

## UNDERSTANDING THE SCIENCE OF HIV



### Key points:

1. HIV is a virus that is transmitted in bodily fluids.
2. HIV uses the CD4 cells to multiply.
3. If untreated, HIV infection progresses to AIDS illness.
4. Infections are caused by pathogens (germs).
5. When the immune system is weak you get more infections.

Understanding HIV/AIDS is important for your health if you are HIV positive, but all South Africans should know the science of HIV/AIDS. Being treatment-literate helps you make informed decisions about your health. If you share

your treatment literacy knowledge with people you know, you could make a difference to how people think about HIV/AIDS. We all have a responsibility to test regularly, stay negative and get treatment if we are HIV positive.





## ABOUT THIS CHAPTER

The HIV lifecycle is complicated and can take time to understand. Remember that the reason we are learning this is to better understand how HIV attacks the immune system and how ARVs work.

### This chapter covers:

- Different kinds of germs
- HIV transmission: how people get HIV
- HIV lifecycle
- The stages of HIV
- HIV and society
- National Strategic Plan for HIV/AIDS



**Welcome to Chapter 3 of the Health Literacy Manual.** In Chapter 2 we learned about the human body and especially about the immune system. In this chapter we are going to talk about different kinds of germs and learn more about the HI virus. We will also talk about the different infections someone with HIV/AIDS can get. We will learn how HIV enters the human body and what happens when it is inside our bodies. We will also look at how HIV progresses and what we need to know to look after our health.

## Different kinds of germs

Episode 2, Chapter 2



There are different reasons why people get sick. Many everyday illnesses are caused by germs. Another word for germ is 'pathogen'. A pathogen is something that causes infection in the body. Pathogens do not belong in the body and make us sick. We have already learnt how the immune system finds pathogens and tries to get rid of them so our bodies can be healthy again. Pathogens are microorganisms, which means they are very, very small and can only be seen under a microscope. You will remember that we also need a microscope to see cells.

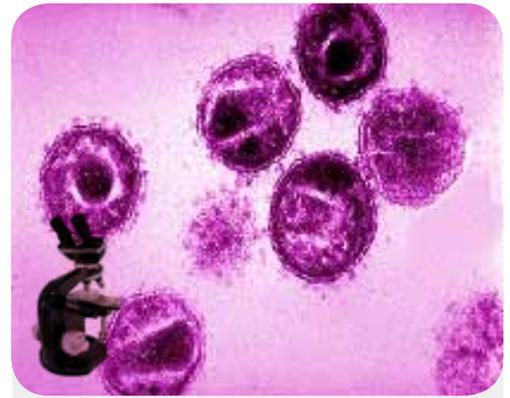




## VIRUSES

Viruses are even smaller than bacteria. Viruses are about 100 times smaller than bacteria. Viruses cannot grow or reproduce outside the cells of other creatures. We have already learnt how HIV reproduces inside the CD4 cell. Besides HIV, examples of viruses include colds, flu and herpes.

Viruses cannot be treated with antibiotics, but there are antiviral medicines. Viruses are very difficult to kill, which is why no-one has discovered truly effective treatments for colds and flu. One of the biggest challenges of treating viral infections is that viruses change (mutate) which means that viruses can survive treatment. This is why it is difficult to find a treatment that kills the virus completely. As we have discussed, HIV treatment is called antiretroviral treatment or ARVs. We will learn a lot more about ARVs later.



*Here is a photo of HIV.*

## FUNGI

Yeasts, moulds and mushrooms are examples of fungi. We use yeast when we bake bread to make the bread rise. If we leave food for a long time without eating it, it goes off and often we can see mould, like bread mould. Fungi are often parasitic, which means they feed off something else, such as a tree or animals and humans.

Fungi can also infect our bodies. Parasitic fungi that infect our bodies include athlete's foot, dandruff, thrush and PCP pneumonia. Ringworm is actually also a fungus, even though it's called a worm. Thrush is a common opportunistic infection. We have already talked about how it can affect the mouth and oesophagus if untreated. Thrush can be treated with Fluconazole.



*Here is a photo of other kinds of fungi, such as bread mould and mushrooms.*



*Here is a picture of athlete's foot, which is also a fungus that causes peeling between the toes.*



*Here we can see thrush on the tongue. Thrush is a kind of fungus.*

## PROTOZOA

The last main category of germs or pathogens is called protozoa. Examples of protozoan infections include malaria, toxoplasmosis and cryptosporidiosis. In the example of malaria, the mosquito is an insect that carries the protozoan infection which results in malaria illness. Not all mosquitoes can give us malaria and most of South Africa is malaria-free, but further north we enter a malaria area. You can take medication to protect yourself from malaria, but most people who live in malaria areas don't take this medicine and rather use mosquito nets and treat the illness when the first symptoms appear.

