



## OPPORTUNISTIC INFECTIONS

### Key points:

1. Opportunistic infections affect people with weak immune systems, especially those living with HIV.
2. Opportunistic infections are caused by germs (pathogens).
3. ARVs help prevent opportunistic infections.
4. Get treatment for opportunistic infections early.

Many people living with HIV experience opportunistic infections because their immune systems are weakened by HIV. This is particularly true for HIV positive people living in remote areas and without access to good health care. ARVs strengthen the immune system and so prevent many opportunistic infections. HIV negative people also get many of the same infections, but they are usually more common or serious with people who have weak immune systems.

Controlling and preventing opportunistic infections is vital for the health of people living with HIV. This is why knowledge of opportunistic infections is so important. Knowledge of opportunistic infections helps you to identify symptoms and encourages you to get treatment early before the infection gets serious and before it harms your immune system. Be treatment literate and get treated early.



# Terms

In this chapter, we may use terms you have not heard before. Please look in the Glossary for a full definition of any words you do not understand when using this manual. Please see the table below for a list of terms translated into different languages used throughout South Africa. You can also write down everyday language that you commonly use to describe these terms.

TERMS	ISIXHOSA	ISIZULU	SESOTHO	SLANG
Oral Thrush	<i>Amalevula</i>	<i>Amalonda</i>	<i>Diso tsa molomo / masela</i>	
Plain yoghurt	<i>iyoghurt eplein</i>	<i>i yoghurt e plein</i>	<i>Lebejana le feela</i>	
Oesophageal trush	<i>Mqala omhlope</i>	<i>Amalonda Empinjeni</i>	<i>diso tsa kgogotho / Masela a kgogotho</i>	
Vaginal thrush	<i>Inkunkqa</i>	<i>Amaququva avana nezilonda zomkhuhlane</i>	<i>Lekgopho sethong sa bosadi</i>	
Cold sores/ HS1	<i>Nyebethu</i>	<i>Izilonda zonkhuhlane</i>	<i>Diso tsa Sefuba 1</i>	
Herpes simplex 2	<i>Nyebethu</i>	<i>isilonda somkhuhlane</i>	<i>Diso tse kang tsa sefuba 2</i>	
Tingling	<i>Ubunambululu / Inkantsi</i>	<i>ukulunywalunywa</i>	<i>Ho hlohlonga / Botsikinyane</i>	
Penis	<i>Incanca, ipipi</i>	<i>umthondo/4-5</i>	<i>Setho sa bonna</i>	
Vagina	<i>Ikuku, iboso</i>	<i>Isitho somuntu wesifazane sangasese</i>	<i>Setho sa bosadi</i>	
Genitals	<i>amasende, amatapile</i>	<i>Isibumbu</i>	<i>Bokapele</i>	
Anus	<i>limpundu</i>	<i>mdidi/ndunu</i>	<i>Motete/ Dibono</i>	
STI	<i>Izifo ezosulela ngokwabelana ngesondo</i>	<i>Izifo zoncansi</i>	<i>Mahloko a thobalano</i>	
Nerve cells	<i>Imithambo luvi</i>	<i>Imizwa</i>	<i>Methapo kutlo</i>	
Prophylactic	<i>Isikhuseli</i>	<i>Isivikeli</i>	<i>Thibelo</i>	
Germ	<i>lintsholongwane</i>	<i>Amagciwane</i>	<i>Ho hohlela ho omeletseng</i>	
Dry cough	<i>Unkonkonko / uphephephe</i>	<i>Ukukhwehlela okomile</i>	<i>Ho hohlela ho omeletseng</i>	
Sinusitis	<i>Amarhanana</i>	<i>sinas</i>	<i>Mahanapa a ruruhileng</i>	
Shortness of breath	<i>Iphika/ ukuvaleka</i>	<i>Ukuphelelwa umphefumulo</i>	<i>Ho fehelwa</i>	
Meninges	<i>Inwebu egqume ingqondo</i>	<i>brain/ubuchopho</i>	<i>Lera le sireleditseng boko</i>	
Inflamed	<i>Ukudumba</i>	<i>vuvuka</i>	<i>Ho ruruha</i>	
Change in personality, moods	<i>Tsintsha Ubuwena</i>	<i>moods</i>	<i>Ho fetoha ha botho</i>	
Blurred vision	<i>Awuboni kakuhle</i>	<i>Ukubona kalufifi</i>	<i>Pono e lerotho</i>	
Clot	<i>Ihlwili</i>	<i>Ihluli</i>	<i>Mahlwele</i>	
Sex drive	<i>Umdla wezesondo</i>	<i>uyalunywa ngaphansi</i>	<i>takatso / takatso ya motabo</i>	
Psychiatric illness	<i>Ukugula ngengqondo</i>	<i>uyahlanya</i>	<i>Ho kula ha kelello</i>	
Rash	<i>amaqhakuva amancinci</i>	<i>Ukulunyelwa</i>	<i>Lekgopho</i>	
Herpes Zoster	<i>Intsumpa</i>	<i>Ibhande</i>	<i>Tjhabadimo/ Lebanta</i>	
Pneumonia	<i>Ingqe</i>	<i>Iyumonya</i>	<i>Serame sa matshwafo</i>	
Blood clot	<i>Ihlwili legazi</i>	<i>Amahlulu engazi</i>	<i>Mahlwele</i>	
Depression	<i>Unxunguphalo</i>	<i>depression</i>	<i>Kgatello ya maikutlo</i>	
Shingles	<i>Ibhanti</i>	<i>Ibhande</i>	<i>Lebanta</i>	
Mumps	<i>Qilikwane</i>	<i>Izindlala</i>	<i>Ditemetwane</i>	



## ABOUT THIS CHAPTER

The aim of this chapter is to give a good understanding of the different kinds of opportunistic infections an HIV positive person can get.

