

Appendix B

Post-Exposure Prophylaxis, Counseling and Follow-up

A. MANAGEMENT OF POTENTIALLY EXPOSED WORKERS

The City of Philadelphia will make available to their workers a system that includes written protocols for prompt reporting, evaluation, counseling, treatment, and follow-up of occupational exposures that may place workers at risk for acquiring any bloodborne infection, including HIV. The City has also established an exposure control plan, including post-exposure follow-up for their employees. Access to clinicians who can provide post-exposure care is available during all working hours, including nights and weekends through the City of Philadelphia's network of Workers' Compensation and Regulation 32 treatment sites. Currently, Jeannes Hospital and Temple Hospital should be used for communicable disease exposures. Anti-retroviral agents for PEP are available for timely administration (i.e., either by providing access to PEP drugs on site or creating links with other facilities or providers to make them available offsite). Persons responsible for providing post-exposure counseling are familiar with evaluation and treatment protocols and the facility's procedures for obtaining drugs for PEP. Workers will be educated to report occupational exposures immediately after they occur, particularly because PEP is most likely to be effective if implemented as soon after the exposure as possible. Workers who are at risk for occupational exposure to HIV will be taught the principles of post-exposure management, including options for PEP, as part of job orientation and ongoing job training.

B. Exposure Report Form

Occupational exposures should be recorded on a communicable disease exposure report form. Post-exposure management should be recorded in the worker's confidential medical record. The communicable disease exposure report form should contain:

- date and time of exposure;
- details of the procedure being performed, including where and how the exposure occurred, and if the exposure was related to a sharp device, the type of device and how and when in the course of handling the device the exposure occurred;
- details of the exposure, including the type and amount of fluid or material and the severity of the exposure (e.g., for a percutaneous exposure, depth of injury and whether fluid was injected; or for a skin or mucous-membrane exposure, the estimated volume of material and duration of contact and the condition of the skin [e.g., chapped, abraded, or intact]);
- details about the exposure source (i.e., whether the source material contained HIV or other bloodborne pathogen[s]), and if the source is an HIV-infected person, the stage of disease, history of antiretroviral therapy, and viral load, if known; and
- date and time that the employee received counseling, post-exposure management, and follow-up.

C. Exposure Management

1. Treatment of an Exposure Site

Wounds and skin sites that have been in contact with blood or body fluids should be washed with soap and water; mucous membranes should be flushed with water. There is no evidence that the use of antiseptics for wound care or expressing fluid by squeezing

the wound further reduces the risk for HIV transmission. However, the use of antiseptics is not contraindicated. The application of caustic agents (e.g., bleach) or the injection of antiseptics or disinfectants into the wound is not recommended.

D. Assessment of BBP Infection Risk

After an occupational exposure, the source-person and the exposed worker should be evaluated to determine the need for HIV PEP. Follow-up for hepatitis B virus and hepatitis C virus infections also should be conducted in accordance with published CDC recommendations

1. HIV Evaluation of exposure.

- a) The exposure should be evaluated for potential to transmit HIV based on the type of body substance involved and the route and severity of the exposure. Exposures to blood, fluid containing visible blood, or other potentially infectious fluid (including semen; vaginal secretions; and cerebrospinal, synovial, pleural, peritoneal, pericardial, and amniotic fluids) or tissue through a percutaneous injury (i.e., needlestick or other penetrating sharps-related event) or through contact with a mucous membrane are situations that pose a risk for bloodborne transmission and require further evaluation (Figure 1).
- b) In addition, any direct contact (i.e., personal protective equipment either was not used or was ineffective in protecting skin or mucous membranes) with concentrated HIV in a research laboratory or production facility is considered an exposure that requires clinical evaluation to assess the need for PEP.
- c) For skin exposures, follow-up is indicated if it involves direct contact with a body fluid listed above and there is evidence of compromised skin integrity (e.g., dermatitis, abrasion, or open wound). However, if the contact is prolonged or involves a large area of intact skin, post-exposure follow-up may be considered on a case-by-case basis or if requested by the worker.
- d) For human bites, the clinical evaluation must consider possible exposure of both the bite recipient and the person who inflicted the bite. HIV transmission only rarely has been reported by this route. If a bite results in blood exposure to either person involved, post-exposure follow-up, including consideration of PEP, should be provided.