## PARASITES

Our bodies can also be infected by larger parasites like tapeworms or Bilharzia worms. Bilharzia worms infect us by digging their way into our bodies through our skin. Worms can infect and even block blood vessels and our intestines. They eat the food inside us and use up the energy we should be getting. Up to 90% of children in some informal settlements have worms. If you have pet dogs and cats it is important to make sure that they do not have worms, because it is easy for children who play with animals to get worms.

Fortunately, treating worms is cheap and easy. Go to your chemist and get worm treatment. There is also some evidence that treating worms alone can reduce the amount of HIV in our bodies.

**Children must be de-wormed regularly**

Understanding what kind of germ causes an illness can help you understand treatment better. For example, both shingles (Herpes Zoster) and cold sores (Herpes Simplex) can be treated with Acyclovir because both are caused by the same virus that attacks the nerve endings. Another reason why it is important to understand what causes illness is because you can also know how to prevent it. For example, we know that TB is caused by bacteria which spread through coughing. We also know that TB spreads easily in small areas with no fresh air so we should try and make sure that we air our homes, especially if someone has TB. We also know that HIV is spread through bodily fluids. This means that we know we can reduce the chance of HIV infection during sex if we use a condom.



*Here is a photo of a mosquito that can give us malaria.*



*Here is a photo of some round worms.*



*Here is a photo of a Bilharzia worm.*



# HIV transmission: how people get HIV

Episode 1, Chapter 4



We already know that HIV is a virus and that it is spread or transmitted through infected body fluids, such as blood, semen, vaginal fluids and breast milk. Let's talk about transmission in some more detail so that we can learn how to reduce our chances of getting infected with HIV and infecting others. Remember: Protect yourself. Protect others.

## Ways of transmission are:

1. Vaginal or anal sex without a condom or if the condom breaks or slips off.
2. Sharing syringe needles for drugs.
3. Mother-to-child transmission when the baby is being born or when it is in the womb.
4. Mother-to-child transmission through breast milk.
5. Accidents or careless sterilisation in hospitals. For example, if a health care worker is pricked with a syringe needle (called a needle-stick injury) or cut with an unsterilised scalpel.

## You cannot get HIV from:

1. Kissing someone who is HIV positive
2. Touching someone who is HIV positive
3. Sharing cups, plates, spoons and other things you eat with
4. Being bitten by mosquitoes
5. Coughing or sneezing

## HIGH RISK AND LOW RISK

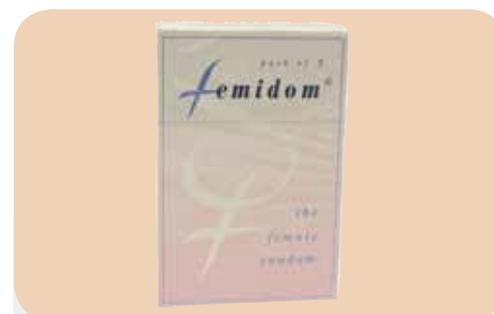
When we talk about the transmission of HIV, it is important that we talk about things that are high risk, (meaning you can get HIV easily) and low risk (small chance of getting HIV). We already know that in South Africa HIV is spread mainly by unprotected sex between a man and a woman. We also know that if you don't want to get HIV then you can protect yourself by abstaining (having no sex); having sex in a monogamous relationship where both people are HIV negative and both have no other partners; and by using condoms. Being married to someone does not make you safe from HIV infection. Even if you think you can trust your partner it is better to use a condom every time you have sex so that you can be sure you are protected. Condoms are also very effective in preventing pregnancy and many STIs (sexually transmitted infections) if used correctly.

Unprotected vaginal and anal sex is high risk. If you have more than one partner and you are having unprotected sex, then you are running a very high risk of getting HIV. If you or your partner has a sexually transmitted infection and is HIV positive you have an even bigger chance of being infected with HIV or infecting your partner with HIV. We will talk about this in more detail later. This is why it is important for you to use a condom or a female condom every time you have sex.

Understanding how HIV is transmitted helps reduce stigma



*If used correctly, a male condom is very effective in protecting you from HIV*



*A female condom can also protect you from HIV.*



## HIV lifecycle

Episode 2, Chapter 4



In this section we are going to look at the HIV lifecycle. This means we are going to learn what happens when HIV enters the human body. We will learn how HIV reproduces and weakens the immune system. The reason it is important to understand how the HIV lifecycle works is because then we can understand when to start ARVs and also how ARVs work.

