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What is HIV?

VIRUS HUMAN IMMUNODEFICIENCY (HIV)

HIV is a virus that attacks the immune system, which is our body's natural defence against illness. The virus destroys a type of white blood cell in the immune system called a T-helper cell, and makes copies of itself inside these cells. T-helper cells are also referred to as CD4 cells.

As HIV destroys more CD4 cells and makes more copies of itself, it gradually breaks down a person's immune system. This means someone living with HIV, who is not receiving treatment, will find it harder and harder to fight off infections and diseases.

If HIV is left untreated, it may take up to 10 or 15 years for the immune system to be so severely damaged it can no longer defend itself at all. However, the speed HIV progresses will vary depending on age, health and background.

Basic facts about HIV

- HIV stands for human immunodeficiency virus.
- There is effective [antiretroviral treatment](#) available so people with HIV can live a normal, healthy life.
- The earlier HIV is diagnosed, the sooner treatment can start – leading to better long term health.
- HIV is found in semen, blood, vaginal and anal fluids, and breast milk.
- HIV cannot be transmitted through sweat, saliva or urine.
- Using [male condoms](#) or [female condoms](#) during sex is the best way to prevent HIV and other [sexually transmitted infections](#).
- If you [inject drugs](#), always use a clean needle and syringe, and never share equipment.

If you are [pregnant](#) and living with HIV, the virus in your blood could pass into your baby's body, or after giving birth through breastfeeding. Taking [HIV treatment](#) virtually eliminates this risk.

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FAST FACTS:

- HIV cannot multiply on its own.
- HIV attaches itself to an immune system 'T-helper' cell, fuses with it, takes control of its DNA, replicates itself inside the cell, and then releases new HIV into the blood.
- Different HIV treatment drugs stop the virus fusing, stop it integrating its genetic code, and stop it releasing new copies of itself into the bloodstream.

Understanding how HIV infects the body is important to help explain how HIV drugs work to treat the virus. The science behind the virus and the HIV life cycle help put wider [prevention](#), [treatment](#), and general HIV awareness into context.

The immune system and HIV

The HIV virus attacks a type of white blood cell called T-helper cells (also called CD4 cells). These cells are important when it comes to having a healthy immune system as they help us fight off diseases and infections.

HIV cannot grow or reproduce on its own. Instead, it makes new copies of itself inside T-helper cells. This damages the immune system and gradually weakens our natural defences. This process of infected T-helper cells multiplying is called the HIV life cycle.

How quickly the virus develops depends on your overall health, how early you are diagnosed and started on treatment, and how consistently you take your treatment. It's important to know that [antiretroviral treatment](#) will keep the immune system healthy if taken correctly, preventing the symptoms and illnesses associated with AIDS developing.

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The HIV life cycle

There are several steps in the life cycle of HIV that can happen over many years. Antiretroviral treatment works by interrupting the cycle and protecting your immune system. There are different drugs offered depending on the particular stage of the HIV life cycle.

Understanding the HIV life cycle helps scientists to know how to attack the virus when it is weak and reduce its ability to multiply. Drug resistance means a person's HIV treatment no longer prevents the virus from multiplying. This usually happens if treatment has not been taken correctly, allowing the virus to mutate.

Stages of the HIV life cycle

1. Binding and fusion

First, the HIV virus attaches itself to a T-helper cell and releases HIV into the cell.

Drugs that can stop this part of the process are called fusion or entry inhibitors.

2. Conversion and integration

Once inside the cell, HIV changes its genetic material so it can enter the nucleus of the cell and take control of it.

Drugs that can stop this part of the process are called NRTIs (nucleoside reverse transcriptase inhibitors), NNRTIs (non-nucleoside reverse transcriptase inhibitors) and integrase inhibitors.

3. Replication

The cell then produces more HIV proteins that can be used to produce more HIV.

4. Assembly, budding and maturation

New HIV particles are then released from the T-helper cell into the bloodstream. These are now ready to infect other cells and begin the process all over again.