2. Evaluation and testing of an exposure source.

- a) The person whose blood or body fluids are the source of an occupational exposure should be evaluated for HIV infection and hepatitis infection.
- b) Information available in the medical record at the time of exposure (e.g., laboratory test results, admitting diagnosis, or past medical history) or from the source person may suggest or rule out possible HIV infection. Examples of information to consider when evaluating an exposure source for possible HIV infection include laboratory information (e.g., prior HIV testing results or results of immunologic testing [e.g., CD4+ count]), clinical symptoms (e.g., acute syndrome suggestive of primary HIV infection or undiagnosed immunodeficiency disease), and history of possible HIV exposures (e.g., injecting-drug use, sexual contact with a known HIV-positive partner, unprotected sexual contact with multiple partners [heterosexual and/or homosexual], or receipt of blood or blood products before 1985).
- c) If the source is known to have HIV infection, available information about this person's stage of infection (i.e., asymptomatic or AIDS), CD4+ T-cell count, results of viral load testing, and current and previous antiretroviral therapy, should be gathered for consideration in choosing an appropriate PEP regimen.

- If this information is not immediately available, initiation of PEP, if indicated, should not be delayed; changes in the PEP regimen can be made after PEP has been started, as appropriate.
- d) If the HIV serostatus of the source person is unknown, the source person should be informed of the incident and, if consent is obtained, tested for serologic evidence of HIV infection. If consent cannot be obtained (e.g., patient is unconscious), procedures should be followed for testing source persons according to Pennsylvania Act 148 applicable state and local laws. Confidentiality of the source person should be maintained at all times.
 - e) HIV-antibody testing of an exposure source should be performed as soon as possible. Hospitals, clinics, and other sites that manage exposed workers should consult their laboratories regarding the most appropriate test to use to expedite these results.
 - f) If the source is HIV seronegative and has no clinical evidence of acquired immunodeficiency syndrome (AIDS) or symptoms of HIV infection, no further testing of the source is indicated. It is unclear whether follow-up testing of a source who is HIV negative at the time of exposure, but recently (i.e., within the last 3–6 months) engaged in behaviors that pose a risk for HIV transmission, is useful in post-exposure management of workers; Workers who become infected generally seroconvert before repeat testing of a source would normally be performed.
 - g) If the exposure source is unknown, information about where and under what circumstances the exposure occurred should be assessed epidemiologically for risk for transmission of HIV. Certain situations, as well as the type of exposure, may suggest an increased or decreased risk; an important consideration is the prevalence of HIV in the population group (i.e., institution or community) from which the contaminated source material is derived. For example, an exposure that occurs in a geographic area where injecting-drug use is prevalent or on an AIDS unit in a health-care facility would be considered epidemiologically to have a higher risk for transmission than one that occurs in a nursing home for the elderly where no known HIV-infected residents are present. In addition, exposure to a blood-filled hollow needle or visibly bloody device suggests a higher-risk exposure than exposure to a needle that was most likely used for giving an injection. Decisions regarding appropriate management should be individualized based on the risk assessment.
 - h) HIV testing of needles or other sharp instruments associated with an exposure, regardless of whether the source is known or unknown, is not recommended. The reliability and interpretation of findings in such circumstances are unknown.

E. Clinical Evaluation and Baseline Testing of Exposed Workers

1. Exposed workers should be evaluated for susceptibility to bloodborne pathogen infections. Baseline testing (i.e., testing to establish serostatus at the time of exposure) for HIV antibody, Hepatitis C virus (HCV) should be performed.

2. If the source person is seronegative for HIV, baseline testing or further follow-up of the worker normally is not necessary. If the source person has recently engaged in behaviors that are associated with a risk for HIV transmission, baseline and follow-up HIV-antibody testing (e.g., 3 and/or 6 months post-exposure) of the worker should be considered.
3. For the person exposed to an HCV-positive source, baseline and follow-up testing including
 - a. baseline testing for antibody to HCV (anti-HCV) and Alanine aminotransferase (ALT) activity; and
 - b. follow-up testing for anti-HCV (e.g., at 4–6 months) and ALT activity.
 - c. For earlier diagnosis of HCV infection, testing for HCV Ribonucleic acid (RNA) may be performed at 4–6 weeks.
4. Serologic testing should be done for all workers who are concerned that they may have been exposed to HIV.
5. For purposes of considering HIV PEP, the evaluation also should include information about medications the worker may be taking and any current or underlying medical conditions or circumstances (i.e., pregnancy, breast feeding, or renal or hepatic disease) that may influence drug selection.
6. Pregnancy testing should be offered to all nonpregnant women of childbearing age whose pregnancy status is unknown.