### This chapter covers:

- Opportunistic infections of the mouth
- Opportunistic infections of the skin
- Opportunistic infections of the respiratory system
- Opportunistic infections of the nervous system



**Welcome to Chapter 7.** In this chapter we are going to talk about opportunistic infections (OIs). You will remember when we talked about the science of HIV, we also talked about the different kinds of germs that can cause infections. You might want to remind yourself and read Chapter 3 again. When we get sick it is usually because we have been infected by a germ. The different kinds of germs are bacteria, viruses, fungi and protozoa.

Many people living with HIV have opportunistic infections at some stage. Some people only test for HIV once they are sick with opportunistic infections. Other people still have a very healthy immune system when they discover they are HIV positive and so may not have had any serious opportunistic infections. This chapter will give you a good understanding of more common OIs. It will help you identify the symptoms and will also talk about the treatment of different OIs. Most OIs are easy to treat if you catch them early.

We have talked about the progression from HIV infection to AIDS-related illness. If a person does not get ARV treatment their immune system is eventually overpowered by all the opportunistic infections and they die of AIDS. But with ARVs, the immune system is kept stronger and so keeps away many opportunistic infections. A person on ARVs can still get OIs, because like an HIV negative person there will be times when their immune system is weakened, like in winter or if they have a lot of stress. HIV negative people also get many of the same infections, such as bronchitis or TB. But with someone who is living with HIV, the infections are usually more common and more serious.

We will talk about opportunistic infections in different sections to keep it simpler. We will start with OIs of the mouth, then the skin, the respiratory system and the nervous system. Some of the OIs might be found in more than 1 place in the body, such as thrush which can be in the mouth, oesophagus and the vagina. The important thing to remember is that each opportunistic infection is caused by a particular germ and needs a particular treatment, depending on if it is a fungal, bacterial or viral infection.



## DISCUSSION POINTS

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

**1. Why do HIV positive people get opportunistic infections?**

HIV positive people get OIs because their immune systems are weakened.

**2. What happens if an HIV positive person does not get ARVs?**

If an HIV positive person does not get ARVs, their immune system is eventually overpowered by the opportunistic infections and they die of AIDS.

**3. Why do ARVs help prevent OIs?**

ARVs strengthen the immune system and so many OIs are prevented because the immune system can protect the body against the germs (pathogens).

**4. What causes opportunistic infections?**

Opportunistic infections are caused by germs (pathogens).



## WORKBOOK NOTES

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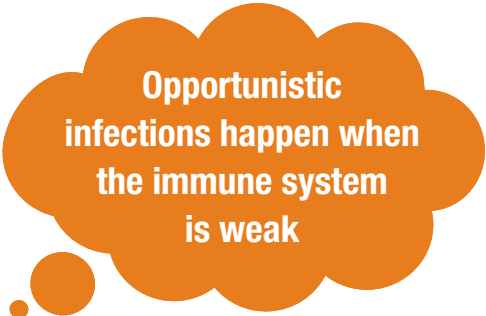
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## Opportunistic infections of the mouth

Episode 6, Chapter 1



Opportunistic infections can attack all areas of the body including the mouth and the throat. When this happens you cannot swallow because of pain and you lose your appetite. In this way you lose weight and feel weak. The best way to prevent infections in the mouth is to keep your mouth and teeth clean and healthy. Let's learn how.

### HOW TO KEEP YOUR MOUTH HEALTHY

Many of us really like sweet things. It is best to avoid sweet and sugary foods, because sugar encourages germs and can make holes in our teeth. It can be hard to stop children from having sweet things to eat, but parents need to limit the amount of sugar children eat and make sure that their children brush their teeth. This is the same message we give to parents whose children are not HIV positive.

The bacteria in your mouth and the germs in your mouth feed on sweet foods and produce acids, which eat up the teeth and cause tooth decay. The best thing to do is to limit sugary foods as much as possible. Brushing your teeth removes the sugar and other things which help tooth decay. Brushing your teeth also controls the bacteria in your mouth.

Baby teeth are not as strong as the adult teeth. You should not give your baby or toddler sweetened drinks because it is bad for their teeth. It is also not good to put sugary drinks in bottles and dummies because it can encourage bacteria to grow, especially in the bottle teat and on the dummy.

### Brush your teeth

It is best to brush with a rounded motion. If you brush up and down you can push the gums back and expose the roots of your teeth. It is best to use a small, soft toothbrush and to brush for at least 3 to 5 minutes. Brush the inside of your teeth as well. You will have to get inside there with your brush and brush around the insides of the teeth. Do not forget the insides of the bottom teeth. This is where you can get a build-up of plaque and you will then need an oral hygienist to remove it professionally.

You must brush your teeth twice a day after meals. Never share a toothbrush, because this way you can catch infections of the mouth. You must visit the dentist regularly.

### Flossing

To floss your teeth you need to put the floss in between the teeth and gently wiggle it downwards to dislodge any of the food trapped in-between. Flossing removes pieces of food that a toothbrush can't move. Flossing also removes plaque. You should floss every day, but even a few times a week can make a big difference to your oral hygiene.



*The best way to avoid OIs of the mouth is to make sure your teeth and mouth are clean.*



*Try and limit the amount of sweets you and your family eat.*



*Flossing removes food stuck in between the teeth and helps keep the mouth clean.*



## DISCUSSION POINTS

### 1. Why must we avoid sugary foods?

The bacteria in your mouth feed off sugary foods and make acid which causes tooth decay.

### 2. Why must we not share our toothbrush?

If you share a toothbrush you might also pass on or get infections of the mouth.

### 3. Describe how we brush our teeth.

When we brush our teeth we should use a rounded action and not brush up and down. We should also brush on the inside of our teeth on the top and the bottom.