We have just talked about the different ways that HIV can be transmitted or how it can enter the body. Like any other virus, HIV needs to live inside a human body in order to survive. HIV cannot survive outside the human body. This is because HIV needs human cells in order to reproduce or make copies of itself.

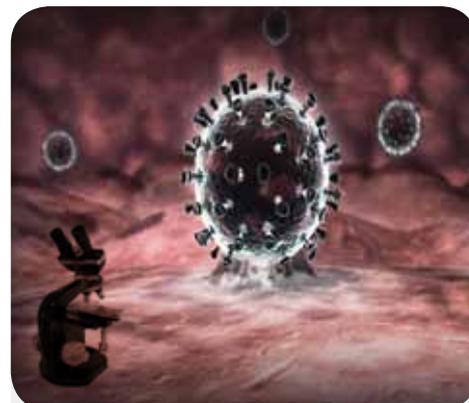
Every cell in our bodies has a nucleus. The nucleus of the cell contains all the information needed to make a copy of this cell. To make copies of the cell, a special chemical called DNA is needed. DNA stands for deoxyribonucleic acid. DNA is the instruction code that tells our bodies how to work. You can also think of DNA as a manual that tells the cell what to do and how to work. HIV does not have DNA, which means that it cannot make copies of itself. But HIV is very clever and enters a CD4 cell so that it can use the DNA in the CD4 cell to make copies of itself.

The CD4 cell is an important part of our immune system. Our immune system is able to fight pathogens by removing them from our bodies. The first thing that our immune systems do is find the pathogens (germs) that do belong inside our bodies. Once they have found the pathogens the immune system knows what they are looking for and then goes and destroys all the germs. But with HIV it is different, because HIV enters the CD4 cells. Once HIV is inside the CD4 cells, the immune system cannot fight it. When HIV is inside the CD4 cells it steals the CD4 cell DNA and makes copies of itself, so in a way it becomes part of our bodies.

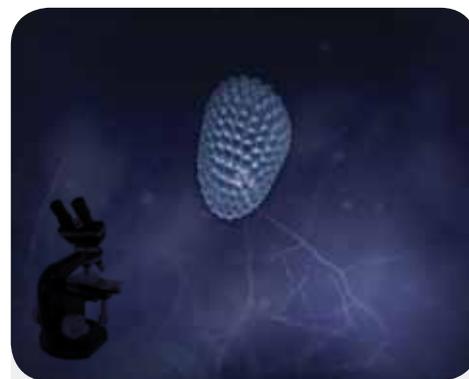
To make copies of itself inside the CD4 cell, HIV first has to change its viral RNA into viral DNA. To change itself from viral RNA to viral DNA, HIV uses a special protein or enzyme called reverse transcriptase.

HIV cannot use the CD4 cell's DNA without turning its viral RNA into viral DNA. HIV then uses an enzyme called integrase to insert or fit its viral DNA into the DNA of the CD4 cell. Once HIV has fitted its viral DNA into the CD4 cell's DNA it can make copies or reproduce.

The viral DNA tells our CD4 cells to make all the different pieces of the new HI viruses. All the different pieces that are part of HIV, such as proteins, enzymes and other molecules, make up the new HI viruses that then push out of the CD4 cell and enter the body. This is called budding. To get out of the cell, HIV needs another special protein called protease. Once all the new HIV has budded out of the CD4 cell, the CD4 cell dies. This means that when someone is infected with HIV, their CD4 cells become less and less. You can see this as their CD4 count drops and the viral load increases. With fewer CD4 cells, the immune system is weak and can no longer fight infections.



*HIV joining the CD4 cell.*



*HIV inside the CD4 cell.*



*A photo of HIV budding out of the CD4 cell.*

### Summary of how HIV makes copies:

1. Enters the CD4 cell
2. Changes viral RNA to viral DNA (needs reverse transcriptase)
3. Inserts/fits viral DNA into the DNA of the CD4 cell (needs integrase)
4. CD4 cells help make copies of HIV
5. New copies of HIV bud out of the CD4 cell (needs protease)
6. CD4 cell dies

We can see how HIV almost becomes part of our bodies as it uses the CD4 cells to reproduce and then multiply. This is why it is so difficult to treat effectively. This is also one of the reasons why no cure has been found yet. Another reason is that like most viruses, HIV changes all the time or mutates. Most of the antiretroviral (ARV) drugs block or stop the process where viral RNA is converted to viral DNA using reverse transcriptase. Because the ARVs stop the conversion of viral RNA into viral DNA, HIV is unable to copy itself and it dies.

