

HIV and AIDS

HIV is a virus which is most commonly passed on by sexual contact and attacks cells of the immune system. Over a number of years the immune system 'weakens' so that the body cannot defend against various bacteria, viruses and other germs; this is when AIDS develops.

HIV stands for human immunodeficiency virus. This is a virus in the group of viruses called retroviruses. HIV destroys cells in the body called CD4 T-cells. CD4 T-cells are a type of lymphocyte (a white blood cell). These are important cells that protect the body against various bacteria, viruses and other 'germs'. HIV actually multiplies within CD4 cells. HIV cannot be destroyed by white blood cells as it keeps on changing its outer coat so protecting it.

AIDS stands for acquired immunodeficiency syndrome. This is a term which covers the range of infections and illnesses which can result from a 'weakened' immune system caused by HIV.

*Note: when first infected with HIV you do **not** have AIDS. There is usually a time lag of several years between first being infected with HIV and subsequently developing infections and other AIDS-related problems. This is because it usually takes several years for the number of CD4 T-cells to reduce to a level where your immune system is weakened. **People with HIV can pass the virus on to others whether or not they have any symptoms.***

How do you become infected with HIV?

- **Sexual transmission.** This is the most common way the virus is passed on. You can become infected if you have sex with an infected person (vaginal, anal or oral sex). Semen, vaginal secretions and blood from an infected person contains HIV. The virus can enter the body through the lining of the vagina, vulva, penis, rectum or mouth during sex.
- **Needle sharing.** HIV (and other viruses such as hepatitis B and C) can be transmitted by drug users who share needles, syringes and other injecting equipment which is contaminated with infected blood.
- **Infected blood.** In the past quite a number of cases occurred from infected blood transfusions and other blood products. This is now rare in the UK as since 1985 all blood products are checked for HIV before being used. It is still a significant problem in developing countries.
- **Accidental needlestick injuries.** The risk is extremely low; health care workers who have been injured accidentally by contaminated needles only have a risk of 3 in 1000.
- **From mother to child.** Pregnant women with HIV can pass the infection on to their babies during pregnancy or childbirth. Studies suggest that about 1 in 7 babies born to HIV-infected mothers are likely to be infected, although this is higher in Africa. However, treatment with anti-HIV drugs during pregnancy greatly reduces the risk of passing on the virus. Having a caesarean section to deliver the baby reduces the risk even further. HIV can occasionally be passed to babies through breast milk during breastfeeding. If formula milk is available, mothers with HIV are encouraged not to breastfeed.

*Note: To become infected with HIV, some infected blood, semen or vaginal secretions has to get into your body. You can **not** catch HIV from ordinary contact with someone with HIV such as hugging, shaking hands or touching, or from sharing food, towels, utensils, swimming pools or telephones.*

How common is HIV? The number of people worldwide living with HIV in 2007 has been estimated as 33.2 million. This is a reduction of 16% compared to the estimation published for 2006. However, the number of people diagnosed with HIV in the UK is steadily rising, mainly in young people, drug abusers and homosexual men. Every day worldwide, over 6,800 people become infected with HIV and over 5,700 people die from AIDS. This is still mainly due to inadequate access to HIV prevention and treatment services in some developing countries.

How does HIV cause problems in the body? Once HIV is in your body the virus attaches to and gets into the CD4 T-cells. The virus then uses the DNA (the genetic code inside the cell) to replicate (make copies of itself). As new virus particles break out of a CD4 T-cell, the cell dies. The new virus particles then attach and enter new CD4 T-cells and so the process continues. Millions of new virus particles are made in CD4 T-cells each day and millions of CD4 T-cells die each day. To counter the virus destruction the body continues to make new CD4 T-cells each day. However, over time, the virus usually 'wins' and the the number of CD4 T-cells gradually falls (usually over several years). Once the level of CD4 T-cells goes below a certain level, your immune system is weakened. If your immune system is severely weakened by HIV infection then you are likely to develop various 'opportunistic' infections. These are infections caused by germs which are commonly around us. You would not normally develop infections from these germs if you have a healthy immune system. A low

level of CD4 T-cells also increases the risk of developing other conditions which the immune system helps to prevent such as certain cancers.

What are the symptoms of HIV and AIDS?

