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Contact Hours: **3**

HIV/AIDS Education for Washington, DC, Nurses

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LEARNING OUTCOME AND OBJECTIVES: Upon completion of this course, you will have increased your knowledge of HIV/AIDS in order to better care for your patients. Specific learning objectives to address potential knowledge gaps include:

- Discuss the etiology and epidemiology of HIV in the United States and the District of Columbia.
- Summarize the factors and risks for transmission of HIV in general and among healthcare workers in particular.
- Identify preventive and control measures for HIV/AIDS, including PEP and PrEP.
- Discuss accepted procedures and regulations for HIV testing and counseling.

ETIOLOGY AND EPIDEMIOLOGY OF HIV/AIDS

HIV, the **human immunodeficiency virus**, is a virus that spreads via certain body fluids and specifically attacks the CD4⁺ or **T cells** of the immune system. CD4⁺ T cells are also called *helper T cells*. They are the cornerstones of both inflammatory and regulatory responses of our immune system. T cells are lymphocytes that are predominantly produced in the thymus and play a key role in the immune system's defense of the body against infection. As time passes, the virus can destroy so many of these specialized cells that the immune system no longer is able to fight off infections and disease.

HIV is unique among many other viruses because the body is unable to destroy the HIV completely, even with treatment. As a result, once a person is infected with the virus, the person will have it for the remainder of their life (CDC, 2019a).



A single T cell (red) infected by numerous, spheroid-shaped HIV particles (yellow).
(Source: National Institute of Allergy and Infectious Diseases, 2012.)

After the initial infection and without treatment, the virus continues to multiply, and over a period of time (which can be ten years or longer), common opportunistic infections (OIs) begin to take advantage of the body's very weak immunity. Common OIs can be life-threatening and may include:

- Cryptococcal meningitis
- Toxoplasmosis
- Pneumocystis pneumonia
- Esophageal candidiasis
- Certain cancers, such as Kaposi's sarcoma

Once they have such an opportunistic infection, the person now is considered to have AIDS, **acquired immunodeficiency syndrome**, the most advanced stage of the HIV infection (NIAID, 2019).

Origin and Strains of HIV

DNA analysis has identified the HIV-1 virus as originating in a strain of chimpanzees in Kinshasa, in the Democratic Republic of Congo, around 1920. Chimpanzees were hunted for food, and it is believed that the simian (chimpanzee) version of the virus was most likely transmitted to humans following contact with the animal's infected blood after ingestion of the meat. The simian immunodeficiency virus then mutated into the human form of the virus. HIV has existed in the United States at least since the mid to late 1970s (CDC, 2019a; Avert, 2019).

HIV, like other viruses, changes over time, resulting in different strains (genetic variants or subtypes) of the virus. There are **two main types of HIV**: HIV-1 and HIV-2. HIV-1 is the most



common, while HIV-2 is less common and accounts for fewer infections. The strains of HIV-1 can be classified into four groups: M, N, O, and P. The N, O, and P strains are quite uncommon, while group M is responsible for approximately 95% of all infections worldwide.

In 2020 a new strain of HIV was found for the first time in nearly 20 years. The newly discovered strain is part of group M and has been labelled as sub-type L. This new strain is important, but it does not pose a new public health threat since it occurs rarely and can be effectively treated with existing antiretrovirals (Yamaguchi et al., 2020).

Disease Pathogenesis

HIV is unable to grow or reproduce on its own and depends on a host cell for the raw materials and energy necessary for all the biochemical activities that allow the virus to reproduce. In order to accomplish this, it must locate and bind to a specific type of cell, a CD4⁺ T cell.

CD4⁺ T cells (or T-helper cells) are the cornerstones of both the inflammatory and regulatory responses of the immune system. They are a class of white blood cells that help other lymphocytes (memory B cells) that are responsible for remembering an antigen and producing an antibody to fight it based on stored data following exposure to it in the past.

Once the virus binds to the cell, it then enters the cell and eventually takes control of the cell's DNA and begins to replicate itself. This leaves the T cell unable to perform its vital function as part of the immune system. The new HIV particles are then released from the cell into the bloodstream, where the process begins again in other T cells (Cachay, 2019).

Following transmission of the virus, the individual will typically progress through three stages of the illness.

- **Stage 1: Acute infection** is the earliest stage, when seroconversion takes place, and the person is very contagious.
- **Stage 2: Clinical latency** is a stage that can last for 10 or 15 years, during which time immunosuppression gradually develops. The person may be asymptomatic and can transmit the virus to others.
- **Stage 3: AIDS** is the final, severe stage of HIV infection, at which point the immune system is severely damaged and opportunistic infections or cancers begin to appear.

Epidemiology

NATIONALLY

Approximately 1.1 million people in the United States are living with HIV. From 2010 to 2017, the annual number of new HIV diagnoses decreased 9%. In 2018, there were an estimated 38,000 new HIV infections. Trends varied for different groups of people.



In 2018, 17,032 people in the United States and six dependent areas received a stage 3 (AIDS) diagnosis, and in 2017 there were 16,350 deaths (due to any cause) among adults and adolescents with a diagnosis of HIV (CDC, 2019b; HIV.gov, 2020a).

Gay and bisexual men are the population most affected by HIV. In 2018, they accounted for 69% of all HIV diagnoses:

- HIV diagnoses among Black/African American gay and bisexual men remained stable.
- HIV diagnoses among White gay and bisexual men decreased 19%.
- HIV diagnoses among Hispanic/Latino gay and bisexual men increased 27%.

Heterosexuals and people who inject drugs also continue to be affected. In 2018:

- Heterosexuals accounted for 24% of HIV diagnoses, with men accounting for 7% and women for 16%.
- People who inject drugs accounted for 7% of HIV diagnoses, men 4% and women 3%.

By race/ethnicity, Blacks/African Americans and Hispanics/Latinos are disproportionately affected by HIV.

- Blacks/African Americans comprise 13% of the population and accounted for 42% of new diagnoses.
- Hispanics/Latinos comprise 18% of the population and accounted for 27% of new HIV diagnoses.

HIV DIAGNOSES BY RACE/ETHNICITY, 2018

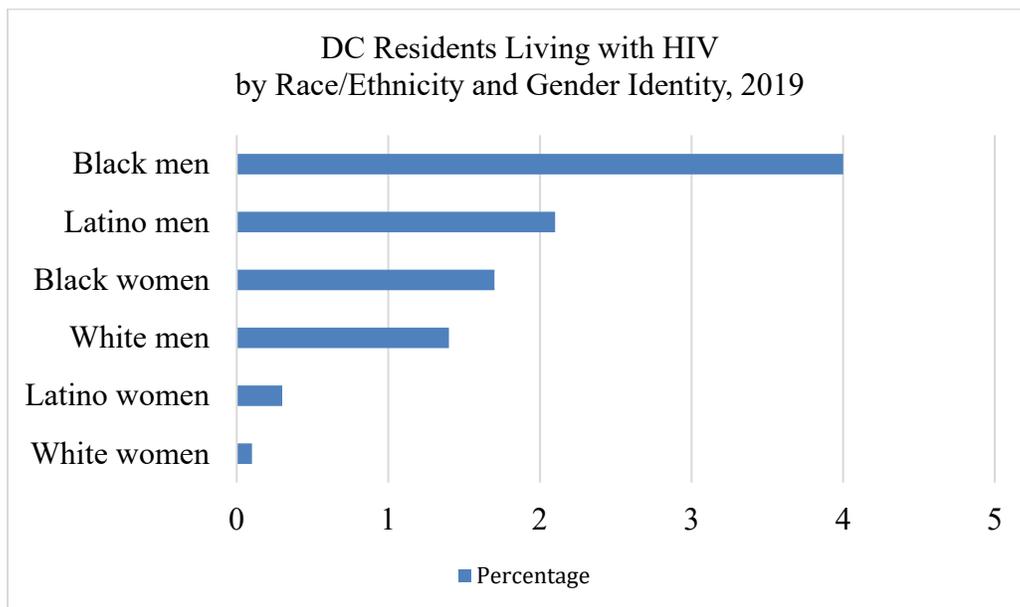
- 43% Black/African American
 - 26% Hispanic/Latino
 - 26% White
 - 2% Asian
 - <1% American Indian/Alaska Native
 - <1% Native Hawaiian/Other Pacific Islander
 - 3% Multiple races
- (CDC, 2019b)

