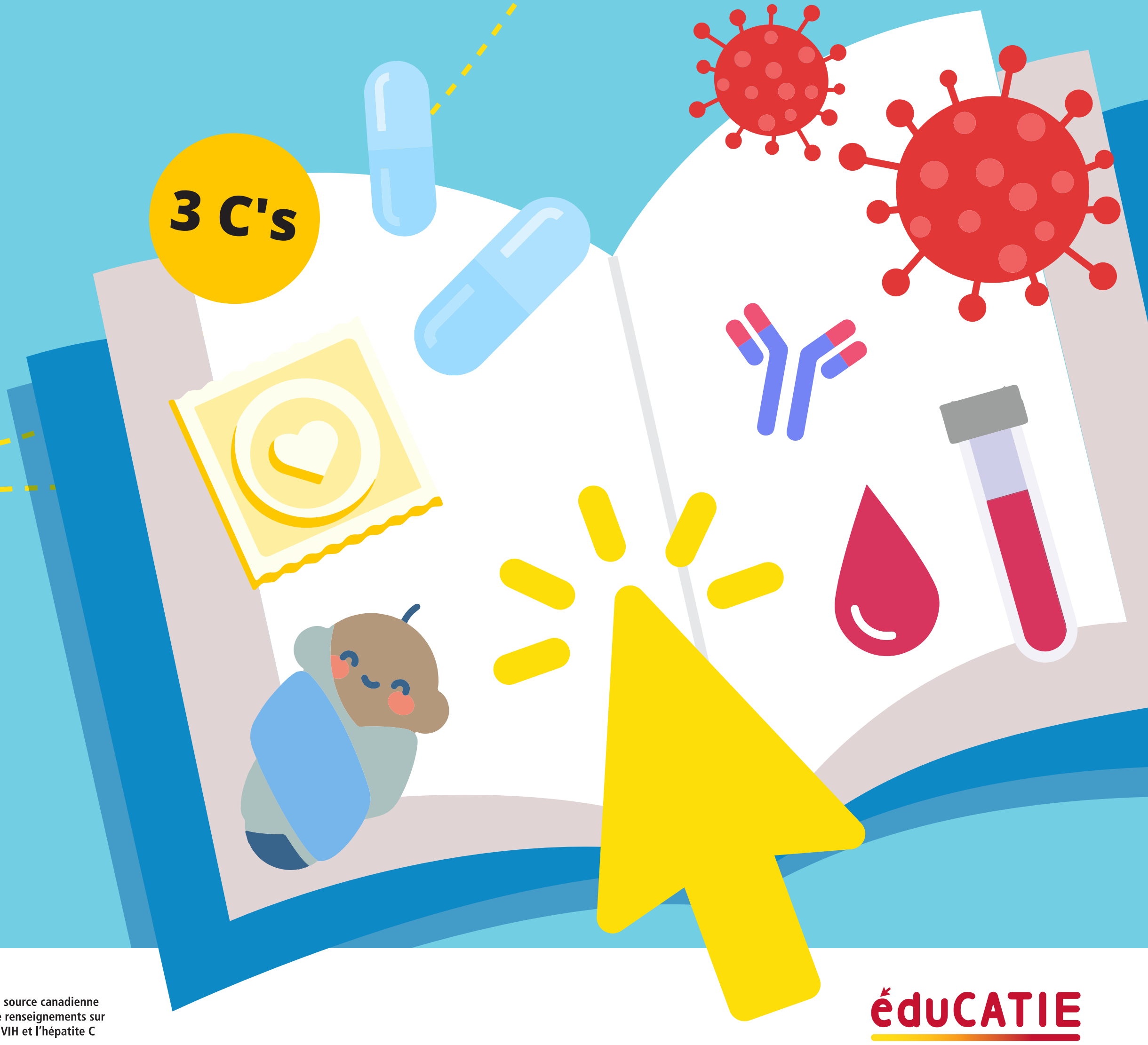
/ COURSE CONTENT

# HIV Basics

Foundational knowledge of HIV for service providers working with people living with or at risk of HIV.



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# 1

# Introduction to HIV

**At the end of this unit, you will be able to:**

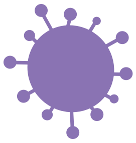
1 *Explain what HIV is.*

2 *Identify the populations most impacted by HIV in Canada.*

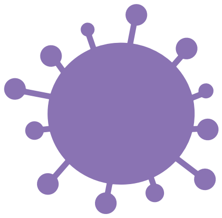
3 *Recognize the influence of social and structural factors on HIV health inequity.*

4 *Explain how to provide services that help address HIV health inequities.*

## What is HIV and how does it affect the body?



HIV, which stands for ***human immunodeficiency virus***, is a virus that attacks the body's immune system. The immune system is responsible for organizing a complex response to fight viruses and bacteria that enter the body from the outside world. This response is essential for maintaining good health.



When HIV gets into the body it attacks the immune system and over time it can severely weaken the body's ability to fight off disease and illness. HIV does this by targeting and entering a type of cell in the immune system known as the ***CD4 cell***. HIV needs to take over the CD4 cell in order to make copies of itself. When the new copies of the virus are released from the CD4 cell into the body, the CD4 cell is destroyed. The new viral copies then go on to infect more CD4 cells in the body to make even more copies of HIV.

Without HIV treatment, over a few years the number of CD4 cells in the body is depleted. This weakens the immune system's ability to fight disease and illness because CD4 cells play an important role in directing our body's immune system response. When the immune system has been badly damaged by HIV, it can no longer defend against certain infections and diseases that typically only occur when a person's immune system is very weak. This is known as AIDS or ***Acquired Immunodeficiency Syndrome***. Thanks to effective HIV treatment, most people with HIV in Canada never get AIDS.

## How is HIV transmitted? Can it be prevented?

HIV is transmitted from person to person. The two main ways that HIV is transmitted in Canada are through unprotected anal or vaginal sex and through sharing needles and other equipment to inject drugs. HIV can also be passed during pregnancy and childbirth.

There are many highly effective ways to prevent HIV. Using condoms for sex, new equipment to inject drugs and taking HIV prevention medications like ***pre-exposure prophylaxis*** (PrEP) and ***post-exposure prophylaxis*** (PEP) are all highly effective ways to prevent HIV.

Another highly effective way to prevent HIV is for people living with HIV to be on successful HIV treatment. Successful HIV treatment prevents HIV from passing to sex partners and can also prevent HIV from passing to a baby during pregnancy or delivery. Successful treatment can also lower the chance of passing HIV when people share equipment to inject drugs, but we don't know by how much.

## How do people know if they have HIV?

The only way to know if someone has HIV is to get tested. People can have HIV and not know it.

Some people have flu-like symptoms when they first get HIV (fever, sore throat, swollen glands). But many people have no symptoms at all. People can have HIV and not know it. The only way to know for sure is to get tested.