There are also ARVs that attack HIV only after it has completed the RNA to DNA conversion and the new HIV nucleus has been formed. These ARVs block or stop HIV from using the protease enzyme to get out of or bud from the CD4 cell. By stopping or blocking the protease enzyme, these ARVs prevent the newly formed HIV from budding from the CD4 cell and so it dies. These ARVs are often called Protease Inhibitors or PIs.



## DISCUSSION POINTS

In a group talk about the following questions and see if you can answer them.

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| <p><b>1. Where do we find the 'instruction code' for the cells in our bodies?</b><br/>We find the instruction code for our bodies in our DNA.</p>  | <p><b>5. What enzyme does HIV use to exit the cell?</b><br/>To get out of the cell, HIV needs an enzyme called protease.</p>  |
| <p><b>2. What cell does HIV enter in order to copy itself?</b><br/>HIV enters the CD4 cell so that it can make copies of itself.</p>   | <p><b>6. What is the relationship between these enzymes and ARVs?</b><br/>Some ARVs stop or block the protease so the HIV cannot leave the CD4 cell. Other ARVs stop or block the reverse transcriptase which means that the viral RNA cannot be made into viral DNA.</p> |
| <p><b>3. What enzyme does HIV use to copy its 'instruction code' and create viral DNA?</b><br/>To change itself from viral RNA to viral DNA, HIV uses a specialised enzyme called reverse transcriptase.</p> |   |
| <p><b>4. What enzyme does HIV use to insert the viral DNA into the DNA of the CD4 cell?</b><br/>HIV then uses an enzyme called integrase to insert or fit its viral DNA into the DNA of the CD4 cell.</p>    |   |



## WORKBOOK NOTES

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# The stages of HIV

Episode 1, Chapter 5



When your body gets infected with HIV, your body has never seen HIV before and it does not know how to fight it. This means the immune system does not attack the HIV and so it reproduces very fast. As the number of HI viruses grows, the viral load becomes very high and then slowly drops. The viral load is the number of copies of the HI virus in our blood. This is when the CD4 cells notice that there is something wrong and they fight the virus and the viral load goes down. But without treatment the CD4 cells and the rest of the immune system cannot win against the HIV. This is because HIV uses the CD4 cells to reproduce and so weakens the immune system. The immune system cannot work properly and the body starts to get opportunistic infections and eventually these illnesses overpower the body. There is, however, still a lot that scientists don't fully understand about HIV.

We are going to look more closely at this progression from HIV infection to AIDS-related illness. The World Health Organisation (WHO) has developed guidelines to help health workers understand how advanced a person's HIV is. The reason the WHO made an HIV and AIDS Staging System is because it can help doctors treat people and can also be a guide on when to start ARVs. The WHO staging system does not need a CD4 count so it is useful for places where the clinic or hospital does not have the equipment to get a CD4 count. A CD4 count is a measurement of how many CD4 cells are in the body and tells you how weak or strong the immune system is. The WHO Staging System groups together different HIV-related illnesses into 4 stages. Stage 1 is after HIV infection. Stage 4 is AIDS. This is why assessing the health of people with HIV is called 'HIV staging'.

## Stage 1

When we first get infected, HIV multiplies very quickly in our bodies and we develop a very high viral load. That means there are many copies of the virus in our body fluids, and anyone who is exposed to our blood, semen or vaginal fluids is at VERY high risk of getting infected. Studies suggest that many new HIV infections happen during this time because the viral load is high and the person does not feel sick so they do not know about their HIV infection.

About 12 weeks after first being exposed to HIV, our immune systems manage to get control again. This is when we often develop a flu-like illness called 'acute retroviral syndrome' or 'sero-conversion illness'. The signs and symptoms include fever, aches and pains, and headaches. At around the time of this illness, our body starts to make HIV antibodies. The term 'sero-conversion' means that there is a change from having no antibodies against HIV in the blood, to having specific HIV antibodies.

Most HIV tests used in clinics and hospitals test for HIV antibodies, and not HIV itself. This is why the period from the time of infection until sero-conversion is called the 'window period'. During the window period, HIV antibody tests do not recognise that we are infected, even though the HIV virus is already present in the body.

After sero-conversion, our viral load drops sharply. From then on, it increases slowly over years. During Stage 1, we will experience very little illness, though we might have swollen glands a lot of the time. This is called persistent generalised lymphadenopathy.

