

Guidelines for Managing Exposures to Blood Borne Pathogens

Revised May 2005

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Guidelines for Managing Exposures to Blood Borne Pathogens

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Introduction

The purpose of this document is to provide healthcare providers with information on the assessment and management of persons with accidental exposures to blood and body fluids that may be infected with hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV). The attached Health Unit guidelines were extrapolated from recent scientific data on the exposure of health care workers (HCW) to blood borne pathogens. As well, an infectious diseases physician with expertise in antiretroviral management also provided input into the development of these guidelines.

In 1997, the Laboratory Center for Disease Control (LCDC) published a protocol for managing exposures to blood borne pathogens in HCW. The LCDC document was intended for hospital employees, health care workers, laboratory personnel, and emergency response personnel exposed while on the job. As well, the Ontario Hospital Association / Ontario Medical Association is continually updating the 'Blood Borne Diseases Surveillance Protocol for Ontario Hospitals' (latest being May 2004), which emphasized the importance of testing and prophylaxis following a HIV exposure "among persons carrying on activities in the hospital".

Non-occupational exposures were not addressed in either of these guidelines. The majority of reported exposures to blood borne pathogens are occupationally acquired. However, non-occupational exposures do occur and there is currently very little information available on how to manage such injuries. Therefore, the Health Unit cannot make definitive recommendations regarding the use of post-exposure prophylaxis (PEP) for this purpose. Despite this, the principles embodied in this document can be applied to both occupational and non-occupational exposures at the discretion of the physician. Physicians considering using PEP for HIV exposure in the non-occupational setting should be aware that the benefits would likely be limited to scenarios in which the risk for HIV is high, and the medication regimen can be initiated promptly and medication compliance is probable.

All exposures to blood/body fluids should be assessed on a case-by-case basis. If PEP is to be initiated, the Health Unit recommends consultation with an infectious disease specialist. As well, decisions surrounding non-occupational exposures should be made by balancing the uncertain risk of infection against the potential toxicity associated with prophylactic medications.

All persons with significant recent exposures to blood or body fluids should be immediately referred to the nearest emergency department. If post exposure prophylaxis is indicated, it should begin as soon as possible, preferably within two hours of exposure. Delays in presenting to an emergency department should be avoided.

Occupational Exposure to Blood/Body Fluids

A. Initial Management Guidelines

I. General Measures

- Allow the wound to bleed freely.
- Cleanse the wound thoroughly with soap and water.
- If contact is with mucous membranes (eyes, nose, or mouth), flush well with water.
- Remove clothing that is contaminated with blood or body fluids.

II. Evaluate the Significance of the Exposure

Body fluids capable of transmitting HBV, HCV and HIV from an infected source include:

- Blood, serum, plasma and all biological fluids visibly contaminated with blood.
- Laboratory specimens, samples or cultures that contain concentrated HIV, HBV, or HCV.
- Semen and vaginal fluids (very low risk for hepatitis C).
- Amniotic, pleural, peritoneal, pericardial, synovial, and cerebrospinal fluids.
- Saliva (for HBV, HCV and HIV if it is contaminated with blood and for HBV only if it is not contaminated with blood).
- Organs and tissues.

Note: Feces, nasal secretions, sputum, tears, urine and vomitus are not implicated in the transmission of HBV, HCV and HIV unless visibly contaminated with blood.

To be considered significant, one of the potentially infectious fluids listed above must come into contact with tissue in one of the following ways:

- Percutaneous injury: needle stick or puncture/cut with a sharp object.
- Contact with mucous membranes: splash to eyes, nose or mouth.
- Contact with non-intact skin: prolonged or extensive contact with exposed skin, which is chapped or abraded, with blood or other potentially infectious body fluids.

If a significant exposure has occurred, further investigation of the source is warranted. (Refer to Table 1 on page 5). If the source is known to be HIV positive or believed to be high risk and the risk of transmission is a real possibility then PEP should be initiated.

Patients with significant recent exposures (Refer to Section B III. The Importance of Timing) to blood or body fluids should be immediately referred to the nearest emergency department. The emergency physician should be informed of the case prior to referral and made aware of the urgency of the matter.

Table 1	
Source Risk Factors of Blood Borne Pathogens	
Blood Borne Pathogen	Risk Factor
HBV	<ul style="list-style-type: none"> • Consider high-risk if the source has: <ul style="list-style-type: none"> - High-risk sexual behaviour (i.e. men who have sex with men, sexual partner who is an injection drug user (IDU), multiple sexual partners) - Sexual partner of HBV infected persons or persons practicing high-risk behaviour - History of injection drug use - Comes from a highly endemic region
HCV	<ul style="list-style-type: none"> • Consider high-risk if lifetime risk factors of source patient include: <ul style="list-style-type: none"> - High-risk sexual behaviour (i.e. a sexual partner who is an IDU, long term sexual partner who is HCV infected) - Injection drug use - Receipt of blood or blood products before 1990 - Receipt of blood-derived coagulation products before 1985
HIV	<ul style="list-style-type: none"> • Consider high-risk if source has: <ul style="list-style-type: none"> - High-risk sexual behaviour (i.e. men who have sex with men, sexual partner who is an injection drug user (IDU), multiple sexual partners) - History of injection drug use - Has received a blood transfusion, blood products or organs between 1978 and 1985 - Involved with a sexual partner from any of the above groups - Infants born to HIV infected mothers