DISTRICT OF COLUMBIA

In 2020, the District of Columbia Department of Health (DC Health) reported that the number of new HIV cases decreased by the widest margin in the past five years. Key points from the year 2019 include:



- 12,408 current residents of the District of Columbia or 1.8% of the population are living with HIV.
- The number of newly diagnosed HIV cases in the District decreased to 282 cases in 2019, a decline of 61% from 721 cases in 2011 and 79% from 1,374 cases in 2007.
- There were two babies born with HIV in 2019.
- The number of newly diagnosed HIV cases attributable to injection drug use decreased by 99% from 150 cases in 2007, prior to the scale up of DC’s needle exchange program, to 2 cases in 2019.
- Blacks and Latinos with HIV exceeded 1% of their respective populations, with Blacks disproportionately impacted at 2.8%.
- More than half of people living with HIV in DC are 50 years old and older.
- Young people ages 13 to 24 represent nearly 20% of new HIV diagnoses between 2015 and 2019; the number of new HIV diagnoses among young people ages 20–24 remained level for the past three years.
- Men who have sex with men and heterosexual contact are the two leading modes of transmission reported among newly diagnosed and identified HIV cases.
(DC Health, 2020)



(Data source: DC Health, 2020.)

TRANSMISSION AND INFECTION CONTROL

Transmission Routes

HIV is a weak virus that cannot survive without a human host and is not spread by casual contact. In order for HIV transmission to occur, there must be an HIV source, sufficient dose and virulence of the virus, and access to the bloodstream of another person.

Under certain conditions, HIV has been able to survive in dried blood at room temperature for up to 5 or 6 days, although the concentrations will be low to negligible. Once exposed to air and the fluid it is contained in begins to dry, HIV becomes damaged and inactive. Once inactive, it is no longer infectious.

HIV is transmitted from one person to another only through contact with certain body fluids, and transmission is only possible if these fluids come in contact with mucous membranes or damaged tissue, or are directly injected into the bloodstream (e.g., from a needle or syringe). Mucous membranes are located in the rectum, the vagina, the opening of the penis, and the mouth (USDHHS, 2020; CDC, 2019e).

HIV can only be transmitted through the following body fluids:

- Blood
- Semen
- Preseminal fluids
- Rectal fluids
- Vaginal fluids
- Breast milk

In addition, any bodily fluid visibly contaminated with blood should be considered capable of transmitting HIV. These may include:

- Cerebrospinal fluid
- Amniotic fluid
- Pleural fluid
- Synovial fluid
- Peritoneal fluid
- Pericardial fluids



Unless blood is visibly present, HIV **cannot be transmitted by:**

- Saliva
- Sputum
- Sweat
- Tears
- Feces
- Nasal secretions
- Urine
- Vomitus

Other than those described above, HIV **cannot be transmitted by:**

- Air
- Water
- Closed-mouth kissing
- Insects
- Pets
- Sharing food or drinks

(Waseem, 2019; CDC, 2019e)

SEXUAL CONTACT

Anal sex is the riskiest type of sex for infection by or transmission of HIV. Receptive anal sex is a greater risk than insertive anal sex. The receptive partner's risk of getting HIV is very high because the lining of the rectum is thin and may allow HIV to enter the body during anal sex from body fluids that carry HIV, including semen or preseminal fluid.

The insertive partner is also at risk because HIV can enter the body through the urethra; the foreskin if the penis is not circumcised; or small cuts, scratches, or open sores anywhere on the penis. There is evidence that circumcision may decrease the risk for an insertive partner, but there is no evidence that it benefits the receptive partner (CDC, 2019b).

In extremely rare instances, HIV has been transmitted through oral sex. For the most part, there is little to no risk of getting HIV from oral sex, but transmission of HIV is theoretically possible if an HIV-positive man ejaculates into his partner's mouth during oral sex (CDC, 2019e).



INJECTION DRUG USE

HIV can live in blood inside a used needle for up to 42 days depending on the temperature and other factors. Sharing injection needles, syringes, and other paraphernalia with an HIV-infected person can send HIV (as well as hepatitis B and C viruses and other bloodborne diseases) directly into the user's bloodstream. Paraphernalia with the potential for transmission include the syringe, needle, "cooker," cotton, and/or rinse water (sometimes called *works*) (CDC, 2019e).

BLOOD TRANSFUSION

Due to careful donor selection criteria, it is very rare for HIV to be transmitted through a blood transfusion. However, despite the precautions, it may still occur. Theoretically there are three reasons; however, only the first has been documented to have occurred:

1. Donations may be collected during the window period of infection, which is the interval of time after the donor becomes infected with HIV and before the development of positive findings on laboratory testing.
2. Infection may occur from variant strains of HIV that may escape detection by current screening assays.
3. Testing or clerical errors may occur.
(Silvergleid, 2019)

TATTOOING, BODY PIERCING, AND BLOOD-SHARING ACTIVITIES

There are no known cases in the United States of anyone becoming infected with HIV from tattooing, body piercing, or blood-sharing activities such as "blood brothers/sisters" rituals or ceremonies where blood is exchanged or unsterilized equipment contaminated with blood is shared.

There is, theoretically, a potential risk, especially during the time period when healing is taking place. It is also possible to become infected by HIV from a reused or not properly sterilized tattoo or piercing needle or other equipment, or from contaminated ink. The risk is very low but increases when the person doing the procedure is not properly trained and licensed (CDC, 2020d).

MOTHER-TO-CHILD TRANSMISSION

The use of HIV medications and other strategies have led to a lowered incidence of mother-to-child transmission of HIV to 1% or less in the United States and Europe. When women with HIV who are pregnant take HIV medications to reduce the risk of perinatal transmission, and when started early, mother-to-child transmission prevention is effective.

However, despite continued use of HIV medicines after childbirth, a woman with HIV can still transmit HIV to her child while breastfeeding. In the United States, infant formula is a safe and



available alternative to breast milk, and it is for these reasons that women with HIV in the United States should not breastfeed their babies (USDHHS, 2020).

Additionally, babies should not eat food that was prechewed by a person with HIV, as the only known cases of HIV transmission by eating food that has been prechewed by a person with HIV are among infants (CDC, 2019e).

ESTIMATED PER-ACT* PROBABILITY OF ACQUIRING HIV FROM AN INFECTED SOURCE	
Type of Exposure	Risk per 10,000 Exposures
Parenteral	
Blood transfusion (with infected blood)	9,250
Needle-sharing during injection drug use	63
Percutaneous (needle-stick)	23
Sexual	
Receptive anal intercourse	138
Insertive anal intercourse	11
Receptive penile-vaginal intercourse	8
Insertive penile-vaginal intercourse	4
Receptive oral intercourse	Low
Insertive oral intercourse	Low
Other	
Biting	Negligible
Spitting	Negligible
Throwing body fluids (including semen or saliva)	Negligible
Sharing sex toys, razors, toothbrushes	Negligible
* There may be a relatively small chance of acquiring HIV when engaging in a risk behavior with an infected partner <i>only once</i> ; but, if <i>repeated many times</i> , the overall likelihood of becoming infected after repeated exposures is much higher.	
(CDC, 2019b)	

At-Risk Populations and Behaviors

HIV can infect anyone. However, there are certain groups at higher risk for HIV because of specific risk factors and behaviors.

MEN WHO HAVE SEX WITH MEN

Gay, bisexual, and other men who have sex with men are the population most affected by HIV in the United States. Gay and bisexual men ages 13 to 34 make up 64% of new HIV diagnoses



among all gay and bisexual men. Most gay and bisexual men get HIV from having anal sex without protection (not using a condom or taking medicine to prevent or treat HIV) (CDC, 2019c).

RACIAL AND ETHNIC MINORITIES

In the United States, some racial and ethnic groups are more affected than others relative to their percentage of the population. Because there are higher rates of HIV in these communities, this raises the risk of new infections with each sexual or injection drug use encounter. Additionally, a range of social, economic, and demographic factors—such as stigma, discrimination, income, education, and geographic region—affect risk for HIV. These factors help to explain why African Americans have worse outcomes on the HIV continuum of care, including lower rates of linkage to care and viral suppression (HIV.gov, 2020b; CDC, 2020a).