Drugs that can stop this part of the process are called protease inhibitors.

Antiretroviral treatment (or ART for short) uses a number of different HIV medicines to treat HIV infection. By combining different drugs that target different steps in the HIV life cycle ART is now very effective at preventing HIV from multiplying, and enables people who are on treatment to live longer, healthier lives.

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What is AIDS?

AIDS is not a virus but a set of **symptoms** (or syndrome) caused by the HIV virus. A person is said to have AIDS when their immune system is too weak to fight off infection, and they develop certain defining symptoms and illnesses. This is the last stage of HIV, when the infection is very advanced, and if left untreated will lead to death.

Basic facts about AIDS

- AIDS stands for acquired immune deficiency syndrome.
- AIDS is also referred to as advanced HIV infection or late-stage HIV.
- AIDS is a set of symptoms and illnesses that develop as a result of advanced HIV infection which has destroyed the immune system.
- Treatment for HIV means that more people are staying well, with fewer people developing AIDS.

Although there is currently no **cure for HIV** with the right treatment and support, people with HIV can live long and healthy lives. To do this, it is especially important to take treatment correctly and deal with any possible side-effects.

FAST FACTS:

- There are three stages of HIV infection.
- Stage 1 after initial infection can feel like flu, but not everyone will experience this.
- Stage 2 may last for 10 years or so, with no more apparent symptoms.
- Stage 3 is when the immune system has been so badly damaged that it can no longer fight off serious infections and diseases.
- The earlier you have HIV diagnosed and start treatment, the better your likely long-term health.
- Because many people do not have any symptoms for stages 1 and 2, HIV often gets transmitted from people who simply don't know they are infected.

The symptoms of HIV can differ from person-to-person and some people may not get any symptoms at all for many years. Without **treatment**, the virus will get worse over time and damage your immune system. There are three broad stages of HIV infection, with different possible effects.

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Stage 1: Acute primary infection

Around one to four weeks after becoming [infected with HIV](#), some people will experience symptoms that can feel a lot like flu. This may not last long (a week or two) and you may only get some of the flu symptoms – or none at all. Experiencing these symptoms alone is not a reliable way of diagnosing HIV.

You should always visit your doctor if you are worried you have been at risk of HIV infection, even if you don't feel unwell or have any of the following symptoms. They can then arrange for you to have an [HIV test](#).

Symptoms can include:

- fever (raised temperature)
- body rash
- sore throat
- swollen glands
- headache
- upset stomach
- body rash
- joint aches and pains
- Muscle pain.

These symptoms can happen because your body is reacting to the HIV virus. Cells that are infected with HIV are circulating throughout your blood system. Your immune system, in response, tries to attack the virus by producing HIV antibodies. This process is called seroconversion. Timing varies but it can take up to a few months to complete.

It may be too early to get an accurate HIV test result at this stage (depending on the [type of HIV test](#), it can take anything from a few weeks to a few months for HIV to show up), but the levels of virus in your blood system are very high at this stage. [Condoms](#) are the best way way to protect you from HIV when having sex. Using a condom is especially important if you think you have been exposed to HIV.

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Stage 2: The asymptomatic stage

Once the seroconversion stage is over, many people start to feel better. In fact, the HIV virus may not reveal any other symptoms for up to 10 or even 15 years (depending on age, background and overall health). However, the virus will still be active, infecting new cells and making copies of itself. Over time this will cause a lot of damage to your immune system.

Stage 3: Symptomatic HIV infection

By the third stage of HIV infection there has been a lot of damage to your immune system. At this point, you are more likely to get serious infections or bacterial and fungal diseases that you would otherwise be able to fight off. These infections are referred to as '[opportunistic infections](#)'.

Symptoms that you may have during this time can include:

- weight loss
- chronic diarrhoea
- night sweats
- a fever
- a persistent cough
- mouth and skin problems
- regular infections
- Serious illnesses or diseases.