III. Serologic Testing for HBV, HCV and HIV

i. Test the Source Patient

- If possible, perform serologic testing for HBV, HCV and HIV in the source patient.
- Informed consent must be obtained from the source prior to testing and the source must be aware that the results will be disclosed to the exposed patient.
- If the source patient tests positive for HBV, HCV or HIV, the Medical Officer of Health must be notified.

ii. Test the Exposed Patient

Obtain consent from the exposed patient to do baseline and follow-up serologic testing for HBV, HCV and HIV irrespective of whether or not prophylaxis is initiated. Recommended testing is as follows:

- Baseline: antibody to HBV, HCV and HIV;

Note: Without baseline data, any future claim for compensation for occupationally acquired HIV illness could be jeopardized.

- Repeat HIV serology at 6 weeks, 12 weeks and 6 months (if negative on previous testing);
- Repeat HCV and HBV testing at 3 months and 6 months if negative at baseline.
- It is also recommended that for those with high-risk exposures (exposures where antiretroviral therapy is recommended) be tested again at 12 months post exposure¹.

A theoretical potential exists for prophylaxis to delay the HIV seroconversion event. However, the vast majority of persons infected with HIV will seroconvert within 3 months of exposure.

¹ The Laboratory Center for Disease Control 1997 Protocol does not recommend testing at 12 months because there is a “low probability of seroconversion after 6 months”. However, the BC Centre for Excellence in HIV/AIDS recommends testing at 12 months because antibody formation can be delayed when PEP fails to prevent infection. Their policy was based on an unpublished case of a health care worker who was started on PEP and seroconverted 9 months after the exposure.

Offer referral to infectious disease/HIV clinic at:

- Kingston General Hospital - Dr. D. Zoutman/ Dr. W. Wobesser
Phone: 613-548-3232
- or
- Ottawa General Hospital - Dr. Garber, General Campus Modular G
Phone: 613-737-8856

IV. Options Under the Health Protection and Promotion Act: Bill 105

If a patient has been potentially exposed to a blood borne pathogen and is either a victim of crime or came into contact with body fluids in the course of providing emergency health care or first aid, the patient may have the right to know the HIV, hepatitis B and C status of the source, under provisions of the Health Protection and Promotion Act Section 22.1.

Provisions under Bill 105 provide a statutory right to certain persons to apply to the Medical Officer of Health for an order requiring the taking of a blood sample from the source patient under circumstances listed above. The blood sample is to be tested for hepatitis B, hepatitis C and HIV and results made available to the physician of the exposed individual to assist in his or her management of care.

For more information on how to initiate the process under Bill 105 refer to http://www.health.gov.on.ca/english/providers/legislation/bill_105/105_hosp.html#1

B. Post Exposure Follow-up: (HIV)

I. Risk of HIV Infection Post Exposure

The average risk of acquiring HIV infection following a percutaneous exposure to an infected source is currently estimated at 0.3%-0.4%. The risk of HIV transmission following a mucocutaneous exposure is 0.1%. These figures represent only an average risk and the risk may actually be higher depending on other factors. Factors that increase the risk of HIV transmission include:

- High viral load in the source patient (source in seroconversion illness or late AIDS disease).
- Deep injury.
- Injury with a device previously placed in the source patient's vein or artery or with a device visibly contaminated with blood.

II. Efficacy of Antiretroviral Chemoprophylaxis

A case control study published in the Morbidity and Mortality Weekly Report December 1995, showed that PEP with zidovudine (AZT) for occupational exposure to HIV, reduced seroconversion by 79% (44:929-33). Recently, the New England Journal of Medicine confirmed this earlier finding (Cardo, D.M., et al., 1997, 337; 1485-1490).

III. The Importance of Timing

If antiretroviral therapy is indicated, it should be initiated as soon as possible after exposure, **preferably within 2 hours to offer the best chance of preventing HIV transmission**. By offering treatment during the ‘window of opportunity’ following an HIV exposure, it may be possible to limit infection locally and permit the immune system to eliminate the virus. Although animal studies suggest that PEP is probably not effective if started later than 24-36 hours post exposure, the interval after which there is no benefit from PEP is undefined. Therefore, there is no absolute cut-off time for the initiation of therapy. If there is any question about the indication for PEP, the therapy should be initiated and then re-evaluated after consultation with an infectious disease specialist.

IV. Medication Availability and Cost (Antiretrovirals)

The use of PEP for HIV is recommended, offered or not offered depending on the characteristics of the source patient. (Refer to Table 2 on page 9).

Most exposures do not result in transmission of HIV infection and data on the toxicity of antiretroviral agents other than zidovudine (AZT) in healthy patients is limited. Given the complexity of the HIV PEP protocol and restricted access to the recommended medications, the Health Unit recommends that post exposure prophylaxis be initiated by emergency department physicians in consultation with an infectious diseases specialist.