PERSONS WHO INJECT DRUGS

The prescription opioid and heroin crisis has led to an increase in the number of persons who inject drugs (PWID), placing new populations at risk for HIV. This crisis has disproportionately affected those living in nonurban areas, where HIV prevalence rates historically have been low. These are areas that have limited services available for HIV prevention and treatment as well as for substance use disorder treatment.

A high-risk behavior among this population is sharing drug paraphernalia such as needles, syringes, and other drug injection equipment. In cities with high levels of HIV infection, 40% of new PWID (those who have been injecting for 5 years or less) reported sharing syringes. During the decade between 2005 and 2015, syringe sharing declined 34% among Black/African American PWID and declined 12% among Hispanic/Latinx PWID, but syringe sharing did not decline among White PWID. It has been found that PWID under age 30 are more likely to share syringes than older PWID.

These persons may also engage in risky sexual behaviors. This may include having sex without protection, having sex with multiple partners, or trading sex for money or drugs. It has been found that young PWID are more likely than older PWID to have sex without a condom, have more than one sex partner, and have sex partners who also inject drugs (CDC, 2020b).

PERSONS WHO EXCHANGE SEX FOR MONEY OR NONMONETARY ITEMS

The risk of HIV is high among individuals who exchange sex for money or other items, and many of them have a history of homelessness, unemployment, incarceration, mental health issues, violence, and emotional/physical/sexual abuse by clients, intimate partners, and the police. All of these complicate screening and treating this population (Weibel, 2018).

Some transgender persons may be involved in this behavior because of discrimination and lack of economic opportunities, with the goal of generating income for rent, drugs, medicines, hormones, and gender-related surgeries (CDC, 2019b).



PEOPLE WHO MISUSE ALCOHOL OR DRUGS

People who misuse alcohol or drugs are at an increased risk for acquiring or transmitting HIV. These substances are more likely to put them at risk by affecting the choices made about sexual behavior. A person who is inebriated might have more sexual partners, sex with someone they do not know, sex without using a condom, or more difficulty using a condom in the correct manner every time they have sex. They may also be more likely to share needles and other drug equipment. Drugs such as methamphetamine, poppers, and ecstasy are linked to having more sexual partners or sex without a condom (CDC, 2019b).

INCARCERATED PERSONS

Prisoners are at high risk for HIV transmission related to engaging in high-risk sexual behaviors, being raped, using drugs and sharing needles, and tattooing with homemade and unsterile equipment. Overcrowding as well as stress, drugs, and violence weaken the immune system, making people living with HIV more susceptible to the development of opportunistic infections (Avert, 2017).

HIV testing programs are not systematically implemented in correctional facilities, which is partly the result of the need for resource allocation. Additionally, the rapid turnover among this population makes it difficult to test inmates for HIV and help them gain access to treatment. Inmates also have concerns about disclosing their high-risk behaviors for fear of being stigmatized (CDC, 2017; Weibel, 2018).

OLDER ADULTS

According to the CDC, in 2016 nearly half of the people in the United States and dependent areas living with diagnosed HIV were aged 50 and older. The number of older adults living with HIV is increasing because many people diagnosed with HIV at a younger age are growing older, and life-long treatment with HIV medications is helping them live longer and healthier lives. However, thousands of older people are also newly diagnosed with HIV every year.

Many risk factors for HIV are the same for adults of any age, but some age-related factors can put older adults at risk for HIV infection, such as age-related thinning and dryness of the vagina in older women. In addition, women who are no longer concerned about pregnancy may be less likely to use a condom when engaged in sexual activities.

Older people are less likely to get tested for HIV, as the signs and symptoms of HIV infection may be mistakenly attributed to aging or age-related conditions. For this and other reasons related to stereotyping and stigma, HIV is more likely to be diagnosed at an advanced stage in many older adults (USDHHS, 2020).

WOMEN AND GIRLS

HIV diagnoses among women have declined in recent years; however, more than 7,000 women received an HIV diagnosis in the United States and dependent areas in 2017, making up 19% of



all new HIV diagnoses. The majority of these women acquired HIV through heterosexual contact, and the highest percentage was among Black/African American women. One in 9 women with HIV are unaware they have it, and because many women may be unaware of their male partner's risk factors for HIV, they may not use condoms or take HIV prevention medications.

In general, receptive sex is riskier than insertive sex, which means that women have a higher risk for acquiring HIV during vaginal or anal sex than their sex partners, with receptive anal sex being the riskiest behavior.

Women who have been sexually abused may be more likely to engage in risky sexual behaviors such as exchanging sex for drugs, having multiple sex partners, or having sex without using a condom (CDC, 2020c).

INFANTS AND CHILDREN

HIV can be passed from mother to child anytime during pregnancy, childbirth, and breastfeeding. In 2017, the CDC reported there were 73 new diagnoses of perinatal HIV in the United States, the greatest number of which were among Black/African American children. It is notable that perinatal diagnoses have decreased 41% since 2012. By 2017 in the United States, 11,915 people were living with HIV they acquired through perinatal transmission, and over 1,800 of them were children under the age of 13.

Women with HIV may not know they are pregnant, how to prevent or safely plan a pregnancy, or what they can do to reduce the risk of transmitting HIV to their unborn child. The risk of transmitting HIV to the baby is much higher if the mother does not remain on HIV treatment throughout pregnancy and childbirth or if HIV medications are not provided to the baby. The risk is also higher if the woman acquires HIV while she is pregnant.

In addition, social and economic factors, especially poverty, may make it harder for some women with HIV to access healthcare and remain on treatment (CDC, 2019d).

TRANSGENDER PERSONS

Transgender persons are people whose gender identity or expression is different from their sex assigned at birth. The CDC reported in 2017 that the percentage of transgender people who received a new HIV diagnosis was three times the national average, with over half occurring among Black/African American persons.

Certain behaviors and socioeconomic factors increase the risk for this population, including having multiple sex partners, anal or vaginal sex without protection, and sharing needles or syringes to inject hormones or drugs. Additional factors include commercial sex work, mental health issues, incarceration, homelessness, unemployment, and high levels of substance misuse compared to the general population.



Transgender persons are also placed at increased risk for HIV related to stigma, discrimination, social rejection, exclusion, violence, and lack of family support, all of which affect healthcare, education, employment, and housing (CDC, 2019c).

Other Factors Affecting Transmission Risk

Many other factors, alone or in combination, affect the risk of HIV transmission.

HIGH VIRAL LOAD

Viral load refers to the amount of HIV copies present in one milliliter of blood in someone who is HIV positive. Viral load is one of the **most important determinants** for HIV transmission.

When a person acquires the virus, it replicates in the blood. Initially a person's viral load is typically high, and shortly after acquiring the virus, the load will drop as the immune system starts to fight the virus. Without treatment, however, the viral load will rise again as the virus starts to destroy CD4⁺ T cells.

As the viral load rises, the more copies of the virus there will be in the blood. The higher the number of copies found in the blood, the higher the number that will be present in other bodily fluids, such as vaginal fluid and semen.

The risk of HIV sexual transmission rises when the viral load is above 1,500 copies/ml. HIV-positive people who are taking HIV medicines and are virally suppressed are much less likely to transmit HIV. However, having a low or undetectable viral load (<40 to 50 copies/ml) does not eliminate the chance of infecting partners (Korobchuk et al., 2019; CDC, 2020e; Avert, 2020).

OTHER SEXUALLY TRANSMITTED DISEASES/INFECTIONS (STDs/STIs)

People who have a sexually transmitted disease (also called *sexually transmitted infection*) may be at an increased risk of acquiring or transmitting HIV. Some of the most common STDs include gonorrhea, chlamydia, syphilis, trichomoniasis, human papillomavirus (HPV), genital herpes, and hepatitis.