F. HIV Post Exposure Prophylaxis (PEP)

The following recommendations apply to situations where a worker has had an exposure to a source person with HIV or where information suggests that there is a likelihood that the source person is HIV-infected. These recommendations are based on the risk for HIV infection after different types of exposure and limited data regarding efficacy and toxicity of PEP. **Because most occupational HIV exposures do not result in the transmission of HIV**, potential toxicity must be carefully considered when prescribing PEP. When possible, these recommendations should be implemented in consultation with persons having expertise in antiretroviral therapy and HIV transmission.

1. Explaining PEP to Workers

- a) Recommendations for chemoprophylaxis should be explained to workers who have sustained occupational HIV exposures.
- b) For exposures for which PEP is considered appropriate, workers should be informed that
 - i. knowledge about the efficacy and toxicity of drugs used for PEP are limited;
 - ii. only ZDV has been shown to prevent HIV transmission in humans;
 - iii. there are no data to address whether adding other antiretroviral drugs provides any additional benefit for PEP, but experts recommend combination drug regimens because of increased potency and concerns about drug-resistant virus;
 - iv. data regarding toxicity of antiretroviral drugs in persons without HIV infection or in pregnant women are limited for ZDV and not known regarding other antiretroviral drugs; and
 - v. any or all drugs for PEP may be declined by the worker.
- c) Workers who have HIV occupational exposures for which PEP is not recommended should be informed that the potential side effects and toxicity of taking PEP outweigh the negligible risk of transmission posed by the type of exposure.

2. Factors in Selection of a PEP Regimen

- a) Selection of the PEP regimen should consider the comparative risk represented by the exposure and information about the exposure source, including history of and response to antiretroviral therapy based on clinical response, CD4+ T-lymphocyte counts, viral load measurements, and current disease stage.
- b) Most HIV exposures will warrant only a two-drug regimen, using two NRTIs, usually ZDV and 3TC.
- c) The addition of a third drug, usually a PI (i.e., IDV or NEL), should be considered for exposures that pose an increased risk for transmission or where resistance to the other drugs used for PEP is known or suspected.
- d) Because of severe, life-threatening, cases of hepatotoxicity among patients treated post occupational exposure with this drug, the use of nevirapine (NVP) is **not** recommended for basic or expanded PEP regimens.

3. **Timing of PEP Initiation**

- a) PEP should be initiated as soon as possible. The interval within which PEP should be started for optimal efficacy is not known. Animal studies have demonstrated the importance of starting PEP within hours after an exposure.
- b) To assure timely access to PEP, an occupational exposure should be regarded as an urgent medical concern and PEP started as soon as possible after the exposure (i.e., within a few hours rather than days).
- c) If there is a question about which antiretroviral drugs to use, or whether to use two or three drugs, it is probably better to start ZDV and 3TC immediately than to delay PEP administration.
- d) Although animal studies suggest that PEP probably is not effective when started later than 24–36 hours post-exposure, the interval after which there is no benefit from PEP for humans is undefined. Therefore, if appropriate for the exposure, **PEP should be started even when the interval since exposure exceeds 36 hours.**
- e) Initiating therapy after a longer interval (e.g., 1–2 weeks) may be considered for exposures that represent an increased risk for transmission; even if infection is not prevented, early treatment of acute HIV infection may be beneficial.
- f) The optimal duration of PEP is unknown. Because 4 weeks of ZDV appeared protective in workers, PEP probably should be administered for 4 weeks, if tolerated.