Antiretroviral chemoprophylaxis is usually prescribed for 4 weeks. It costs between \$600 and \$1100, depending on the combination of medications used. At this time, it is up to the individual to pay for the medications and then seek recovery of the cost, if appropriate, from Workplace Safety and Insurance Board, private insurance or the Trillium Drug Plan. Individuals without a private insurance plan may be eligible for assistance through the Trillium Drug Plan if a large part of their income is spent on prescription medication. Applications for the Trillium Drug Plan are available at most pharmacies.

V. Serologic Testing (if antiretrovirals are indicated)

If antiretroviral therapy is started, drug toxicity monitoring including a complete blood count, renal and hepatic function tests should be completed initially and again 2 weeks after the patient begins taking the medications. If toxicity is suspected, the treating physician should consult with an infectious disease specialist.

Table 2
Prophylaxis after exposure to Human Immunodeficiency Virus
(Adapted from Gerberding JL Ann Intern Med 1996;125:497-501, MMWR 1996;45:468-472)

Attributed of the exposure	Attributes of the source patient			Antiretroviral regimen
	Asymptomatic, known low titre, unknown HIV status but has risk factors (see Table 1)	AIDS, symptomatic infection	Pre-terminal AIDS, acute infection, known high titer	
<u>Percutaneous injuries</u>				
Superficial injury	Offer	Recommend	Strongly encourage	ZDV + 3TC
Visibly bloody device used in artery or vein	Recommended	Recommend	Strongly encourage	ZDV + 3TC +/- IDV
Deep intramuscular injury or actual injection	Strongly encourage	Strongly encourage	Strongly encourage	ZDV + 3TC + IDV
<u>Mucosal contacts</u>				
Small volume and brief contact	Offer	Offer	Offer	ZDV + 3TC
Large volume or prolonged contact	Recommend	Recommend	Recommend	ZDV + 3TC +/- IDV
Large volume and prolonged contact	Recommend	Recommend	Strongly encourage	ZDV + 3TC + IDV
<u>Cutaneous contacts</u>				
Small volume and brief contact	Offer only if obvious portal of entry	Offer only if obvious portal of entry	Offer only if obvious portal of entry	ZDV + 3TC
Large volume or prolonged contact	Offer (recommend if obvious portal on entry)	Offer (recommend if obvious portal of entry)	Offer (recommend if obvious portal of entry)	ZDV + 3TC +/- IDV
Large volume and Prolonged contact	Offer (recommend if obvious portal of entry)	Recommend (especially with portal of entry)	Recommend (especially with portal of entry)	ZDV + 3TC +/- IDV

Fluid containing visible blood, other potentially infectious fluid (semen, vaginal secretions, CSF, synovial, pleural, peritoneal, pericardial, amniotic fluid and inflammatory exudate)-OFFER

Other body fluids including urine, sputum, feces, tears, saliva and vomitus- DON'T OFFER

ZDV-Zidovudine 200 mg tid, 3TC-lamivudine 150 mg bid, IND-indinavir 800 mg q8h

C. Post Exposure Follow-up: Hepatitis B Virus (HBV)

I. Risk of HBV Infection Post Exposure

The risk of transmission of HBV following a needle stick exposure from an infected source is 6-30%. In the case of a human bite where the skin is broken, the risk of transmission to the person who was bitten is unknown but is likely to be quite low since the concentration of HBV is 1000 times lower in saliva than in blood.

II. Post Exposure Prophylaxis for HBV

The management of persons with possible exposures (percutaneous or mucosal) to hepatitis B is outlined in Table 3. For persons who previously received a full course of hepatitis B vaccine, it is important to determine whether an adequate level of anti-HBs has been previously documented. (Refer to Table 3 on page 11).

Table 3			
Hepatitis B Post Exposure Prophylaxis			
Exposed Person		Source	
Vaccination Status	Antibody Hepatitis B level (anti-HBs)	HBsAg Positive	Unknown Status
Vaccinated	≥ 10 IU/L documented	No action necessary	No action necessary
	Known non responder (anti-HBs level ≤ 10 IU/L after vaccination)*	HBIG *	HBIG *
	Level unknown and unable to determine within 48 hours - regardless of having hepatitis B series previously	HBIG Single booster	HBIG
Unvaccinated	≥ 10 IU/L	No action necessary	No action necessary
	Unknown level	HBIG Full vaccine course	HBIG Full vaccine course
<p>Hepatitis B immune globulin 0.06 ml/kg should preferably be given within 48 hours of exposure. Efficacy decreases with time and is unknown after 7 days.</p> <p>* If exposed person has received only three vaccine doses, an additional 3 dose series may also be given.</p>			

This advice differs from the 1998 Canadian Immunization Guide in that HBIG is not recommended because “HBIG will be of value only in the unlikely situation that the source is infected and the worker has no protection despite immunization”. However, it also states that HBIG should be given if there is compelling reason to do so. This table corresponds to recommendations set out in the CCDR Supplement ‘An integrated protocol to manage health care workers exposed to blood borne pathogens’. March 1997.

D. Post Exposure Follow-up: Hepatitis C Virus (HCV)

I. Risk of HCV Infection Post Exposure

The risk of acquiring HCV following a needle stick exposure to an infected source is estimated to be in the range of 3%-10%.