## Is there treatment for HIV?

While there is no cure for HIV, with proper treatment and care, people with HIV can live long and healthy lives and avoid passing HIV to others. In fact, a person living with HIV who is on successful treatment cannot pass HIV to their sex partners.

Today's treatments are so effective that when used as prescribed they can reduce the amount of HIV in the body to levels that aren't detectable by current tests. This is known as having an undetectable viral load. Being 'undetectable' does not mean that HIV is no longer in the body. It's still there, but at greatly reduced levels. If treatment is stopped, the amount of virus in the body will start to increase and HIV will become detectable again. This can also happen if someone is not taking their treatment as prescribed.

We have learned that there are huge benefits to starting HIV treatment early, before the virus has had a chance to do much damage to the immune system. The earlier someone is diagnosed with HIV after infection and the earlier they start treatment, the better it is for their health. With the highly effective and easy-to-take treatments now available, many people can limit the long-term effects of HIV infection on their body by starting treatment early.

However, some people don't get diagnosed until later in their infection, after their immune system has been damaged by HIV. It is possible for the immune system to recover some of its function if a person starts treatment as soon as possible after diagnosis and taking treatment as prescribed.

HIV treatment is a lifesaver. There are now many HIV medications available that are very effective and have few side effects. Starting and staying on treatment is the best thing that a person living with HIV can do for their health.

## Populations most impacted by HIV in Canada

HIV can affect anyone, no matter their age, sex, gender, sexual orientation, race or ethnic origin. However, certain populations carry a disproportionate burden of HIV in Canada.

In Canada, the HIV epidemic is concentrated in marginalized communities, notably sexual minorities and communities of colour, due to structural and social factors that create health inequities. The populations that are disproportionately affected by HIV in Canada include:

- Two Spirit, gay, bisexual, queer, and other men who have sex with men (cis and trans)
- Trans women
- People who inject drugs
- Indigenous peoples (First Nations, Inuit, Métis)
- African, Caribbean and Black communities
- Sex workers
- People living in or recently released from correctional facilities

While these populations have higher rates of HIV and carry a disproportionate burden of HIV compared to the broader population, this does not mean that being a member of one of these populations is a risk factor for HIV. The intersections of many factors and experiences over an individual's lifetime can lead to increased risk among people within these populations. It is also important to recognize the strengths and protective factors that exist within each of these communities and to work toward building upon those strengths to support and enhance health and wellness.

## Influence of social and structural factors on HIV health inequity

Certain populations are overrepresented in the HIV epidemic in Canada because they disproportionately experience a range of structural and social factors that can create health inequities (which are unfair differences in health status). These factors and the resulting inequities can increase vulnerability to HIV, create barriers to health services, and lead to poorer health outcomes for people living with HIV in these populations.

## What are these structural and social factors and how do they create health inequities?

Structural factors include broad political, economic, social and environmental conditions that result in social divisions or class structure in our society. Structural factors influence the distribution of power and resources differently across lines such as race, gender, sexual orientation and class. Structural factors are complex and are linked to a lack of resources and opportunity. We can see these structural factors and access to resources at play when we look at the social, economic and environmental conditions in which people are born, grow up, live, work and age. These conditions are referred to as social factors or are sometimes referred to as "***social determinants of health***."

Social factors are diverse and can lead to HIV health inequities. Examples of social factors include poverty; lack of employment or job security; lower educational attainment; incarceration; being underhoused or homeless; experiencing social exclusion, stigma, racism, homophobia, sexism and/or other discrimination; and a lack of social support networks. These social factors can lead to HIV health inequities because they often result in social discrimination and stigma, and they impact the resources and opportunities available to people.

Let's work through a few very simplified examples to demonstrate how this works. However, in the real world it is much more complicated than these examples depict.

**Example one**

> A structural factor that has impacted Indigenous communities in Canada is the ongoing legacies of colonialism. This includes both past and current oppressive colonial systems in Canada. This structural factor has affected Indigenous communities in many ways: It sought to destroy Indigenous communities, cultures and ways of knowing and being; disconnected Indigenous peoples from their lands and languages; and imposed colonial systems, such as residential schools, which has resulted in oppressive social, political and economic systems. As a result of colonial policies and attitudes, Indigenous peoples are more likely than non-Indigenous people to have experienced social factors such as racism, discrimination and intergenerational trauma. These social factors can create HIV health inequities in many ways. For example, there is a recognized link between the harms of intergenerational trauma and the use of substances as a way to cope with this trauma, which in turn increases the risk of getting HIV. There is also a clear relationship between ongoing anti-Indigenous racism within the health system and Indigenous people's access to health services. Because of this, some Indigenous people may not seek out HIV testing, treatment or prevention services due to previous experiences of stigma, discrimination and racism from healthcare providers.

**Example two**

> A structural factor that has impacted people who use drugs is the ongoing criminalization of drug use in Canada. This structural factor has affected people who use drugs in many ways, such as by increasing their risk for incarceration, homelessness and poverty. These social factors can create HIV health inequities by excluding people who use drugs from mainstream society and impacting their ability to access resources that can support them to prevent or manage HIV. For example, stable housing has been found to be a key factor in preventing HIV among people who use drugs, but people who use drugs can be systemically excluded from housing due to the criminalization of drug use. People who use drugs also experience stigma and discrimination within the healthcare system, which impacts their willingness and ability to access a range of health services.

## Providing services that help to address HIV health inequities

To help address HIV health inequities we need to ensure that our programs work with communities and individual service users to tackle all facets of wellness, including the factors that contribute to HIV vulnerability and poor HIV health outcomes. This includes addressing barriers to programs and services (e.g., stigma, racism and homophobia) that exist for communities disproportionately affected by HIV in Canada and addressing social factors that contribute to HIV vulnerability and poor HIV health outcomes. Our programs also need to draw on the strengths and protective factors that exist within each of these communities (e.g., traditional Indigenous knowledge and wellness practices, harm reduction knowledge and practices) and to work toward building upon those strengths to support and enhance health and wellness.

HIV programs and services must be client centered and culturally appropriate and provide welcoming care. Service providers can better do this by meaningfully engaging communities and service users in the development and delivery of services to ensure that they are appropriate and responsive to the community's needs (e.g., through consultation and employment). This includes understanding community and cultural norms related to HIV prevention, testing, care and treatment and the factors that influence individuals' perceptions of and ability to engage in these services.

We also need to work with individual service users to address any social factors that may increase their vulnerability to HIV and/or impact their ability to access services. Consider who an individual is and where they are coming from, including the role of their family, community and past experiences. For example, we may assist service users with housing and income support programs or we may help people navigate the health system by accompanying them to appointments. Addressing the barriers that individuals face contributes to individual well-being.

HIV services should address engagement and linkage across the continuum of prevention, testing, treatment, care and support. The goal is to provide an integrated approach that develops more comprehensive services that reach people in the right place, at the right time, in order for them to reduce HIV transmission and improve HIV health outcomes.