### 4. Describe how to floss our teeth.

When we floss our teeth we can push the floss in between the teeth and then gently wiggle it down to remove any food trapped in between the teeth.

Four horizontal dashed orange lines for writing.

For people living with HIV, one of the most common infections of the mouth is thrush. Thrush is a white fungal infection. This is also one of the first problems we usually see with people with HIV. The other common problem for people with HIV is mouth ulcers. All of us, whether we are HIV positive or HIV negative, have probably had ulcers at some stage of our life. But with HIV positive people, ulcers can become chronic and difficult to heal. This can make it difficult to eat, drink and swallow. As soon as you find something wrong, you must go and seek early and effective treatment for it.



## DISCUSSION POINTS

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

### 1. What are 2 common problem of the mouth for people with HIV?

Thrush and mouth ulcers are both common problems for HIV positive people.

### 2. What should we do when we have a sore in our mouth?

If we have a sore in our mouth, we should go to the clinic immediately so we can get treatment.

Four horizontal dashed orange lines for writing.



## ORAL THRUSH AND HOW TO TREAT IT

Oral thrush is a common opportunistic infection. Symptoms are white patches on the tongue, which look like sour milk or cottage cheese. Thrush can sometimes also appear as red patches. If untreated, oral thrush becomes very painful when you touch it. Because thrush can make it hard for people to swallow and therefore to eat, people who get it can quickly become weak.

Thrush is caused by a germ called *Candida*. It is a fungus and becomes more common when your CD4 count is below 200. That's why thrush is most common in Stages 2 and 3 of HIV infection. There are different ways to treat thrush. If you don't get early and effective treatment, it can be dangerous. It can spread down your throats and enter your body. When it is inside your body, it is called 'systemic thrush'.

There are 2 types of thrush. The first kind of thrush is not so serious and this is usually when it is in the beginning stages of infection. We also have a more serious thrush that needs strong medicines. For less serious thrush you are given an ointment called Nystatin. Nystatin needs to be used 5 times a day. You must apply the Nystatin ointment to your tongue or you can take Nystatin tablets. For less serious thrush, you can also put plain yoghurt on your tongue. Make sure that the yoghurt has no flavour and no sugar. Plain yoghurt has bacteria in it that can fight the thrush fungus and clear the infection.

Some people realise too late that they have oral thrush. Those people wait until it covers the whole tongue. More severe thrush needs to be treated with pills called Fluconazole. Fluconazole is available in government clinics free of charge.

**Treat oral thrush early to prevent problems with swallowing**

### Episode 6, Chapter 2



A photo of oral thrush caused by a fungus called *Candida*.



Nystatin helps clear less serious oral thrush.



For more serious oral thrush you must take Fluconazole.

## DISCUSSION POINTS

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

### 1. How do we recognise oral thrush?

Oral thrush looks like a white paste on the tongue.

### 2. At what stage of HIV is thrush more common?

Thrush is most common in Stages 2 and 3 HIV infection.

### 3. How do we treat thrush?

We treat less serious thrush with Nystatin or plain yoghurt.

More serious thrush is treated with Fluconazole.

### 4. What is thrush called when it spreads inside our bodies?

When thrush spreads inside our bodies it is called 'systemic thrush'.

## THRUSH BEYOND THE MOUTH

Not brushing your teeth properly and at least twice a day can make it easy to get oral thrush. If left untreated, oral thrush can spread down your throat or oesophagus. It is then called oesophageal thrush and can cause a lot of pain when swallowing, as well as chest pains. If you have oesophageal thrush, you need to be treated with Fluconazole. Oesophageal thrush is a Stage 4 infection so you need to start ARVs.

If you are woman, you can also get vaginal thrush. Vaginal thrush can be treated with plain yoghurt if it is not serious. More serious vaginal thrush is treated with an anti-fungal cream, such as Medispore, but there are different kinds. HIV negative women can also get vaginal thrush, but it can get very serious with HIV positive women. Early treatment is very important. If you are HIV positive, it is also a good idea to use mild soap, because strong soaps can also kill the useful bacteria in the vagina. Green Sunlight soap which is usually used for washing clothes is an affordable and mild soap. To avoid getting vaginal thrush, it is also a good idea to not wear synthetic underwear and to rather wear cotton underwear.



## WORKBOOK NOTES

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## DISCUSSION POINTS

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

**1. What other parts of our bodies can get thrush?**

We can also get thrush in the throat or oesophagus and it can spread into the body.

**2. What are the symptoms of oesophageal thrush?**

Chest pains and a lot of pain when swallowing are symptoms of oesophageal thrush.

**3. What Stage infection is oesophageal thrush?**

Oesophageal thrush is a Stage 4 infection.

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## HERPES SIMPLEX

Another viral infection of the mouth is Herpes Simplex 1. We often call herpes 'cold sores' because we can get it when we have been sick with a cold or flu and our immune system is weak. Both HIV positive and HIV negative people can get Herpes Simplex 1. The herpes virus attacks our nerves and creates painful sores on our lips or inside our mouth. Herpes flares up when people are run down or stressed.

The first line of treatment for small herpes sores in the mouth is an ointment called Povidine-Iodine. But if things get worse you must use Acyclovir, which comes either as an ointment or pills. Often, people feel a tingling sensation when they are about to experience a herpes outbreak. If it is taken early, Acyclovir can stop the outbreak. Acyclovir is now available at government clinics, and so it is easier for people to get early and effective treatment.



For more serious herpes you will need Acyclovir.

### Episode 6, Chapter 3



Here are 2 examples of what Herpes Simplex 1 can look like.



Acyclovir can come in pills or ointment.