The most important things to remember about Stage 1 are that it is asymptomatic and that this is when sero-conversion happens. Asymptomatic means there are no serious symptoms of illness. Sero-conversion means that the body produces HIV antibodies which can be found in an HIV test.



*The rapid test, which is the most common HIV test, looks for HIV antibodies in the blood. The time before sero-conversion is called the window period.*



## DISCUSSION POINTS

In a group talk about the following questions and see if you can answer them.

### 1. What is the 'window period'?

The 'window period' is the time it takes after someone gets infected with HIV until the immune system makes HIV antibodies that can be found in a common HIV test.

### 2. What is 'sero-conversion'?

Sero-conversion is the change from having no HIV antibodies in our body to having HIV antibodies.

### 3. What does 'asymptomatic' mean?

It means that there are no symptoms of illness.

## Stage 2

When we first get infected, HIV multiplies very quickly in our bodies and we develop a very high viral load. That means there are a great many copies of the virus in our body fluids, and anyone who is exposed to our blood, semen or vaginal fluids is at VERY high risk of getting infected. Studies suggest that many new HIV infections happen during this time because the viral load is high and the person does not feel sick so they do not know about their HIV infection.

In Stage 2 the viral load is higher than Stage 1 and the CD4 count is starting to drop as the immune system gets weaker. This means that the body will start to experience an increase in opportunistic infections. But the immune system is still able to fight off some infections and the infections are not very serious and can usually be treated fairly easily.

### Common signs and symptoms are:

- Moderate unintentional weight loss (less than 10% of usual body weight).
- Skin infections such as Dermatitis and itchy rashes.
- Mouth sores.
- Shingles (Herpes Zoster) can appear on 1 side of the face or the back or round the middle.
- Recurrent respiratory tract infections, such as bronchitis.
- Sinusitis is an inflammation of the sinuses. The air passages get blocked and you can't breathe freely.
- Herpes (simplex) can appear on the mouth and is also called a cold sore. These sores can also appear on the penis and sometimes on the vagina. It looks like a pimple or blister and leaves a burnt-like mark when it bursts.
- Fungal infections on the skin or around the fingernails.



## DISCUSSION POINTS

In a group talk about the following questions and see if you can answer them.

### 1. What is the main difference between Stage 1 and Stage 2?

Stage 1 is asymptomatic while in Stage 2 we start to get opportunistic infections.

### 2. What happens to the CD4 count during Stage 2?

The CD4 count starts to drop or go down.

### 3. What are some of the symptoms of Stage 2?

Weight loss, skin infections, mouth sores, fungal infections, shingles, sinusitis and herpes.



## Stage 4

Stage 4 is also defined as AIDS. At this stage, the viral load is very high and the CD4 count is very low. The person is seriously ill and can have lots of opportunistic infections and is very weak. The kinds of infections found in Stage 4 show that the immune system is very weak and the infections are usually life-threatening if untreated.

### Common signs and symptoms include:

- Severe HIV wasting (loss of weight and muscle weight)
- PCP pneumonia (now called *Pneumocystis jiroveci* pneumonia)
- Thrush (candidiasis) of the throat (tracheal), food pipe (oesophageal) or lungs (pulmonary)
- Kaposi Sarcoma (KS)
- Extra-pulmonary tuberculosis (TB infections outside the lungs)
- Central nervous system toxoplasmosis (Toxo)
- Cryptosporidiosis (parasitic) plus diarrhoea lasting over a month
- Isosporiasis (parasitic infection) plus diarrhoea
- Cryptococcosis (Crypto) found outside the lungs (extrapulmonary)
- Cytomegalovirus infection other than liver, spleen or lymph node (CMV)
- Severe herpes simplex infection
- Acute meningitis (swelling of the lining of the brain)
- Disseminated Mycobacteria infection (MOTT)
- Non-typhoidal *Salmonella* septicemia
- Lymphoma (cancer in the lymph nodes)
- HIV encephalopathy (swelling of the brain caused by the HIV virus)
- Cervical cancer
- All the above and/or being bedridden more than half the time during the last month

**HIV stage 4  
is called AIDS**

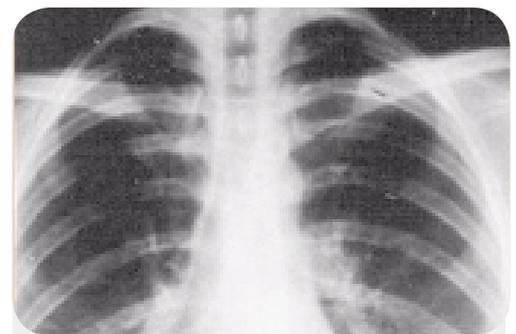
As you can see, in Stage 4 there are many different infections you can get. Many of these infections are very serious and many of them can lead to death if untreated. This is why it is better to know your HIV status early so that you can avoid Stage 4 and start on ARVs before your immune system gets this weak. We are now going to talk about some of the more common Stage 4 illnesses.

