UW Global Health Institute

Guidelines for

Blood-borne Pathogen Exposure and Post-Exposure Prophylaxis in Global Health Field Sites

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Purpose

The purpose of this policy is to delineate recommended actions that should be taken in case of an occupational exposure of any member of the UW Global Health Institute to infected or potentially infected bodily fluid. The policy extends to faculty and also to clinical volunteers. The policy can also extend to non-clinical students, staff or faculty if they should experience an exposure, occupational or otherwise.

This policy outlines the recommendations of the UW Global Health Institute (GHI). It does not replace individual choice. Each exposed person has the right to weigh the risks and benefits and make their own choice about when to take post-exposure prophylaxis (PEP).

Policy

All lead faculty and participants of GHI field programs will be given a copy of this policy and requested to be familiar with it ahead of time in case a potential exposure should occur. Exposure to blood-borne pathogens will be avoided as much as is reasonably possible, as outlined by Universal Precautions policies. Should a potential exposure occur, immediate action will be taken to protect the exposed person. Starter packs of PEP medications, along with a copy of this policy, will be readily available to GHI lead faculty. Access to counseling and a medical visit with an HIV specialist will be available within less than 3 days and a regular follow-up schedule of visits and testing in recommended. Likewise, risk of hepatitis B infection will be prevented by vaccination but, if for whatever reason vaccination has not been done and immunity is documented, options for the reduction of transmission risk will be offered. Records will be kept of any event of potential exposure and the outcome. Program members taking PEP will be encouraged but not required to share the information about the course of their PEP and the final outcome for the record. Those who prefer not to take PEP when it is recommended by this policy will be asked to sign a statement of informed consent to decline PEP.

Reduction of Risk

All members of the GHI field programs, including clinical faculty, residents, and clinical volunteers, are required to have a full course of vaccination against hepatitis B. If possible, antibody titers should be obtained to prove immunity. It is highly recommended that all

members, including faculty, residents, and clinical volunteers, be tested for HIV on a yearly basis regardless of personal risk factors.

It is also the policy of the GHI that all members should use universal precautions when potentially exposed to blood or body fluids.

PEP Background Information

Definition of Exposure

Occupational exposure is defined as any contact with an infectious body fluid as a result of an injury with a needle or any other sharp instrument, or via mucous membranes or an existing cutaneous condition (wound, eczema, scratch, etc.). Non-occupational exposures to infectious body fluid may also occur, such as in the case of unprotected intercourse or blood exposure during a motor vehicle crash. A potentially infectious body fluid that comes from a person who carries an infection is termed infectious.

- Potentially infectious body fluids include: blood, CSF, synovial fluid, pleural fluid, pericardial fluid, amniotic fluid, semen, or vaginal secretions.
- Non-infectious body fluids include feces, nasal secretions, saliva, sputum, sweat, tears, urine, and vomit, as long as these are not visibly contaminated with blood.

Risk of Infection due to Exposure

People are considered to be at risk of infection from hepatitis B, hepatitis C, and HIV as the result of an occupational or non-occupational exposure.

The average risk for HIV transmission after a single percutaneous exposure to HIV-positive blood is low (see table 1) and this risk is considerably lower than that arising from hepatitis B and C viruses (respectively 100 times and 10 times less). The risk of transmission of HIV due to intercourse is summarized in table 2.

There is also a risk, although a lower one, of transmission of any other infectious agent present in the blood (hemorrhagic fevers, trypanosomiasis, etc.).

Factors of the exposure that are associated with higher risk of HIV transmission are a percutaneous injury with a needle that has been placed in a vein or artery of the source patient, a sharp that is visibly contaminated with HIV-positive blood, or a source patient with primary HIV infection or end-stage HIV.

The HIV prevalence in some world regions is high. Estimates of prevalence in sub-Saharan African countries range from approximately 3% to 30% depending on what population is considered. The inpatient population is estimated to be roughly 50% HIV-positive. Hepatitis B and C rates are often unknown.