One reason for this is that the behaviors that put people at risk for one infection often put them at risk for others. When a person with HIV acquires another STD such as gonorrhea or syphilis, it is likely they were having sex without using condoms. Also, STDs and HIV tend to be linked, and when someone gets an STD, it indicates they may have acquired it from someone who may be at risk for other STDs as well as HIV.

People with HIV are more likely to shed HIV when they have urethritis or a genital ulcer, and in a sexual partner, a sore or inflammation caused by an STD may allow infection that would have normally been stopped by intact skin. Even STDs that cause no breaks or open sores can increase the risk by causing inflammation that increases the number of cells that can serve as targets for HIV.



Both syphilis and HIV are highly concentrated among men who have sex with men, and men who have syphilis are at a very high risk of being diagnosed with HIV in the future. HIV is more closely linked to gonorrhea than chlamydia (common among young women), and herpes simplex (HSV-2) is commonly associated with HIV. Studies have shown that persons infected with herpes are at three times higher risk for acquiring HIV infection (CDC, 2019e; CDC, 2019f).

LACK OF CIRCUMCISION

HIV acquisition rates are higher among uncircumcised males. This may be related to a high density of HIV target cells in the male foreskin. It has been demonstrated that circumcision reduces the risk of female-to-male HIV transmission by 50% to 60%. However, circumcision in men with HIV does not appear to decrease the risk of HIV transmission to the female partner, and the effectiveness of circumcision in men who have sex with men has not been demonstrated (Cohen, 2019).

Prevention and Risk-Reduction Methods

HIV is preventable. Nevertheless, new infections continue to occur despite the knowledge available about how the virus is transmitted and the means to prevent its transmission or acquisition. These include:

- **Sexual abstinence:** Not having oral, vaginal, or anal sex is the only 100% effective option to prevent the sexual transmission of HIV.
- **Limiting the number of sex partners:** The more sex partners one has, the more likely one of them has poorly controlled HIV or has a partner with an STI.
- **Condom use:** Using condoms correctly and every time when engaging in sexual activity will reduce HIV transmission risk.
- **HIV testing:** It is recommended that individuals get screened for HIV and that they know the HIV status of their partner(s).
- **Screening and treating for STIs:** Given the shared risk factors for HIV and other STIs, it is recommended that people at risk for HIV get screened and treated for STIs.
- **Stopping injection drug use:** Or, if unable to stop injecting drugs, using only sterile drug injection equipment and rinse water and never sharing equipment with others. (AHF, 2019)

CONDOMS AND THEIR CORRECT USE

A male condom is a thin layer of latex, polyurethane (plastic), polyisoprene (synthetic rubber), or natural membrane (i.e., lambskin) worn over the penis during sex. A female condom is a thin pouch made of synthetic latex called nitrile and is designed to be worn in the vagina during sex.



Latex condoms provide the best protection against HIV. Polyurethane or polyisoprene condoms are good options for people with latex allergies, but plastic ones break more often than latex ones.

Natural membrane (such as lambskin) condoms have small holes in them and **do not block HIV and other STDs** (CDC, 2019a).

Both women and men may need instruction in the correct use of condoms:

- Use latex or polyurethane condoms.
- Put on a condom before having sex.
- Read the package and check the expiration date.
- Make sure there are no tears or defects.
- Use water-based or silicone-based lubricant to prevent breakage.
- Do not use nonoxynol-9 (a spermicide), as this can cause irritation.
- Do not use oil-based products (e.g., baby oil, lotion, petroleum jelly, cooking oil) due to risk of breakage.
- Do not use more than one condom at a time.
- Do not reuse a condom.
- Store condoms in a cool, dry place.
- Do not store condoms in a wallet (due to risk of heat and friction damage).

Correct application of a male condom includes:

- Before any genital contact, place the condom on the head of the erect (hard) penis. If uncircumcised, pull back the foreskin first.
- Pinch air out of the tip of the condom.
- Unroll the condom all the way down to the base of the penis.
- After sex but before pulled out, hold the condom at the base, then pull out while holding the condom in place.
- Carefully remove the condom, check for breakage, and throw it in the trash.

(CDC, 2019a)

ANTIRETROVIRAL-BASED STRATEGIES

In addition to behavioral strategies, antiretroviral-based strategies have proven highly effective in preventing and reducing HIV transmission.



In infected persons, antiretroviral therapy medications prevent HIV from multiplying, reduce the viral load, and allow the immune system to recover and produce more CD4⁺ T cells. The main goal is to reduce the person's viral load to an undetectable level that effectively decreases to zero the risk of transmitting HIV to others (USDHHS, 2020).

Women with HIV should take HIV medications during pregnancy and childbirth to reduce the risk of transmitting HIV to their babies. Newborn babies also receive HIV medications for 4 to 6 weeks after birth, which reduces the risk of infection from any HIV that may have entered the baby's body during childbirth (CDC, 2019d).

In uninfected persons, pre-exposure prophylaxis (PrEP) is medication taken daily to prevent HIV infection. The FDA has approved certain medications (e.g., Truvada, Descovy) for daily use, and each medication has its own recommended use. Studies have shown that, when taken daily, PrEP reduces the risk of HIV infection from sex by about 99% and reduces the risk among people who inject drugs by 74% to 84%. It is much less effective when not taken consistently (CDC, 2019h).

Eligibility criteria for HIV pre-exposure prophylaxis is based on self-reported behavioral markers associated with high risk of acquiring HIV. People without HIV who are at risk and who should be assessed for PrEP include:

- Sexually active gay and bisexual men
- Sexually active heterosexual men and women
- Sexually active transgender persons
- Persons who inject drugs
- Persons who have been prescribed postexposure prophylaxis (PEP) and report continued risky behavior or have used multiple courses of PEP (CDC, 2019i)

Postexposure prophylaxis (PEP) involves taking a combination of three antiretroviral medications after being potentially exposed to HIV to prevent becoming infected. Exposure may occur due to a broken condom during sex, when sharing needles and works to prepare drugs, following a sexual assault, or through occupational exposure.

To be effective, PEP must be started within 72 hours after a recent possible exposure to HIV and must be taken once or twice daily for 28 days. It is effective in preventing HIV when taken correctly, but it is not 100% effective. Therefore, the person is advised to continue to use condoms with sex partners and to use safe injection practices when taking PEP (CDC, 2019g).



WHERE TO GET PEP AND PrEP IN WASHINGTON, DC

The DC Health and Wellness Center provides a variety of HIV prevention and treatment services to DC residents, including both PEP and PREP. Services are provided virtually via telehealth visits, in-person consultations, or a mix of virtual and in-person consultations. They include:

- Testing and treatment for patients with STIs/STI symptoms
- Emergency postexposure prophylaxis (PEP)
- Pre-exposure prophylaxis (PrEP) starts and routine visits, including TelePrEP
- Rapid HIV antiretroviral treatment starts
- Prescription refills
- Assistance with benefits and access to other services
(DC Health and Wellness Center, 2021)

Reducing Occupational Exposure to Bloodborne Pathogens

Although current data finds the risk of transmitting a bloodborne pathogen in a healthcare setting is low, some risk is unavoidable. This risk, however, can be greatly reduced by following the employee prevention control recommendations outlined in OSHA's Bloodborne Pathogen Standards and the Needlestick Safety and Prevention Act.

BLOODBORNE PATHOGENS STANDARDS TRAINING

In 1991 the Occupational Safety and Health Administration (OSHA) published the Bloodborne Pathogens Standard, which outlines measures that employers must follow to protect employees from bloodborne disease. In 2001, the standard was revised following passage of the Needlestick Safety and Prevention Act.

The standard covers private sector employers and workers in all 50 states, the District of Columbia, and other U.S. jurisdictions either directly through OSHA or through an OSHA-approved state plan. There are 22 states or territories that have such OSHA-approved state programs. The standard requires that employers must implement an exposure control plan for the worksite that includes details on employee protection measures. The standard requires employers to:

- Establish an exposure control plan and update the plan annually
- Implement the use of Standard Precautions that include:
 - Routine use of barriers (such as gloves and/or goggles) when anticipating contact with blood or body fluids



- Washing hands and other skin surfaces immediately after contact with blood or any other body fluids
- Careful handling and disposing of sharp instruments during and after use
- Identify and use engineering controls
- Identify and ensure the use of work practice controls
- Provide personal protective equipment (PPE), such as gloves, gowns, eye protection, and masks
- Make available hepatitis B vaccinations to all workers with occupational exposure
- Make available postexposure evaluation and follow-up to any occupationally exposed worker who experiences an exposure incident
- Use labels and signs to communicate hazards
- Provide information and training to workers
- Maintain worker medical and training records (OSHA, n.d.)