II. Post Exposure Prophylaxis for HCV/Early Treatment for HCV

There is no prophylactic treatment currently available for a person exposed to the blood of a patient with hepatitis C virus infection. However, new research suggests that early treatment of acute hepatitis C infection with a 24-week course of interferon alpha-2b prevents chronic infection. Persons experiencing a needle stick injury from a known or high-risk hepatitis C source should be monitored closely for acute hepatitis symptoms. Symptomatic patients and patients with detectable levels of HCV RNA in serum should be referred to a specialist for assessment and possible treatment.

HCW exposed to HCV should be tested as soon as possible after exposure for the antibody to HCV and if negative, test again 3 and 6 months. Baseline liver function testing should also be done and be repeated at 3 and 6 months.

E. Post Exposure Counseling

All exposed persons should receive initial counseling in the emergency department setting. Initial counseling should concentrate on initiating antiretroviral therapy and reducing the risk of secondary spread from the exposed person to others.

Repeat counseling with the family physician and as needed is critical, as anxiety may limit comprehension in the emergency department setting. Follow-up counseling should include more in-depth counseling and emotional support for this critical incident. The following are general guidelines for follow-up counseling. It is recommended that an infectious disease specialist follow-up all pregnant, breastfeeding and pediatric patients being treated for a possible HIV exposure.

The **Health Unit will provide** persons with psychological support, counseling and educational resources after a reported puncture wound, mucous membrane or non-intact skin exposure, if requested.

I. Risk of Infection Post Exposure

The exposed patient should be counseled thoroughly about the risks of infection and about the potential risks and benefits of antiretroviral chemoprophylaxis.

II. Reporting Illness in the Follow-up Period

Patients should be counseled to report to the physician any illness during the 6-month follow-up period as follows:

- Following a possible HIV exposure counsel to report any fever, aches, rashes, swollen glands, fatigue and general malaise.
- Following a possible hepatitis exposure (B and C) counsel to report any abdominal discomfort, sore joints, jaundice and any change in colour of urine or stool.

III. Secondary Spread

- For counseling recommendations regarding secondary spread.
(Refer to Table 4 on page 14).

IV. Medication (PEP) Compliance and Medical Follow-up

- Patients should be advised not to adjust the dose or stop the medications without consulting with a physician.
- Advise patients that a doctor must be consulted before taking any other medication; this includes any medications prescribed by a doctor and any over the counter medications.
- Counsel the exposed patient to report any side effects that develop.

Zidovudine (Retrovir) (Appendix A)

Zidovudine may cause stomach upset and is usually tolerated best when taken with food. Other side effects may include: headaches, insomnia, fatigue and muscle aches. Anemia may also occur but is reversible when the drug is discontinued.

Indinavir (Crixivan) (Appendix B)

The most common side effects are: gastrointestinal upset, fatigue, flank pain, kidney stones, insomnia and hyperbilirubinemia. Patients should be advised to drink at least 1.5 litres of liquids daily to reduce the risk of kidney stones. Indinivir should not be taken with food.

Lamivudine (3TC) (Appendix C)

Lamivudine may cause side effects such as headache, insomnia, gastrointestinal upset, diarrhea, rash or tingling in the hands and feet. Pancreatitis may occur in rare instances.

Table 4	
Counseling Recommendations	
Blood Borne Pathogen	
HBV	<ul style="list-style-type: none"> • Risk of HBV transmission to sexual partner(s) of persons recently exposed who were non-immune and now receiving HBIG and/or the HBV vaccine series is unknown. • May consider safer sexual practices and should discuss with their partner(s). • Do not donate blood, semen, organs or tissues for 6 months. • Do not share razors, toothbrushes, or needles.
HCV	<ul style="list-style-type: none"> • Risk of sexual transmission is low (0.1%) the exposed person should advise their sexual partner(s) of the potential risk. • Transmission from mother to infant is rare. • There is no known prophylaxis for HCV. • Do not donate blood, semen, organs or tissues for 6 months. • Do not share razors, toothbrushes, or needles.
HIV	<ul style="list-style-type: none"> • Should be advised to practice safer sex for a 6-month period and advise sexual partners of the potential risk. • Pregnancy should be avoided for 6 months. • Breastfeeding should be stopped (consult an infectious diseases physician). • Do not donate blood, semen, organs or tissues for 6 months. • Do not share razors, toothbrushes, or needles.

Managing Non-Occupational Exposures to Blood/Body Fluids

F. Community Acquired Needle Stick Injuries

I. Decisions Surrounding Community Exposures

The most common scenario is one in which the source is unknown. Factors influencing decisions following a community acquired needle stick injury may include:

- **The Characteristics of the Exposure**

For instance, an injury with a visibly bloody syringe and/or deep wound would carry an increased risk for transmission of blood borne infections.

- **The Time Since the Exposure**

Ideally, post exposure prophylaxis for HIV should be **initiated within 1-2 hours of the exposure**. For hepatitis B, HBIG is preferably given within 2 days and the efficacy is unknown after 7 days.