We also have a role to play in advocating for change at the structural level to help improve the political, economic, social and environmental conditions that negatively affect the communities we serve (for example, working to end the criminalization of drug use in Canada).

# 2

# HIV Transmission and Prevention

**At the end of this unit, you will be able to:**

1 *Explain the HIV transmission equation (fluid, route, activity).*

2 *Identify the activities that most commonly transmit HIV.*

3 *Recognize common misconceptions of how HIV is transmitted.*

4 *Identify the highly effective ways to prevent HIV.*

## HIV transmission equation

The spread of HIV from person to person is called HIV transmission. It requires a particular set of circumstances for it to occur. The HIV transmission equation can help to illustrate the three components that are necessary for HIV transmission to happen.

The HIV transmission equation breaks HIV transmission down into three necessary components: ***fluid***, ***route*** and ***activity***. There needs to be a bodily fluid from a person living with HIV that contains enough HIV to cause infection, a route within an HIV-negative person that HIV can use to enter that person's body, and an activity that brings the fluid and route together.

There are ***five bodily fluids*** that can contain enough HIV to transmit the virus: blood, semen (including pre-cum), rectal fluid, vaginal fluid and breast milk (sometimes referred to as chest milk).

There are ***two routes*** that HIV can use to get into the body of an HIV-negative person. HIV can get into the body by crossing a mucous membrane. Mucous membranes are the wet linings of the body, such as the opening of the penis, the foreskin, the vagina or the rectum. The second way that HIV can get into the body is through a break in the skin, such as when someone shares needles used to inject drugs or someone has a needlestick injury.

Finally, there needs to be an activity that brings the fluid and route together for HIV transmission to occur.

In Canada, the activities that most commonly bring the fluid and route together are unprotected sex and the sharing of injection drug use equipment, such as needles and cookers. HIV is less commonly transmitted during pregnancy, birth and breastfeeding due to a high level of HIV treatment uptake that can help prevent HIV transmission to the infant. Finally, HIV transmission rarely happens from oral sex, tattooing and piercing and needlestick injury.

Let's start with the activities that most commonly lead to HIV transmission in Canada: unprotected sex and the sharing of injection drug use equipment.

## Activities that most commonly transmit HIV

### *Anal sex*

Let's begin with anal sex. HIV can be transmitted during unprotected anal sex through semen, including pre-cum, rectal fluid or blood, if present.

For transmission to occur through anal sex, one of these fluids, containing enough HIV, must come in contact with a mucous membrane of an HIV-negative person and then cross the mucous membrane to enter the body. The mucous membranes involved in anal sex are the rectum for the receptive partner (also known as the bottom) and the opening of the penis or the foreskin for the insertive partner (also known as the top).

Anal sex carries the highest chance for HIV transmission. The chance for HIV transmission is also dependent on a person's position during anal sex. The receptive partner, the bottom, has a higher chance of HIV transmission compared to the insertive partner, the top. This is because HIV can more easily get into a person's body through the thin rectal lining than through the urethra or foreskin of a penis.

### *Vaginal (frontal) sex*

HIV can also be transmitted during unprotected vaginal sex through vaginal fluid, semen/pre-cum or blood, if present.

For transmission to occur, one of these fluids, containing enough HIV, must come in contact with a mucous membrane of an HIV-negative person and then cross the mucous membrane to enter the body. The mucous membranes involved in vaginal sex are the opening of the penis or the foreskin for the insertive partner and the vagina (or front hole) or cervix for the receptive partner.

Vaginal sex, also known as frontal sex, has a lower chance for HIV transmission than anal sex but still carries a high chance for HIV transmission. The receptive partner has a higher chance of HIV transmission compared to the insertive partner. This is because HIV can more easily get into a person's body through the vagina or cervix than through the urethra or foreskin of a penis.

### *Injection drug use*

HIV can be transmitted through blood that remains in used needles or other injection drug use equipment, even if the amount of blood is so small it can't be seen.

When a needle or other injection drug use equipment is re-used, blood that may contain HIV can be injected directly into another person's bloodstream.

Sharing needles or other equipment used to inject drugs carries a high chance for HIV transmission.

## Pregnancy, delivery and breastfeeding

HIV is less commonly transmitted during pregnancy, labour and delivery (also known as perinatal HIV transmission) in Canada because the vast majority of pregnant people are on effective HIV treatment that significantly reduces the chance of HIV transmission. In fact, if effective HIV treatment is used throughout pregnancy, HIV will not be transmitted during pregnancy or delivery.

Infants who do get HIV through perinatal transmission usually acquire it during labour and delivery, when they are exposed to blood and vaginal fluid as they pass through the birth canal. Additionally, HIV in the parent's blood can pass to a fetus through the placenta during pregnancy.

HIV can also be transmitted to an infant through breast milk. However, in Canada formula feeding is recommended to eliminate the chance of transmission. If a person chooses to breastfeed their infant (sometimes referred to as chestfeeding), it is important to work with a knowledgeable healthcare provider who can provide support to do so as safely as possible.

## Activities that rarely transmit HIV

Let's move on to those activities that only rarely result in HIV transmission in Canada. These include oral sex, tattooing and piercing and needlestick injury. These activities have the potential to transmit HIV but they either have a much lower chance for transmission or transmission is much less likely to happen due to protocols or procedures that have been put in place to limit transmission.

### *Oral Sex*

The chance of HIV transmission from oral sex ranges from very low to zero depending on the type of oral sex.

For people **giving** oral sex, HIV transmission can happen through sores or cuts in the mouth or through the mucous membranes of the mouth and throat if a person with HIV ejaculates (cums) in their mouth; however, the chance is very low. There is almost no chance of getting HIV from performing oral sex on a penis (blow job) when the person does not ejaculate or from performing oral sex on a vulva (eating someone out).

For people **receiving** any type of oral sex, there is no chance of getting HIV.

### *Tattooing or piercing*

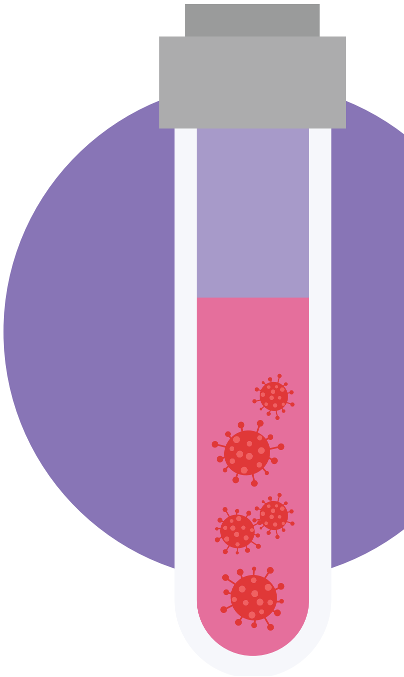
HIV can be transmitted through blood that remains in used needles or other equipment, including ink, used for tattooing or piercing. This can happen even if the amount of blood is so small it can't be seen. However, most tattooing and piercing in Canada is done using proper infection control procedures, which ensures that all equipment is new or properly sterilized between each use. There is no chance of HIV transmission from tattooing or piercing in Canada when proper infection control procedures are used. However, it is possible to get HIV from tattooing or piercing if proper infection control procedures are not used.