EMPLOYER PROTOCOL FOR MANAGING OCCUPATIONAL EXPOSURES

If a healthcare worker experiences an HIV exposure in the workplace, the person should follow the employer's protocol, which is based on guidelines issued by the U.S. Public Health Service (Kuhar et al., 2018).

- Clean the exposed area as recommended.
- Report the exposure to the department or individual responsible for managing exposure.
- Obtain medical evaluation as soon as possible.
- Discuss with a healthcare professional the extent of the exposure, treatment, and follow-up.

OSHA's Bloodborne Pathogens Standard (29 CFR 1910.1030) requires employers to make immediate confidential medical evaluation and follow-up available for workers who have an exposure incident.

POSTEXPOSURE PROPHYLAXIS

The 2018 updated U.S. Public Health Services guidelines for management of occupational exposures to HIV and recommendations for postexposure prophylaxis include:

- Determine HIV status of exposure source patient.



- Start PEP medication as soon as possible after occupational exposure and continue for a 4-week period.
- Include three or more antiretroviral drugs in PEP medication regimens.
- Provide close follow-up, beginning within 72 hours of an HIV exposure.
- If a newer 4th generation combination HIV p24 antigen-HIV antibody test is utilized for follow-up HIV testing, conclude HIV testing in 4 months post exposure; if not, conclude HIV testing in 6 months post exposure.

PEPline

Information regarding the most current PEP regimen is available to any clinician from the **Post-Exposure Prophylaxis Hotline (PEPline): 888-448-4911**.

The National Clinician Consultation Center provides free consultation and advice based on established guidelines and the latest medical literature on occupational exposure management to clinicians, including:

- Assessing the risk of exposure
- Determining the appropriateness of prescribing PEP
- Selecting the best PEP regimen
- Providing follow-up testing
(NCCC, 2020)

Preventing Transmission in the Home Care Environment

Healthcare professionals and other caregivers who care for HIV patients at home or in home-like settings are also at risk of exposure to HIV and other bloodborne pathogens. Nurses, nursing assistants, personal care assistants, and family members may experience percutaneous injuries and other exposures to blood and body fluids during care of an HIV-infected person.

Medical procedures contributing to percutaneous injuries in home care include injecting medications, performing fingersticks and heelsticks, and drawing blood. Other contributing factors include sharps disposal, contact with waste, and patient handling.

Healthcare workers should follow Standard Precautions and the Bloodborne Pathogen Standard when working in patients' homes and other home-like settings.

GLOVES AND HANDWASHING

Gloves (latex, vinyl, or nitrile in the case of latex allergy) should be worn whenever a caregiver anticipates contact with any body substance (blood/OPIM [other potentially infectious materials]) or nonintact skin.



When a task is completed, gloves should be carefully removed by pulling them off inside-out, one at a time, avoiding contact with any potentially infectious material. Gloves should be changed and hands washed as soon as possible. Never rub the eyes, mouth, or face while wearing gloves. Disposable gloves should never be washed and reused. Correct handwashing is critically important.

CLEANING BLOOD/OPIM FROM SURFACES

Wear appropriate gloves when cleaning blood from **skin surfaces**. Use sterile gauze or other bandages and follow normal first-aid techniques to stop any bleeding. After applying a bandage, remove the gloves slowly so that fluid particles do not splatter or become aerosolized. Hands should be cleaned using either soap and water or an alcohol-based hand sanitizer as soon as possible.

On **vinyl floors**, pretreat body fluid spills with full-strength liquid disinfectant or detergent; then wipe up with either a mop and hot soapy water or appropriate gloves and paper towels. Dispose of paper towels into a well-marked plastic bag or heavy-duty container. Broken glass should be swept up using a broom and dustpan (never bare hands).

Use a disinfectant (such as 1 part household bleach freshly mixed with 10 parts water) to disinfect the area where the spill occurred. If a mop was used for cleaning, soak it in a bucket of hot water and disinfectant for the recommended time. Empty the mop water into the toilet, not the sink. Sponges and mops used to clean up body fluid spills should not be rinsed in the kitchen sink or in a location where food is prepared.

On **carpeting**, pour dry kitty litter or another absorbent material onto the spill to absorb the body fluid. Carefully pour full-strength liquid detergent onto the carpeting and leave it there for the amount of time indicated in the manufacturer's instructions. Using sturdy rubber gloves, blot the spill with paper towels until it is absorbed. Vacuum normally afterward. Dispose of debris, paper towels, or soiled kitty litter in a sealed plastic bag placed inside another plastic garbage bag.

CLOTHING AND OTHER LAUNDRY

Clothes, washable uniforms, towels, or other laundry stained with blood/OPIM should be washed and disinfected before further use. If possible, have the patient remove the clothing. If necessary, use appropriate gloves to assist with removing the clothes.

If the washing machine is not close by, transport the soiled items in a sturdy plastic bag. Then place the items in the washing machine and soak or wash them in cold, soapy water to remove any blood from the fabric. (Hot water will permanently set blood stains.)

Use hot water for a second washing cycle and include detergent, which will act as a disinfectant. Dry the items in a clothes dryer. Wool clothing or uniforms may be rinsed with cold, soapy water then dry cleaned to remove and disinfect the stain.



DIAPER CHANGES

Use a new pair of gloves to change diapers. Remove gloves carefully and wash hands immediately. Cloth diapers should be washed in very hot water with detergent and a cup of bleach and dried in a hot clothes dryer.

CLEANING SPONGES AND MOPS

Sponges and mops used in the kitchen should not be used to clean body fluid spills or bathrooms. All sponges and mops should be routinely disinfected with a fresh bleach solution or other similar disinfectant.

TOILET AND BEDPAN SAFETY

It is safe to share toilets/toilet seats without special cleaning, unless the surface becomes contaminated with blood/OPIM. If this occurs, spray the surface with 1:10 bleach solution. Wearing gloves, wipe the seat dry with disposable paper towels.

Persons with open sores on their legs, thighs, or genitals should disinfect the toilet seat after each use. Urinals and bedpans should not be shared between family members unless these items are thoroughly disinfected after each person's use.

THERMOMETERS

Electronic thermometers with disposable covers do not need to be cleaned between uses for the same individual unless visibly soiled. Wipe the surface with a disinfectant if necessary. Glass thermometers should be washed with soap and warm water before and after each use. If the thermometer will be shared among family members, after each use it should be soaked in 70% to 90% ethyl alcohol for 30 minutes then rinsed under a stream of warm water.

PERSONAL HYGIENE ITEMS

People should not share razors, toothbrushes, personal towels or washcloths, dental hygiene tools, vibrators, enema equipment, or other personal care items.

SAFE AND LEGAL DISPOSAL OF SHARPS

Syringes, needles, and lancets are called *sharps*, and their disposal is regulated. Sharps can carry hepatitis, HIV, and other bacteria and viruses that cause disease. Throwing them in the trash or flushing them down the toilet can pose health risks for others (such as sanitation workers, other utility workers, and the public) from needlesticks and illness. Rules and disposal options vary according to circumstances, so it is essential to check with the local health department to see which option applies to any given situation.

Parents and caregivers should make sure that children understand never to touch a found needle or syringe but to immediately ask a responsible adult for help.



Safe disposal of syringes found in parks and other public locations should follow these guidelines:

- Do not pick up a found syringe or needle with bare hands. Use gloves and tongs, shovel, or a broom and dustpan to pick it up. Hold the needle away from the body.
- Do not break the needle off from the syringe.
- Place used sharps and syringes in a safe container with at least a one-inch opening and a lid that will seal tightly, such as an empty plastic laundry detergent container or glass bottle or jar. If a glass jar is used, place it in a larger plastic bucket or container that has a tight-fitting lid. Soda cans are **not** good containers to use because people often try to recycle discarded cans. Do not flush needles or syringes down the toilet.
- Tape the container shut for added safety and label it with the warning: “SHARPS, DO NOT RECYCLE!” Place it well out of reach of children.
- Call the local health department to determine what disposal sites are available.