II. Infectious Risks

- **Human Immunodeficiency Virus (HIV)**

HIV is believed to survive for only several hours after infected blood has dried on a surface. Therefore the risk of HIV acquisition from a discarded needle is considered to be very low. However, it is recommended that each situation be assessed on a case-by-case basis. Currently, there are no studies available that indicate whether therapy with antiretrovirals will decrease the risk of seroconversion in children who sustain needle stick injuries. Decisions to initiate post exposure prophylaxis for HIV should be made weighing the likelihood of infection against the potential medication toxicities. Physicians considering providing PEP for HIV exposure in the non-occupational setting should be aware that the benefits would likely be limited to situations in which the risk for HIV is high, the medication regimen can be initiated promptly and medication compliance is probable.

- **Hepatitis B Virus (HBV)**

Of the blood borne pathogens, hepatitis B virus is considered to be the greatest risk following a community acquired needle stick injury because the virus can survive for several days on environmental surfaces. The management of a potential percutaneous exposure to hepatitis B should be based on the vaccination and antibody status of the injured person. It is critical to determine whether the injured person has received the full course of the vaccine and to determine the anti-HBs antibody level. In this instance, extrapolation from similar injuries in HCW may be appropriate and chemoprophylaxis should be considered.

- **Hepatitis C Virus (HCV)**

Despite the high transmission among intravenous drug users, the risk of transmission of hepatitis C from a discarded syringe is considered to be low. It is believed that the viability of the virus to survive on environmental surfaces is poor. There are no drugs or vaccines that are effective either before or after exposure to prevent hepatitis C infection.

III. Counseling Recommendations and Follow-up

- The low risk of transmission for all blood borne pathogens should be emphasized.
- Appropriate counseling regarding the aforementioned infectious agents should be provided. (Refer to Table 4 on page 14).
- The serologic testing outlined for HCW can be followed for community acquired needle stick injuries. However, opinions vary regarding the necessity for baseline testing and are at the discretion of the attending physician.

G. Sexual Exposures

I. Evidence of Current Practice

To date, there are no published data on the effectiveness of HIV prophylaxis among people who have had sexual exposures to HIV. Despite this, some physicians are prescribing PEP for sexual exposures at high risk for HIV transmission². The British Columbia Centre for Excellence in HIV/AIDS has published 'A Guideline for Accidental Exposure to HIV', which recommends antiretroviral agents for victims of sexual assault (in addition to occupational and community HIV exposures). However, they do not provide antiretroviral therapy in the event of an exposure occurring as a part of an individual's personal behavior.

II. The Risk of Transmission from a Single HIV Exposure

The risk for HIV transmission per episode of receptive penile-anal sexual exposure is 0.1%-3%. The risk per episode of receptive vaginal exposure is estimated at 0.1%-0.2%. Rates increase with exposure of non-intact mucosa. As well, there is documentation of high-risk HIV transmitters such as those recently infected (seroconversion illness) and those in late AIDS disease.

I. Health Unit Commentary

The Health Unit is unable to recommend for or against providing HIV PEP following a sexual exposure because of the lack of efficacy data available at this time.

² Some HIV Primary Care Physicians in Toronto are prescribing PEP medications for sexual contacts according to the STD/AIDS Unit, Public Health Branch.

However, if this therapeutic approach is initiated, health care providers should:

- Consult with an infectious diseases specialist.
- Inform the patient of the lack of data available.
- Monitor medication and side effects closely.
- Provide counseling regarding risk reduction, if appropriate.
- Advise the patient that physicians have differing opinions about using PEP to treat non-occupational exposures to blood/body fluids.

H. Human Bites

I. Significance of the Exposure

A bite that causes a break in the skin can increase the risk of transmission of blood borne pathogens.

A significant exposure has occurred if:

- The skin of the person bitten has been broken (possible exposure of the bitten person to hepatitis B from saliva).
- The skin has been broken and the bitten person's blood is found in the biting person's mouth (possible exposure of the biting person to HIV, hepatitis B and hepatitis C from blood).

For bites that do not break the skin, there is no risk of transmission of blood borne pathogens.

II. Management of Human Bites

- **Human Immunodeficiency Virus (HIV)**

The transmission of HIV through a bite is extremely unlikely but theoretically possible. The risk of HIV transmission following a mucocutaneous exposure is 0.1%. The role of HIV PEP for bites remains unclear. In situations involving a high-risk source (known to be HIV positive or high-risk for HIV) and a significant blood exchange or situations involving multiple bites, consultation with an infectious disease specialist is recommended.

- **Hepatitis B Virus (HBV)**

Of the blood borne pathogens, hepatitis B transmission is the greatest concern because it is the most infectious. Instances where the skin has been broken and the bitten person's blood is found in the biting person's mouth, the need for hepatitis B vaccine and/or hepatitis B immune globulin should be assessed for both parties. (Refer to Table 3 on page 11).

- **Hepatitis C Virus (HCV)**

Hepatitis C can theoretically be transmitted through bites if there has been contact of the mucous membranes with contaminated blood. There is not any measure, other than flushing the mouth with water, which can be taken to prevent the development of infection in this situation. (Refer to Section D: Post-Exposure Follow-up: Hepatitis C Virus).