Primary infection with HIV

When you first become infected with HIV it is known as the 'primary infection'. You may not have any symptoms at this time. However, some people develop symptoms similar to flu or glandular fever. This commonly happens 6-8 weeks after becoming infected. This is sometimes called 'seroconversion illness' as it is the time when antibodies first appear in the bloodstream. Symptoms may include: fever, sore throat, blotchy red rash, feeling sick, diarrhoea, swollen glands, headache, tiredness and general aches and pains. These symptoms can last up to three weeks and are often just thought of as 'flu' or a 'viral illness'. This is not AIDS but just an initial reaction to being infected with HIV. A test for HIV may well be negative during this early infection.

After the primary infection

After any primary infection settles, without any treatment you can remain without any symptoms for several years. On average this is for ten years. As there are often no symptoms during this time, many people do not realise that they are even infected with HIV. However, the virus continues to multiply, the number of CD4 T-cells tends to gradually fall, and you can pass on the virus to others. During this time some people with HIV who are otherwise well may develop persistent swollen lymph glands (persistent generalised lymphadenopathy) or night sweats.

In time you may start to develop problems such as recurring mouth ulcers, recurring herpes or shingles infections or seborrhoeic dermatitis (a skin condition caused by a yeast). Old TB (tuberculosis) infection may 'reactivate' in some cases even before AIDS develops, especially in people in the developing world. Other symptoms of HIV that may occur before AIDS develops include diarrhoea, skin rashes, tiredness and loss of weight.

Symptoms of AIDS The term AIDS is used to describe the most advanced stages of HIV infection. AIDS is a general term which includes various diseases which can result from a very weakened immune system. Typically, a person with AIDS has:

- A very low level of CD4 T-cells (around 200 cells per cubic millimeter of blood or below), and/or...
- One or more opportunistic infections such as pneumocystic jiroveci pneumonia (PcP), severe thrush in the vagina or mouth, fungal infections, tuberculosis (TB), mycobacterium avium complex, toxoplasmosis, cytomegalovirus, etc. These infections can cause a range of symptoms including sweats, fever, cough, diarrhoea, weight loss and generally feeling unwell.

In addition, people with AIDS have an increased risk of developing other conditions such as:

- Certain cancers. Kaposi's sarcoma is a cancer which is usually only seen in people with AIDS. There is also an increased risk of developing cancer of the cervix and lymphoma.
- An AIDS-related brain illness such as HIV encephalopathy (AIDS dementia)
- A severe body wasting syndrome.

Many different symptoms can develop from the above conditions. Children with AIDS can develop the same opportunistic infections and problems as adults. In addition, they may also develop severe common infections of childhood such as severe ear infections or severe tonsillitis.

What tests are done?

It is very important to have an HIV test if you think you are at risk of HIV infection. In some clinics it is now even possible to have the result of the test in the same day as the test is taken.

Confirming the diagnosis

HIV can be diagnosed from a blood, saliva or even (less commonly) a urine test.

Note: for several weeks after being first infected, an HIV test can be negative. If there is a strong suspicion that you may have recently been infected with HIV and the test is negative, then the test should be repeated a few months later.

Assessing the extent of disease

If you are confirmed to have HIV then your doctor may do a blood test to check amount of virus in your blood (the viral load) and the number of CD4 T-cells in your blood. These tests may be done from time to time to assess how far the disease has progressed (and the response to treatment).

Tests to diagnose AIDS-related conditions

You may have a range of other tests to detect opportunistic infections or other AIDS related conditions. These will depend on the type of symptoms that you develop.

What is the treatment for HIV infection?

Although there is still no cure for HIV, treatment is now effective at allowing people with HIV to live their lives as normally as possible. Since the introduction of drugs to treat HIV, the death rates from AIDS has reduced dramatically. The drugs also slow the progression of HIV to AIDS. It is not uncommon for people with HIV to feel low or even depressed, especially soon after the diagnosis is made. If you have any feelings of depression then you should speak to your doctor.