Definition of Post-Exposure Prophylaxis (PEP)

Post-exposure prophylaxis refers to medications given to prevent infection after exposure. The prophylactic treatment offers both benefit and risk to the exposed person (see table 3). This policy provides a recommendation about when to take PEP and describes how PEP should be administered but does not mandate that PEP be taken when recommended, or not taken when not recommended. The exposed person must be advised of the risks and benefits and make their own decision whether or not to take PEP.

Actions to Follow in Case of an Exposure:

1. **The exposed person will stop what they are doing immediately and rinse/disinfect the exposed area.** Percutaneous injuries should be allowed to bleed, and rinsed thoroughly in running water for 5 minutes. Mucous membranes including the eyes should be rinsed with saline or with water for 5 minutes.

2. **Alert a GHI faculty member,** as well as any other direct supervisor. Do not delay the rest of the steps while waiting for supervisor or faculty member. The faculty member will initiate the incident report.

3. **Evaluate the mode of exposure** according to table 4. For percutaneous injuries, categorize into more or less severe exposure. For mucous membranes or nonintact skin exposure, categorize into small-volume or large-volume. For exposure through unprotected sexual contact, categorize into higher and lower risk exposure.

4. **Evaluate the source patient** and categorize according to table 6. If a current HIV and Hepatitis B test for the source patient is not immediately available, have someone gain consent from the source patient and coordinate testing. The best person to coordinate this testing will vary depending on the clinical situation. The patient has the right to refuse testing. Do not delay the administration of PEP more than 2 hours post-exposure while obtaining laboratory results. Refer to table 5 for considerations regarding HIV testing and interpretation of test results. The two tests that are available are rapid HIV testing and HIV DNA PCR. The patient may also be tested for Hepatitis B Sag. All three of these tests are recommended to be sent, although only the rapid HIV BSAg and HIV DNA PCR may help in later decision-making or may add to peace of mind. In all cases where there is an identifiable source patient, evaluate the patient clinically for signs and symptoms of HIV, or hepatitis, including signs and symptoms of primary HIV. In some cases the source patient may not be identified, for example, in the case of a needle-stick from a discarded sharp or sexual assault by a perpetrator who is not in custody.

5. **The exposed person must have the following laboratory tests** as soon as possible: HIV Rapid Test, Hepatitis B Surface Antigen, Full Blood Count, ALT,

AST, and Urine HCG (for females only). Do not delay the administration of PEP more than 2 hours post-exposure while obtaining laboratory results. If the exposed person is HIV-positive, do not initiate PEP; instead refer to HIV clinic for routine care.

6. **Use table 7 to determine whether HIV PEP is recommended and table 8 to determine the recommended prescription and initiate PEP if indicated.** When choosing PEP prescription, keep in mind that Efavirenz is contraindicated in pregnancy. If it is indicated, PEP should be initiated as soon as possible after the exposure. If more than 72 hours have passed since the exposure, PEP may not be recommended. Seek consultation with an HIV specialist in this case. PEP should be taken every 12 hours. Take the first dose as soon as possible after the exposure, then take the second dose at a time convenient for ongoing use and continue on a 12 hourly schedule. Do not allow more than 12 hours between the first and second doses.

   When two-drug PEP is recommended, some exposed people find themselves desiring to use three-drug PEP rather than two-drug PEP in order to feel more protected. The exposed person should be encouraged to keep in mind that the side effects of three-drug PEP are often more severe, and so a full course of three-drug PEP is harder to complete. There is also little good evidence that three-drug PEP is superior to two-drug PEP, hence the recommendation for two-drug PEP is sound in the cases where it is recommended.

   Obtaining the testing and medication: Check with field course faculty director, or if not immediately available, with the clinical director of your field site.