I. Important Contact Information

Infectious Disease Consultation:

Kingston General Hospital
24 hour service: ID Physician on-call
(613) 548-3232

Ottawa General Hospital
(613) 737-8222
24 hour service: ID Physician on-call

For Public Health Consultation and Vaccine Requests:

Leeds, Grenville & Lanark District Health Unit
24 hour service
(613) 345-5685

For Registering a Patient in the National Post-Occupational Known HIV Exposure Surveillance Program:

(613) 957-1813 or (613) 957-1777

For Obtaining HBIG:

Canadian Blood System
(613) 739-2392 (business hours)
(613) 761-3301 (after hours)

Appendix A

ZIDOVUDINE (AZT)

Other names: Retrovir®

Why is this drug prescribed?

Zidovudine is an antiretroviral (anti-HIV) drug that is part of the nucleoside reverse transcriptase inhibitor (NRTIs or Nukes) family. It is used together with other antiretrovirals to delay the progression of HIV infection. By doing this, your immune system should improve (increase in CD4⁺ count) and you will be better protected against infections.

Zidovudine does not cure AIDS or completely kill the HIV virus, but helps to prevent further damage by slowing down the production of new viruses. Treatment with zidovudine does not reduce the risk of passing infection on to others. You will still be able to pass HIV by sexual contact, by blood transfer or by sharing needles. You should always use appropriate precautions to prevent passing HIV on to others.

How should this drug be taken?

Generally, the starting dose of zidovudine is 600 mg per day. This dose may need to be decreased if you have kidney problems. It can be taken with or without food.

Your dosage is:

^ 100 mg capsules:

___ capsules(___mg)___times a day

or

^ 10 mg / mL syrup:

___ mL (___ mg) ___ times a day

What should you do if you forget a dose?

If you miss a dose of zidovudine, take it as soon as possible. However, if it is time for your next dose, do not double the dose, just carry on with your regular schedule.

Why should you not forget to take this drug?

If you miss doses of zidovudine, the amount of HIV virus in your blood (known as the viral load) will start increasing again and your immune system will be further damaged. A few missed doses can be enough for zidovudine to stop being active. A phenomenon known as resistance. When this happens, other antiretrovirals that work in a similar way to zidovudine may also become inactive. Therefore, missing doses of zidovudine can decrease treatment options for the future. Even if you do not feel well,

you should always take your doses of zidovudine. Please do not stop zidovudine without talking to your doctor first.

What adverse effects can this drug cause? What should you do about them?

Adverse effects sometimes seen in the first weeks of therapy are nausea, vomiting, decreased appetite, headaches, and a general feeling of being unwell. Your doctor and pharmacist can suggest ways to manage these symptoms. Serious effects of zidovudine that may occur in less than 10% of people include anemia (a reduced number of red blood cells that can make you feel tired or short of breath), or leucopenia (a decrease in the number of white blood cells so that you have a higher risk of bacterial infection). These adverse effects usually occur after you have been on the drug for a long period of time. Blood tests will be done regularly to check for any changes in these values. Also, muscle pain can occur after you have been on the drug for many months. Inform your doctor if you notice symptoms such as fever, chills, shortness of breath, racing heart beat, fatigue, or muscle pain.

Your blood will also routinely be checked for any changes in liver and pancreas function.

What other precautions should you follow while using this drug?

You must make sure that you are taking the right dose. If you take higher doses of zidovudine than what is prescribed, you may increase the chance of having adverse effects. If you take lower doses of zidovudine than what is prescribed, the HIV virus may become resistant to zidovudine.

Certain drugs can increase or decrease the effect of zidovudine. Also, zidovudine might influence the effect of other drugs you are taking. Inform your doctor and pharmacist of all prescribed and non-prescribed drugs you are taking. As well, you should inform them of natural products you are taking. If you wish to start a new drug or natural product, please consult with your pharmacist before doing so.

Please inform your doctor if you are pregnant. Your doctor can recommend the appropriate treatment to help to reduce the risk of passing the HIV virus on to your baby. Breastfeeding is not recommended if you have HIV as you might transmit the virus to your baby through your breast milk.

How should this drug be stored?

Zidovudine should be stored in a cool (15-30°C) dry place, protected from light and well out of the reach of children. Ensure that the drug has not expired by checking the expiry date ("EXP") shown on the outside of the package.

Do not store in your bathroom or kitchen, as heat and moisture may cause the medication to be less active.

Reference: Product monograph. Retrovir® (zidovudine). Saint-Laurent, Qc, Canada: GlaxoSmithKline, 2002.

Additional medication fact sheets and updates may be found at Toronto General Hospital University Health Network:

<http://www.tthivclinic.com/FactSheets/html/ZIDOVUDINE.html>

Appendix B

INDINAVIR

Other names: Crixivan®

Why is this drug prescribed?

Indinavir is an antiretroviral (anti-HIV) drug that belongs to a class of drugs called protease **inhibitors**. Protease inhibitors interfere with a different step in virus reproduction than other classes of drugs previously available to fight HIV.