Kaposi's Sarcoma (KS) is a cancer that usually affects the skin. It can also affect the lining of the mouth, nose or eye and can spread to other parts of the body. It usually shows as spots or patches on the skin on the face, arms and legs. The patches (lesions) look red or purple on pale skin and bluish, brown or black on dark skin. It is a Stage 4 illness but some people get it in Stage 3. Strong antiretroviral treatment is the best treatment and can stop the growth and clear up the lesions. KS can also be treated with radiation therapy.



*A photo of Kaposi's Sarcoma.*

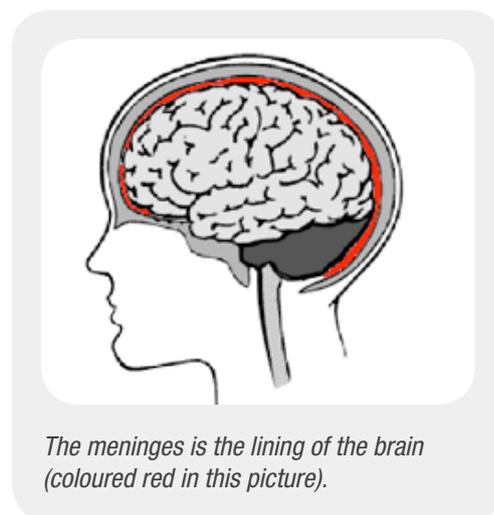
PCP Pneumonia is an infection of the lungs caused by a fungus. Symptoms include a fever, dry cough (you don't cough up anything), shortness of breath (especially after exercise), weight loss and night sweats. The risk of getting PCP increases when the CD4 count is below 200. The name 'PCP' is used even though the full name is now *Pneumocystis jirovecii* pneumonia (and not *Pneumocystis Carinii* Pneumonia). PCP is mostly treated with Co-trimoxazole, sold as Bactrim.



*An x-ray of PCP pneumonia.*

In Stage 4 you can get TB outside of the lung, such as TB of the brain, stomach and bones. It is usually more difficult to diagnose extra-pulmonary TB (outside of the lungs) which can make early treatment more difficult. Extra-pulmonary TB is mostly treated with the same antibiotics as TB of the lungs, but might need other treatments, such as surgery in cases of severe TB of the bones.

In Stage 4 people can get HIV Dementia, which is a memory disorder. The symptoms are mental slowness, trouble remembering things and bad concentration. There can also be speech problems and changes in mood and behaviour. HIV Dementia is caused by the HIV in the brain. ARVs can prevent the infection and also improve the mental function of people with HIV Dementia.



In Stage 4 you might also get Cryptococcal Meningitis. Meningitis is a word that describes a swelling of the meninges, which is the lining of the brain. Meningitis is usually caused by viral, bacterial or fungal infections. Cryptococcal Meningitis is caused by a fungal infection and is common among people with very weak immune systems. Symptoms are a stiff neck, headaches and some mental disturbance. It is treated with high doses of antifungals and ARVs.



## WORKBOOK NOTES

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## DISCUSSION POINTS

In a group talk about the following questions and see if you can answer them.

**1. Which HIV stage is called AIDS?**

Stage 4 is called AIDS.

**2. Is the CD4 count high or low in Stage 4?**

The CD4 count is very low in Stage 4.

**3. What eventually happens to people in Stage 4 if they do not get ARV treatment?**

People in Stage 4 will eventually die if they do not get ARV treatment.

# How long does it take to go from Stage 1 to Stage 4?

On average in South Africa, it takes between 5 and 10 years for people to progress from Stage 1 to Stage 4. But depending on our health and other things, it can be as little as 3 or 4 years, or as many as 15.

It is very important to know your HIV status so that you can go for tests to monitor your CD4 count and your viral load. In this way, you can start ARVs before you get to Stage 4. Stage 4 is AIDS. If you have any Stage 4 illness ARV treatment must be started regardless of your CD4 count.

It is not known exactly what causes some people to progress more rapidly from HIV infection to AIDS than others.

**The following things may play a role:**

- Our general state of health
- Getting enough healthy food (a balanced and nutritious diet) every day
- Substance abuse, alcohol or tobacco use
- Whether or not we get quick, effective treatment for opportunistic illnesses

It is very important that people with HIV make sure that they are treated early and effectively for any infections including OI's (Opportunistic Infections). Untreated infections burden the immune system and weaken it even further, which can cause severe illness and eventually death.

