Can we prevent infection with HIV after an exposure? The world of post-exposure prophylaxis (PEP)

By Harlon Davey, Laurel Challacombe and James Wilton

Much of the work we do in HIV prevention is aimed at trying to stop people from engaging in behaviours that could expose them to HIV and potentially lead to infection. But what happens if someone thinks they may have already been exposed to HIV? Is there a way we can stop them from getting infected? Post-exposure prophylaxis, or PEP, could be an option.

What is post-exposure prophylaxis?

With PEP, an HIV-negative person who may have been exposed to HIV takes anti-HIV drugs prescribed by a doctor to prevent infection. These are the same drugs that people living with HIV take. PEP involves taking two or three of these drugs for a period of one month. To effectively reduce a person’s risk of becoming HIV-positive, PEP must be taken within 72 hours of possible exposure to HIV but ideally as early as possible.

In the world of PEP, exposure to HIV is often divided into two categories: occupational exposure and non-occupational exposure. “Occupational” exposure refers to exposure to HIV at work, in a healthcare setting. For example, a healthcare provider could be exposed to HIV through a needlestick injury at work. “Non-occupational” exposure refers to exposure to HIV through sex or drug use, for example, when a person shares a needle or has sex without a condom.

What is the rationale for PEP?

In the first one to three days following exposure to HIV, there is a ‘window of opportunity’ when taking PEP might prevent an HIV infection from occurring. During this ‘window of opportunity,’ the virus is busy infecting cells at the site of exposure (such as in the anus, penis or vagina). Once the virus is inside a cell, it starts replicating to produce more HIV (also known as virions). After a few days, these new HIV virions start to spread throughout the body; once this happens, infection is permanent. The theory is that if PEP is given to a person early enough, it can stop the virus from replicating at the initial site of exposure, preventing virions from spreading throughout the body – stopping the infection from becoming permanent. The cells that initially became infected would eventually die out and the virus would not be able to replicate.

What is the evidence on PEP?

There is some evidence that suggests that providing PEP after a potential exposure to HIV can help reduce a person’s risk of HIV infection. However, we also know that PEP is not 100% effective, meaning that it will not prevent all HIV infections.
What does someone need to know to access PEP?

People at risk need to know that PEP exists. If people are unaware of PEP, they won’t know that PEP is an option in the event of a high-risk behaviour that could result in being exposed to HIV. Very little research has been done to determine how many people are aware of PEP; however, based on the research that has been done, it seems that only a small proportion of gay and heterosexual men and women, even in cities with well-established PEP programs, are aware of PEP.  

People at risk need to know that time is of the essence. The later someone starts PEP, the less likely it is to prevent HIV infection. The best time to start PEP is immediately after exposure. However, PEP has some ability to prevent HIV infection up to 72 hours after infection.

People at risk need to know where to go. PEP must be prescribed by a doctor. Since time is of the essence, people need to be able to access services that are always open, such as emergency rooms. As a service provider, it may be important for you to know if there is a physician or healthcare facility in your area willing to prescribe PEP. If there isn’t, perhaps your organization can inform local clinicians of PEP and push for access to PEP for your clients.

Anyone accessing PEP will be tested for HIV. PEP is used to prevent HIV, not to treat it. People who go to a healthcare facility for PEP will be tested for HIV. They will still be prescribed PEP while the test results are pending; however, if the result is positive, PEP may either be discontinued or the anti-HIV drugs may be changed to HAART (highly active antiretroviral therapy) to treat the person’s HIV infection.

PEP can be costly and it may have to be paid for out of pocket. The cost of a full course of PEP is approximately $1100 to $1500. PEP may be covered by some private insurance plans and some public health insurance plans, depending on the province and the nature of the exposure. However, many at-risk individuals may not have access to any drug coverage and may not be able to afford it. There may be a need for advocacy in your area or province to fight for universal access to PEP.

People on PEP may experience side effects. Depending on the anti-HIV drugs prescribed, people may experience side effects from PEP, such as fatigue, nausea or diarrhea. This can cause people to stop taking their PEP drugs as prescribed, which can decrease the ability of the medications to prevent HIV infection and increase the likelihood of being infected with a drug-resistant strain of HIV.

People on PEP have to be monitored by a doctor. Testing for toxicity will be required to make sure the drugs are not causing harm to the body. The type of tests may differ depending on the anti-HIV drugs that are prescribed but would likely include liver and kidney tests.