When proper infection control procedures are not used and a needle or other equipment is re-used, blood that may contain HIV can make its way directly into a person's body through the tattooing or piercing process.

### *Needlestick injury*

HIV can be transmitted through a needlestick injury in healthcare and community-based settings. However, the use of universal precautions, also known as standard precautions, helps to minimize the chance of accidental needlestick injuries in Canada. In addition, post-exposure prophylaxis (PEP) can be used to help prevent infection after a needlestick injury.

## Viral load



Viral load is the amount of HIV in the body of someone with HIV. The viral load of a person living with HIV is the most important biological factor that can increase or decrease the chance of HIV transmission to an HIV-negative person.

A high amount of HIV in the body (a high viral load) can greatly increase the chance of HIV transmission. On the other hand, a low viral load can dramatically lower the chance. We now know that people who are on HIV treatment and have an undetectable viral load cannot transmit HIV to others through sexual activities.

Viral load is highest shortly after someone gets HIV and is also high among people who are not on successful treatment. It is very important to diagnose, support and offer treatment to people as soon as possible after they get HIV. It is also important to support people to stay on treatment over the long term to maintain their health and to help prevent further transmissions in the community.

## Misconceptions of how HIV is transmitted

Misconceptions of how HIV is transmitted continue to exist in Canada. It is important to bust these misconceptions to reduce stigma and discrimination.

Some common misconceptions are that HIV can be passed by:

- shaking hands, working or eating with someone who has HIV
- hugging or kissing

- coughing, sneezing or spitting
- swimming pools, toilet seats or water fountains
- insects or animals

We know that HIV cannot be transmitted through saliva, tears, sweat, urine or feces, or through casual contact with a person who has HIV, or through objects such as toilet seats, doorknobs or dishes used by a person who has HIV.

Some people got HIV after receiving a blood transfusion or organ or tissue transplant. However, Canada implemented HIV screening for all blood and tissue donations in 1985. There have been no cases of HIV transmission from blood donations in Canada since this time.

## Highly effective ways to prevent HIV

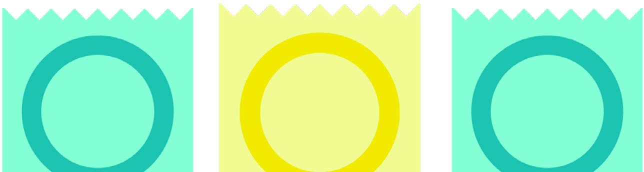
We now have more tools and strategies than ever before to help prevent HIV transmission. Highly effective strategies include using condoms and new equipment to inject drugs, pre-exposure prophylaxis (PrEP), post-exposure prophylaxis (PEP) and effective treatment for people living with HIV.

When highly effective HIV prevention strategies are used consistently and correctly, they reduce the chance of HIV transmission to low or zero. There are also additional HIV risk reduction tools that can help minimize risk, such as choosing sexual or drug use activities that have a lower chance of transmitting HIV.

### *Condoms*

Condoms are a highly effective strategy to help prevent HIV and other sexually transmitted infections (STIs) if they are used the right way each time someone has sex. There are two types of condoms: external (sometimes called male condoms) and internal (sometimes called insertive or female condoms). Depending on a person's preference, either can be used for vaginal or anal sex. The use of a water-based or silicone-based lube is recommended, as it reduces friction and lowers the chances of the condom breaking during sex. Oil-based lube is not recommended because it can lead to condom breakage.

The chance of getting HIV or STIs is very low if condoms are used the right way each time someone has sex.



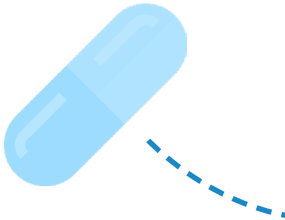
### *New injection drug use equipment*

Using new equipment every time someone injects drugs is a highly effective strategy to prevent HIV, as well as hepatitis B and C. When injecting drugs, people should use new needles, syringes, filters, cookers, acidifiers, alcohol swabs and sterile water each time. This equipment should not be shared or re-used.

There is no chance of getting HIV or hepatitis B or C through drug use if new equipment is used each time someone injects drugs, which means no sharing of drug use equipment occurs.

### *HIV medications to prevent HIV for people who are HIV negative*

There are two highly effective ways to prevent HIV through the use of HIV medications for people who are HIV negative. These include ***pre-exposure prophylaxis*** (PrEP), and ***post-exposure prophylaxis*** (PEP).



PrEP is used by people who are HIV negative to help prevent them from getting HIV. PrEP is a combination of 2 medications in a single pill that a person takes starting before and continuing after they might come into contact with HIV. PrEP can be used to prevent HIV in gay, bisexual and other men who have sex with men (gbMSM), women, trans people, people who use drugs, people who are pregnant, those who are breastfeeding, and anyone else who may be at risk for HIV. For most people, PrEP is prescribed to be used every day.

However, there is another PrEP option for gbMSM. Some gbMSM can take intermittent, or on-demand, PrEP. On-demand PrEP means taking pills only on days before and after having sex.

It is important to take PrEP as prescribed for it to work. When PrEP is taken as prescribed, the chance of getting HIV is extremely low.

The other highly effective strategy that uses HIV medications to prevent HIV is PEP. PEP is used by people who are HIV negative to help prevent getting HIV after an exposure to HIV. This can include unprotected sex (whether consensual or non-consensual), having a condom break during sex or sharing equipment used to inject drugs. PEP is a combination of three medications that an HIV-negative person takes orally for 28 days after an exposure to lower their chance of getting HIV. To be effective, PEP needs to be taken as soon as possible after a potential exposure and no later than 72 hours after. It is important to take the pill as prescribed for PEP to work.

PEP can be used to prevent HIV in gbMSM, women, trans people, people who use drugs, people who are pregnant or breastfeeding, or anyone else who may be at risk (after consulting with a doctor).

When PEP is taken as prescribed and within 72 hours after exposure, the chance of getting HIV is low.