**In order for early and effective treatment to work:**

1. Everyone needs to get tested and know their HIV status.
2. HIV positive people need to go to the clinic as soon as they have an infection or condition.
3. The clinics must have the correct treatment.
4. The patient must finish all medication for the treatment of opportunistic infections, such as TB.
5. Treatment literacy helps us to recognise infections when they occur, understand what treatment is required and demand it if it is not available.

**Know your HIV status & get treated early**



*Alcohol abuse can cause HIV infection to progress quickly to AIDS illness, because it weakens the immune system. People who drink too much often do not eat properly and forget to look after their health.*



## DISCUSSION POINTS

In a group talk about the following questions and see if you can answer them.

### 1. When will someone with HIV be 'HIV-staged'?

Someone will be HIV staged when they have been newly diagnosed with HIV, and health workers want to see if they need to go onto ARVs.

### 2. What things can change the time it takes us to progress from HIV infection to AIDS?

The time it takes to move from HIV infection to AIDS depends on our general health, access to health care, a healthy diet and substance abuse.



## WORKBOOK NOTES

## HIV and society

Everywhere in the world, most middle-class and wealthy HIV positive people take longer to develop AIDS. Most middle class people are better educated than poor people and so have stable jobs, which means that they have a stable income. A stable income will make sure that people have enough food and can also afford medical care. Being better educated also means that you can get treatment literate more easily because you can read and search on the internet and read books.

**In South Africa, how much money you have also determines your access to basic services such as:**

- Access to clean water (which helps avoid infections and diarrhoea).
- Proper sanitation and waste disposal (i.e. flush toilets and municipal rubbish collection).
- Access to a clinic (if the nearest clinic is hard to reach, we're less likely to get quick, effective treatment).
- Access to medicine (not all government-run clinics always have all the medicines they should have, so even if you get to the clinic when you should, you may not get the right treatment).
- Access to competent medical care (if health workers are not well-trained or well-supported, patients will not get proper treatment).



*Many South Africans live in informal settlements where there is limited access to running water and flush sanitation.*



## DISCUSSION POINTS

In a group talk about the following questions and see if you can answer them.

### 1. Why do middle class and wealthy HIV positive people take longer to progress from HIV infection to AIDS?

People who are better educated and have more money usually don't progress as quickly from HIV infection to AIDS because they have a better diet and access to better services.

### 2. What basic services can make a difference for someone living with HIV?

Clean water, proper sanitation, waste disposal and access to clinics and medication can all improve an HIV positive person's health and slow down the progression from HIV infection to AIDS.

# What social changes are needed to improve the lives of poor HIV positive people?

A major challenge in South Africa is the need to educate and empower poor people. In most heterosexual HIV epidemics in the world, poor people are the worst affected by HIV/AIDS. In sub-Saharan Africa the main way that HIV is spread is through unprotected heterosexual sex. This is also 1 of the poorest and most undeveloped parts of the world.

Many South Africans live in informal settlements where living conditions are poor and overcrowded. Houses are poorly built and are cold and wet in winter. There is also limited access to clean water. Sewerage and other waste is not properly removed which means that there is a much higher chance of getting bacterial and fungal infections. We have seen how having access to basic services such as clean water, flush sanitation, waste removal and access to health care can improve the health of HIV positive people by reducing their exposure to infectious diseases and illnesses, such as TB and diarrhoea. We need to campaign for the government provision of these services.



*The Treatment Action Campaign was involved in campaigning for access to antiretroviral treatment.*

Education is also very important. In the past many South Africans did not have a good education and so today many people cannot read or write. We have a right to education and must campaign to make sure that our children are getting a decent education. With a better education, we are able to get better jobs and earn a stable and higher income compared to unskilled work. A stable income means that we can eat properly and also look after our families better. We also need to campaign for jobs because South Africa has very high unemployment.

We also need to look closely at our society and the inequalities between men and women. Girl and boy children have an equal right to education. Women and men need to talk about sex and stop supporting negative behaviour, such as women not being able to suggest condom use. Women need to be financially independent of their male partners so that they can be free to have their say when it comes to sex. Women need to be educated about their reproductive health and make use of contraceptives and PMTCT (Prevention of mother-to-child transmission) services.

Prevention programs need to be improved. We need to make safer sex the thing people want - not unprotected sex. People need to understand their risks and make better decisions. Condoms and Female condoms need to be made more easily available. Children need to know the facts about sex before they become sexually active. We also need to give young people a vision so that they can look forward to their future and want to remain HIV negative.