PEP can fail to prevent HIV infection if someone doesn’t take the anti-HIV drugs as prescribed. Taking the anti-HIV drugs exactly as prescribed (also known as adherence) is central to the success of PEP. If someone doesn’t take their PEP as prescribed, then HIV infection could occur. There are two issues with adherence:

- Some people might start PEP but stop using it early (before the four weeks are over). In research studies 24% to 78% of people who started PEP stopped taking it early.  
- Some people may not take their PEP exactly as prescribed. For example, some people may occasionally forget doses, or take only every second dose.

Drug resistance can develop if a person doesn’t take the anti-HIV drugs as prescribed. If a person becomes HIV-positive due to non-adherence, they may develop drug resistance. When someone does not take PEP as prescribed, the amount of anti-HIV drugs in the blood can be too low to suppress the HIV, which can allow the virus to evolve and develop resistance. It is important to understand that infection with a drug-resistant strain of HIV limits a person’s future treatment options. If a person with a drug-resistant strain of HIV subsequently infects someone else with HIV, drug resistance spreads within the community.

Community agencies can provide adherence support for people on PEP by providing ongoing consultation and...
encouragement to help people take PEP exactly as prescribed and to complete their treatment.

**PEP may fail to prevent HIV infection due to drug resistance.** If a person is exposed to a drug-resistant strain of HIV and the person is prescribed the drug they are resistant to, as part of their PEP regime, then PEP may fail to prevent HIV infection. Unfortunately, there is no way to know within the first one to three days if someone has been exposed to drug-resistant HIV.

**Using PEP inappropriately**

Some policy makers are concerned that promoting PEP may have a negative effect on people’s behaviour. They worry that PEP may lead to more people participating in risky sex or injection practices, and that we could end up with more HIV infections than before. The other issue is that PEP does not protect against hepatitis B or C, or other sexually transmitted infections. Any increase in risky behaviours could lead to an increase in these as well.

This stems from a fear that people may look at PEP like the ‘morning after pill’ – a quick fix to any behaviour that could result in their getting HIV. However, PEP is far from a quick fix. As we already know, PEP is not 100% effective and it can be difficult to tolerate due to its potential side effects.

The research done to date has found no increase in risk behaviours among those who have accessed PEP. Furthermore, there is little evidence that people continue to use PEP after their first use. This may be because all of the PEP programs that were researched had strong risk-reduction counselling services. This could explain why risky behaviours didn’t increase among PEP users. It also highlights the need for risk reduction counselling for all people who access PEP.

**What are the guidelines for PEP in Canada?**

The Joint United Nations Programme on HIV/AIDS (UNAIDS) has guidelines for universal access to PEP, as do many countries in the developed world, including the US, UK, France and Australia. Surprisingly, there are no national guidelines for PEP use in Canada. The Canadian STI guidelines mention PEP for occupational exposure; however, these make no mention of PEP use for non-occupational exposure. It is important for us to push for the development of national guidelines that stress universal access to PEP similar to those of the US and many other countries.

Some provinces in Canada have their own guidelines, some for occupational exposure, some for both occupational and non-occupational exposure (and some for specific types of non-occupational exposure, such as sexual assault). Even if your province has guidelines, they may not be followed in your area, because the decision about offering PEP often lies with local healthcare providers, such as hospital emergency rooms. To find out about access to PEP in your area, try contacting your local hospital, infectious disease doctor and/or family physician that provides HIV care in your area. Ask them whether they provide PEP for non-occupational exposure to HIV and what they would suggest you tell your clients about accessing PEP.

**Cost-effectiveness**

Cost-effectiveness is a way of determining if the benefits gained by an intervention are worth the costs required to provide it. This kind of analysis is often used to guide public health decision making. In the field of HIV prevention, an intervention is generally considered to be cost-effective if the cost of preventing one infection is lower than the cost of treating a person who is infected with HIV. Studies show that it isn’t cost-effective to give PEP to everyone. Before offering PEP, it is important to screen people to determine if there is a real risk. Studies have found that it is cost-effective to promote PEP, as a public health measure, under the following circumstances:

- If a person’s partner is known to be HIV-positive, then it is cost-effective to use PEP for any activity that could potentially transmit HIV.
- If the HIV status of the partner is unknown, PEP is cost-effective for gay men practicing receptive anal sex. It may also be cost-effective for people who share needles and for women who may have been exposed to HIV through unprotected anal or vaginal intercourse. The use of PEP for other kinds of exposures is not considered cost-effective because of the low risk of transmission and the very high cost of PEP.
People who are accessing PEP for an exposure to a person whose HIV status is unknown should be encouraged, if possible, to bring the partner to the clinic to be tested for HIV even if PEP has already been started. If the partner tests negative, then there is no risk of HIV transmission and PEP can be avoided or stopped. This will save money and avoid any unpleasant side effects that may result from taking PEP.

