INTERNATIONAL HEALTH ELECTIVES COMMITTEE
POLICY GUIDELINES FOR HIV PREVENTION
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INTRODUCTION

Dalhousie University has a responsibility to provide advice and assistance to students undertaking foreign electives. Students also have a responsibility to themselves when studying in foreign countries, where health conditions that are rare, or which have an epidemiology different from that in North America, are often encountered. This document provides guidelines for students undertaking International Health Electives in the Faculty of Medicine, so that they are able to protect themselves from infection with HIV, which is common in many parts of the world. It should be understood that the document is just that, a guide, and not a definitive statement on the subject of occupational HIV prevention. The document addresses HIV prevention from a clinical standpoint only, assuming that students are well aware of the need for protection in personal situations. In particular, the document provides advice which is easy to understand and follow, so that students will be able to make decisions that do not require the weighing of a very large number of probabilities in difficult situations.

The guidelines have one underlying principal: proactive thought. It is expected that students who undertake foreign electives will have seriously considered the steps they will take if an exposure or possible exposure to HIV occurs, including wound management, chemoprophylaxis and repatriation to Canada/transfer to another developed country. This will involve developing a knowledge of i) the prevalence of HIV infection in the country to be visited; and, ii) the types of duties and experiences the student will have during the elective (exposure to potentially infected blood/body fluids during surgical, medical and obstetrical procedures). The student should also develop a plan for action if a potential exposure does occur, prior to departure for the elective experience.

The document will address five main areas: i) the epidemiology of HIV infection; ii) acute exposure management; iii) risk assessment after exposure in the clinical situation; iv) post-exposure prophylaxis; and, v) considerations to be made prior to travel.

1. EPIDEMIOLOGY OF HIV INFECTION:

(i) International Statistics. According to the Joint United Nations Program on HIV/AIDS (UNAIDS) and the World Health Organization[1], as of December, 2007 33.2 million people were estimated to be living with HIV/AIDS (30.8 million adults; 15.4 million women, and 2.5 million aged < 15).

[1] UNAIDS. AIDS Epidemic Update: December, 2007

In 2007, 2 million people died from AIDS and overall, since 1981, about 21.8 million people have died from AIDS: 17.5 million adults and 4.3 million children under fifteen.
More than 95% of all HIV-infected people now live in the developing world, which has experienced 95% of all deaths from AIDS. Approximately one in every three children orphaned by HIV/AIDS is under age five[2].

(ii) Prevalence Rates by Individual Country. In order to understand the risk of HIV infection due to occupational exposure in various settings, it is necessary to have some estimate of the prevalence of infection in the country to be visited, which can be very high, especially in regions such as sub- Saharan Africa. While it is not possible to list estimates of infection for all areas of all countries the UNAIDS website: *"UNAIDS/WHO/ UNICEF Epidemiological fact sheets on HIV and AIDS"* [3] provides very useful information on a country-specific basis. This site also gives demographic information that could prove useful to students for planning their elective experiences.

(iii) HIV Infection Due to Occupational Exposure in the United States. Data from the U.S. provide some indication of the risk of contracting HIV through occupational exposure. Of those persons reported with AIDS in the United States through December 31st, 2002, 24,844 were employed in health care, representing 5.1 percent of the 486,826 AIDS cases reported for whom occupational information was known. Work type was known for 23,212 (93 percent) of the 24,844 reported health care workers with AIDS. Specific occupations were as follows: 1,792 physicians, 122 surgeons, 5,378 nurses, 492 dental workers, 476 paramedics, 3,182 technicians, 1,082 therapists, and 5,638 health aides.[4] The remainder were maintenance workers, administrative staff, etc. In December 2006, CDC was aware of 57 health-care workers in the United States who were documented as having seroconverted to HIV following occupational exposure. Those who seroconverted included 16 laboratory workers, 24 nurses, 6 physicians, and 11 technicians/other workers. Forty-eight had percutaneous (puncture/cut injury) exposure, 5 had mucocutaneous (mucous membrane and/or skin) exposure, 2 had both of these, and 2 had an unknown route of exposure. Fifty exposures were to HIV-infected blood, 3 to concentrated virus, 1 to visibly bloody fluid, and 1 to an unspecified fluid.