Anyone with an accidental needlestick requires prompt assessment by a medical professional. Testing for HIV, HCV, and HBV may be recommended. If someone finds and handles a syringe but no needlestick occurs, testing for HIV is not necessary.

SAFE FOOD PREPARATION

Kitchens can harbor bacteria that may prove life threatening to a person with HIV/AIDS due to their compromised immune system. Use the following precautions during food preparation and cleanup:

- Wash hands thoroughly before preparing food.
- Use a clean spoon to taste food, and wash the spoon after using it once.
- Avoid unpasteurized milk, raw eggs or products that contain raw eggs, cracked or nonintact eggs, and raw fish. Cook all meat, eggs, and fish thoroughly to kill any organisms that may be present. Wash fruits and vegetables thoroughly.
- Disinfect countertops, stoves, sinks, refrigerators, door handles, and floors regularly. Use window screens to keep out insects.
- Discard food that has expired or is past a safe storage date, shows signs of mold, or smells bad.
- Use separate cutting boards for meat and for fruits and vegetables. Avoid wood cutting boards if possible. Disinfect cutting boards frequently.
- Keep kitchen garbage in a leak-proof, washable receptacle that is lined with a plastic bag. Seal the garbage liner bags and change bags frequently.



PET CARE

Certain animals can pose hazards for people with compromised immune systems. These animals include turtles, reptiles, birds, puppies and kittens under the age of eight months, wild animals, and pets without current immunizations or with illnesses of unknown origin. Pet cages and cat litter boxes can harbor infectious organisms that may become aerosolized. Pets can also spread disease by licking a person's face or open wounds.

- All pet care should be followed by thorough handwashing.
- Cats' claws and dogs' nails should be kept trimmed.
- Latex or nitrile gloves should be worn to clean up any pet urine, feces, vomit, or OPIM. The soiled area should be cleaned with a fresh 1:10 bleach solution.
- Pet food and water bowls should be washed regularly in warm, soapy water and rinsed clean.
- Cat litter boxes should be emptied out regularly and washed at least monthly.
- Fish tanks should be kept clean. Heavy latex gloves that reach to the upper arms, such as "calf-birthing" gloves, can be purchased from a veterinarian for immunocompromised individuals to wear to clean a fish tank.
- Pets should not be allowed to drink from the toilet or eat other animal feces, any type of dead animal, or garbage.
- Cats should be restricted to indoors. Dogs should be kept indoors or on a leash.

Many communities have volunteer groups and veterinarians who will assist people with HIV to take care of their pets, if needed.

HIV TESTING AND COUNSELING

About 1 in 7 people in the United State who have HIV **do not know** they are infected and are not aware of their risk. HIV infection goes undiagnosed in over 50% of HIV-positive 13- to 24-year-olds.

The only way people can know they are infected with HIV is if they get tested. People who are aware of their positive status can then receive treatment that can help them to remain healthy for many years, and the sooner they begin treatment following diagnosis, the more they can benefit. People who test negative for HIV can also be prepared to make more informed decisions about matters of sex, drug use, and healthcare. Those who are HIV-negative and are at very high risk, may begin HIV pre-exposure prophylaxis (PrEP), which is highly effective for prevention of HIV (HIV.gov, 2018; NIH, 2020).



SOCIAL BARRIERS TO TESTING

Some of the social barriers that prevent accessing HIV testing and antiretroviral therapy include gender inequality and harmful gender norms that are rooted in cultural practices and laws, the influence of masculine ideology on risk-taking behaviors, stigma, racism, and homophobia. Discrimination, stigma, and homophobia remain prevalent against racial/ethnic and sexual minorities, people who inject drugs, and HIV-positive individuals, which often discourages them from seeking testing, prevention, and treatment services. Language barriers and concerns about immigration status present additional challenges in accessing HIV testing, prevention, and treatment (Weibel, 2018).

CDC Testing Recommendations

The CDC recommends that **everyone between the ages of 13 and 64** get tested for HIV at least once as part of routine healthcare and that people with certain risk factors be tested quarterly or at least annually.

Repeat testing may be done many times. If an individual has tested negative for HIV in the past and answers any of the following questions affirmatively since that previous test, **repeat HIV testing** should be done:

- Are you a man who has had sex with another man?
 - Have you had sex (anal or vaginal) with an HIV-positive partner?
 - Have you had more than one sex partner?
 - Have you injected drugs and shared needles or works with others?
 - Have you exchanged sex for drugs or money?
 - Have you been diagnosed with, or sought treatment for, another sexually transmitted disease?
 - Have you been diagnosed with or treated for hepatitis or tuberculosis?
 - Have you had sex with someone who could answer “yes” to any of the above questions or someone whose sexual history you do not know?
- (HIV.Gov, 2018)

TESTING MEN WHO HAVE SEX WITH MEN

CDC recommends that clinicians screen asymptomatic gay, bisexual, or men who have sex with men (MSM) at least annually. Furthermore, clinicians should consider the benefits of more frequent screening (e.g., once every 3 or 6 months) for individual MSM at increased risk for HIV infection (CDC, 2019k).



TESTING PREGNANT WOMEN

The chance that HIV infection will be transmitted from an HIV-infected pregnant woman to her child can be reduced to 1% or less if the mother's HIV status is known and she receives treatment. Since 1975 the CDC has recommended that all pregnant women be tested for HIV. Despite this recommendation, however, many women still do not get tested for HIV during pregnancy for a variety of personal reasons.

There are two ways to approach pregnant women about HIV testing:

- **Opt-in:** Pregnant women are given pre-HIV test counseling, and they must agree to receive an HIV test, usually in writing.
- **Opt-out:** Pregnant women are told that HIV testing will be included in the standard group of prenatal tests and that they may decline the test. Unless they decline it, they will receive the test.

Evaluations of both approaches have led the CDC to recommend universal opt-out HIV testing for all pregnant women early in every pregnancy. A second test in the third trimester is recommended in certain geographic areas or for women who are known to be at high risk for becoming infected. The CDC also recommends HIV testing at labor and delivery for women without a prenatal test result (CDC, 2020f).

TESTING SEXUAL ASSAULT VICTIMS

Anyone who has been sexually assaulted should have an HIV antigen test, which can detect infection sooner than standard antibody testing. They should also be started on postexposure prophylaxis (PEP) within 3 days of exposure (HIV.gov, 2018).

Types of HIV Tests

There is no HIV test that can detect HIV immediately after infection. The time between acquiring HIV and when a test can accurately detect it is called the *window period*. This period varies from person to person and also depends on the type of HIV test (HIV.gov, 2018).

ANTIBODY TESTS

Most HIV tests, including most rapid tests and home tests, look for antibodies produced by the immune system. Most people will develop detectable antibodies within 3 to 12 weeks of infection, and so the soonest an antibody test can detect infection is 3 weeks. These tests are usually done with **blood** from a fingerstick or with **oral fluid**, and results are ready in 30 minutes or less.

Oral testing uses a specially treated pad placed into the mouth and gently rubbed between the lower cheek and gum. The pad collects oral mucosal transudate (OMt), which contains HIV



antibodies in an HIV-infected person. (It does not test for HIV in saliva.) OMt testing is an alternative to blood testing and is able to detect infection one month or more later than blood-based tests due to the lower concentration of antibodies in oral fluid than in blood.

Urine HIV antibody tests use the urine ELISA and urine Western Blot technique to detect HIV antibodies and are FDA-licensed as an alternative to blood testing (CDC, 2019j).

ANTIBODY-ANTIGEN COMBINATION (FOURTH-GENERATION) TESTS

This type of testing (ELISA test or EIA/enzyme immunoassay) is the most accurate and reliable and looks for both HIV antibodies and part of the virus itself, the p24 antigen. The antigen can be detected before antibodies appear, and combination tests are recommended as the first test to be done in a laboratory setting.