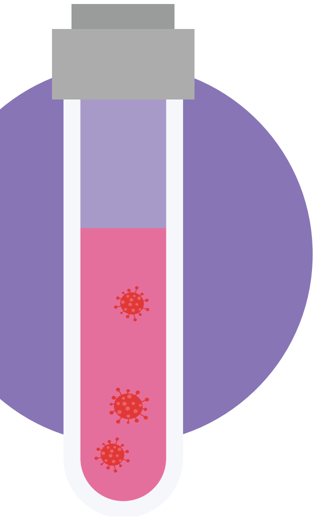
**What is the difference between PEP and PrEP?**

**PEP**

- Taken as soon as possible after a potential exposure to HIV (up to a maximum of 72 hours)
- Taken every day for 28 days
- A combination of 3 HIV medications
- Intended to be used to prevent HIV transmission from a single exposure

**PrEP**

- Taken before and after potential exposure to HIV
- Usually taken every day on an ongoing basis
- A combination of 2 HIV medications
- Intended for regular use as an ongoing HIV prevention method



## *HIV treatment and an undetectable viral load*

Finally, effective treatment for people living with HIV is another highly effective way to prevent HIV. If a person living with HIV takes HIV treatment as prescribed, the amount of HIV in their blood, also known as their viral load, can become so low that tests can't detect it. This is called having an undetectable viral load. Having an undetectable viral load has two important benefits: It helps people with HIV live long and healthy lives and it also helps prevent transmitting HIV to others. However, the benefit for prevention varies depending on the route of HIV transmission.

When someone is on HIV treatment and maintains an undetectable viral load, they will not transmit HIV through sex.

When someone is on HIV treatment and maintains an undetectable viral load throughout their pregnancy, they will not transmit HIV to their baby through pregnancy or delivery. However, if someone begins HIV treatment only after conception and maintains an undetectable viral load for the remainder of their pregnancy, there may be a small chance of HIV transmission through pregnancy.

The chance of transmitting HIV through breastfeeding when a person has an undetectable viral load is very low.

When someone is on treatment and maintains an undetectable viral load, the chance of transmitting HIV from sharing equipment for using drugs is also reduced but we don't know exactly by how much. It is best to use new injection drug use equipment every time.

## Choosing sexual activities with a lower chance of HIV transmission

In addition to these highly effective strategies, there are other risk reduction tools that people can use to reduce their chance of getting HIV. This includes choosing to have sex or use drugs in ways that have a lower chance for HIV.

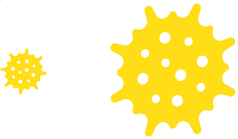
Some types of sex have a lower chance for HIV transmission than others. In some situations, people may choose to avoid having vaginal or anal sex and instead choose a type of sex with either no chance or a lower chance of HIV transmission. For example, fingering, hand jobs and mutual masturbation have no chance of transmitting HIV. However, STIs can be transmitted through some of these types of sex.

## Choosing drug use activities with a lower chance of HIV transmission

People may choose to change the way they use drugs to lower their chance of getting HIV. Taking drugs by swallowing, snorting or smoking them carries little chance of getting HIV. However, there may be a risk for hepatitis B and C, so people should still make sure to use their own equipment (such as a new straw or pipe).

## Prevention counselling

Access to counselling and resources for safer sex and safer drug use can help people lower their chances



of HIV transmission. This includes learning how HIV can be transmitted and how to make safer-sex and safer drug use decisions.

Supporting a person can include the following strategies:

Improve awareness of highly effective HIV prevention strategies to prevent the transmission of HIV and knowledge of how to use them correctly. Education and counselling activities related to HIV prevention should include information on the HIV prevention benefits of condoms, new injection drug use equipment, PrEP, PEP and effective treatment for people living with HIV. For both HIV-positive and HIV-negative people, the knowledge that people with HIV who are on successful treatment cannot pass HIV through sex should be discussed. Education and counselling can also include information on additional risk reduction tools like choosing sexual and/or drug use activities that have a lower chance of transmitting HIV. Support and education on how to use HIV prevention strategies consistently and correctly is also important.

Encourage a comprehensive plan for overall health. Discuss how different HIV prevention strategies fit into a comprehensive plan for health, including regular HIV, STI and hepatitis B and C testing, safer sex, safer drug use practices, and overdose prevention. It is important that clients understand the risks and the options available to them so they can make an informed decision about their HIV prevention options as part of a comprehensive health plan.

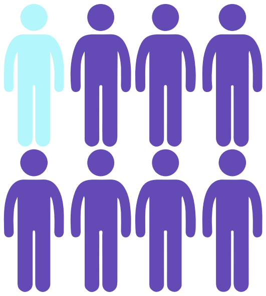
Facilitate and support the uptake of prevention strategies. Once a person decides which strategy or strategies they wish to use, support may be needed to take up these strategies consistently and correctly. This will depend on the strategy itself but can include activities such as providing free access to condoms and lube or new needles and injection equipment; knowledge of where people can access PrEP and PEP in their area to support appropriate referral; and adherence support for PrEP and PEP if needed.

Address underlying health and social factors that may lead to an increased risk of HIV transmission. In addition to reinforcing safer sex and drug use strategies and providing information about all HIV prevention options, service providers can help clients address the underlying factors that may increase their HIV risk and negatively impact overall wellness, such as mental health concerns, homelessness, poverty or use of alcohol and other substances. Providing referrals and linkage to other appropriate and relevant support services can help set people up to successfully adopt HIV prevention strategies.

# 3 HIV Testing

**At the end of this unit, you will be able to:**

1. *Explain the importance of HIV testing.*
2. *Identify the different types of HIV tests commonly used in Canada.*
3. *Discuss the window period and how it impacts testing.*
4. *Describe the HIV testing process.*
5. *Recognize the importance of linking HIV testers to care and other health and social supports.*



In Canada, many people living with HIV don't know they have it. An estimated 1 in 8 people living with HIV (13%) are undiagnosed (in 2018). This is problematic, as individuals who are undiagnosed cannot benefit from early HIV treatment and may unknowingly transmit HIV. In fact, we know that the majority of HIV transmissions originate from those who are undiagnosed.

It is important for everyone to know their HIV status. HIV testing is the only way to know for sure whether someone has HIV.

We all have a role to play in increasing access to testing, treatment, and prevention within our communities.

## Symptoms of HIV

Most people do not experience any symptoms around the time of HIV infection. A few will experience some symptoms within two to four weeks after HIV infection, but these symptoms are quite similar to other infections, such as the flu, and may not prompt someone to get an HIV test. These early symptoms of HIV can include fatigue, fever, sore throat, swollen lymph nodes, headache, loss of appetite and rash. They only last for a short period of time. Any individual who presents with these symptoms and has had a potential exposure to HIV should be offered a test or referred to testing to determine if the symptoms are the result of an HIV infection.

After these initial symptoms, it is common for people with HIV to not experience any obvious symptoms for many years, even though the virus is active and affecting their body. As untreated HIV infection weakens the immune system, a person can become vulnerable to infections, diseases and certain cancers. Clinical indications of a chronic HIV infection, such as an AIDS-defining illness or unexplained weight loss, should prompt the offer of an HIV test.