## WORKBOOK NOTES

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# National Strategic Plan for HIV/AIDS

South Africa has the biggest HIV epidemic in the world in terms of number of people infected. Only recently did the South African government develop a plan to stop the spread of HIV and treat those people who are infected. This plan is called the National Strategic Plan for HIV/AIDS and STIs. We can call it the NSP for short. The NSP gives the Government clear targets which tell us how many people they are committed to helping and exactly what they plan to do.

## Important NSP goals are:

1. Halving the HIV incidence rate;
2. Extending antiretroviral treatment (ART) coverage to 80% of those in need - roughly 1,5 million adults;
3. Increasing uptake of PMTCT services to 95%;
4. Increasing to 95% the proportion of pregnant women tested for HIV;
5. Increasing to 70% the number of adults who have ever been tested for HIV;
6. Increasing to 25% the proportion of adults tested for HIV in the last 12 months;
7. Testing 90% of people diagnosed with TB for HIV;
8. Testing 90% of people testing positive for HIV for TB

If we achieve or come close to achieving these goals, HIV/AIDS will be much less of a burden on people, families and society. The South African government cannot do this alone. It needs all of us to make a contribution. Being treatment literate will help you to encourage people in your community, workplace, church, sports club, school and in your family to be part of doing the right thing - testing regularly, staying negative and seeking treatment in good time should you become HIV positive. Government and civil society are working on the new National Strategic Plan for 2012 to 2016.



## WORKBOOK NOTES

**Well done on completing Chapter 3.** This chapter, together with Chapters 1 and 2, has given you a good understanding of the basics of HIV/AIDS, where it came from, how it is transmitted and how it affects the human body. It is important that you understand all this information before you move to the rest of the chapters and the DVDs in the series. Ask questions and talk about those things that you need more time to understand. Read through all the chapters again and make notes. Remember, we're all different and learn at different speeds, but this doesn't mean we're less able than each other. The really important thing is to just carry on trying, and helping each other understand.



## BEFORE WE END OFF

Make sure all questions have been answered. It is important that you understand the following key points:

1. HIV is a virus that is transmitted in bodily fluids.
2. HIV uses the CD4 cells to multiply.
3. If untreated HIV infection progresses to AIDS illness.
4. Infections are caused by pathogens (germs).
5. When the immune system is weak you get more infections.

**By understanding  
the science of HIV, we can  
better understand how to  
beat HIV**



## MULTIPLE CHOICE QUESTIONS

Name : .....

Circle the correct answer for each question. You can only choose 1 answer for each question.

1. Which of the following is not a pathogen (germ)?

- a) Virus
- b) Bacteria
- c) Worms
- d) Fungi

2. Which of the following can only be seen under a microscope?

- a) A human hair.
- b) A virus.
- c) A drop of water.
- d) A drop of blood.

3. Which 1 of the following sicknesses is caused by a viral infection?

- a) Pneumonia
- b) Bronchitis
- c) Shingles
- d) TB

4. Which of the following statements is true?

- a) HIV has DNA.
- b) HIV enters the CD4 cell to multiply.
- c) HIV can reproduce in water.
- d) HIV enters the CD8 cell to multiply.

5. Viral load measures

- a) The number of cells in a millilitre of blood.
- b) The number of CD4 cells in a millilitre of blood
- c) The number of HI viruses in a millilitre of blood.
- d) The number of HI viruses in a litre of blood.

6. How many stages does the WHO have to describe HIV progression?

- a) 5
- b) 40
- c) 2
- d) 4

7. Which of the following statements is true?

- a) The CD4 count goes up in Stage 4.
- b) The viral load goes down in Stage 4.
- c) The CD4 count is very low in Stage 4.
- d) Stage 4 is when someone is getting better.

8. Which stage of HIV infection is AIDS?

- a) Stage 3
- b) Stage 4
- c) Stage 1
- d) Stage 2

9. What is the main way that HIV is transmitted in South Africa?

- a) Sex between 2 men.
- b) Car accidents.
- c) Sex between a man and a woman.
- d) Unprotected sex between a man and a woman.

10. The National Strategic Plan (NSP) is

- a) A plan to win the world cup soccer.
- b) A plan to build South Africa as a nation and create employment.
- c) A plan to reduce the spread of HIV/AIDS and increase the number of people on treatment.
- d) A plan to build the economy.



## WORKBOOK NOTES

A series of horizontal dashed orange lines spanning the width of the page, providing a template for handwritten notes.