

Organisms

3. Breathing

CONCEPT 3

LESSON GUIDE

EFFECTS OF LIFESTYLE AND DISEASE ON BREATHING

PRECISE LEARNING POINTS

KNOW

I know how breathing can be affected by lifestyle and disease.

APPLY

I can apply my knowledge to explain how smoking affects the body.

EXTEND

I can extend my knowledge to evaluate data in relation to smoking.

NOTES

Lifestyle choices such as exercising regularly can affect our breathing. Exercise can make our lung volume increase as it makes the intercostal muscles in the rib cage stronger which means your chest can expand more when you breathe in. It also causes a greater amount of blood capillaries to develop around the alveoli which enables a greater amount of oxygen to be absorbed into the blood stream.

On the other hand, lifestyle choices such as smoking can negatively affect breathing. More on this in the next section.

Diseases such as asthma, cancer, covid-19 and TB can negatively affect the breathing system making it harder to breathe. The causes of asthma vary and can include exposure to cigarette smoke, premature birth, due to genetic inheritance or allergies. During an asthma attack two things happen to decrease the amount of air entering the lungs. The muscles in the wall of the bronchioles tighten up and get thicker. Cells lining the bronchioles also release more mucus than normal. This can build up and both of these can significantly narrow the airways reducing the amount of air passing down the bronchiole.

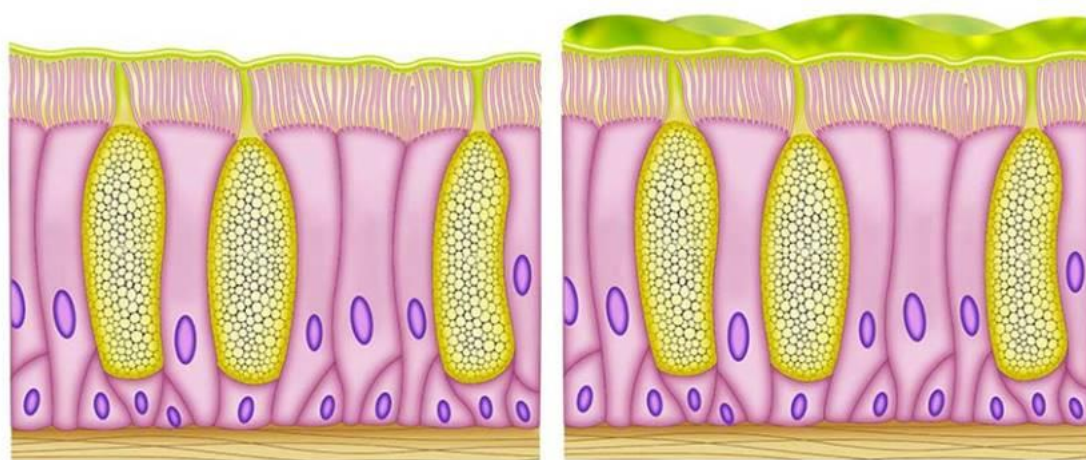


When a person smokes a cigarette, thousands of chemicals are breathed in. One of the chemicals, called tar, which is thick and sticky, can build up inside the breathing system. This accumulation of tar has been linked to the cause of lung cancer in smokers.

A chemical called nicotine is absorbed from the smoke into the bloodstream. This chemical causes biochemical changes in the body and addiction, making it hard for a person to stop smoking. In addition, a chemical called carbon monoxide is also absorbed into the blood stream. Carbon monoxide reduces the amount of oxygen the bloodstream can transport. This reduces the amount of oxygen available to cells for respiration.

Some of the cells lining the airways are also affected by cigarette smoke. The ciliated epithelial cells are cells with tiny hair like structures, called cilia, on the surface. The job of the cilia is to trap dust and microbes in the mucus on their surface and then sweep this collection up to the throat to be swallowed. The hostile conditions of the stomach will destroy any microbes. This prevents a build-up of dust and microbes in the breathing system.

When a person smokes, the movement of the cilia stop. In addition, the tar can stick to the cilia and prevent them from moving and sweeping. Mucus, dust and microbes can build up in the airways. This causes irritation in the lungs as dust and microbes are not cleared, causing many smokers to cough a lot which can lead to alveoli being damaged.



There is now clear statistical evidence making a direct link between smoking and the incidence of lung cancer. Historically this has not always been the case. Cigarette packets now come with health warning messages printed on them. Before the 1950's, tobacco companies may have exerted an influence over scientific research into the effects of smoking resulting in biased conclusions being made. Eventually, when the scientific evidence became very clear, tobacco companies were banned from advertising on TV, cinema and radio. More evidence came to light in the 1970's on the dangers of passive smoking. That is inhaling cigarette smoke from someone else despite you not actually smoking. Now it is illegal in the UK to smoke in a car that has anyone under the age of 18 and also it is illegal to smoke in public places such as pubs, cinemas, shops and restaurants.

20-Year Lag Time Between Smoking and Lung Cancer

