

# **BHIVA guidelines on the management of opportunistic infection in people living with HIV: The clinical management of pulmonary opportunistic infections 2024:**

## **non-technical summary**

### **HIV and pulmonary (lung) infections**

The British HIV Association (BHIVA) produces medical guidelines about HIV treatment. These guidelines are mainly for healthcare professionals. But you should know what is in the guidelines that is relevant for your care. This non-technical summary gives you the main points from the chapter on pulmonary (lung) infections in the opportunistic infection guidelines. You can check the full guidelines for more detail at: <https://www.bhiva.org/OI-guidelines-pulmonary>.

### **Key messages:**

- Pulmonary (lung) infections were commonly seen in people living with HIV before there was effective HIV treatment. Today these infections are typically seen in people with weakened immune systems (CD4 count less than 200 cells/mm<sup>3</sup>).
  - The best way for people living with HIV to prevent lung infections is to be on antiretroviral treatment (ART), with an immune system that is working well. This means that your CD4 count will be greater than 200 cells/mm<sup>3</sup>.
  - Smoking increases the risk of lung infections. If you are a smoker, the best way to reduce the risk of lung infections is to stop or significantly reduce smoking.
  - *Pneumocystis pneumonia* (PCP) is an infection caused by a fungus. It usually only causes disease in people with a weakened immune system.
    - PCP has symptoms that are similar to those of other conditions. So it can be hard to diagnose.
    - If the PCP is mild, it can be treated with antibiotics taken by mouth (orally). But if it is severe, treatment is usually given directly into the vein (intravenously). You may also need steroids.
    - There is no vaccination to prevent PCP. If your immune system is weak, you may need medicine (usually co-trimoxazole tablets) as prevention.
    - If you are not already on HIV treatment, ART should be started within 2 weeks of a PCP diagnosis.
  - Pneumonia is a common disease. Older people, heavy smokers and people with other health conditions (such as asthma or chronic obstructive pulmonary disease [COPD]) or weakened immune systems are most at risk of serious disease.
    - You should be offered a pneumococcal vaccine to reduce the risk of disease.
  - Influenza (flu) is a common infection. It may cause severe health complications.
    - You should be offered annual flu vaccination.
  - There are other less common pulmonary infections (such as cryptococcosis, aspergillosis and cytomegalovirus [CMV]). They are mainly seen in people who have very weakened immune systems because of other diseases or treatments.
  - Tuberculosis (TB) is a bacterial infection that mainly affects the lungs. It is often seen in people living with HIV, especially in areas with high rates of TB. This is discussed in separate guidelines.
-

### What are opportunistic infections?

These are infections that occur more often, and are more severe, in people with a weakened immune system. In the UK, most people living with HIV are on effective antiretroviral treatment (ART). This has greatly reduced the number of opportunistic infections they may experience. Most of these infections are now seen in people who have HIV but have not been diagnosed, or who have been diagnosed late, when their immune systems have already been severely weakened.

### What are pulmonary infections?

These are infections of the lung. They may be caused by viruses, bacteria or (more rarely) different types of fungus. Pneumonia is the most common type of lung infection in the general population. It leads to swelling of the tissue in one or both lungs. Other underlying health conditions, such as asthma or chronic obstructive pulmonary disease (COPD), can make pneumonia more serious. Smoking increases the risk of lung infections.

Lung infections are seen most often in people with weakened immune systems. This includes people with HIV who have low CD4 counts (less than 200 cells/mm<sup>3</sup>). The CD4 count is a measure of how well the immune system is performing. The normal range in a healthy person is between 500 and 1500 cells/mm<sup>3</sup>. With ART, your immune system will improve if your CD4 count is low, and it will generally recover to normal levels. If you have a low CD4 count, starting ART is one of the best ways to prevent lung infections.

Even if your HIV treatment is effective and you have a healthy immune system, you are still at risk of lung infections. The impact of any infection may be more severe than in the general population.

### What is in the pulmonary chapter of the opportunistic infection guidelines?

This chapter includes a number of lung infections:

- *Pneumocystis* pneumonia (PCP)
- Bacterial pneumonia
- Influenza (flu)
- Other pulmonary infections caused by:
  - Cryptococcus
  - Aspergillus
  - Cytomegalovirus.

There are two other types of lung infection that are not covered. They are tuberculosis (TB) and COVID-19.