7. **For hepatitis B** PEP: All exposed persons should receive the hepatitis B vaccine, except for those who have received it within the last five years AND have had antibody testing to prove response with anti-HbS level >10 IU/L. If the person has ever had an antibody anti-HbS >100IU/L, there is no need for revaccination regardless of when the last vaccine was given. In the case that the exposed person has never been vaccinated against hepatitis B, the vaccine should be given and the option to travel and to obtain Immune Globulin treatment should be considered. If this option is chosen, the person will receive time off of work in the form of sick days. The cost of this travel and treatment will be paid for by the exposed person.

8. **The exposed person must fill out and hand in an incident report according to the policy of the training site where the incident has taken place. The clinical faculty member to whom the exposure is reported will also fill out an incident report** to be kept on file. The incident report will contain the name of the person exposed, the date, a narrative of the details of the exposure, the classification of the exposure and the source patient

according to tables 4 and 6, and a record of whether the exposed person decided to take PEP. The case will be reviewed by clinical faculty in six months and the ultimate outcome will be recorded in the report, including any changes in the PEP plan, and final HIV and hepatitis B and C results. The disclosure of information about test results or the course of PEP is completely voluntary on the part of the exposed person, who may not opt to disclose. Disclosure of this information is requested in order to help the program to assess the utility and efficacy of the PEP policy.

9. If the exposed person has any medical conditions, is pregnant or breastfeeding, is currently taking medications, if the source patient is currently on antiretrovirals, or if there are any other questions, concerns, or ambiguities that come up when considering PEP, then **seek consultation with an HIV specialist as soon as possible** concerning management of these situations. Do NOT delay initiation of PEP while awaiting consultation.

10. **The exposed person should follow up with an HIV specialist visit and blood work according to the schedule in table 9** even if they have no medical conditions are having no symptoms or side effects. The exposed person should be counseled not to engage in unprotected sex or to donate blood during the first six months after exposure in order to prevent the possible spread of HIV to partner or pregnancy. They may keep in mind that seroconversion between three and six months is highly unlikely.

11. Many people taking PEP experience uncomfortable side effects and choose to discontinue before the 28 days are complete. **Discontinuation is highly discouraged** without first consulting with an HIV specialist. Many side effects can be managed symptomatically, so a person taking PEP and experiencing side effects is encouraged to seek medical consultation in order to consider options before self-discontinuing PEP. If three-drug PEP and the side effects are intolerable even with symptomatic treatment, a step down to two-drug PEP may be considered in consultation with an HIV specialist.

12. **There is no post-exposure prophylaxis for hepatitis C,** and no easily available laboratory testing in many low resource settings. Exposed persons should seek medical attention immediately if they experience any symptoms of hepatitis. **One hepatitis C antibody test should be performed six months after exposure to rule out hepatitis C infection.** Likewise, complete hepatitis B serologies are recommended after the six-month interval to rule out hepatitis B infection and to document hepatitis B immunity.

13. Following the introduction of tetanus toxoid vaccines in the United States, the incidence of tetanus declined from 0.4 per 100,000 in 1947 to 0.05 per 100,000 since the mid 1970s. Currently, the majority of tetanus cases occur in persons

who have not completed a 3-dose primary series or who have uncertain vaccination histories. Spores of *C tetani* are ubiquitous in the environment, especially where there is soil contaminated with excreta. Wounds, recognized or unrecognized, are where the organism multiplies and elaborates toxin. Contaminated wounds, those that result from deep puncture, and those with devitalized tissue are at greatest risk. All persons should be vaccinated against diphtheria, tetanus, and pertussis, and immunity should be maintained through booster immunization every 5-10 years.