4. **PEP if Serostatus of Source Person is Unknown**

- a) If the source person's HIV serostatus is unknown at the time of exposure (including when the source is HIV negative but may have had a recent HIV exposure), use of PEP should be decided on a case-by-case basis, after considering the type of exposure and the clinical and/or epidemiologic likelihood of HIV infection in the source.
- b) If these considerations suggest a possibility for HIV transmission and HIV testing of the source is pending, it is reasonable to initiate a two-drug PEP regimen until laboratory results have been obtained and later modify or discontinue the regimen accordingly.

5. **PEP if Exposure Source is Unknown**

If the exposure source is unknown, use of PEP should be decided on a case-by-case basis. Consideration should include the severity of the exposure and the epidemiologic likelihood that the worker was exposed to HIV.

6. **PEP for Pregnant Workers**

If the worker is pregnant, the evaluation of risk and need for PEP should be approached as with any other worker who has had an HIV exposure. However, the decision to use any antiretroviral drug during pregnancy should involve discussion between the woman and her health-care provider regarding the potential benefits and potential risks to her and her fetus.

G. Follow-up of Workers Exposed to HIV

1. Post-exposure Testing

Workers with occupational exposure to HIV should receive follow-up counseling, post-exposure testing, and medical evaluation regardless of whether they receive PEP.

- a) HIV-antibody testing should be performed for at least 6 months post-exposure (e.g., at 6 weeks, 12 weeks, and 6 months and 12 months).
- b) HIV testing should be performed on any worker who has an illness that is compatible with an acute retroviral syndrome, regardless of the interval since exposure. HIV-antibody testing using EIA should be used to monitor for seroconversion.
- c) The routine use of direct virus assays (e.g., HIV p24 antigen EIA or polymerase chain reaction for HIV RNA) to detect infection in exposed workers generally is not recommended. Although direct virus assays may detect HIV infection a few days earlier than EIA, the infrequency of worker seroconversion and increased costs of these tests do not warrant their routine use in this setting. Also, HIV RNA is approved for use in established HIV infection; its reliability in detecting very early infection has not been determined.

2. Monitoring and Management of PEP Toxicity

- a) If PEP is used, drug-toxicity monitoring should be performed at baseline and again 2 weeks after starting PEP. Clinical judgement, based on medical conditions that may exist in the worker and any toxicity associated with drugs included in the PEP regimen, should determine the scope of testing.
- b) Minimally testing should include a complete blood count and renal and hepatic chemical function tests. Monitoring for evidence of hyperglycemia should be included for workers whose regimen includes any PI; if the worker is receiving IDV, monitoring for crystalluria, hematuria, hemolytic anemia, and hepatitis also should be included.
- c) If toxicity is noted, modification of the regimen should be considered after expert consultation; further diagnostic studies may be indicated.
- d) Workers who fail to complete the recommended regimen often do so because of the side effects they experience (e.g., nausea and diarrhea). These symptoms often can be managed without changing the regimen by prescribing antimotility and antiemetic agents or other medications that target the specific symptoms. In other situations, modifying the dose interval (i.e., administering a lower dose of drug more frequently throughout the day, as recommended by the manufacturer), may help promote adherence to the regimen.

3. Counseling and Education

- a) Although HIV infection following an occupational exposure occurs infrequently, the emotional impact of the exposure often is substantial. In addition, workers are given seemingly conflicting information. Although workers are told that there is a low risk for HIV transmission, a 4-week regimen of PEP is recommended and they are asked to commit to behavioral measures (i.e., sexual abstinence or condom use) to prevent secondary transmission, all of which influence their lives for several weeks to months.