Treatment to tackle the virus itself

HIV is now a treatable medical condition and most people with the virus remain fit and well on treatment. Since the 1990s a number of drugs have been developed called antiretroviral drugs. Antiretroviral drugs work against HIV infection by slowing down the replication of the virus in the body. Newer drugs are more effective than drugs used in the past. There are several classes of these drugs which include: nucleoside reverse transcriptase inhibitors (NRTIs), nucleotide reverse transcriptase inhibitors (NtRTIs), protease inhibitors (PI) and non-nucleoside reverse transcriptase inhibitors (NNRTIs). Newer classes of drugs have recently been introduced which are integrase inhibitors, fusion inhibitors and CCR5 antagonists. The drugs in each class work in different ways but all work to stop the HIV from replicating itself. Taking three or more antiretroviral drugs at the same time, each attacking HIV at different points in its cycle of replication, is more effective than one or two drugs alone. This is called HAART (highly active antiretroviral therapy). Taking a combination of different drugs also reduces the risk that the virus will become resistant to any individual drug. In 2008 the first one pill a day treatment was launched. Each pill contains three different drugs. This is popular as it is convenient to take and has few side-effects. The choice of drugs are considered and chosen for each individual patient. The treatment for HIV can be complicated as it involves taking many different medications. A team of healthcare professionals are usually involved in looking after you and giving your treatment. The aim of treatment is to reduce the 'viral load' to low levels. In most people who are treated with HAART, the viral load reduces to very low levels and the number of CD4 T-cells rises. This means your immune system is no longer as weakened and you are not likely to develop opportunistic infections. However, it is vital to take the medication regularly and as exactly as prescribed to maintain success, and to help prevent the virus from becoming resistant to the drugs.

As with other powerful drugs, antiretroviral drugs can cause side-effects in some cases. In addition, some of these drugs can react with other commonly used medications. It may be necessary to change an initial combination of drugs to a different combination because of problems with side-effects, reactions or resistance of the virus to an initial drug. Therefore, different people with HIV can often take different combinations of drugs. Common side-effects include nausea, vomiting and headaches.

When is treatment with antiretroviral drugs started? As a general rule, antiretroviral drugs are usually started if:

- Opportunistic infections or other AIDS-related problems develop, or
- Your CD4 T-cells fall below a certain level (around 350 cells per cubic millimeter of blood or less) - even without symptoms. The exact level when treatment is started depends on many different factors which your doctor will discuss with you. These include any symptoms present and the rate of decline of the CD4 T-cells.

However, the treatment of HIV is a rapidly changing area of medicine. Trials are underway to assess whether antiretroviral drugs should be started earlier in people who have no symptoms, even as early as when first infected with HIV. The trials aim to show whether there are benefits from treatment before symptoms develop which outweigh the risk of side-effects from the drugs. You are likely to have regular blood tests to monitor for side effects whilst taking treatment.

Treatment and prevention of infections Having protected sexual intercourse is very important to protect against other sexually transmitted infections including herpes and hepatitis. People with HIV are usually vaccinated against Hepatitis A and B, influenza and the pneumococcus (a common cause of pneumonia). Opportunistic infections are usually treated with antibiotics, antifungals or anti-TB drugs, obviously depending on which infection develops. Even if you have not developed an infection, once the CD4 T-cells falls to a low level you will normally be advised to take a regular dose of one or more antibiotics or other drugs to prevent certain opportunistic infections from developing.

How can infection with HIV be prevented? There is no vaccine to HIV. Development of one is still proving to be very difficult as the HIV virus is constantly mutating and changing. Therefore the main way to prevent infection by HIV is to avoid activities that put you at risk such as sharing needles and having unprotected sex. Using condoms protects against the transmission of HIV.

Some cases of HIV can be prevented in other ways. For example:

- If you are an injecting drug user then do not share needles or other injecting equipment. If available, use local needle exchange schemes.
- Health care workers should follow local guidelines to reduce the chance of needlestick injury. If you do have an injury, see your occupational health specialist urgently. A course of anti-HIV drugs started within 1-2 hours may prevent infection with HIV developing.
- If you are pregnant and have HIV infection then you need special antenatal care to reduce the risk of passing on the virus to your baby. HIV treatments can be taken during pregnancy. An HIV test is offered to all pregnant women in the UK.

What is the prognosis? Before the mid 1990s, most people did not survive more than 1-2 years after AIDS had developed. Since the introduction of antiretroviral drugs the outlook has vastly improved for those who have access to such treatment. Many people with HIV and AIDS in richer countries are now living full and normal lives. The life expectancy of people with HIV and AIDS has improved dramatically. For example, a research study published in the Lancet in 2008 (details at the end) came to the conclusion that we should now think of HIV as a chronic condition like diabetes, rather than a fatal disease. The study looked at over 43,000 patients with HIV and found that a person now diagnosed at 20 years old could expect to live for another 49 years (provided they had access to modern treatment). Most people with HIV live in developing countries and do not have access to effective drugs. Therefore the HIV epidemic worldwide continues to claim millions of lives each year.

National Aids Trust aims to promote a wider understanding of HIV and AIDS, develop and support efforts to prevent the spread of HIV and improve the quality of life of people affected by HIV and AIDS. www.nat.org.uk