CDC was also aware of 140 other cases of HIV infection or AIDS among health-care workers who did not report other risk factors for HIV infection and who reported a history of occupational exposure to blood, body fluids, or HIV-infected laboratory material, but for whom seroconversion after exposure was not documented. The number of these workers who acquired their infection through occupational exposures is unknown.[5]

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[2] UNAIDS, Report on the Global AIDS Epidemic, July 2008

[3] Epidemiological fact sheets on HIV and AIDS http://www.unaids.org/en/KnowledgeCentre/HIVData/Epidemiology/epifactsheets.asp

[4] CDC Surveillance of Healthcare Personnel with HIV/AIDS, as of December 2002: http://www.cdc.gov/ncidod/dhqp/bp_hiv_hp_with.html

[5] CDC (2006, December) 'Surveillance of occupationally acquired HIV/AIDS in healthcare personnel, as of December 2006'

Thus, the risk of seroconversion as a result of occupational exposure to HIV is small, but measurable. The estimated risk of transmission following accidental exposure to contaminated blood (defined as any contact with blood or a body fluid contaminated by blood as a result of injury with a needle or any other sharp instrument, or via mucous membranes or an existing cutaneous condition e.g. eczema, wound, etc.) is 0.3% for percutaneous exposure and 0.03% for mucocutaneous exposure. The most common procedures that present a risk of contaminated blood exposure to individuals carrying out clinical duties are:[6]

- Taking blood samples and samples of body fluids containing blood.
- Surgical interventions, especially those of long duration and where excessive bleeding may occur.
- The cleaning of re-useable medical material.

2. Management of Acute Exposure

In cases of injury by blood-contaminated medical equipment, or when contact occurs between broken skin and body fluids:

- Allow wound to bleed freely and wash wound or exposed skin area with soap and water for 10 minutes, rinsing frequently.
- After exposure affecting eyes or mucous membranes:
    - rinse the exposed area for 10 minutes with isotonic saline solution (if not available use clean water)

3. Risk Assessment After Exposure in the Clinical Situation

The risk of occupational infection with HIV depends on several factors:

- *The type of incident*. Incidents involving large bore needles with visible contamination, and those involving IV or arterial line needles pose a higher risk of infection.
- *The degree of exposure*. Deep wounds constitute a large exposure, needle pricks moderate exposure, and superficial dermal erosions, minimal exposure.
- *HIV status of the source, as assessed by health status*. This is often the most difficult area of risk assessment and is usually due to of lack of adequate testing resources. If testing is attempted, it should be done with the patient's informed consent. Whether or not testing can be carried out, the source can usually be questioned with respect to risk activities and health status to determine certain aspects of risk status and likely degree of infectiousness. Considerations are:
    - History of HIV/AIDs in sexual partner(s) or children
    - Symptoms of HIV infection (chronic diarrhea, lymphadenopathy, weight loss, cough > 1 month, oral thrush, etc.)
    - Other conditions suggestive of HIV infection (Kaposi Sarcoma , PCP, cerebral toxoplasmosis, cryptococcal infection, TB, esophageal candidiasis, recurrent pneumonia)
    - personal risk history: (occupation - prostitution, migrant worker, soldier, truck driver; h/o blood transfusion; h/o surgery/injections under questionable circumstances; IVDU; high risk sexual activity/STD history)

[6] Médicins Sans Frontières. Procedures to be Followed After an Accidental Exposure to Blood. MSF Medical Departments. July, 1997

If the source is not available, risk assessment will depend upon the type of exposure, and to a certain extent, knowledge of country/regional HIV epidemiology.

4. Decisions About Chemoprophylaxis

The administration of antiretroviral drugs as postexposure prophylaxis (PEP) should be considered after exposure to infected or potentially infected blood or body fluids. This decision is made considering local epidemiology, nature of the exposure and risk status of the source. PEP has been shown to be safe and associated with decreased risk for occupationally related HIV infection.

As a guide to thinking about such decisions, the following extract from the DHHS[7] is offered: The use of PEP for occupational exposure to HIV is either recommended, considered, or not offered depending on the circumstances of the exposure and the characteristics of the source.