## DISCUSSION POINTS

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

**1. What is another name for Herpes Simplex 1?**

Another name for Herpes Simplex 1 is 'cold sores'.

**2. Where does herpes attack us?**

Herpes makes sores on our lips or inside our mouth.

**3. What can make herpes flare up?**

If we are stressed or run down, we can get an outbreak of herpes, because our immune system is weak.

**4. How do we treat herpes?**

If it is not serious, we can treat herpes with an ointment called Povidine-Iodine. If it is more serious then we need Acyclovir which is either an ointment or pills.

# Opportunistic infections of the skin

Episode 6, Chapter 7



Skin problems are common with HIV. They can be caused by fungal or bacterial infections. To prevent and control skins problems you must:

- Wash every day with soap and water. You don't need special or expensive soap. Try to use a gentle or mild soap.
- Make sure you rinse the soap off carefully.
- Be particularly careful about washing your hands thoroughly after handling rubbish, going to the toilet or being in a dirty place.
- Keep your nails short and clean.
- If you do get a rash, try to avoid scratching it. Scratching makes the itch worse and it can cause infection of the irritated skin by bacteria and fungi.



## DISCUSSION POINTS

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

### 1. What are skin problems caused by?

Skin problems are caused by bacterial and viral infections.

### 2. Are skin problems common for people with HIV?

Yes, skin problems are common with HIV positive people.

### 3. What can we do to help avoid skin infections?

Washing every day with soap and water and rinsing properly can help to avoid skin problems.

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## WHAT ARE SKIN RASHES CAUSED BY?

Skin rashes are very common in people living with HIV. There are many different skin rashes that people get during Stages 2, 3 and 4 of HIV infection. A skin rash is an indication that your body is fighting something that doesn't belong in your body.

Having a skin rash can also be a side effect of your medication. That is why it's very important to read the instructions and be aware of the side effects you might experience from the medication. For example, TB medicine can also cause a skin rash. If you have a rash that looks like small pimples it is most likely a side effect of medication you are taking. If you get a skin rash, go to the clinic. You might need to change medication, or you might be told it will go away in a few days and get some ointment to stop the itching.

HIV can also causes some skin rashes. A common kind of rash caused by HIV is a dry, dandruff-like skin rash. This type of rash is most common when you have just discovered that you have HIV. You will get dryness of the scalp and your skin. This can also happen to someone who doesn't have HIV. Lots of things can lower your CD4 count (whether you have HIV or not), which could affect the skin. Therefore you can't judge people and think that just because they have dry skin it means they have HIV.



## DISCUSSION POINTS

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

**1. What are skin rashes caused by?**

Skin rashes can be caused by HIV, a fungal or viral infection.  
Skin rashes can also be a side effect of medication.

**2. Can HIV negative people get skin rashes?**

Yes, both HIV positive and HIV negative people can get skin infections.

## HERPES

Episode 6, Chapter 3 & 4



Once you have been infected with herpes, the virus will always be in your body. Like HIV, herpes is also a virus for which there is no cure. The good news is that it can be easily treated and controlled. Herpes only becomes a problem when it flares up when you are stressed or ill.

There are 2 kinds of herpes virus. Cold sores, or herpes sores around the mouth, are caused by Herpes Simplex 1. Herpes Simplex 2 causes sores around the genitals (anus, penis and vagina) and is an STI. We have already talked about herpes sores around the mouth (cold sores).

You don't have to be HIV positive to get herpes. Anyone who has been exposed to the herpes virus can get it. People whose immune systems have been damaged by HIV are likely to experience more severe herpes outbreaks. Herpes is transmitted when you kiss someone who has cold sores or fever blisters, or have sex with someone who has genital herpes sores. Herpes blisters can be extremely small and it's quite possible to have sex with someone without noticing that they have herpes.

Like more serious cases of herpes of the mouth, genital herpes is also treated with Acyclovir. You need to start treatment for herpes the moment you feel the signs of an outbreak coming on – this is usually a tingling feeling because herpes is a disease of the nerves. If herpes is very bad Acyclovir can be used as a prophylactic treatment to prevent outbreaks. This means that you will take Acyclovir all the time to prevent herpes outbreaks.



## DISCUSSION POINTS

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

**1. What virus causes herpes sores (or cold sores) around the mouth?**

Herpes Simplex 1 causes herpes around the mouth.

**2. What virus causes genital herpes?**

Genital herpes is caused by Herpes Simplex 2 virus.

**3. How is herpes transmitted?**

Herpes around the mouth is transmitted by kissing someone who has the virus. Genital herpes is transmitted when you have sex with someone who has genital herpes.

**4. How is genital herpes treated?**

Genital herpes is treated with Acyclovir.

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## SHINGLES (HERPES ZOSTER)



Another kind of herpes is called Herpes Zoster. This is the kind of herpes that causes shingles. Shingles is a painful infection of the nerve cells. It usually only affects 1 side of the body because it follows the line of the nerve cells.

Shingles is a Stage 2 HIV infection. As with all opportunistic infections, it is important to get early and effective treatment. The only treatment that works for shingles is an anti-viral medicine, like Acyclovir. Because chicken-pox is also caused by Herpes Zoster, one way to avoid getting shingles is by staying away from children who have chicken-pox.

The warning sign of shingles is getting tingling over a specific area of skin. If you feel that tingling, go to the clinic and ask for treatment with Acyclovir immediately. You might also get blisters with more serious cases of shingles. These blisters might be painful and your doctor might give you Amitriptyline for the pain.



Here we can see shingles on the back.

**Treat all opportunistic infections early**



Acyclovir helps treat shingles.

## DISCUSSION POINTS

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

**1. Which herpes virus causes shingles?**

Herpes Zoster causes shingles.

**2. Which part of the body is infected when we get shingles?**

When we get shingles the nerves are infected with the Herpes Zoster virus.