---

### *Pneumocystis pneumonia (PCP)*

#### What is PCP?

PCP is a serious infection that leads to a buildup of fluid in the lungs. It is caused by a common fungus that spreads through the air.

#### Who is at risk of PCP?

Nearly everyone will be exposed to the fungus. But most people's immune systems will fight it off without them becoming ill. It can cause serious illness in people who have weakened immune systems. These include people who have had an organ transplant, are being treated for some types of cancer or are taking drugs to treat autoimmune diseases such as rheumatoid arthritis and inflammatory bowel disease.

For people living with HIV, PCP is mainly seen in those with a low CD4 count (usually less than 200 cells/mm<sup>3</sup>).

### **What are the symptoms of PCP?**

You may not have symptoms early in the infection, or they could be mild. Symptoms include fatigue (tiredness), chills and weight loss. The most common symptoms are a dry cough and shortness of breath. Symptoms usually come on slowly, over a period of several weeks. But they may start much more quickly in some people whose immune systems are weak.

### **How is PCP diagnosed?**

Many other conditions can cause similar symptoms. This can make diagnosis of PCP difficult. There is no single test commonly used to confirm whether or not you have PCP.

If you have symptoms that suggest that you might have PCP, an initial test will be done to see how much oxygen is in your blood. This is usually done with a simple device called a pulse oximeter that clips onto your fingertip. If your blood oxygen levels are low, you may need a chest X-ray or a computed tomography (CT) scan.

The most commonly used test to diagnose PCP is a molecular test called a polymerase chain reaction (PCR) test. This can detect small amounts of genetic material from the fungus in fluid or tissue from your lungs. Your doctor will help you cough up fluid from your lungs or a sample may be collected using a tool called a bronchoscope, which goes through your mouth into your airways. Sometimes a blood test called a beta-D-glucan (BDG) serum test is needed. The results of all these tests need to be carefully examined to confirm a PCP diagnosis.

### **How is PCP treated?**

PCP is usually treated with antibiotics. If the disease is mild, this is usually in the form of pills to swallow by mouth (orally). But if you are very ill, you may need antibiotics through a needle into your vein (intravenously). High doses of these antibiotics may cause some severe side effects in some people. Alternative treatment options may then be offered. If your oxygen levels are low, you may also be prescribed steroids for a short period.

If you are diagnosed with PCP before you have started ART for HIV, you should normally start ART within 2 weeks of your PCP diagnosis.

### **How is PCP prevented?**

There is no vaccine to prevent PCP. If you are living with HIV, the best way to prevent PCP is to improve your immune system so that it can better fight infections. Starting ART or staying on ART if you are already taking HIV treatment will improve your immune system.

Some medication used to treat PCP (usually co-trimoxazole) can also help to prevent it. You may need this if:

- Your immune system is very weak (typically if your CD4 count is less than 100 cells/mm<sup>3</sup>).
- You have had PCP before.
- You are taking other drugs that suppress your immune system.

Whether or not you may need medication to prevent PCP will depend on your individual circumstances. Your healthcare team will discuss this with you, if needed.

---

## **Bacterial pneumonia**

### **What is bacterial pneumonia?**

This is pneumonia caused by bacteria. There are many different bacteria that can cause pneumonia. Bacterial pneumonia is widely seen in the general population. It may involve just part of your lung, an entire lung or even both lungs. Pneumonia can make it difficult to get enough oxygen into your blood. This can lead to serious illness. A number of things can affect how severe the pneumonia will be. These include:

- The type and strength of the bacterial infection
- How quickly you are diagnosed and treated
- Your age
- Your overall health and the state of your immune system
- Whether you have other health conditions such as asthma or COPD
- Your lifestyle such as smoking or working or living in an environment in which you may be exposed to bacteria.

### **What are the symptoms of bacterial pneumonia?**

The most common symptoms are:

- A cough with thick yellow or green mucus
- Shortness of breath
- Fever
- Chills.

A less common symptom is a stabbing pain on taking a deep breath or when coughing.

### **How is bacterial pneumonia diagnosed?**

Your doctor will examine you if you show symptoms of pneumonia. Samples of your blood may need to be taken and mucus or phlegm (thick mucus) from when you cough. You may also need a chest X-ray.

### **How is bacterial pneumonia treated?**

Bacterial pneumonia is treated in the same way in people living with HIV as in people without HIV. Most cases can be treated at home with oral antibiotics. In more severe cases, you may need intravenous antibiotics or hospital treatment.

