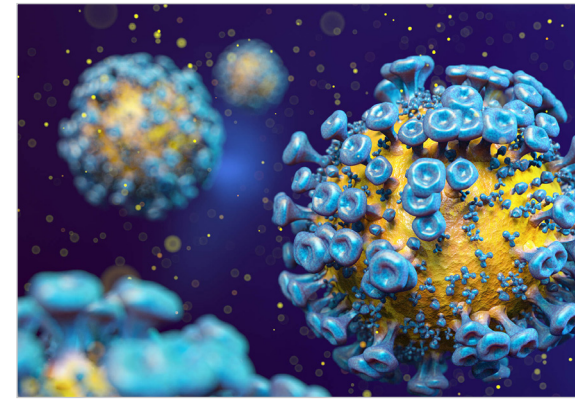
# HIV Infection and Cancer Risk



## Do people infected with human immunodeficiency virus (HIV) have an increased risk of cancer?

Yes. People infected with HIV have a substantially higher risk of some types of cancer compared with uninfected people of the same age.[1] The general term for these cancers is "HIV-associated cancers." Three of these cancers are known as "acquired immunodeficiency syndrome (AIDs)-defining cancers" or "AIDS-defining malignancies": Kaposi sarcoma, aggressive B-cell non-Hodgkin lymphoma, and cervical cancer. A diagnosis of any of these cancers in someone infected with HIV confirms a diagnosis of AIDS.

Compared with the general population, people infected with HIV are currently about 500 times more likely to be diagnosed with Kaposi sarcoma, 12 times more likely to be diagnosed with non-Hodgkin lymphoma, and, among women, 3 times more likely to be diagnosed with cervical cancer.[2]

In addition, people infected with HIV are at higher risk of several other types of cancer (collectively called "non–AIDS-defining cancers").[1,2] These other malignancies include cancers of the anus, liver, oral cavity/pharynx, and lung, and Hodgkin lymphoma.[3,4]

People infected with HIV are 19 times more likely to be diagnosed with anal cancer, 3 times as likely to be diagnosed with liver cancer, 2 times as likely to be diagnosed with lung cancer, about 2 times as likely to be diagnosed with oral cavity/pharynx cancer, and about 8 times more likely to be diagnosed with Hodgkin lymphoma compared with the general population.[2]

In addition to being linked to an increased risk of cancer, HIV infection is associated with an increased risk of dying from cancer. HIV-infected people with a range of cancer types are more likely to die of their cancer than HIV-uninfected people with these cancers.[5,6]

## Why might people infected with HIV have a higher risk of some types of cancer?

Infection with HIV weakens the immune system and reduces the body's ability to fight viral infections that may lead to cancer.[2,7,8] The viruses that are most likely to cause cancer in people with HIV are[9]:

- Kaposi sarcoma-associated herpesvirus (KSHV), also known as human herpesvirus 8 (HHV-8), which causes Kaposi sarcoma and some subtypes of lymphoma
- Epstein-Barr virus (EBV), which causes some subtypes of non-Hodgkin and Hodgkin lymphoma
- Human papillomaviruses (HPV), high-risk types of which cause cervical cancer, most anal cancers, and oropharyngeal, penile, vaginal, and vulvar cancer
- Hepatitis B virus (HBV) and hepatitis C virus (HCV), which both cause liver cancer

HIV-infected persons are more likely to be infected with these viruses than people in the general population.[10–13]

In addition, the prevalence of some traditional risk factors for cancer, especially smoking (a known cause of lung and other cancers) and heavy alcohol use (which can increase the risk of liver cancer), is higher among people infected with HIV.[12,14] Also, because people infected with HIV have compromised immune systems, both immunosuppression and inflammation may have direct or indirect

roles in the development of some cancers that are elevated in people infected with HIV.[2,9]

The poorer cancer survival of HIV-infected people may result, at least in part, from the weakened immune system in such individuals. The increased risk of death could also result from the cancer being more advanced at diagnosis, delays in cancer treatment, or poorer access to appropriate cancer treatment.

## Has the introduction of antiretroviral therapy changed the cancer risk of people infected with HIV?

The introduction of highly active antiretroviral therapy (HAART), also called combination antiretroviral therapy (cART), starting in the mid-1990s greatly reduced the incidence of certain cancers in HIV-infected patients, especially Kaposi sarcoma and non-Hodgkin lymphoma.[2] The likely explanation for this reduced incidence is that cART lowers the amount of HIV circulating in the blood, thereby allowing partial restoration of immune system function to fight the viruses that cause many of these cancers.

Although the risk of these AIDS-defining cancers among people infected with HIV is lower than in the past, it is still much higher than among people in the general population.[15] This persistently high risk may reflect the fact that cART does not completely restore immune system functioning. Also, many people infected with HIV are not aware they are infected, have had difficulty in accessing medical care, or for other reasons are not receiving adequate antiretroviral therapy.

The introduction of cART has not reduced the incidence of all HIV-related cancers, and in fact there has been an increase in non–AIDS-defining cancers. For example, the incidence of liver and anal cancer may be increasing among HIV-infected individuals.[2,15]

An important factor contributing to the increase in non–AIDS-defining cancers is that as cART has reduced the number of deaths from AIDS, the HIV-infected population has grown in size and become older. The fastest growing proportion of HIV-infected individuals is the over-40 age group. These individuals are now developing cancers common in older age and also have an increased cumulative risk of developing HIV-associated cancers.

## What can people infected with HIV do to reduce their risk of cancer or to find cancer early?

Taking cART as indicated based on current HIV treatment guidelines lowers the risk of Kaposi sarcoma and non-Hodgkin lymphoma and increases overall survival.

The risk of lung, oral, and other cancers can be reduced by quitting smoking. Because HIV-infected people have a higher risk of lung cancer, it is especially important that they do not smoke.

The higher incidence of liver cancer among HIV-infected people appears to be related to more frequent infection with hepatitis virus (particularly HCV in the United States) than among HIV-uninfected people.[12,16] Therefore, HIV-infected individuals should know their hepatitis status.

In addition, if HIV-infected people currently have viral hepatitis, they should discuss with their health care provider whether antiviral treatment is an option for them.[9,16–19] Some drugs may be used for both HBV-suppressing therapy and cART.[16]

Because HIV-infected women have a higher risk of cervical cancer, it is important that they be screened regularly for this disease. In addition, the Centers for Disease Control and Prevention (CDC) recommends vaccination against human papillomavirus (HPV) for women and men with HIV infection up to age 26 years. Cervical cancer screening guidelines that incorporate results of a Pap test and an HPV DNA test are evolving, and women should discuss screening options with their healthcare provider.[20]

Some researchers recommend anal Pap test screening to detect and treat early lesions before they progress to anal cancer.[21] However, it is not clear if this type of screening benefits all HIV-infected people or if treating such lesions prevents anal cancer. These questions are being addressed in an NCI-funded trial called the Anal Cancer/HSIL Outcomes Research (ANCHOR) Study. This study is currently enrolling men and women with HIV to undergo anal Pap testing and then be randomly assigned to receive either treatment or observation (no treatment). The goal is to determine whether treatment of anal lesions prevents anal cancer in HIV-infected people with anal lesions.

KSHV is secreted in saliva, and transmission of this virus may occur through deep kissing, through the use of saliva as a lubricant in sex, or through oral–anal sex. Reducing contact through these routes may reduce the chance of being infected with KSHV.

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**Source:** National Cancer Insititute. ■

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