## Early diagnosis and treatment leads to better health outcomes

HIV testing is the only way to know for sure whether someone has HIV. If a person regularly participates in activities that can transmit HIV, regular testing is necessary to know their current HIV status. Frequent testing allows people who acquire HIV to be diagnosed and referred to care as soon as possible.

The earlier a person is diagnosed and starts treatment, the better it is for their long-term health. This is because HIV can have lasting damage on the body if it is left untreated for too long. With early diagnosis and treatment, most people with HIV can avoid long-term complications, stay healthy and live a long, full life.

In addition to the benefit to a person's health, successful treatment helps to prevent HIV from passing to others.

## Accessing HIV testing in Canada

All HIV tests in Canada require a blood sample.

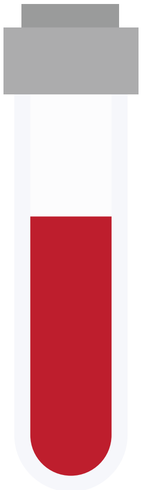
There are a few ways that people can access HIV testing in Canada. The most common way to access an HIV test is from a healthcare provider's office, but it can also happen in a variety of healthcare and community-based settings such as hospitals, public health clinics, sexual health clinics, health centres, pharmacies and mobile vans or other outreach settings. The availability of testing in settings outside of healthcare providers' offices varies by province/territory.

To access a test from a healthcare provider or community worker, a person can voluntarily request a test or a provider may offer a test to the person seeking care. In both cases, a person must consent before having an HIV test.

Blood may be collected at the place where the test is offered or a healthcare provider may give a person a requisition to have blood drawn at a local laboratory.

Self-tests are available for purchase from the manufacturer and may also be available in some pharmacies. Self-tests may be available for free through some community organizations and research projects, but access is limited.

## Standard testing

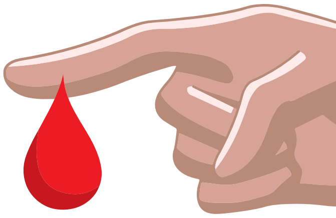


The majority of HIV testing is done through a laboratory. This is known as ***standard HIV testing***. To test for HIV, blood is drawn from a person's vein and sent to a laboratory for testing.

This is the kind of testing that would generally be initiated in a healthcare provider's office, but it can also happen in a variety of healthcare and community-based settings. The person being tested may be asked to return for a second visit once the result is available (usually one to two weeks later) or they may receive their result over the phone or online if the result is negative.

In a laboratory, a blood sample first goes through a screening test. If the screening test is negative, no further testing is done and a negative result is reported back to the healthcare provider. If the screening test result is positive, then a confirmatory test is done on the same blood sample. If the confirmatory test is positive, no further testing is done and a positive result is reported back to the healthcare provider and an HIV diagnosis is made.

## Dried blood spot testing

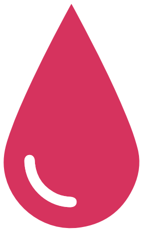


A limited number of communities in Canada currently offer ***dried blood spot (DBS) testing***. This is another way to take a blood sample for standard testing in a laboratory. DBS uses blood from a finger prick that is collected as blots on a paper card and dried at room temperature. The card is then mailed to a laboratory for testing.

Once at the laboratory, a blood sample first goes through a screening test. If the screening test is negative, no further testing is done and a negative result is reported back to the healthcare provider. If the screening test is positive, then a confirmatory test can be done with a blood sample from the same card. If the confirmatory test is positive, no further testing is done and a positive result is reported back to the healthcare provider and an HIV diagnosis is made.

Very few laboratories in Canada are currently able to process DBS cards.

## Point-of-care (POC) testing



***HIV point-of-care (POC) tests*** are rapid tests that allow HIV screening to happen at the location where blood is taken. These tests require only a drop of blood from a finger prick to test for HIV and the person being tested gets their screening result within a few minutes.

If the HIV POC test result is negative, no further testing is done and the person who was tested is told their negative result on the spot.

If an HIV POC test result is positive (sometimes called reactive or a preliminary positive), it needs to be confirmed by a standard laboratory test. The person who was tested needs to have a blood sample drawn from their vein and sent to a laboratory for testing to confirm the result. An HIV-positive diagnosis is made only after a confirmatory test done in a laboratory indicates that a person has HIV.

HIV POC testing is only available in some provinces and territories. Where it is used, it is generally only available in a limited number of specified community locations.

## Self-testing

The ***HIV self-test*** available in Canada uses the same technology as the HIV POC test. If the self-test result is negative, no further testing needs to be done.

A person who gets a positive result using a self-test needs to access a confirmatory test through a provider in order to confirm their result. This includes having a blood sample drawn from their vein and sent to a laboratory for confirmatory testing.

## What does a negative HIV test mean?

An HIV-negative test result means that the test could not detect an HIV infection at the time of the test. However, if a person has had a recent exposure to HIV, there is a chance that the person is not actually HIV negative. This is because it takes time before an HIV test can detect a recent HIV infection.

## What is the window period?

No test can detect HIV immediately after infection. This concept is known as the ***window period***.

The window period is the time between when a person has been exposed to HIV and when a test can detect that they have HIV. The window period can vary between two weeks and three months. The length of the window period varies from person to person and with the type of test used. Some people develop markers of HIV infection that are detected by HIV tests slowly (such as antibodies), and some people develop them more rapidly.

If someone has had a recent exposure to HIV and gets tested for HIV during the window period, the test may come back as negative despite the person actually having HIV. This would happen if their body had not started producing the markers of HIV infection at levels that are detectable by the test. When a test result is negative after a recent exposure to HIV, the person should be retested at the end of the window period to confirm that they are indeed HIV negative. Some provinces recommend testing at intervals until the end of the window period to pick up HIV infection as early as possible.

If at any time a person gets a positive result from a confirmatory test for HIV, it means that the window period is over and the person has HIV.

## What are the window periods for different tests?

For the HIV POC test and the HIV self-test, the window period is between three and 12 weeks. This test can detect HIV antibodies in 50% of people by about 22 days after exposure to HIV and 99% of people by 12 weeks after exposure.

For the HIV test done in a laboratory, including those using dried blood spots, the window period is between two and six and a half weeks. This test can detect HIV in 50% of people by 18 days after exposure to HIV and 99% of people by 44 days after exposure.

## How does the window period impact testing?

Recall that when a test result is negative after a recent exposure to HIV, the person should be retested at the end of the window period to confirm that they are indeed HIV negative. If a person has ongoing potential exposures, they should be tested regularly to detect an HIV infection as soon as possible. Different provinces and territories have different recommendations for frequency and timing of tests, but window periods can be used as a guideline when counselling about HIV testing.

## Approaches to testing

When someone gets an HIV test, some of their non-identifying personal information may be collected. This may include their age, sex, city of residence, country of birth, ethnicity and how they may have gotten HIV.