An example of a PEP program in Canada

Clinique médicale l’Actuel, based in Montreal, is one of the only clinics in Canada that has established a program that offers PEP to people who may have come into contact with HIV through risky sex or drug use. While other clinics may offer PEP on a case-by-case basis, Clinique médicale l’Actuel engages in an ongoing poster campaign in the gay community in Montreal to increase awareness of PEP and encourage people at risk to use it. While the services offered by the clinic are available to everyone, their promotion of their PEP service specifically targets gay and bisexual men, because of their increased risk of HIV.

The service offers access to PEP and helps individuals adhere to PEP for the 28 days. In addition to PEP, the clinic offers other services, such as testing and counselling for sexually transmitted infections, HIV, hepatitis B and hepatitis C. It also provides safer sex education. Since people who access PEP have recently had a risky encounter, they may benefit from these additional services.

Clinique médicale l’Actuel provides universal access to PEP. While the program specifically targets gay men, they have prescribed PEP to others at risk of infection. In Quebec, the cost of PEP is covered, either through private insurance (if the person has insurance) or by Quebec’s provincial drug plan.

Next steps

There is some research that shows us that PEP can prevent HIV infections if people take it soon enough after exposure and as prescribed. Despite this evidence, only a very small proportion of people at high risk for HIV are aware of PEP. Furthermore, the availability of PEP varies across the country and there are no national guidelines on PEP use and no strategy to ensure access for those in need.

Access to PEP in Canada currently depends on whether there is a healthcare provider in your area willing to prescribe PEP to people who may have been exposed to HIV through sex or drug use. If PEP is available, your agency may have a role to play to ensure that messaging about PEP is clear, to help people make informed decisions about PEP use, and to support those who are taking PEP. If PEP is not available in your area, then advocacy may be the key to making it available and to ensuring universal access.

References


**About the author(s)**

**Harlon Davey** is a former member of the Board of Directors of CATIE. He has been living with HIV since 1987 and in 2007 successfully completed treatment for Hepatitis C. He has a B.A. in Economics, a B.Sc. in Zoology and a Master’s of Forest Conservation (M.F.C.). Harlon has been appointed as the patient member to the Committee to Evaluate Drugs, an expert advisory committee that makes recommendations on which drugs will be listed on the Ontario formulary. His passion is for fair and equal access to treatment. His inspiration is walking through the forest.

**Laurel Challacombe** holds a Masters degree in Epidemiology and is currently Manager of Research and Evaluation at CATIE. Laurel has worked in the field of HIV for over 10 years and has held a variety of positions in both provincial and regional organizations, working in research and knowledge transfer and exchange.

**James Wilton** is the Project Coordinator of the Biomedical Science of HIV Prevention Project at the Canadian AIDS Treatment Information Exchange (CATIE). James has an undergraduate degree in Microbiology and Immunology from the University of British Columbia.
Disclaimer

Decisions about particular medical treatments should always be made in consultation with a qualified medical practitioner knowledgeable about HIV- and hepatitis C-related illness and the treatments in question.

CATIE provides information resources to help people living with HIV and/or hepatitis C who wish to manage their own health care in partnership with their care providers. Information accessed through or published or provided by CATIE, however, is not to be considered medical advice. We do not recommend or advocate particular treatments and we urge users to consult as broad a range of sources as possible. We strongly urge users to consult with a qualified medical practitioner prior to undertaking any decision, use or action of a medical nature.

CATIE endeavours to provide the most up-to-date and accurate information at the time of publication. However, information changes and users are encouraged to ensure they have the most current information. Users relying solely on this information do so entirely at their own risk. Neither CATIE nor any of its partners or funders, nor any of their employees, directors, officers or volunteers may be held liable for damages of any kind that may result from the use or misuse of any such information. Any opinions expressed herein or in any article or publication accessed or published or provided by CATIE may not reflect the policies or opinions of CATIE or any partners or funders.

Information on safer drug use is presented as a public health service to help people make healthier choices to reduce the spread of HIV, viral hepatitis and other infections. It is not intended to encourage or promote the use or possession of illegal drugs.

Permission to Reproduce

This document is copyrighted. It may be reprinted and distributed in its entirety for non-commercial purposes without prior permission, but permission must be obtained to edit its content. The following credit must appear on any reprint: This information was provided by CATIE (the Canadian AIDS Treatment Information Exchange). For more information, contact CATIE at 1.800.263.1638.

© CATIE

Production of this content has been made possible through a financial contribution from the Public Health Agency of Canada.