Indinavir is used together with other antiretrovirals to delay the progression of HIV infection. By doing this, your immune system should improve (increase in CD4⁺ count) and you will be better protected against infections.

Indinavir does not cure AIDS or completely kill the HIV virus, but helps to prevent further damage by slowing down the production of new viruses. Treatment with indinavir does not reduce the risk of passing infection on to others. You will still be able to pass HIV by sexual contact, by blood transfer or by sharing needles. You should always use appropriate precautions to prevent passing HIV on to others.

How should this drug be taken?

Indinavir is available as 200 mg and 400 mg white capsules. The recommended dose of indinavir is 800mg every 8 hours. This dose may need to be adjusted if you are taking other protease inhibitors or if you have liver problems.

It should be taken on an empty stomach, that is 1 hour before or 2 hours after a meal. If nausea is a problem, it can be taken with a light snack low in fat and protein (dry toast with jelly, corn flakes with skim milk and sugar). If you are also taking ritonavir (Norvir Sec®), indinavir can be taken with a meal.

Your dosage is:

^ 200 mg capsule

^ 400 mg capsule

____ capsules (____mg) every ____ hours

It is important to drink at least 1.5 litres of liquid each day to ensure adequate hydration. If you exercise, have a fever, take ritonavir (Norvir Sec®) or if it is extremely hot, you should drink 2.0 to 2.5 litres of liquid each day. This may decrease the chance of developing kidney stones. Accepted liquids include water, tea, coffee, and skim milk. The necessary amount of liquid should not be drunk all at the same time, but rather spread out though the day.

What should you do if you forget a dose?

If you miss a dose of indinavir, take it as soon as possible. However, if it is time for your next dose, do not double the dose, just carry on with your regular schedule.

Why should you not forget to take this drug?

If you miss doses of indinavir, the amount of HIV virus in your blood (known as the viral load) will start increasing again and your immune system will be further damaged. A few missed doses can be enough for indinavir to stop being active. A phenomenon known as resistance. When this happens, other antiretrovirals that work in a similar way as indinavir may also become inactive. **Therefore, missing doses of indinavir can decrease treatment options for the future.** Even if you do not feel well, you should always take your doses of indinavir. Please do not stop indinavir without talking to your doctor first.

What adverse effects can this drug cause? What should you do about them?

The most commonly reported adverse effects include: kidney stones associated with **back pain** with or without **blood in the urine, weakness, fatigue, abdominal pain, diarrhea, nausea, dizziness, headache, dry skin, rash, and taste changes.** If these effects occur and are bothersome, please call the clinic or discuss them at your next visit.

Regular blood tests will be done to detect any changes in your cholesterol, triglyceride, bilirubin, and blood sugar level. Increases in these values and increases in blood pressure have occasionally been seen.

The long-term effects of indinavir are unknown at this time. Further studies are being carried out. Abnormal weight gain or changes in body shape have been reported, but it is uncertain if indinavir is responsible for these changes.

It is important that you keep your doctor appointments and come for your laboratory tests so that your progress can be followed.

What other precautions should you follow while using this drug?

You must make sure that you are taking the right dose. If you take higher doses of indinavir than what is prescribed, you may increase the chance of having adverse effects. If you take lower doses of indinavir than what is prescribed, the HIV virus may become resistant to indinavir.

Certain drugs can increase or decrease the effect of indinavir. Also, indinavir might influence the effect of other drugs you are taking. Inform your doctor and pharmacist of all prescribed and non-prescribed drugs you are taking. As well, you should inform them of natural products you are taking. If you wish to start a new drug or natural product, please consult with your pharmacist before doing so.

Do NOT take the following medications with indinavir:

- Astemizole (Hismanal®)
- Cisapride (Prepulsid®)
- Ergot derivatives [Ergotamine (Cafergot®, Bellergal®, Ergodryl®, Gravergol®), ergo-novine, dihydroergotamine (Migranal®), methylergonovine (Methergine®)]
- Midazolam (Versed®)

- Pimozide (Orap®)
- Rifampin (e.g. Rifadin®, **Rimactane®**, Rofact®)
- Triazolam (Halcion®)
- Terfenadine (Seldane®)

Indinavir should be administered at least 1 hour apart from didanosine (Videx®) and antacids (Maalox®, Tums®, etc.)

The safety of indinavir has not been established during pregnancy. Please inform your doctor if you are pregnant. Your doctor can recommend the appropriate treatment to help reduce the risk of passing the HIV virus on to your baby. Breastfeeding is NOT recommended if you have HIV as you can transmit the virus to your baby through your breast milk.

How should this drug be stored?

Indinavir capsules are sensitive to moisture. Indinavir capsules should be stored in a cool (15 - 30°C) dry place, in a tightly closed container, protected from light and moisture. Keep well out of the reach of children. Ensure that the drug has not expired by checking the expiry date ("EXP") shown on the outside of the package.

Do not store in your bathroom or kitchen, as heat and moisture may cause the drug to be less active.

Reference: Product monograph Crixivan® (indinavir sulfate). Kirkland, Qc, Canada: Merck Frosst Canada & Co, 2002.