- b) Therefore, access to persons who are knowledgeable about occupational HIV transmission and who can deal with the many concerns an HIV exposure may raise for the worker is an important element of post-exposure management. HIV-exposed workers should be advised to use the following measures to prevent secondary transmission during the follow-up period, especially during the first 6–12 weeks after the exposure when most HIV-infected persons are expected to seroconvert:
 - i. use sexual abstinence or condoms to prevent sexual transmission and to avoid pregnancy;
 - ii. and refrain from donating blood, plasma, organs, tissue, or semen.
- c) If the exposed worker is breastfeeding, she should be counseled about the risk for HIV transmission through breast milk, and discontinuation of breastfeeding should be considered, especially following high-risk exposures. If the worker chooses to receive PEP, temporary discontinuation of breastfeeding while she is taking PEP should be considered to avoid exposing the infant to these agents. NRTIs are known to pass into breast milk; it is not known whether this also is true for PIs.
- d) There is no need to modify an worker’s patient-care responsibilities to prevent transmission to patients based solely on an HIV exposure. If HIV seroconversion is detected, the worker should be evaluated according to published recommendations for HIV-infected workers.
- e) Exposed workers should be advised to seek medical evaluation for any acute illness that occurs during the follow-up period. Such an illness, particularly if characterized by fever, rash, myalgia, fatigue, malaise, or lymphadenopathy, may be indicative of acute HIV infection but also may be due to a drug reaction or another medical condition.
- f) Exposed workers who choose to take PEP should be advised of the importance of completing the prescribed regimen.
- g) Information should be provided about potential drug interactions and the drugs that should not be taken with PEP, the side effects of the drugs that have been prescribed, measures to minimize these effects, and the methods of clinical monitoring for toxicity during the follow-up period. They should be advised that the evaluation of certain symptoms should not be delayed (e.g., back or abdominal pain, pain on urination or blood in the urine, or symptoms of hyperglycemia [i.e., increased thirst and/or frequent urination]).

H. Recommendations For The Selection Of Drugs For PEP

1. The selection of a drug regimen for HIV PEP must strive to balance the risk for infection against the potential toxicity of the agent(s) used. Because PEP is potentially toxic, its use is not justified for exposures that pose a negligible risk for transmission (Figure 1).
2. Also, there is insufficient evidence to recommend a highly active regimen for all HIV exposures. Therefore, two regimens for PEP are provided (Table 1): a “basic” two-drug regimen that should be appropriate for most HIV exposures and an “expanded” three-drug regimen that should be used for exposures that pose an increased risk for transmission (Figure 1) or where resistance to one or more antiretroviral agents is known or suspected. When possible, the regimens should be implemented in consultation with persons having expertise in antiretroviral treatment and HIV transmission.

I. Situations That Require Special Consideration

1. Resistance of the Source Virus to Antiretroviral Drugs

It is unknown whether drug resistance influences transmission risk; however, transmission of drug-resistant HIV has been reported (81,82) and is therefore a theoretical concern when choosing PEP regimens.

- a) If the source-person's virus is known or suspected to be resistant to one or more of the drugs included in the PEP regimen, the selection of drugs to which the source person's virus is unlikely to be resistant is recommended (69).
- b) If the resistance is to one class of antiretroviral drugs, the addition to the basic PEP regimen of a drug from another class might be considered (e.g., addition of a PI when a source patient has not been treated with a PI but has virus resistant to one or more NRTIs).
- c) It is strongly recommended that PEP be started regardless of the resistance status in the source virus; if resistance is known or suspected, a third or fourth drug may be added to the regimen until consultation with a clinical expert in the treatment of HIV infection or disease can be obtained.

2. Known or Suspected Pregnancy in the worker

- a) Pregnancy should not preclude the use of optimal PEP regimens, and PEP should not be denied to an worker solely on the basis of pregnancy. However, as discussed previously, an occupationally exposed pregnant worker must be provided with full information about what is known and not known regarding the potential benefits and risks associated with use of the antiretroviral drugs to her and her fetus for her to make an informed decision regarding the use of PEP.
- b) The choice of antiretroviral drugs to use for PEP in pregnant workers is complicated by the potential need to alter dosing because of physiologic changes associated with pregnancy and the potential for short- or long-term effects on the fetus and newborn. Thus, considerations that should be discussed with a pregnant worker include the potential risk for HIV transmission based on the type of exposure; the stage of pregnancy (the first trimester being the period of maximal organogenesis and risk for teratogenesis); and what is known about the pharmacokinetics, safety, and tolerability of the drug or combination of drugs in pregnancy.

J. RESOURCES FOR CONSULTATION

1. Clinicians who seek consultation on HIV PEP for assistance in managing an occupational exposure should access local experts in HIV treatment as much as possible.
2. In addition, the "National Clinicians' Post-Exposure Prophylaxis Hotline (PEP-Line)" has been created to assist clinicians with these issues; telephone (888) 448-4911.
3. Other resources and registries include the HIV Post-exposure Prophylaxis Registry, the Antiretroviral Pregnancy Registry, FDA, and CDC (Table 2).