**3. What are the warning signs of shingles?**

When you get a tingling feeling in a particular part of the body, it is a warning sign that you are going to get a shingles outbreak.

**4. How is shingles treated?**

Shingles is treated with anti-viral medicine, like Acyclovir.

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## KAPOSI'S SARCOMA

Episode 6, Chapter 6



Kaposi's sarcoma (KS) is a serious Stage 4, AIDS-defining opportunistic infection and therefore HIV positive people with Kaposi's sarcoma must start antiretroviral therapy straight away. Kaposi's Sarcoma 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. If in the mouth, a chest x-ray should be done to check if it is also in the lungs. 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 chemotherapy or radiation therapy.



## DISCUSSION POINTS

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

## 1. Why must we take KS seriously?

KS is a Stage 4 illness which means that the immune system is very weak.

## 2. What does KS look like?

KS usually appears on the skin and looks like purple, black or brown marks or spots on the skin.

## 3. How is it treated?

KS usually clears up when ARVs are started, but if it is serious it can be treated with chemotherapy or radiation therapy.

During the early stages of HIV infection, skin infections are not too serious. However, they can lead to greater complications, so we must always take them seriously. For example, when your immune system is very weak, Herpes Zoster (that causes shingles) can infect the lungs or your brain. If you don't take shingles seriously, it can develop a secondary or additional bacterial infection. You can even get TB infections of the skin.



*An example of Kaposi's Sarcoma.*

**Skin infections can lead to greater complications**



## WORKBOOK NOTES

# Opportunistic infections of the respiratory system

Episode 6, Chapter 8



We have already talked about the respiratory system in detail earlier in the Health Literacy Manual. As we know the respiratory system is what enables us to breathe and allows oxygen to enter the body. The most common OIs of the respiratory system are TB and pneumonia. We will learn about TB in a lot of detail in the next chapter.

TB and pneumonia infections can attack you at any stage of HIV infection. The first sign of possible infection of the respiratory system is a 2-week-long cough. We must also look out for sharp pains in the chest, tiredness, fever and shortness of breath. If you have greenish or yellowish sputum or blood in your sputum, you should go to the clinic and be checked for a lung infection. Early and effective treatment is important with every opportunistic infection.



## DISCUSSION POINTS

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

### 1. What are the most common OIs of the respiratory system?

TB and pneumonia are the most common OIs of the respiratory system.

### 2. What stage of HIV can these infections attack?

TB and pneumonia can attack an HIV positive person at any stage of infection.

### 3. What are the signs that we might have a lung infection?

Green or yellow sputum and blood in the sputum are all signs that we might have a lung infection.

### 4. What should we do if we see any of these symptoms?

We should go to the clinic and be checked for a lung infection.

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## SINUSITIS

Episode 6, Chapter 9



The sinuses are the cavities or holes located within the skull surrounding the nose. Sinusitis is usually caused by a bacterial infection. If you have sinusitis your nose will be blocked or running all the time. You may get a nasty taste in your mouth as well. Sometimes you will have a minor headache or feel feverish. Sinusitis is treated with antibiotics. It can also be helped by breathing in steam to try and open up the passages in our noses again.

Sinusitis is usually a Stage 2 opportunistic infection. Sinusitis can be treated easily. It's vital that you get early and effective treatment for opportunistic infections to slow down the time it will take for the HIV to make you sick. People suffering from sinusitis usually get some kind of a nasal spray.



## BRONCHITIS

Episode 6, Chapter 10



Bronchitis is a more serious infection of the lungs. You can get it at any stage of HIV and you don't have to be HIV positive to get bronchitis. The symptoms are finding it difficult to breathe and chest pain. Bronchioles are small tubes in the lungs and when you get bronchitis it means that there is an infection blocking the bronchiole. When you have an infection, the bronchiole tubes secrete mucous to fight off infection and you will probably cough up yellowish or greenish sputum. If you develop bronchitis, you will experience some pain behind the chest. You can also experience sharp pains and feel tired, because the tubes that assist the breathing process have been affected.



*Here we can see the lungs. Bronchitis infects the small tubes inside the lungs called the bronchioles.*



### DISCUSSION POINTS

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

**1. Where are our sinuses?**

Our sinuses are in our skull near our noses.

**2. What is sinusitis caused by?**

Sinusitis is caused by bacterial infections.

**3. How do we treat sinusitis?**

We can take antibiotics to treat sinusitis.

People with HIV who smoke are more vulnerable to bronchitis. Stop smoking or smoke less. You must rest as much as possible. Bronchitis is usually caused by a bacterial infection and so it is treated with antibiotics. If you have a tight feeling in your chest it can help to breathe in steam. You can pour boiling water into a bowl and put a towel over your head and lean your head over the bowl and breathe in the steam. You can also add eucalyptus oil to the water as this will help loosen the sputum and help you cough it up.



### DISCUSSION POINTS

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

**1. What are bronchioles?**

The bronchioles are small tubes in the lungs.

**2. How do bronchiole tubes fight off infection?**

Bronchiole tubes help fight infection by making mucous.

**3. What are the symptoms of bronchitis?**

If you have bronchitis you find it difficult to breathe and have chest pain. You might feel tired and cough up yellowish and greenish sputum.

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Pneumonia caused by bacteria is the most common opportunistic infection. HIV negative people can also often get pneumonia, just like bronchitis and sinusitis. You can get pneumonia even when your CD4 count is high. Pneumonia is a serious, potentially fatal illness if it is not treated properly.

There are 2 kinds of pneumonia and they both attack your lungs. Bacteria cause 1 kind of pneumonia and fungi the other. 50% of HIV positive people are usually attacked by the pneumonia caused by bacteria. Pneumonia caused by bacteria has killed a lot of HIV positive people. Symptoms of pneumonia include fever, coughing a lot (sometimes producing green or yellow sputum), shortness of breath and feeling cold when it is hot or hot when it is cold.