Diphtheria and tetanus vaccine: May administer into deltoid or midlateral thigh muscles in children and adults; Primary immunization: 0.5 mL IM, give 2 injections 4-8 wk apart and a third dose 6-12 mo after second injection; Booster dose: 0.5 mL q10y

Patients receiving immunosuppressants, including corticosteroids or radiation therapy, may remain susceptible despite immunization due to poor immune response; avoid concurrent use of medication with systemic chloramphenicol since it may impair amnestic response to tetanus toxoid

Tetanus immune globulin (Hyper-Tet): Used for passive immunization of any person with a wound that might be contaminated with tetanus spores. Administer if immunization status is unclear or patient is allergic to diphtheria/tetanus vaccine.
Prophylaxis: 250-500 U IM in opposite extremity to tetanus toxoid lesion;
Clinical tetanus: 3000-10,000 U IM

Tables:

Table 1: Risk for transmission after occupational exposure to infected blood

Agents	Exposure Mode	Risk of Infection
HIV	Percutaneous exposure	0.3%
HIV	Mucocutaneous contact*	0.03-0.09%
HBV	Percutaneous exposure	10-30%
HCV	Percutaneous exposure	0-10%

*This refers to the exposure of mucus membranes or cutaneous cuts or abrasions.

Table 2: Risk for HIV transmission after a single event of sexual activity

Exposure Mode	Risk of Infection
Receptive anal intercourse	0.5%
Receptive vaginal intercourse	0.1%
Insertive anal intercourse	0.065%
Insertive vaginal intercourse	0.05%

Receptive oral sex with male partner	0.005%
Other sexual exposure	0.004%
Rape	Unknown

Table 3: Description of post-exposure prophylaxis (PEP)

Virus	PEP Options	Benefit	Risk
HIV	28 days of combined antiretroviral medications	80% reduction of risk of infection	Medication side effects. These depend upon the antiretroviral agents used.
Hepatitis B	Hepatitis B vaccine	No good data as an occupational form of PEP, but when given in combination with HBIG, perinatal transmission from mother to child is prevented in 85%-95% of cases	Allergic reaction, pain at injection site, risk of bacterial infection.
Hepatitis C	None		

Table 4: Categorization of severity of exposure

Mode of exposure	Category of exposure	Definition
Percutaneous injury	Less severe	Solid needle or superficial injury
	More severe	Large-bore hollow needle, deep puncture, visible blood on device, or needle used in source patient's artery or vein
Mucus membrane	Small-volume	A few drops
	Large-volume	A major splash
Sexual contact	Higher risk	Receptive intercourse of any kind or intercourse causing trauma
	Lower risk	All other sexual exposure

Table 5: ***Considerations regarding HIV testing and window periods***

Rapid HIV testing

The window period for the rapid HIV test is 12 weeks. This means that if the patient's infection began within 12 weeks of the test, the test may be falsely negative. Very rarely someone will develop a true positive test during the time between 12 weeks and six months after infection. Test results are available within a half hour and the test is available at all practice sites during regular business hours.

HIV DNA PCR testing

The window period for HIV DNA PCR is six weeks. This means that if the patient's infection began within six weeks of the test, the test may be falsely negative. Most people will have a positive HIV DNA PCR well before six weeks after time of infection, so six weeks is a conservative estimate. The test is done off-site and results are usually available within one to four weeks. Because of this, most decisions whether or not to initiate PEP must be made without the information from this testing, but in some cases a negative HIV DNA PCR test may allow discontinuation of PEP or may offer reassurance to the exposed person.

Timing of vertical transmission of infection

Remember than an infant's infection can start antenatally, during delivery, or during breastfeeding. Even asymptomatic infants can have very high viral loads.

Maternal antibodies detected in infant with rapid HIV testing

An infant born to a mother with circulating HIV antibodies may have a positive rapid HIV test detecting mother's antibodies that have been transferred to child transplacentally or in breast milk. This may be the case for up to 18 months of age, even if the infant is HIV-negative.