FIGURE 1. Determining the need for HIV postexposure prophylaxis (PEP) after an occupational exposure*

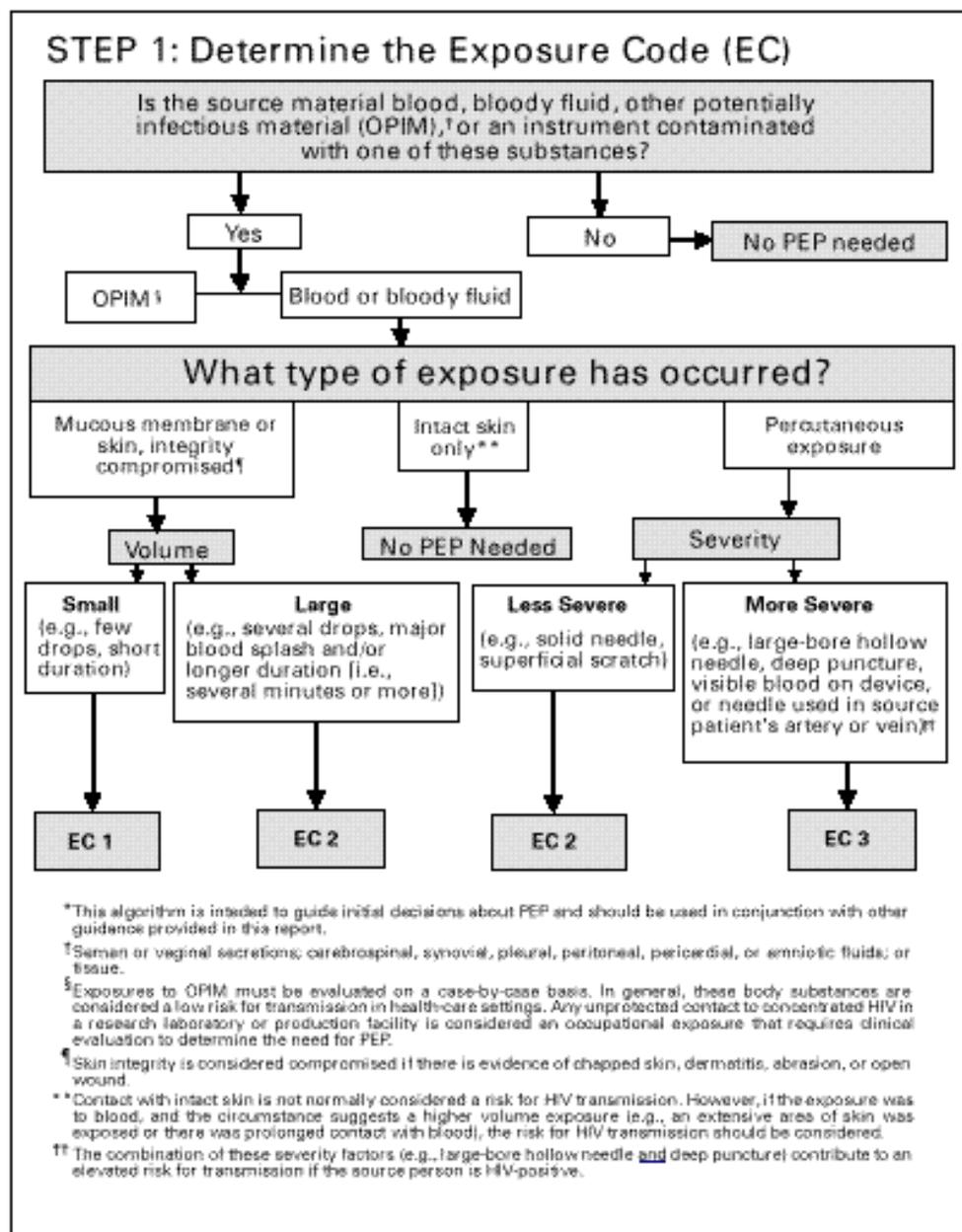


FIGURE 1. Determining the need for HIV postexposure prophylaxis (PEP) after an occupational exposure* — Continued