You may also get sharp pains in your back, especially when you are coughing. You must be aware of the symptoms and go to your doctor. Pneumonia caused by a bacterial infection can be treated with Amoxicillin or Erythromycin. Pneumonia can be a Stage 3 illness. If you are in Stage 3, you must take Bactrim or Cotrimoxazole. Bactrim can be used to prevent other bacterial infections as well as an infection by fungal pneumonia or PCP.



### DISCUSSION POINTS

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

**1. Is pneumonia a common opportunistic infection?**

Yes.

**2. What causes pneumonia?**

Pneumonia can be caused by either bacterial or fungal infections.

**3. What are the symptoms of pneumonia?**

If you have pneumonia you can get a fever, cough a lot, struggle to breathe and feel cold when it's hot and hot when it's cold.

**4. How is pneumonia treated?**

Pneumonia is treated with Amoxicillin or Erythromycin.

**5. What do we take to prevent pneumonia?**

We can take Bactrim to prevent pneumonia.

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## PCP PNEUMONIA

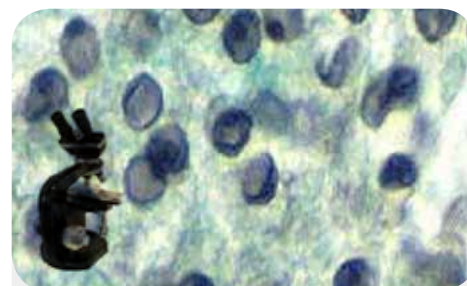
PCP pneumonia is an infection of the lungs caused by a fungus. The symptoms are the same as with the other type of pneumonia and you will have a dry cough, fever and sharp pain in the back when coughing. Some people experience difficulty walking. This is because you get fatigued if you do not get enough oxygen.

A dry cough means you don't cough up anything. You can also have shortness of breath, especially after exercise, as well as weight loss and night sweats. The risk of getting PCP increases when the CD4 count is below 200. PCP pneumonia can also be called PJP - Pneumocystis Jirovecii Pneumonia - and is caused by the Juroveci fungus. When you take Bactrim to prevent bacterial infections it is called Bactrim prophylaxis. Prophylaxis means to prevent. Sometimes you can get a skin rash side effect from taking Bactrim. If you experience a skin rash with Bactrim, go and tell your healthcare worker – don't just stop taking your medication. If you are in Stage 3, you must prepare to go on ARVs. If your CD4 count is very low when you start ARVs, you will probably keep taking Bactrim until your CD4 count is over 350 or 400. Once your CD4 count is higher it shows that your immune system is stronger and you don't need to take Bactrim as a prophylactic.

To see if you have PCP you will need to have an x-ray. PCP is treated with high doses of Cotrimoxazole (Bactrim). You will receive this in hospital on a drip. You might also be given an oxygen mask to breathe through. You must continue Bactrim as a prophylaxis after the PCP pneumonia has been treated, to prevent other infections. You might also be given Vitamin B complex to help you get back to strength.

PCP pneumonia is very common in people who have CD4 cell counts of less than 100. If you get PCP pneumonia it means you are in Stage 4. You will need to start taking ARVs if you get PCP regardless of your CD4 count. You can stop taking the Bactrim once the ARVs have helped push your CD4 count up above 200 again. Other ways of avoiding getting OIs of the respiratory system, include stopping smoking, staying away from others who smoke and making sure the air in our homes is fresh.

## Episode 6, Chapter 12



Here we can see what PCP looks like under a microscope.



Here we can see an x-ray that shows PCP pneumonia infection (hazy whiteness in the lungs).



Bactrim (Cotrimoxazole) is used to treat PCP pneumonia.



## DISCUSSION POINTS

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

### 1. What is the difference between PCP pneumonia and other kinds of pneumonia?

PCP (PJP) pneumonia is caused by a fungus and other pneumonia is caused by bacterial infection.

### 2. How do you find out if you have PCP?

You will need to have an x-ray to see if you have PCP pneumonia.

### 3. Why must you go on ARVs if you have PCP?

If you have PCP you must go on ARVs because PCP is a Stage 4 defining illness which means that your immune system is very weak.



## WORKBOOK NOTES

# Opportunistic infections of the nervous system

Opportunistic infections of the nervous system are usually very serious. You should seek treatment immediately if you have an OI of the nervous system. We have already talked about the nervous system and we know that the nervous system is all those parts of our body that allow us to think and feel and move.

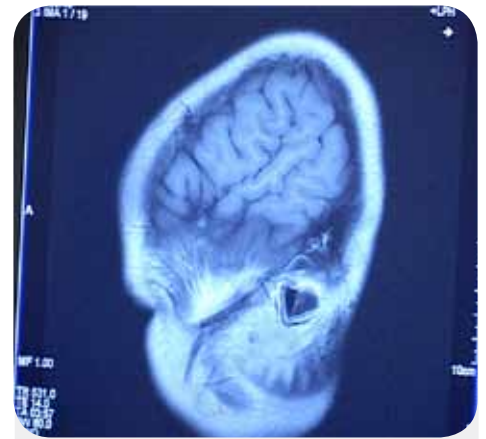
The nervous system consists of the central nervous system (CNS) and the peripheral nervous system (PNS). The central nervous system is the largest part of the nervous system and includes the brain and spinal cord. The peripheral nervous system consists of the nerves and nerve cells that live inside and outside the brain and spinal cord. Peripheral means 'on the edge or side'. The brain allows us to think, remember, judge, calculate etc. The role of the nerves is to process and move information around our bodies. For example, the nerves carry information from our senses to the brain and tell us whether something is hot or cold, loud or soft or sweet or bitter. Nerves also carry instructions from the brain to the muscles and control how our bodies move and tell us to walk, talk, sit etc.