Table 6: Categorization of the source patient

Adult case	Pediatric case*	Category of source patient
Asymptomatic HIV infection or known viral load <1500 RNA copies/mL, has never taken antiretrovirals	No pediatric case in this category	**HIV-positive class 1**
Symptomatic HIV infection, AIDS, acute serconversion, or known high viral load, or is taking/has taken antiretrovirals	Infant/child <18 months: positive HIV DNA PCR test Infant/child >18 months: positive rapid HIV test OR positive HIV DNA PCR test	**HIV-positive class 2**
Cannot test for HIV but has clinical signs and symptoms consistent with HIV/AIDS, including but not limited to: oral thrush, wasting, and recurrent illnesses OR clinical signs and symptoms	Infant with positive rapid HIV test (or whose mother has a positive rapid HIV test) for whom no HIV DNA PCR test has been done OR who have a negative HIV DNA PCR	**HIV unknown, high risk**

of primary HIV infection, including: flulike syndrome with fever, ± rash, lymphadenopathy oral ulcers	test but were still exposed (in utero, during birth, or through breastfeeding) within 6 weeks prior to that test	
Cannot test for HIV, but has no clinical signs consistent with HIV/AIDS	No pediatric case in this category	**HIV unknown, lower risk**
HIV test negative, but possible exposure within the test's window period	Infants with negative rapid HIV or HIV DNA PCR tests whose mothers have a negative rapid HIV or HIV DNA PCR test, but who have been exposed to the mother during the window period of the test used to test the mother	**HIV-negative, at risk for false negative**
HIV test negative and no possible exposure within the test's window period	Infants or children of any age with negative HIV DNA PCR test OR negative rapid HIV test who have had no exposure to mother within the window of the test used and not sexually active	**HIV-negative**
Exposure to a potentially infectious fluid from a person who cannot be identified for evaluation	(same as left)	**Unknown source**

*****Assuming vertical transmission, i.e.: transmission in early infancy, children infected via an exposure at a later stage in development can be assessed by using the criteria in the adult column.

Table 7: PEP recommendations according to source patient and exposure categories

Source Patient	Exposure					
	Percutaneous		Mucus membranes		Sexual contact	
	Less severe	More severe	Small-volume	Large-volume	Higher risk	Lower risk
HIV-positive class 1	2-drug PEP	3-drug PEP	Consider 2-drug PEP	2-drug PEP	3-drug PEP	2-drug PEP
HIV-positive class 2	3-drug PEP	3-drug PEP	2-drug PEP	3-drug PEP	3-drug PEP	3-drug PEP
HIV unknown, high risk	3-drug PEP	3-drug PEP	2-drug PEP	3-drug PEP	3-drug PEP	3-drug PEP
HIV unknown, lower risk	2-drug PEP	2-drug PEP	Consider 2-drug PEP	2-drug PEP	2-drug PEP	2-drug PEP
HIV-negative,	No PEP	No PEP	No PEP	Consider 2-	Consider 2-	Consider 2-

at risk for false negative				drug PEP	drug PEP	drug PEP
HIV-negative	No PEP	No PEP	No PEP	No PEP	No PEP	No PEP
Unknown source	2-drug PEP	2-drug PEP	Consider 2-drug PEP	2-drug PEP	2-drug PEP	2-drug PEP

Table 8: *PEP prescriptions*

PEP	Prescription	Notes
2-drug PEP	• CombivirR (zidovudine 300mg/lamivudine 150mg) onetablet twice daily	
3-drug PEP	• CombivirR (zidovudine 300mg/lamivudine 150 mg) one table twice daily • KaletraR (lopinavir 200mg/ritonavir 50 mg) two capsules twice daily with food	
Source patient taking Kaletra	• CombivirR (zidovudine 300 mg/lamivudine 150 mg) one tablet bid • Efavirenz 600 mg, qhs	Pregnancy test before using efavirenz because efavirenz contraindicated in pregnancy
Source patient taking ZDV (Zidovudine, AZT)	May consider substituting d4T (stavudine) for ZDV (zidovudine, AZT): • D4T 30 mg, one capsule twice daily Administer d4T along with 3TC and Kaletra or with 3TC and Efavirenz: • 3TC (lamivudine) 150 mg, one tablet twice daily • KaletraR (lopinavir 200 mg/ritonavir 50 mg) two capsules twice daily with food • Efavirenz 600 mg qhs	D4t associated more commonly with severe side effects, such as lactic acidosis, peripheral neuropathy, and pancreatitis than ZDV.