Whether or not a person's name and personal information gets recorded depends on the testing option: nominal (name-based), non-nominal (non-identifying) or anonymous testing. Most testing in Canada is nominal. Anonymous testing is only available in some provinces and territories.

## The 3 Cs of testing

**3 C's**

Canada has HIV testing guidelines for healthcare providers and community workers who provide testing. The HIV testing guidelines take a human-rights approach, which includes consideration of the "3Cs" of testing—counselling, consent and confidentiality. Provinces may also have guidelines that cover this information.

***Counselling*** involves having discussions with people both before and after the test, known as pre- and post-test counselling. It ensures that people receive the information, resources and supports they need.

Informed ***consent*** means that a person gives their approval to be tested with full knowledge of the possible benefits and risks of taking the test, which are explained during pre-test counselling. A person should not be forced to test and should be made aware of their right to decline testing, except for in very rare circumstances. HIV testing does not require written consent; verbal consent is sufficient.

***Confidentiality*** is an important consideration for a person who is deciding to be tested for HIV. It is the responsibility of the person performing the test to ensure that test results and counselling discussions are kept confidential. However, since HIV is a public health issue, all positive test results in Canada must be reported to public health authorities.

## Testing is an important entry point into other services

For people who test positive for HIV, testing is an important entry point into both HIV treatment and prevention services. For those who test negative, it is an opportunity to learn about options for ongoing HIV prevention, such as PrEP.

Regardless of the outcome of a person's test, getting tested can also be an entry point for accessing other healthcare and social services that might benefit the person. This could include sexual health, harm reduction, housing and mental health services.

## Linkage to care, treatment, and other supports

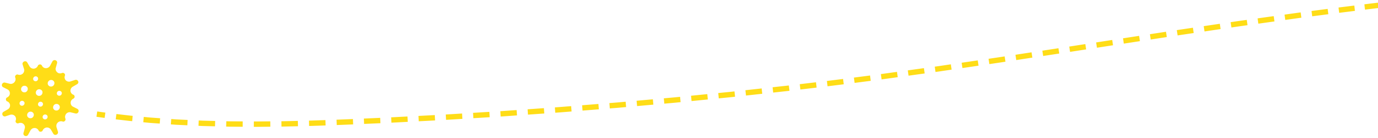
People who are diagnosed with HIV need to be linked to, engaged and retained in care and treatment. They should also be linked to information and services related to prevention in order to help them lower the chance of passing HIV to other people.

Linkage to care should begin immediately after an HIV diagnosis, however, sometimes it can take a while to get an appointment with a clinician. Some people need extra support to connect with a provider and remain engaged in HIV care and treatment.

Providing immediate linkage to care can help people diagnosed with HIV become engaged in care as soon as possible and can increase the likelihood that they will start treatment and successfully manage HIV.

Service providers can support people to overcome the barriers that impede access to a healthcare provider after a diagnosis.

People who test negative but have an ongoing chance of getting HIV should be linked to prevention services (such as PrEP or harm reduction services) and repeat testing.



# 4 HIV Treatment

**At the end of this unit, you will be able to:**

1. *Describe what HIV treatment is.*
2. *Explain how HIV treatment works.*
3. *Explain the benefits of HIV treatment.*
4. *Discuss the tests used to monitor HIV.*
5. *Explain the importance of adhering to HIV treatment.*
6. *Discuss the side effects of HIV treatment.*
7. *Recognize the importance of engaging someone newly diagnosed in HIV care, treatment and support.*

## What is HIV treatment?

***HIV treatment is a lifesaver.*** There is no cure for HIV but there are medications that can keep the virus under control and allow a person with HIV to stay healthy and live a long and full life. Our knowledge about HIV treatment and the medications involved have improved over time. Very effective HIV drugs that are easy to take and have few side effects are now available.

## When should HIV treatment be started?

***People should start HIV treatment as soon as possible after diagnosis.*** The earlier HIV treatment is started, the better the health outcomes for people living with HIV. It is now recommended that HIV treatment be offered right away to people diagnosed with HIV. However, the decision to start treatment belongs to the person living with HIV. It is important that people are ready to make the commitment to taking HIV treatment on a regular basis.

*Some people may think that they only need to be on HIV treatment if they are feeling unwell. This is not correct. HIV treatment prevents people from getting sick from HIV-related illnesses and keeps them healthy over time.*

## What does HIV treatment consist of?

Usually, HIV treatment consists of a combination of HIV drugs that are taken every day. A typical drug regimen usually consists of two or three drugs formulated into a single pill. Since there is no cure for HIV, treatment has to be taken for the rest of the person's life.

While most people take HIV drugs in pill form every day, long-acting formulations of HIV drugs are also available. These formulations are injected by a healthcare provider every 1-2 months. Long-acting injectable treatment may be a good option for some people who are already on stable oral treatment.

*The first drugs that were developed to treat HIV often had many side effects and were difficult to tolerate. People who have been living with HIV for a long time and who took some of these earlier HIV drugs may have also experienced long-term side effects of HIV treatment. Examples of long-term side effects that occurred with earlier HIV drugs include nerve injury (peripheral neuropathy) and changes in body shape (lipodystrophy). Healthcare providers can help to manage some of the long-term side effects of earlier HIV drugs.*

There are many HIV drugs and treatment combinations available. This usually makes it possible for a person living with HIV to work with their healthcare providers to find a treatment that works for them, with minimal or no side effects and that fits their schedule.

*People with HIV and their healthcare providers will consider many factors when deciding on the appropriate treatment, including possible side effects, whether the person has any resistance to certain HIV drugs, potential drug interactions, other health conditions, and whether the person is pregnant or considering pregnancy.*

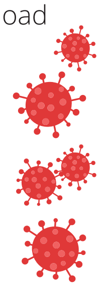
## How does HIV treatment work?

As you may remember from earlier in the course, when HIV gets into the body it targets and enters a type of cell in the immune system known as the CD4 cell and it uses the cell to make copies of itself. This is called viral replication. When new HIV copies are released from the CD4 cell, the CD4 cell is destroyed. If HIV is left untreated, viral replication will slowly deplete the number of CD4 cells in the body. The depletion in CD4 cells weakens the person's immune system. Eventually it leaves the body vulnerable to life-threatening infections and cancers.

The goal of HIV treatment is to stop the viral replication process and reduce the amount of virus in the body, also known as the viral load, to undetectable levels.

Usually, within three to six months of starting HIV treatment a person's viral load will fall to undetectable levels.

HIV treatment does not cure HIV. Even when the viral load is undetectable, HIV still remains hidden in the body. If the person stops taking their treatment or does not adhere to their regular treatment schedule, HIV can begin to replicate again, and the viral load will rise.



## Benefits of HIV treatment

The most important benefit of HIV treatment is the improvement of the health and quality of life of the person living with HIV. With ongoing treatment and care, most people living with HIV can stay healthy (or return to health) and live a long, full life.