## MENINGITIS

Our brain comes with a protective layer (or wrapping) called the meninges. If the meninges becomes inflamed it will swell. This creates very painful pressure in our heads called meningitis and severe headaches. Things to watch out for are out-of-the-ordinary, severe persistent headaches, and stiffness of the neck that makes it difficult to shake or move your head. The other symptom can be a change in personality. This means that you are not in your right state of mind.

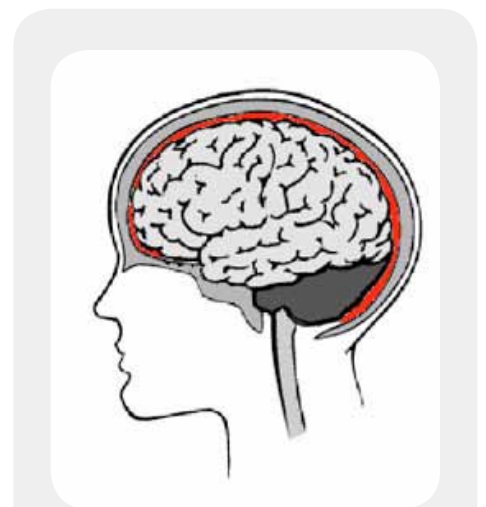
Several different things can cause meningitis, such as bacteria like TB, viruses like herpes and mumps, and fungi like Cryptococcus. Treatment for meningitis varies depending on the cause. Acute meningitis is very serious, but it does not last for long if it is treated quickly. There is also chronic meningitis. When we talk of chronic illness we are talking about never-ending illnesses. So when we say chronic, we mean something that is constant. Any infection of the brain must be treated in time before it goes any further. A lot of damage might occur if it is not treated in time.

Episode 6, Chapter 13



Here we can see a brain scan.

Episode 6, Chapter 14



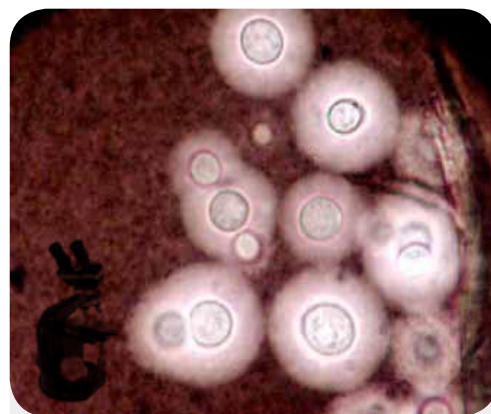
Here you can see the lining of the brain (meninges) coloured red.

### CRYPTOCOCCAL MENINGITIS

Sometimes meningitis is caused by fungus called Cryptococcus Neoformans. This is called cryptococcal meningitis; it means that there is fungus in your brain. The symptoms are the same as for other types of meningitis. You get headaches, you feel like you are going to have a flu or fever, you experience blurred vision, a stiff neck and fatigue.

If you have cryptococcal meningitis, you will first be put on a drip. The drip contains a medicine called Amphotericin B. There is also Amphotericin B in tablets. After you have finished that treatment, you will be given Fluconazole to take to prevent another attack. If you get Cryptococcal or TB meningitis, it means you're in Stage 4 of HIV infection. That is the stage in which you will have to take ARVs. You will take your ARVs together with Fluconazole, until your CD4 cell count goes high above 300. If it exceeds 300, your doctor can advise you to stop taking Fluconazole.

To diagnose meningitis a doctor will extract fluid from your spine using a 'spinal tap' injection. They stick a needle in your spine, extract some fluid, and a sample is sent to the lab for tests. You will be told what type of meningitis you have after the results have come back.



Here we can see the fungus that causes Cryptococcal Meningitis.

**Meningitis is very serious and must be treated quickly**



### DISCUSSION POINTS

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

**1. What is meningitis?**

Meningitis is when the protective layer of the brain is infected and swells.

**2. What causes meningitis?**

Meningitis is caused by an infection by a virus, bacteria or fungus.

**3. How is it diagnosed?**

Meningitis is diagnosed by taking a fluid from the spinal cord and sending it to a laboratory.

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A stroke is when a blood vessel in the brain bursts, cutting off the blood supply to parts of the brain, or when a blood clot forms in a blood vessel, which also cuts off blood supply to the brain. This can lead to different symptoms, such as having problems moving, walking or thinking. Often these symptoms affect one side of the body very strongly. Strokes usually affect older people.

People living with HIV can develop stroke-like symptoms, which look exactly like stroke symptoms in someone who does not have HIV. If this happens to you, you should go for a CT scan. A CT scan takes pictures of our brain to see what's happening. The stroke-like symptoms can be caused by opportunistic infections like Toxoplasmosis, TB, Herpes Encephalitis and even Immune Reconstitution Syndrome after starting ARVs. They can occur at any stage of HIV.



## DISCUSSION POINTS

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

### 1. What happens when someone has a stroke?

When someone has a stroke, a blood vessel in the brain bursts and stops the blood supply to parts of the brain. Or it can mean that a blood clot has formed, also stopping blood supply.

### 2. What are the symptoms of a stroke?

The symptoms of a stroke are problems moving, walking or thinking.

### 3. What else can cause stroke-like symptoms?

Opportunistic infections can also cause stroke-like symptoms.



Peripheral means 'at the edge'. Neuropathy means that it is an illness of the nerves. Peripheral neuropathy, like meningitis, is not just 1 illness. For example, diabetes and HIV can both cause peripheral neuropathy. Drinking too much alcohol can also cause peripheral neuropathy. It can also be a side effect of ARVs (Stavudine and Didanosine) and TB drugs (INH).

