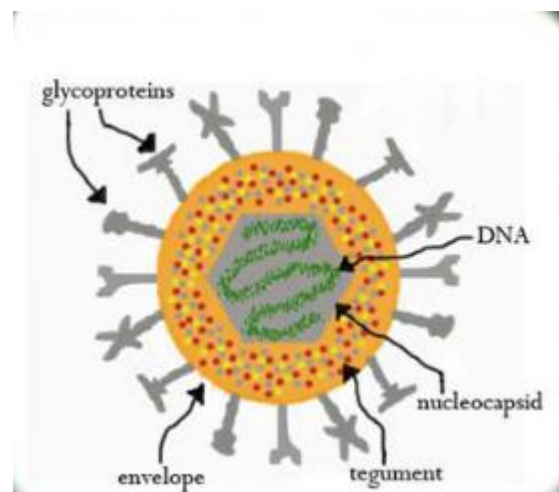


## Herpes Simplex Virus (HSV)

### ***Structure:***

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The basic structure of the herpesviruses includes an icosahedral capsid containing a linear, double-stranded viral DNA genome. Surrounding the capsid is a layer of mRNAs and proteins known as the tegument, which in turn is covered by a lipid bilayer envelope containing various glycoproteins and proteins. Skin keratinocytes represent a primary entry site for herpes simplex virus 1 (HSV-1) *in vivo* and the viruses enter the cells by engulfing after it recognizes the receptors on the human cells.



- HSVs belong to the *Herpesviridae* family of over 100 viruses, each consisting of an enveloped icosahedral capsid containing a proteinaceous tegument and a linear dsDNA genome.
- The herpes simplex virus, or herpes, is categorized into 2 types: herpes simplex virus type 1 (HSV-1) and herpes simplex virus type 2 (HSV-2).
- Both HSV-1 and HSV-2 infections are lifelong.
- Herpes infections are most contagious when symptoms are present but can still be transmitted to others in the absence of symptoms.

Both oral herpes infections and genital herpes infections are mostly asymptomatic but can cause mild symptoms or painful blisters or ulcers at the site of infection.

## ***Herpes simplex virus type 1 (HSV-1)***

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HSV-1 is a highly contagious infection, which is common and endemic throughout the world. Most HSV-1 infections are acquired during childhood, and infection is lifelong. The vast majority of HSV-1 infections are oral herpes (infections in or around the mouth, sometimes called orolabial, oral-labial or oral-facial herpes), but a proportion of HSV-1 infections are genital herpes (infections in the genital or anal area).

### ***symptoms***

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Oral herpes infection is mostly asymptomatic, and the majority of people with HSV-1 infection are unaware they are infected. Symptoms of oral herpes include painful blisters or open sores called ulcers in or around the mouth. Sores on the lips are commonly referred to as “cold sores.” Infected persons will often experience a tingling, itching or burning sensation around their mouth, before the appearance of sores. After initial infection, the blisters or ulcers can periodically recur. The frequency of recurrences varies from person to person.

Genital herpes caused by HSV-1 can be asymptomatic or can have mild symptoms that go unrecognized. When symptoms do occur, genital herpes is characterized by 1 or more genital or anal blisters or ulcers. After an initial genital herpes episode, which may be severe, symptoms may recur, but genital herpes caused by HSV-1 often does not recur frequently.

### ***Transmission***

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HSV-1 is mainly transmitted by oral-to-oral contact to cause oral herpes infection, via contact with the HSV-1 virus in sores, saliva, and surfaces in or around the mouth. However, HSV-1 can also be transmitted to the genital area through oral-genital contact to cause genital herpes.

HSV-1 can be transmitted from oral or skin surfaces that appear normal and when there are no symptoms present. However, the greatest risk of transmission is when there are active sores.

### ***Possible complications***

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## **Severe disease**

In immunocompromised people, such as those with advanced HIV infection, HSV-1 can have more severe symptoms and more frequent recurrences. Rarely, HSV-1 infection can also lead to more severe complications such as encephalitis or keratitis (eye infection).

## **Neonatal herpes**

Neonatal herpes can occur when an infant is exposed to HSV in the genital tract during delivery. This is a rare condition, occurring in an estimated 10 out of every 100,000 births globally, but can lead to lasting neurologic disability or death. The risk for neonatal herpes is greatest when a mother acquires HSV infection for the first time in late pregnancy. Women who have genital herpes before they become pregnant are at very low risk of transmitting HSV to their infants.

## ***Treatment***

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Antiviral medications, such as acyclovir, famciclovir, and valacyclovir, are the most effective medications available for people infected with HSV. These can help to reduce the severity and frequency of symptoms, but cannot cure the infection.

## ***Prevention***

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HSV-1 is most contagious during an outbreak of symptomatic oral herpes, but can also be transmitted when no symptoms are felt or visible. People with active symptoms of oral herpes should avoid oral contact with others and sharing objects that have contact with saliva.

## **Herpes simplex virus type 2 (HSV-2)**

HSV-2 infection is widespread throughout the world and is almost exclusively sexually transmitted, causing genital herpes. HSV-2 is the main cause of genital herpes, which can also be caused by herpes simplex virus type 1 (HSV-1). Infection with HSV-2 is lifelong and incurable.

## ***Signs and symptoms***

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Genital herpes infections often have no symptoms, or mild symptoms that go unrecognised. Most infected people are unaware that they have the infection. Typically, about 10-20% of people with HSV-2 infection report a prior diagnosis of genital herpes. When symptoms do occur, genital herpes is characterised by one or more genital or anal blisters or open sores called ulcers. In addition to genital ulcers, symptoms of new genital herpes infections often include fever, body aches, and swollen lymph nodes.

### ***Transmission***

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HSV-2 is mainly transmitted during sex, through contact with genital surfaces, skin, sores or fluids of someone infected with the virus. HSV-2 can be transmitted from skin in the genital or anal area that looks normal and is often transmitted in the absence of symptoms. And In rare circumstances, HSV-2 infection can be transmitted from a mother to her infant during delivery.

### ***Possible complications***

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#### **HSV-2 and HIV**

HSV-2 and HIV have been shown to influence each other. HSV-2 infection increases the risk of acquiring a new HIV infection by approximately three-fold. In addition, people with both HIV and HSV-2 infection are more likely to spread HIV to others. HSV-2 is amongst the most common infections in people living with HIV, occurring in 60-90% of HIV-infected persons.

### ***Prevention***

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Individuals with genital HSV infection should abstain from sexual activity whilst experiencing symptoms of genital herpes. HSV-2 is most contagious during an outbreak of sores, but can also be transmitted when no symptoms are felt or visible.

The consistent and correct use of condoms can help reduce the risk of spreading genital herpes. However, condoms only provide partial protection, as HSV can be found in areas not covered by a condom. Medical male circumcision can provide men life-long partial protection against HSV-2, in addition to HIV and human papillomavirus (HPV).