Recommended HIV Postexposure Prophylaxis for Percutaneous Injuries

	Infection Status of Source				
Exposure Type	HIV-Positive Class 1*	HIV-Positive Class 2*	Source of Unknown HIV Status1	Unknown Source§	HIV-Negative
Less severe¶	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 factors11	Generally, no PEP warranted; however, consider basic 2-drug PEP** in settings where exposure to HIV-infected persons is likely	No PEP warranted
More severe§§	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 factors11	Generally, no PEP warranted; however, consider basic 2-drug PEP** in settings where exposure to HIV-infected persons is likely	No PEP warranted

* HIV-Positive, Class 1 - asymptomatic HIV infection or know low viral load (e.g. <1,500 RNA 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 postexposure prophylaxis (PEP) should not be delayed pending expert consultation, and, because expert consultation alone cannot substitute for face-to-face counselling, resources should be available to provide immediate evaluation and follow-up care for all exposures.

1 Source of unknown HIV status (e.g. decreased source person with no samples available for HIV testing).

§ Unknown source (e.g. a needle from a sharps disposal container).

¶ Less severe (e.g. solid needle and superficial injury)

** The designation, "consider PEP" indicates that PEP is optional and should be based on an individualized decision between the exposed person and the treating clinician.

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

§§ More severe (e.g. large-bore hollow needle, deep puncture, visible blood on device, or need used in patient's artery or vein).

7 Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HIV and Recommendations for Postexposure Prophylaxis. Morbidity and Mortality Weekly Report; September 30, 2005; 54 (RR-9).

Recommended HIV Postexposure Prophylaxis for Mucous Exposures and NonIntact Skin* Exposures

	Infection Status of Source				
Exposure Type	HIV-Positive Class 11	HIV-Positive Class 21	Source of Unknown HIV Status§	Unknown Source¶	HIV-Negative
Small volume**	Consider basic 2-drug PEP11	Recommend basic 2-drug PEP	Generally, no PEP warranted; however, consider basic 2-drug PEP11 for source with HIV risk factors§§	Generally, no PEP warranted; however, consider basic 2-drug PEP11 in settings where exposure to HIV-infected persons is likely	No PEP warranted
Large volume¶¶	Recommend basic 2-drug PEP	Recommend expanded 3-drug PEP	Generally, no PEP warranted; however, consider basic 2-drug PEP11 for source with HIV risk factors§§	Generally, no PEP warranted; however, consider basic 2-drug PEP11 in settings where exposure to HIV-infected persons is likely	No PEP warranted

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

1 HIV-Positive, Class 1 - asymptomatic HIV infection or know low viral load (e.g. <1,500 RNA 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 postexposure prophylaxis (PEP) should not be delayed pending expert consultation, and, because expert consultation alone cannot substitute for face-to-face counselling, resources should be available to provide immediate evaluation and follow-up care for all exposures.

§ Source of unknown HIV status (e.g. decreased source person with no samples available for HIV testing).

¶ Unknown source (e.g. splash from inappropriately disposed blood)

** Small volume (e.g. a few drops).

11 The designation, "consider PEP" indicates that PEP is optional and should be based on an individualized decision between the exposed person and the treating clinician.

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

¶¶ Large volume (e.g. major blood splash).

In situations where the HIV status of the source is not immediately known, the decision to initiate PEP should be made on a case-by-case basis and may be modified if and when additional information becomes available. If a decision is made to take prophylactic therapy, the following is recommended:

Treatment is by combination therapy to be taken daily over a period of four weeks. If treatment is begun, it is assumed that the student will return to Canada or go to another developed country within one week. Treatment is available as a **7 day kit as follows**:

As before, we advocate 4 weeks of antiretroviral therapy, starting as soon as possible after exposure with:

Combivir® (AZT plus 3TC) 1 tablet po bid
± Kaletra® 2 tablets po bid

for significant exposures as indicated in the guidelines. The decision regarding use of a two or three drug regimen (or no drugs at all) is made based on an understanding of the type of exposure and source of the exposure. Additionally, the choice of prophylaxis may vary if there is reason to believe that the source is infected with an antiviral resistant strain of HIV. Therefore, detailed evaluations of the injury and source are necessary. A two drug regimen represents the basic one with a third drug added for high risk exposure only (see above tables).