### **How is bacterial pneumonia prevented?**

The most important way to reduce the risk of bacterial pneumonia is by keeping your immune system healthy by taking your ART as prescribed. Your risk of infection is much higher if you are a smoker. You may be offered support to stop smoking. The leading cause of bacterial pneumonia is *Streptococcus pneumoniae*. There is a vaccine to protect against this type of pneumonia. In the UK, this vaccine is offered to everyone over 65 years. It is also offered to people with some long-term health conditions, including people living with HIV. This vaccine has been shown to be safe and effective in people living with HIV. There is more information about this vaccine in the BHIVA immunisation guidelines.

---

### **Influenza (flu)**

#### **What is flu?**

Flu is a very common, highly infectious disease caused by a virus. It can be very dangerous, causing serious complications and death for people in high-risk groups. It is estimated that an average of 600 people a year in the UK die from complications of flu. In some years, this can rise to over 10,000 people. Flu leads to hundreds of thousands of GP visits and tens of thousands of hospital stays every year.

#### **What are symptoms of flu?**

Flu symptoms come on suddenly, unlike those of a cold. Symptoms include a dry cough, sore throat, muscle and body aches, headaches, fatigue and sometimes a fever.

#### **How is flu treated and prevented?**

Flu will often get better on its own but some people may become seriously ill. If you have flu symptoms, you should rest, keep warm, drink plenty of water and take paracetamol or ibuprofen. Antibiotics will not help for viral infections such as flu.

People living with HIV may be treated with antivirals for flu if their immune system is weak. You may need to have flu diagnosed by a doctor before you are prescribed antivirals. Treatment should be started within 48 hours of the start of flu symptoms.

Everybody with HIV should be offered a flu vaccine every year, whatever their age. This will offer some protection against severe illness due to flu. There is more information about this vaccine in the BHIVA immunisation guidelines.

---

### **Other pulmonary infections**

There are other lung infections that can cause illness in people living with HIV. However, these are now rarely seen because of effective HIV treatment. But you may be at risk of these other infections if your immune system is weak. This could be due to a number of factors such as being on cancer treatment or having received an organ transplant.

These other infections can include:

- Some fungal infections, particularly if you are being treated for cancer or after receiving organ transplantation. These often begin in the lungs, with few or no symptoms, but can then spread to the brain and spinal cord.
- Cytomegalovirus (CMV). This is a common virus that is usually harmless. Once you have the virus, it stays in your body for the rest of your life. Your immune system usually controls this virus and most people do not realise they have it. But it can cause serious illness in people with extremely weakened immune systems.

### Lung infections not included in these guidelines

TB is a bacterial infection that affects mainly the lungs. It can be a serious condition. TB is often seen in people living with HIV, especially in areas with high rates of TB such as parts of Africa, south-east Asia and South America. TB in people living with HIV is discussed in separate BHIVA guidelines.

There is a separate chapter of the BHIVA opportunistic infections guidelines on non-tuberculous mycobacteria (NTM), which can also cause lung disease.

COVID-19 is a viral illness which can affect the lungs and can lead to serious illness or death. You are more at risk if your immune system is weak. You should be offered annual COVID-19 vaccination, whatever your age. This not only means that you will be less likely to get COVID-19, but it also means that the risk of serious illness, hospitalisation or death is greatly reduced. There is a non-technical summary about COVID-19 vaccinations here:

<https://www.bhiva.org/file/6079af61682b5/COVID-19-vaccine-non-technical.pdf>

---

### Further information and support

Community organisations in the UK that produce information and resources about HIV treatment include HIV i-base (<https://www.i-base.info>), Terrence Higgins Trust (<https://www.tht.org.uk>) and NAM (<https://www.aidsmap.com>).

### About BHIVA

The British HIV Association (BHIVA) is an organisation for health professionals in the UK. Members include doctors, nurses, researchers, pharmacists and community advocates. Since 1995, BHIVA has been committed to providing excellent care for people living with and affected by HIV. BHIVA is a national advisory body on all aspects of HIV care and provides a national platform for HIV care issues. To help promote and monitor high standards of care, BHIVA publishes a range of clinical guidelines:

<https://www.bhiva.org/guidelines>. Information about how BHIVA guidelines are developed can be found at: <https://www.bhiva.org/clinicalguidelines>.