

# The lungs

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The lungs are organs found in the chest, either side of the heart, protected by the ribcage. The right lung tends to be larger than the left lung. The lungs are covered with a thin layer, or membrane, called the pleura, and the rib cage with another membrane. The two membranes slide over each other as we breathe allowing the lungs to expand and contract.

Inside, the lungs look like sponges and are made up of a mass of fine tubes, the smallest of which are air sacs called alveoli, the walls of which are covered in tiny blood vessels.

## The lungs and breathing

The role of the lungs is to absorb oxygen from the air and transfer it to the blood where it is then circulated around the body.

Each time you breath in, air is transported down the nose or throat into the windpipe (or trachea) and into two smaller tubes called bronchi; one going to the left lung, the other to the right. The air is then divided into smaller airways called bronchioles until it reaches the alveoli. Inside the alveoli, oxygen moves into the tiny blood vessels forming the walls and is picked up by red blood cells ready to be transported around the body. At the same time, waste products in the form of carbon dioxide move in the opposite direction; travelling from the blood into the alveoli and onward through the lungs to be breathed out.

## Lung disease

Symptoms such as coughing, shortness of breath, coughing up blood, phlegm or mucus, and pain in the lungs are all signs of a problem in the lungs.

As with anybody else, people with HIV can contract colds or influenza (flu), which can affect the chest, causing symptoms such as a cough, and the production of phlegm. These normally clear up in a few days and cause no lasting damage. There are however some lung problems which are seen more often in people with HIV which can be very serious.

Although anybody can become ill with bacterial pneumonia, pleurisy (inflammation of the membrane surrounding the lungs), and bronchitis, these can be more serious in people with HIV and occur with more frequency, particularly if they have a depressed immune system.

The pneumonia due to pneumocystis (PCP) is an AIDS-defining illness which affects the lungs and is normally seen only in people with a CD4 count below 200. It is rare in countries where people have access to modern medical care. Tuberculosis is seen in increased rates amongst people with HIV and can happen at any time during HIV infection. Globally, it is one of the leading causes of illness and death amongst HIV-positive people. The AIDS-defining cancers Kaposi's sarcoma and non-Hogkin's lymphoma can also affect the lungs.

As well as a range of germs or pathogens, smoking is a very common cause of lung-related problems.

## Tests

If you have any kind of breathing problem, your doctor will listen to your chest with a stethoscope to assess how well your lungs are working.

Other common tests to check for infection or disorders include chest X-rays and, sometimes, an induced sputum test, where a mist of salty water is inhaled in order to 'induce' the patient to cough up sputum from the lungs. A bronchoscopy may also be employed, where a small camera is passed down the nose, and a transbronchial biopsy involves taking small samples of lung tissue for checking. Alternatively, a small piece of pleura may be removed via the chest wall; a pleural biopsy. Lung-function tests, which measure the ability to transfer oxygen and the inflatability of the lungs, may also be used. A body scan may be used to look for some infections or cancers.

## Treatments

Antibiotics can be used to treat and prevent bacterial lung infections such as pneumonia, and can also be successfully used to treated PCP and TB. Taking HIV treatment can prevent your immune system becoming so weak that you develop serious lung infections.

Chemotherapy, radiotherapy and surgery are used to treat cancers in the lungs.

## Keeping your lungs healthy

Smoking is responsible for a lot of lung disease so not smoking, or stopping smoking, will improve the health of your lungs. Taking regular exercise which makes you out of breath improves your lung's efficiency. Ensuring that you receive regular check-ups at your HIV clinic will mean that you can start taking HIV treatment when you need to and are monitored and treated for any possible HIV-related lung problems. And eating a diet rich in fresh fruit and vegetables will help promote your general health.