5. Considerations Prior to Travel

Students should be certain that they understand several issues about occupational HIV exposure before leaving for their electives. These include:

- Being aware of the risks of occupational exposure, the prevalence of HIV in the country in which the elective is being carried out, the types of procedures and interventions they are likely to take part in during the elective, and how to minimize risk of occupational exposures.
- Having an up-to-date combination therapy kit either with them personally, or being certain that combination therapy is readily accessible at the elective site.
- Being familiar enough with travel arrangements in the elective country so that expedient (i.e., within one week) travel to Canada or another developed country can be arranged.
- Giving due pre-consideration of various scenarios of possible exposure, so that decisions can be made reasonably quickly and well. Discussion with the Dalhousie supervisor or another qualified faculty member is recommended.

APPENDIX:

PATIENT INFORMATION *- Occupational Exposure to HIV-Infected Blood*

Name of Medication:	**lopinavir/ritonavir**
Common Trade Name:	**Kaletra®**

***Description*:**
Kaletra® is an antiretroviral agent that is a specific inhibitor of the human immunodeficiency virus (HIV) protease enzyme. HIV protease is required for HIV replication and formation of mature viral particles that allow the HIV to be infectious to normal human cells. Since Kaletra® inhibits the formation of mature particles, the resulting viral products are not infectious. In your case Kaletra® will be used prophylactically in combination with other agents to potentially eradicate the HIV before it can start to replicate, assuming that HIV transmission has taken place (the risk of infection from a single needle stick is approximately 0.3%). There is insufficient information to indicate how effective Kaletra® is in preventing infection with HIV after an occupational exposure. However, it is a very potent antiretroviral and it is theorized to be of benefit in situations where there are high levels of viruses or potentially zidovudine resistant virus in the source patient.

***Proper Use of This Medication*:**
- Take this medication exactly as prescribed by your doctor. Do not take more of it, do not take it more often and do not take it longer than your doctor has ordered.
- Do not stop taking this medication without checking with your doctor first.
- Always take Kaletra® at the same times each day so that constant amount of drug will be in your system.

***Dosing*:**
The dosing of Kaletra® will be 2 tablets twice daily. To ensure constant blood levels, it would be best to take the dose every 12 hours with food.

Missed Doses:
If you miss a dose of the medication, take it as soon as you remember. However, if it is almost time for your next dose, skip the missed dose and go back to your regular dosing schedule. Doubling up on the dose could lead to unwanted effects from Kaletra®. If a situation arises where you are unsure of what to do, immediately contact your doctor, or a pharmacist who is knowledgeable of your case, to get the answer.

***Storage*:**

- Keep out of the reach of children.
- Store at room temperature.
- Do not store in the bathroom, near kitchen sink or in other damp areas. Heat or moisture may cause the medication to break down.
- Do not keep outdated medication and properly discard of any extra medication by returning it to your pharmacist for disposal.

Precautions While on This Medication:

- It is important to keep scheduled doctors appointments to check progress and monitor drug therapy.
- Do not take any other medication, prescription or over-the-counter products, without discussing it with your doctor or pharmacist first.
- There is always potential for an allergic reaction when you start a new medication so if you experience any of the following symptoms, contact your doctor immediately: sudden wheezing and chest pain or tightening; swelling of the eyelids, face and/or lips; skin rash or hives anywhere on the body.
- If you suffer from seasonal allergies, be sure to check with your doctor or pharmacist before using any antihistamines.
- There is very limited information regarding the safety of Kaletra® in pregnancy, its effects on fetal development and early infancy when breast feeding, therefore the risk/benefit ratio should be weighed before using Kaletra®.

Common Side Effects of the Medication:

Along with the desired effects, a medication may cause some unwanted effects. If unwanted effects occur, they should always be reported to your doctor at your next scheduled appointment or possibly sooner.

- Diarrhea: If diarrhea occurs, you may take the over-the-counter medication *Imodium®*.
- Numbness or tingling on the inside of your mouth
- Stomach upset: If stomach upset occurs, it helps to have food in your stomach before you take the Kaletra®. If stomach upset is bothersome your doctor or pharmacist can recommend an over the counter medicine.