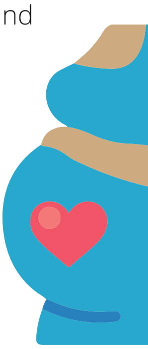
By limiting HIV's ability to replicate and lowering the amount of virus in a person's body, HIV treatment prevents damage to the immune system, allowing it to stay strong (or rebuild if it has been damaged) and to fight off infections. HIV treatment also helps to lower the chance that people with HIV will develop other health conditions, such as cardiovascular disease and certain types of cancer.

By starting treatment early, remaining in care and staying adherent to HIV drugs, people with HIV can expect to live a normal lifespan and minimize the risk of HIV-related complications.

A second important benefit of HIV treatment is the prevention of HIV transmission.

When someone is on HIV treatment and maintains an undetectable viral load, they will not transmit HIV through sex.

When someone is on HIV treatment, engaged in care and maintains an undetectable viral load throughout their pregnancy, they will not transmit HIV to their baby through pregnancy or delivery. However, if someone begins HIV treatment only after conception and maintains an undetectable viral load for the remainder of their pregnancy, there may be a chance of HIV transmission through pregnancy.

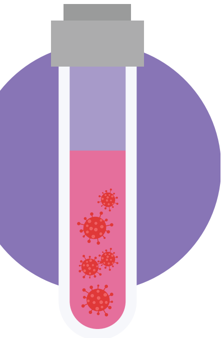


The chance of transmitting HIV through breastfeeding (also known as chestfeeding) when a person has an undetectable viral load is very low but still possible. For this reason, formula feeding is recommended.

When someone is on HIV treatment and maintaining an undetectable viral load, the chance of transmitting HIV from sharing drug use equipment is also reduced but we don't know exactly by how much. Therefore, it is best to use new injection drug use equipment every time.

## Monitoring HIV

There are two key blood tests that healthcare providers use to monitor a person's HIV infection: ***viral load*** and ***CD4 cell count***.



Viral load is a measure of viral activity in the body and is measured as the number of copies of the virus in one millilitre (mL) of blood.

A detectable viral load means that there is a measurable amount of virus in the blood and indicates active replication of HIV. Without treatment, viral load can range from a few thousand copies to several hundred thousand copies or higher per mL.

Effective treatment reduces viral load in the blood to undetectable levels; that is, levels so low that standard laboratory tests cannot detect the virus. Even when the viral load is undetectable in blood, small amounts of the virus are still hiding in the body.

CD4 cell count is a measure of the strength of the immune system and is measured as the number of cells in one cubic millimetre (mm3) of blood.

Generally, a CD4 cell count above 500 is considered to be within the normal range.

A decreasing CD4 cell count indicates declining health of the immune system. As the CD4 cell count declines, the chance of developing serious infections increases. A CD4 cell count below 200 puts a person at risk for life-threatening illnesses, including those caused by opportunistic infections (infections that occur in people with weakened immune systems, including people with HIV).

## Adherence

HIV treatment is a lifelong commitment that requires taking medication regularly, exactly as prescribed. This is called ***adherence***.

Ongoing adherence to HIV treatment is very important. Without enough medication in the blood to suppress the virus, HIV will begin replicating again and will spread throughout the body.

People may have difficulty adhering to their HIV treatment for many reasons. For example, they may: forget to take their pills or renew their prescription on time; regularly miss doses because they believe HIV drugs are toxic or because taking the medications reminds them that they have HIV; have difficulty maintaining a constant supply of medications because of unstable housing or lack of money or fear that others might discover that they are taking HIV drugs.

Inconsistent adherence to treatment or stopping and starting treatment can allow HIV to develop resistance to the drugs taken. In this context, drug resistance refers to HIV that has developed the ability to overcome specific HIV drugs and is able to escape the effects of treatment. Drug resistance limits treatment options because the specific drugs or drug classes to which HIV has become resistant are no longer effective.

Some people may stop taking their medications altogether for a short or long period of time because they feel healthy and don't believe they need to take medications any longer. Stopping HIV treatment is dangerous because it can negatively impact a person's health. If someone is considering interrupting their treatment, it is very important that they discuss their concerns and options with their healthcare providers before they stop taking their medications.

## Side effects

With current HIV drugs, side effects are much less common and are generally mild. Many people experience no side effects at all. The earlier a person is diagnosed with HIV and the sooner they begin treatment, the less likely they are to experience major side effects from HIV treatment. This is another reason to start treatment as early as possible.

There is no way of predicting who will experience side effects. Some short-term side effects that may occur when a person first starts treatment include nausea, headaches or difficulty sleeping. If side effects occur, they tend to disappear after a few days or weeks and most can be managed with over-the-counter treatments (such as ibuprofen for headaches, for example).

It is important for a person to speak to their healthcare providers about the symptoms they experience after starting HIV treatment. Sometimes symptoms may appear to be side effects but are actually linked to other factors. For example, nausea can be a side effect of the HIV drugs, but it can also be the result of many other conditions such as infections, pregnancy or stress.

If it is determined that the symptom is a side effect of HIV treatment, healthcare providers can work with the person to determine how best to address the issue. Some side effects are short term and disappear after a few weeks. If necessary, healthcare providers may suggest ways to manage these side effects during this time. In cases where side effects significantly affect a person's quality of life or do not go away over time, healthcare providers may suggest changing the treatment to reduce side effects.

## Engagement in care, treatment, and support

Access to counselling, referrals to care and treatment, and availability of treatment resources can help a person engage in care and start treatment after an HIV diagnosis.

Supporting a person with HIV can include:

- Helping them come to terms with an HIV diagnosis. This includes supporting people on their HIV journey and providing them with all the information they need to stay healthy and help prevent HIV transmission. Dispelling commonly held myths is very important so people understand that they can live a long and healthy life with HIV.
- Helping them understand the benefits of treatment, including the importance of starting treatment early. The health benefits of HIV treatment are the most important, but prevention benefits should also be discussed.
- Connecting them to clinical care and supporting ongoing engagement in care in order to achieve the best clinical outcomes. Some people may benefit from additional supports to become engaged in care, such as patient navigation or accompaniment to medical appointments.
- Connecting them to support, which may be important for some people with HIV. This can include community services like mental health services, housing services and income support programs, to name of few. Some issues can be barriers to care and result in health inequities. Some people will need support to overcome these barriers through additional support services.
- Helping them decide when to start treatment to give themselves the best chance for success. It is important to meet people where they are in their decision to start treatment and to support them respectfully and without judgment.
- Helping them get ready to start treatment and plan for adherence. Starting HIV treatment involves establishing a new routine for taking medications and attending regular medical appointments. People should be encouraged to consider what will help them stick to their pill-taking schedule. There are many strategies, such as adherence apps, reminders and pill boxes.
- Helping them prepare for short-term side effects and encouraging them to speak to their healthcare providers about any symptoms they are experiencing.