HIV-related peripheral neuropathy is not an opportunistic infection because it is caused by HIV itself. With peripheral neuropathy, HIV seems to attack the nerves themselves. People who have peripheral neuropathy have numbness, pins and needles, painful or burning feeling in their hands and feet. For example, walking or wearing shoes can be very uncomfortable. Peripheral neuropathy can be treated with Amitriptyline. Sometimes the damage to the nerves can be permanent. If peripheral neuropathy is caused by ARVs and if it doesn't go away, doctors may need to switch your drugs. If you start to feel any numbness or pain, go to the clinic immediately and tell your doctor. Don't stop the ARVs by yourself.



## DISCUSSION POINTS

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

### 1. What are the symptoms of peripheral neuropathy?

If you have peripheral neuropathy you can have numbness, pins and needles and a painful and burning feeling in your hands and feet.

### 2. What different things can cause peripheral neuropathy?

Peripheral neuropathy can be caused by diabetes or HIV. It can also be a side effect of some ARVs.

### 3. How peripheral neuropathy treated?

It is treated with Amitriptyline. If it is caused by ARVs, then you might have to change your ARVs.



## DEPRESSION

Episode 6, Chapter 17 

Depression is a state of mind where people feel extremely sad. People with depression feel hopeless, slow and without any energy. They can also feel disinterested in things going on around them. HIV can cause depression when it enters the brain and damages nerve tissue. Damaged brain cells cause a chemical imbalance that leads to depression. Some infections that HIV positive people might get can lead to depression. It is also useful to know that some ARVs and other medication used to treat opportunistic infections can also cause depression.

When people are depressed the way they communicate with people changes. They can become antisocial and not want to be with other people. If someone is depressed it can seem like their personality has changed. They may lack appetite or sex drive. They may find it difficult to sleep. And even if they do sleep, they wake up still feeling tired and want to go back to bed.

Speak to your family, friends or health care worker about problems you may have. Anti-depressants are used as treatment. Anti-depressants work in different ways to increase your serotonin levels, which will make you feel happier and more positive. It is very important to understand is that anti-depressant medication does not work immediately. You will start to benefit from anti-depressants after a week or 10 days and only experience the full benefit after about 4 to 6 weeks.



*If you are feeling depressed you might feel very sad and not want to see people.*

It is important when you get your medication to ask your doctor to explain how the anti-depressants work. What are their side effects? What can I expect to feel over the next few days? Will I feel better next week? This way you will know what to expect. Psychiatric illness can affect your adherence to your ARVs and other medication.

### DISCUSSION POINTS

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

- 1. What is depression?**  
Depression is a mental disorder when you feel extremely sad.
- 2. What are the signs that someone has depression?**  
When someone is depressed they might become antisocial and not want to spend time with other people. They might also lose their appetite and sex drive, as well as feel tired all the time.
- 3. How is depression treated?**  
Depression is treated with anti-depressant medication.
- 4. How could mental health problems affect adherence?**  
Health problems can stop people from adhering to their medication because they can stop caring about themselves and give up on their future.

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**Congratulations on completing the chapter on opportunistic infections.** This chapter has given you important information on the most common opportunistic infections that HIV positive people can get. You are now able to recognise the symptoms and know how these opportunistic infections are treated. We have also spoken about using some medication, like Bactrim or Fluconazole, as a way of preventing infections until a person's CD4 count increases and their immune system is stronger. Remember it is very important to get early and effective treatment for opportunistic infections.

 **BEFORE WE END OFF**

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

1. Opportunistic infections are common with HIV positive people.
2. Opportunistic infections are caused by germs (pathogens).
3. ARVs help prevent opportunistic infections.
4. Get treatment for opportunistic infections early.

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## 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 statements is true?**

- a) Opportunistic infections are common with HIV negative people.
- b) Opportunistic infections are common with HIV positive people.
- c) It is impossible to treat opportunistic infections.
- d) Opportunistic infections only affect people in Stage 4 illness.

**2. Which of the following statements is true?**

- a) It is better to wait until you are very sick before going to the clinic.
- b) The clinic cannot help you if you have opportunistic infections.
- c) It is very important to get early treatment for opportunistic infections.
- d) Opportunistic infections go away on their own.

**3. Oral thrush is an infection caused by:**

- a) A virus.
- b) Spicy food.
- c) A fungus.
- d) A bacteria.

**4. Which of the following causes 'cold sores' on the lips and in the mouth?**

- a) Herpes Zoster.
- b) Herpes Simplex 1.
- c) Spicy food.
- d) Bacteria.

**5. How can you tell if you are going to have a shingles outbreak?**

- a) You feel dizzy.
- b) You feel thirsty.
- c) You have a tingling feeling.
- d) You feel tired.

**6. Kaposi's Sarcoma affects the**

- a) Hair.
- b) Bones.
- c) Skin.
- d) Nerves.

**7. Which of the following is not a symptom of bronchitis?**

- a) Feeling tired.
- b) Coughing up green or yellow sputum.
- c) Feeling dizzy.
- d) Having pain in your chest.

**8. Which of the following cannot cause peripheral neuropathy?**

- a) HIV.
- b) ARV side effects.
- c) Diabetes.
- d) Diarrhoea.

**9. Meningitis is a swelling of the covering of the:**

- a) Heart.
- b) Liver.
- c) Brain.
- d) Kidneys.

**10. Which of the following statements is not true?**

- a) Opportunistic infections show that the immune system is weak.
- b) ARVs help prevent opportunistic infections.
- c) Opportunistic infections only affect people on ARVs.
- d) Most opportunistic infections are easy to treat if found early.



## WORKBOOK NOTES

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