Most laboratories use an immunoassay for detecting the HIV p24 antigen and antibodies to HIV-1, followed by a confirmatory immunoassay to distinguish between HIV-1 and HIV-2. Results take several days to be available.

Most people will make enough antigens and antibodies for fourth-generation or combination tests to accurately detect infection in blood drawn from a vein 2 to 6 weeks after infection. Antigen/antibody tests done with blood from a fingerstick can take longer to detect (up to 90 days) after an exposure (CDC, 2019j).

There are no antigen/antibody tests available for use with oral fluid.

HIV-1/HIV-2 DIFFERENTIATION IMMUNOASSAY (FIFTH GENERATION) TEST

The HIV-1/HIV-2 differentiation immunoassay detects the same biomarkers as the combination tests but can also distinguish between HIV-1 and HIV-2. This is a rapid laboratory-based test typically used to confirm a positive fourth-generation combination assay. Test results can be obtained generally in under 20 minutes.

NUCLEIC ACID TEST (NAT)

This test looks for HIV RNA or DNA in the blood, not the antibodies to the virus. This test is very expensive and is not routinely used for screening people unless they have recently had a high-risk exposure or a possible exposure with early symptoms of HIV infection.

Nucleic acid testing is also used for **infants and children younger than 18 months**. The HIV antibody-only and antigen/antibody combination tests used for adults and older children are not reliable in infants and young children, as they will detect the transplacentally acquired antibody maternal HIV antibodies that persist for many months following birth. It is essential to establish the diagnosis of HIV infection in this population because infected infants have a high morbidity and mortality if treatment is delayed.



There are no nucleic acid tests available for use with oral fluid. Most people will have enough HIV in their blood for a nucleic acid test to detect infection 1 to 4 weeks after infection. The results of NAT may take several days to be available (CDC, 2019j; Gillespie, 2019).

HIV SCREENING TESTS	
Test Category	Test
Antibody tests	<ul style="list-style-type: none"> • Vironostoke HIV-1 Microelisa • Genetic System HIV-1/2
Rapid antibody tests	<ul style="list-style-type: none"> • OraQuick Advance for blood and saliva • Uni-gold Recombigen • INSTI HIV-1/HIV-2
Antibody/antigen combination tests (4th generation)	<ul style="list-style-type: none"> • Determine HIV 1/2 Ag/Ab Combo • ARCHITECT HIV Ag/Ab Combo
HIV-1/HIV-2 differentiation immunoassay (5th generation)	<ul style="list-style-type: none"> • Bio-Rad Geenius HIV1/2 confirmation assay • Bio-Rad Multispot HIV-1/HIV-2
Nucleic acid test	<ul style="list-style-type: none"> • Aptima HIV-1 RNA Qualitative Assay
(CDC, 2020f)	

Testing Sites

HIV tests are generally available in many places, including:

- Healthcare providers' offices
- Health clinics or community health centers
- STD/STI or sexual health clinics
- Local health departments
- Family planning clinics
- VA medical centers
- Substance abuse prevention or treatment programs
- Many pharmacies
- Some community-based organizations that extend the reach of state and local health departments
- Home testing kits available in pharmacies or online (HIV.gov, 2018)

These sites can connect people to HIV care and treatment if they test positive or can discuss the best HIV prevention options if they test negative.



(See also “Resources” at the end of this course for a link to information on free HIV testing sites in Washington, DC.)

HIV Test Funding

HIV screening is covered by health insurance without a co-pay, as required by the Affordable Care Act. If an individual does not have health insurance, some testing sites may offer free tests (HIV.gov, 2018).

Medicare Part B covers an HIV screening once per year if the person meets one of these conditions:

- The person is age 15 to 64.
- The person is younger than 15 or older than 65 and at increased risk for HIV.

Medicare also pays for HIV screening up to three times during a woman’s pregnancy (Medicare.gov, 2020).

Testing Approaches and Reporting Results

There are three approaches by which HIV testing is implemented and carried out. They include:

- **Point-of-care** testing is done onsite where the patient is receiving services. Most rapid HIV testing is done in nonclinical settings. The results of these rapid tests are often provided in less than one hour or even within minutes.
- **Home** testing is an effective method for reaching people who are not otherwise getting tested.
- **Laboratory-based** testing involves testing done in an approved laboratory, with the person returning at a later date for the test result and counseling.

HIV test results are reported as negative, positive, or indeterminate.

A **negative** test result means the person is unlikely to be infected with HIV. However, if the HIV test is done following a recent potential HIV exposure and the result is negative, testing should be done again after the window period. If the result of an HIV test within 3 months following a potential HIV exposure is negative, repeat testing should be done again in 3 months for confirmation. Diagnosing a recently acquired HIV infection is important because this is the period when viral levels are high and the person is most likely to transmit HIV to someone else.

If the test results are **positive**, a follow-up test will be conducted for confirmation.

- If the test was a rapid screening test, the testing site will arrange a follow-up test.



- If the test was a self-test kit used at home, a positive HIV test result must always be confirmed by additional HIV testing performed in a healthcare setting.
- If the blood was tested in a laboratory, the laboratory will automatically conduct a follow-up test on the same sample to rule out a false positive.

If the follow-up test is also positive, the person is diagnosed with HIV infection.

An **indeterminate** result occurs when the test results are not clearly positive or negative. The final result usually depends on the person's risk of having HIV. The most important HIV-related cause of an indeterminate test result is a recently acquired infection. Persons with high risk for HIV may be in the early stages of infection, and follow-up testing will be positive. Sometimes a person can have an indeterminate result for unknown reasons, and follow-up testing will be negative.

False-positive test results can occur due to technical issues associated with the test or biological causes. Technical issues include:

- Specimen mix-up
- Mislabeling
- Improper handling
- Misinterpretation of a visually read rapid test result

Biological causes include:

- Participation in an HIV vaccine study
- Autoimmune disorders
- Other medical conditions

False-negative screening results are more likely to occur with antibody-only tests than with the combination antigen/antibody test. Most false-negative results are due to the window period following acquisition of the HIV infection before antibodies are detectable. The use of combination antigen/antibody assays has reduced, but not eliminated, the possibility of a false-negative result (CDC, 2020g; Sax, 2019).

HIV Counseling

HIV counseling refers to an interactive process of assessing risk, recognizing specific behaviors that increase the risk for acquiring or transmitting HIV, and developing a plan to take specific steps to reduce risks. It is a very important step in the testing process and begins with forming a relationship with a patient. Counseling and risk assessment should be client-focused but counselor-driven.



For individual testing, the CDC no longer supports extensive pretest and post-test counseling. Instead, CDC guidelines recommend:

- Persons who test positive for HIV should be counseled, either on-site or through referral, concerning the behavioral, psychosocial, and medical implications of HIV infection.
- Healthcare providers should assess the need for immediate medical care and psychosocial support.
- Providers should link persons with newly diagnosed HIV infection to services provided by healthcare personnel experienced in the management of HIV infection. Additional services that might be needed include:
 - Substance abuse counseling and treatment
 - Treatment for mental health disorders or emotional distress
 - Reproductive counseling
 - Risk-reduction counseling
 - Case management
- Providers should follow up to ensure that patients have received services for any identified needs
(CDC, 2020g)

Additional recommendations for HIV counseling include the following:

Pretest Counseling

- Discuss HIV, risk factors, and prevention methods
- Explain the meaning of positive and negative test results and their implications
- Assess the patient's personal and social supports
- Determine the patient's readiness to cope with test results
- Discuss disclosure of test results to others
- Advise the patient if reporting positive test results to health authorities is required

Post-Test Counseling

- Inform the patient of the results and meaning of the test results
- Provide education about avoiding risks of sexual and injection drug exposures
- For those who test positive, assess the impact of test results for the patient
- Explain treatment options
- Discuss partner counseling and disclosure of test results to others



- Initiate a support and treatment plan (CDC, 2020g)

Risk Assessment and Harm Reduction Strategies

A patient's individual HIV risk can be determined through risk screening based on self-reported behavioral risk and clinical signs or symptoms. Behavioral risks include injection drug use or unprotected intercourse with a person at increased risk for HIV. Clinical signs and symptoms include those suggestive of HIV infection and other STIs.