Table 9: Recommended doctor visit and follow-up schedule

Time after exposure	Taking PEP	Not taking PEP
Initial visit as soon as possible after exposure	Rapid HIV test, Urine HCG, ALT, AST, FBC. Consider utility of sending Hep B SAb	Rapid HIV test, ALT, AST, Urine HCG. Consider untility of sending Hep B SAb
2 weeks	Rapid HIV test, Urine HCG, ALT, AST, FBC	
6 weeks	Rapid HIV test, Urine HCG, ALT, AST, FBC	Rapid HIV, Urine HCG if at risk for pregnancy

12 weeks	Rapid HIV test, Urine HCG, ALT, AST, FBC	
6 months	Rapid HIV test, ALT, AST, FBC, Hep C, Hep B SAg, Hep B CAb, Hep B SAb	Rapid HIV, Hep C, Hep B SAg, Hep B CAb, Hep B SAb

Table 10: Tetanus Prophylaxis in Wound Management

Primary Series of Tetanus-Toxoid Vaccine	**Tetanus-Prone Wounds[a] Age (Years)**	**Dose of Vaccine**	**Time Since Last Vaccine**	**TIG[b]**	**Clean, Minor Vaccine**	**TIG[b]**
Complete[c]	≤6	<5 years	No	No	No	No
		≥5 years	DTaP[d,e]	No	DTaP[e]	No
	7 to 10	<5 years	No	No	No	No
		≥5 years	No	No	Td[f]	No
	≥11	<5 years	No	No	No	No
		≥5 years	Tdap[g]	No	Tdap[h]	No
Unimmunized, unknown, DTaP[e]		≤6	Not relevant		DTaP[d,e]	No
	Yes					
incomplete, or HIV-infected[i]		7 to 10		Td[f]	No	Td[f]
Yes						
	≥11		Tdap[g]	No	Tdap[h]	Yes

[a]Includes puncture, avulsion, crush, necrotic, and burn wounds; frostbite; and wounds contaminated with dirt, feces, soil, saliva. Wounds should be cleaned, necrotic tissue debrided, and foreign material removed.

[b]The dose of TIG is 250 units given intramuscularly. Immune globulin intravenous can be used if TIG is not available. Equine tetanus antitoxin is not available in the United States. Vaccine and TIG should be given at separate sites.

[c]The primary series is considered complete if the patient has received ≥3 doses of an adsorbed (not fluid) tetanus toxoid. HIV-infected persons should be considered *unimmunized* even if they have received the vaccine series.

[d]A booster dose of DTaP is routinely indicated for all children at 4 to 6 years of age, so a dose should be given to children who have not received a routine booster, even for clean, minor wounds (vaccination here is for catch-up, not wound management).

[e]Use DT if pertussis immunization is contraindicated.

[f]Td is preferred but tetanus toxoid can be used; only adsorbed products are indicated. One brand of Tdap (Boostrix) is licensed down to 10 years of age and may be used instead of Td.

[g]One dose of Tdap is routinely indicated for all adolescents and adults, so a dose should be given (if not previously received) even for clean, minor wounds (vaccination here is for catch-up, not wound management). Use Td if pertussis immunization is contraindicated.
[h]If Tdap is not available or has been given previously, Td (or tetanus toxoid, if Td is not available) should be used. No Tdap is licensed for use in patients >64 years of age. Use Td if pertussis immunization is contraindicated.
[i]For infants <6 months of age who have not received the 3-dose primary series, decisions about the use of TIG should be based on the mother's vaccination history.

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