your health care provider for assessment:  
***fever, rash, jaundice (yellowing of skin or eyes) nausea or upset stomach, lack of appetite, vomiting, tiredness, muscle aches, or swollen glands.***

### *Protecting Others*

Even in situations where the likelihood of becoming infected is very low, it is important for you to protect others from contact with your blood and body fluid. You can do this by taking the following precautions until all your blood test results are known, usually for a period of about 6 months:

- Do not let your blood or body fluid get on another person
- Tell your sexual partners they could be at risk.
- Abstain from having sex or use condoms during sex (including oral, vaginal and/or anal sex).
- Avoid becoming pregnant during this time
- Do not share a razor, toothbrush, nail file or tweezers
- Do not share needles or drug equipment with anyone
- Do not donate blood, semen, organs and tissues.

For questions about these infections, protecting others while waiting for follow-up testing or help with any anxiety about your exposure, you can call the Middlesex-London Health Unit at **519-663-5317 X 2330** during business hours, 8:30 AM - 4:30 PM. For enquires or concerns related to your tests or follow-up treatment, please contact your health care provider.

# Exposure to Another Person's Blood or Body Fluids

## ***What infections can be spread from blood or body fluids?***

The infections that can be spread from one person to another through infected blood or other body fluids are hepatitis B, hepatitis C and HIV (human immunodeficiency virus).

Body fluids capable of spreading any of these infections include blood, semen, vaginal fluid, cerebral spinal fluid, body tissues and organs.

Saliva does not contain HIV or hepatitis C, but may contain small amounts of hepatitis B. Breast milk can contain HIV. Urine, feces, vomit, and tears do not carry these infections. However, any of the body fluids listed here can carry hepatitis B, hepatitis C or HIV if blood is present.

## ***What is the risk of infections from body fluids?***

For an infection to spread, it must be present in the blood or body fluid of another person and have a way to get into your blood stream. This can happen:

- when needles are shared or you have a needle stick injury
- when blood or body fluid comes in contact with skin that is damaged or cut, especially when a cut or abrasion is less than 3 days old
- when infected fluids are splashed or in any way enters your eyes, nose or mouth
- during sexual activity where body fluids are shared

The risk of becoming infected from an exposure to blood or body fluids is greater:

- when the amount of blood is of a large volume
- when the cut or entry point into your body is large or deep

Risk will also depend on what infections the other person has, and whether or not you have previously been vaccinated against Hepatitis B.

Contact between infected blood and healthy skin will not spread infections, as healthy skin acts as a very good barrier to viruses.

## ***What do I do if I am exposed?***

The best action to take is to be assessed at an emergency department as soon as possible after your exposure. You will receive first aid if needed and be assessed for risk of exposure to an infection. You may receive some blood tests to help determine if you need any special treatment. There are some medications that can be taken after an exposure that may prevent you from becoming infected. These treatments are called Post Exposure Prophylaxis or PEP for short.

## ***What treatments can I have to prevent me from getting an infection?***

There are treatments to prevent the spread of hepatitis B and HIV infections after a possible exposure. There is no treatment yet that can stop the spread of hepatitis C once an exposure has occurred.

For hepatitis B, vaccination and/or immune globulin may be an option to give your body immunity. If you have been vaccinated for hepatitis B in the past you may already be immune and will need no additional treatment. A blood test can show whether you are immune or not.

For HIV, there are medications that help to prevent the virus from infecting you. The medications are strong and do have side effects and are recommended only for high risk exposures. The treatment, to work well for you, should be started as soon as possible after an exposure - ideally within 2 hours.

**Who can you talk to if you have more questions?** If you have concerns or questions call the Middlesex-London Health Unit **519-663-5317 X 2330** or visit the health unit website: [www.healthunit.com](http://www.healthunit.com)



### ***How can I find out if the other person is infected?***

If you are worried that the person you've been exposed to (source person) has hepatitis B, C or HIV you may be able to ask that person to voluntarily have a test and share the results.

However, you should know that if the person was very recently infected, it may be too soon to detect the infection.

For this reason, you should keep in mind that a negative result does not always mean the person is free of infection. It is important for you to have your own tests done.

The health care provider providing your care will advise you about what tests you should have and when you should have them done.

### ***What if the other person refuses to be tested?***

There is a law called the Mandatory Blood Testing Act that allows some people in specific situations to submit an application to ask that a source person be ordered to provide a blood sample that will test for hepatitis B, C and HIV. You can learn more about this at the web site for the Ministry for Community Safety and Correctional Services:

[http://www.mcscs.jus.gov.on.ca/english/LinksResources/MandatoryBloodTesting/blood\\_testing.html](http://www.mcscs.jus.gov.on.ca/english/LinksResources/MandatoryBloodTesting/blood_testing.html)

This application must be submitted within 7 days of your exposure, and can take some time to be processed (likely days to weeks); it is important not to wait for this application to start any treatment or testing your health care provider recommends at the time of your exposure.

### ***What should I do after possible exposure?***

It is very important for you to make sure you go for any follow-up testing recommended. You should speak to your health care provider about what you should do to protect others while you are waiting for your follow up tests.

### ***What are the precautions I should take to protect others?***

*Follow these precautions for at least 6 months or for the time period your health care provider has advised, until all your blood test results are known*

- Do not let your blood or body fluid get on another person
- Tell your sexual partners they could be at risk.
- Abstain from having sex or use condoms during sex (including oral, vaginal and/or anal sex).
- Avoid becoming pregnant during this time
- Do not share a razor, toothbrush, nail file or tweezers.
- Do not share needles or drug equipment with anyone
- Do not donate blood, semen, organs and tissues.
- See your health care provider if you develop any of these symptoms in the 6 months following your exposure: fever, rash, jaundice (yellowing of skin or eyes), nausea or upset stomach, lack of appetite, vomiting, tiredness, muscle aches, swollen glands

### ***Who can I talk to if I have more questions?***

If you have concerns or questions, call the Middlesex-London Health Unit **519-663-5317 X 2330** or visit the health unit website: [www.healthunit.com](http://www.healthunit.com)

*If you have experienced an exposure to another person's blood or body fluids, it is important that you be assessed by a health care provider to determine your risk of infection and to get appropriate and timely treatment to help prevent transmission of hepatitis B, hepatitis C and HIV.*