RISK ASSESSMENT QUESTIONS

Behavioral risks can be identified either through open-ended questions by the provider or through screening questions (i.e., a self-administered questionnaire). An example of an open-ended question is: "What are you doing now or what have you done in the past that you think may put you at risk of HIV infection?"

Common risk assessment questions include:

- How do you identify your gender (male, female, trans, other)?
- What is your preference for a sexual partner (male, female, trans, other)? Have you ever had an HIV or STD/STI test in the past, and if so, was it within the last year?
- Since your last HIV/STD test have you:
 - Had unprotected anal or vaginal sex?
 - Had vaginal or anal sex with a person who is HIV positive?
 - (If female) Had vaginal or anal sex with a person whom you know is a man who also has sex with men?
 - Exchanged sex for drugs, money, or something you needed?
 - Had vaginal or anal sex with a person who injects drugs?
 - Used injection drugs, and if so, did you share injection equipment?

(HIV Alliance, 2020)

RISK-REDUCTION COUNSELING AND INTERVENTION STRATEGIES

Risk-reduction counseling and harm reduction strategies can reduce behaviors that result in higher risk of HIV infection. Studies have shown that such counseling decreases the risk of sexually transmitted diseases, including HIV. Risk-reduction counseling can range from brief prevention messages, to high-intensity behavioral discussions tailored to the person's risk, to group-based strategies.



- Continue to advise consistent condom use as a crucial element of prevention. For women who are unable to convince their partners to use a condom, assess other barrier methods. (Female condoms are also impervious to viruses, including HIV; however, there is limited clinical data regarding their efficacy.)
- Recommend screening and treatment of STDs in those at risk for HIV due to the shared risk factors for both and the association of other STDs with HIV infection.
- For those who have high ongoing risk for HIV infection, recommend that they receive daily pre-exposure prophylaxis (PrEP).
- For patients who have had a mucosal or parenteral exposure to HIV within the prior 72 hours, recommend postexposure prophylaxis with an antiretroviral regimen.

For people who inject drugs, risk-reduction interventions can include:

- Voluntary opioid substitution therapy and needle exchange programs. Opioid substitution has been found to decrease illicit opioid use, injection use, and sharing injection equipment.
- Needle exchange or supervised injection programs. Such programs are found to decrease needle reuse and sharing and to increase safe disposal of syringes and more hygienic injection practices.

For couples in which one is HIV infected and the other uninfected:

- Counsel about and recommend the initiation of antiretroviral treatment. Pre-exposure prophylaxis for the uninfected partner may be indicated until the partner with HIV has achieved a stable viral suppression on ART. This usually requires six months of treatment.
- When the infected partner has achieved viral suppression, the risk of HIV transmission is negligible, but the use of condoms should continue in order to reduce risk of STD transmission and in case there is a failure in viral suppression.

Strategies for **preventing mother-to-child transmission:**

- ART for pregnant women
- PEP (postexposure prophylaxis) for the infant

(Cohen, 2019)



CONCLUSION

Despite the passage of time and advances in prevention and treatment, HIV/AIDS continues to affect many people around the world. Today's younger people are living in a time when the disease is known to be controllable, and they may have limited knowledge about the history of HIV/AIDS and a lesser sense of urgency or concern about it. However, the public's attitude toward the populations that are currently in the forefront of the epidemic remains one of stigmatization.

In the medical field, research has produced ever more effective drugs that slow the disease but do not stop it, and the cost of these drugs remains beyond the reach of many. No vaccine has proven effective in preventing HIV, and so the epidemic continues to spread, primarily among those high-risk persons living in disadvantaged and marginalized groups: the poor, people of color, people in prison, people who inject drugs, people who exchange sex for money or goods, and men who have sex with men. Many do not realize they are infected and may unknowingly transmit the virus to others.

The key to controlling this epidemic is prevention. Since most HIV infection is the result of sexual transmission, the most important prevention method is to refrain from unprotected sexual intercourse—vaginal, anal, or oral—unless it takes place within a monogamous relationship. The CDC recommends using latex condoms consistently and correctly and, when considering a sexual relationship, avoiding any type of sexual contact with someone who is unknown, is known to have had several sexual partners, or regularly uses syringes to inject drugs. Secondly, HIV is spread among injection drug users by the sharing of needles. Education and intervention must extend to these individuals to discourage the sharing of any type of drug paraphernalia.

Healthcare professionals have a vital role in meeting the goals for elimination of new HIV infections. These are built on the following key strategies:

- Educating patients, families, and communities about prevention
- Diagnosing all individuals with HIV as early as possible
- Treating people with HIV rapidly and effectively to achieve sustained viral suppression
- Preventing new HIV transmissions by using proven interventions, including pre-exposure prophylaxis and advocating for syringe services programs
- Providing compassionate and nondiscriminatory healthcare to those who have contracted this life-impacting disease



RESOURCES

AIDSinfo (USDHHS)
<https://aidsinfo.nih.gov>

DC Health and Wellness Center (including TelePrEP)
<https://sexualbeing.org/dc-health-and-wellness-center/>
202-741-7692

DC PEP Hotline: 202-299-3PEP (3737)

Emergency Contraception Hotline
<http://www.not-2-late.com>
888-NOT-2-LATE (888-668-2528)

Free HIV testing in DC
https://doh.dc.gov/sites/default/files/dc/sites/doh/page_content/attachments/2017%20APR%20HIV%20TESTING_0.pdf

HIV/AIDS (CDC)
<https://www.cdc.gov/hiv>

HIV.gov
<https://www.HIV.gov>

HIV and AIDS (Office on Women's Health)
<https://www.womenshealth.gov/hiv-and-aids>

HIV hotlines and referrals (CDC)
<https://www.cdc.gov/hiv/library/hotlines.html>

PrEP map
<https://sexualbeing.org/get-prep/prep-map/>

Sexual Being (DC Department of Health)
<https://sexualbeing.org/>

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TEST

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1. Which statement **correctly** describes HIV?
 - a. The body can destroy HIV completely with treatment.
 - b. Once infected with HIV, the person has it for life.
 - c. HIV attacks both red blood cells and the lymphocytes.
 - d. Most HIV infections are caused by the P strain of the virus.

2. The key component of the immune system that HIV attacks is the:
 - a. Memory B cell.
 - b. CD4⁺ T cell.
 - c. N and K cell.
 - d. T 8 cell.

3. Which group of Washington, DC, residents has the highest percentage living with HIV?
 - a. White men
 - b. Latino men
 - c. Black men
 - d. Black women

4. In the United States, which behavior carries the greatest estimated risk of acquiring HIV?
 - a. Shared needles during injection drug use
 - b. Receptive anal intercourse
 - c. Getting a tattoo
 - d. Oral sex

5. The population with the highest risk for acquiring HIV is:
 - a. Men who have sex with men.
 - b. Persons who inject drugs.
 - c. Incarcerated persons.
 - d. Transgender persons.



6. One of the **most important** factors influencing the risk of HIV transmission is:
- Exposure to the saliva of an infected host.
 - Getting gonorrhea.
 - Having a genital ulcer.
 - The viral load in the host's blood.
7. Which is a **true** statement about antiretroviral HIV prevention interventions?
- Postexposure prophylaxis (PEP) is 100% effective when taken correctly.
 - PEP must begin seven days post exposure and continue for one year.
 - Pre-exposure prophylaxis (PrEP) is generally not effective among high-risk persons.
 - PrEP has been demonstrated to greatly reduce HIV infection if taken consistently.
8. The CDC recommends which people be tested for HIV at least once?
- Adults age 18 or older if they are sexually active
 - Only men who have sex with men and injection drug users
 - Everyone between the ages of 13 and 64
 - Only men and women who have more than one sex partner
9. What is the advantage of carrying out a fifth-generation HIV test?
- It can be used for infants and young children under 18 months.
 - It is the most accurate and reliable HIV test.
 - It can distinguish between HIV-1 and HIV-2.
 - It can be done at home.
10. Which is a **correct** statement regarding CDC HIV test counseling guidelines?
- The CDC supports extensive pre- and post-test counseling.
 - The CDC recommends persons who test positive be counseled.
 - The CDC requires pretest counseling only.
 - The CDC requires post-test counseling only.