Other unwanted effects not listed above have the potential to occur in some patients.

Note:

When you have your prescription filled, check your medication before taking it.

NEVER give this or any medication to others.

***PATIENT INFORMATION** - Occupational Exposure to HIV-Infected Blood*

Name of Medication:	**(Zidovudine, AZT) plus (3TC® lamivudine)**
Common Trade Name:	**Combivir®**

***Description*:**
Zidovudine and lamivudine are antiretroviral agents that irreversibly inhibit reverse transcriptase (RNA-dependent DNA polymerase), an enzyme necessary for the human immunodeficiency virus (HIV) to replicate inside human cells. In your case zidovudine and lamivudine (Combivir®) alone or in combination with another drug will be used prophylactically to potentially eradicate the HIV before it can start to replicate, assuming that true HIV transmission has taken place (the risk of infection from a single needle stick is appropriately 0.3%). There is information which indicates that zidovudine use following occupational exposure decreases the risk of acquiring HIV from that exposure. In addition, use of zidovudine during pregnancy, delivery and the neonatal period decreases the risk of the infant of an HIV-infected woman from being infected. Hence, there is a scientific basis for considering zidovudine use prophylactically after certain types of exposures. The formulation that you are being prescribed contains both zidovudine and lamivudine (Combivir®).

***Proper Use of This Medication*:**
- Take this medication exactly as prescribed by your doctor. Do not take more of it, do not take it more often and do not take it longer than your doctor has ordered.
- Do not stop taking this medication without checking with your doctor first.
- Always take Combivir® at the same times each day so that constant amount of drug will be in your system.
- This medication should be taken with **meals**. The most important consideration is that you take Combivir® the same way every time you take a dose to ensure constant blood levels of the drug.

***Dosing*:**
The dosing of Combivir® will be a 1 tablet twice daily. To ensure constant blood levels, it would be best to take the dose every twelve hours.

Missed Doses:
If you miss a dose of the medication, take it as soon as you remember. However, if it is almost time for your next dose, skip the missed dose and go back to your regular dosing schedule. Doubling up on the dose could lead to unwanted effects from Combivir®. If a situation arises where you are unsure of what to do, immediately contact your doctor, or a pharmacist who is knowledgeable of your case, to get the answer.

***Storage*:**

- Keep out of the reach of children.
- Store at room temperature, in a tightly closed vial, away from heat and direct light
- Do not store in the bathroom, near kitchen sink or in other damp areas. Heat or moisture may cause the medication to break down.
- Do not keep outdated medication and properly discard of any extra medication by returning it to your pharmacist for disposal.

Precautions While on This Medication:

- It is important to keep scheduled doctors appointments to check progress and monitor drug therapy.
- Do not take any other medication, prescription or over-the-counter products, without discussing it with your doctor or pharmacist first.
- There is always potential for an allergic reaction when you start a new medication so if you experience any of the following symptoms, contact your doctor immediately: sudden wheezing and chest pain or tightening; swelling of the eyelids, face and/or lips; skin rash or hives anywhere on the body.
- Based on a limited amount of information, the use of zidovudine in the second and third trimesters of pregnancy and early infancy is not associated with serious unwanted effects in mothers or infants. There is not enough information to make the same statement for the first trimester of pregnancy; therefore risk/benefit ratio should be weighed before using zidovudine in the first trimester.

Common Side Effects of the Medication:

Along with the desired effects, a medication may cause some unwanted effects. If unwanted effects occur, they should always be reported to your doctor at your next scheduled appointment or possibly sooner.

- *Unwanted Effects Requiring Immediate Attention:* fever, chills or soar throat; pale skin or muscle weakness; abdominal discomfort, loss of appetite and a general feeling of discomfort.
- *Unwanted Effects To Be Assessed at the Next Doctor Visit*: Headache*, muscle soreness, nausea*, unusual tiredness* or trouble sleeping.

* These unwanted effects are those most often seen in health care workers who have received Combivir® in the past for situations similar to your own.

Other unwanted effects not listed above have the potential to occur in some patients. If you experience an unwanted effect not found above, report it to your doctor.

Note:

When you have your prescription filled, check your medication before taking it.

NEVER give this or any medication to others.