Additional medication fact sheets and updates may be found at the Toronto General Hospital, University Health Network web site:

<http://www.tthivclinic.com/FactSheets/html/INDINAVIR.html>

Appendix C

LAMIVUDINE (3TC®)

Other NAMES: 3TC®, Heptovir®

Why is this drug prescribed?

Lamivudine is an antiretroviral (anti-HIV) drug that is part of the nucleoside reverse transcriptase inhibitor (NRTIs or Nukes) family. It is used together with other antiretrovirals to delay the progression of HIV infection. By doing this, your immune system should improve (increase in CD4⁺ count) and you will be better protected against infections.

Lamivudine does not cure AIDS or completely kill the HIV virus, but helps to prevent further damage by slowing down the production of new viruses. Treatment with lamivudine does not reduce the risk of passing infection on to others. You will still be able to pass HIV by sexual contact, by blood transfer or by sharing needles. You should always use appropriate precautions to prevent passing HIV on to others.

How should this drug be taken?

Generally, the starting dose of lamivudine is 150 mg twice daily. The dose may need to be decreased if you have kidney problems. It can be taken with or without food.

Your dosage is:

^ 150 mg tablet

^ 100 mg tablet

____ tablet (____ mg) ____ times a day

or

^ 10 mg / mL solution:

____ mL (____ mg) ____ times a day

What should you do if you forget a dose?

If you miss a dose of lamivudine, take it as soon as possible. However, if it is time for your next dose, do not double the dose, just carry on with your regular schedule.

Why should you not forget to take this drug?

If you miss doses of lamivudine, the amount of HIV virus in your blood (known as the viral load) will start increasing again and your immune system will be further damaged. A few missed doses can be enough for lamivudine to stop being active. A phenomenon known as resistance. When this happens, other antiretrovirals that work in a similar way to lamivudine may also become inactive. Therefore, missing doses of lamivudine can decrease treatment options for the future. Even if you do not feel well,

you should always take your doses of lamivudine. Please do not stop lamivudine without talking to your doctor first.

What adverse effects can this drug cause? What should you do about them?

Most adverse effects reported with lamivudine are mild, and may include **headaches, dizziness, nausea, vomiting, fatigue, general feeling of being unwell, numbness or tingling sensation in the fingers, toes or limbs, insomnia, diarrhea, fever and rash**. Your doctor or pharmacist can suggest methods to manage these symptoms.

Very rarely, lamivudine can cause a decrease in certain types of blood counts. **Anemia** (a reduced number of red blood cells that can make you feel tired or short of breath), **leucopenia** (a decrease in the number of white blood cells so that you have a higher risk of bacterial infection), or **thrombocytopenia** (a decrease in the number of platelets that can increase your risk of bleeding or bruising) may occur. These adverse effects usually occur after you have been on the drug for a long period of time. Blood tests will be done regularly to check for any changes in these values. Inform your doctor if you notice any symptoms of fever, chills, shortness of breath, racing heart beat, fatigue, bleeding or bruising.

Rarely, very severe stomach cramps accompanied with vomiting may occur and be caused by an inflammation of the pancreas (pancreatitis). Consult a doctor immediately if this occurs.

Your blood will also routinely be checked for any changes in liver and pancreas function.

As with most drugs, some people experience allergic reactions. If you have any of the following symptoms soon after taking lamivudine, STOP taking the drug and tell your doctor immediately: sudden shortness of breath, chest pain, swelling of eyelids, face or lips, and skin rash anywhere on the body.

What other precautions should you follow while using this drug?

If you are diabetic, please note that each adult dose of lamivudine oral solution (150 mg = 15 mL) contains 3 grams of sugar. Due to this sugar content, lamivudine oral solution users should clean their teeth regularly to reduce the risk of tooth decay. You must make sure that you are taking the right dose. If you take higher doses of lamivudine than what is prescribed, you may increase the chance of having adverse effects. If you take lower doses of lamivudine than what is prescribed, the HIV virus may become resistant to lamivudine.

Certain drugs can increase or decrease the effect of lamivudine. Also, lamivudine might influence the effect of other drugs you are taking. Inform your doctor and pharmacist of all prescribed and non-prescribed drugs you are taking. As well, you should inform them of natural products you are taking. If you wish to start a new drug or natural product, please consult with your pharmacist before doing so.

Please inform your doctor if you are pregnant. Your doctor can recommend the appropriate treatment to help to reduce the risk of passing the HIV virus on to your baby. Breastfeeding is not recommended if you have HIV as you might transmit the virus to your baby through your breast milk.

How should this drug be stored?

Lamivudine should be stored in a cool (2-30°C) dry place, protected from light and well out of the reach of children. Ensure that the drug has not expired by checking the expiry date ("EXP") shown on the outside of the package.

Do not store in your bathroom or kitchen, as heat and moisture may cause the medication to be less active.

Reference: Product monograph. 3TC[®] (lamivudine). Saint-Laurent, Qc, Canada: GlaxoSmithKline, 2001. Prepared by the Ontario HIV Pharmacy Professional Specialty Group, 2003.

Additional medication fact sheets and updates may be found at Toronto General Hospital, University Health Network website:

<http://www.tthivclinic.com/FactSheets/html/LAMIVUDINE.html>

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