BBC BITESIZE

Hello, I'm Dr Alex Lathbridge and this is Bitesize Biology.

This is the fifth episode of a six-part series on the organisation of plants and animals.

Do you know how to be healthy? Do you make time for exercise or are you more of a video games and chill type? Life choices have a big impact on your health.

In the last episode I talked about the different types of disease – communicable and non-communicable. If you don't remember that, go back to the last episode and listen again.

This episode is going to focus on the risk factors that can lead to getting ill with non-communicable diseases, things like cancer, cardiovascular disease and diabetes.

Risk factors are things that can increase the chances of someone developing a disease and therefore having poor health.

They can be related to lifestyle, stress or diet.

They can also be related to your environment, which means how our bodies interact with our surroundings, like chemicals in the air caused by air pollution from cars, buildings and what have you, or the harmful chemical substances that build up in our bodies.

Let's take a look at some risk factors that are known to directly cause a disease. So that means there is actual scientific evidence demonstrating causation. So that's a link between cause and effect, basically saying that this thing increases the risk of developing this disease. So grab a pen and let's make some notes.

First up, obesity. So being dangerously overweight can cause Type 2 diabetes and cardiovascular disease.

Obesity leads to high blood pressure and the arteries get blocked by fatty deposits, which as we know from the previous episode, can cause cardiovascular disease. A high level of body fat also impacts the body's ability to use a special hormone called insulin.

In Type 2 diabetes, the body's cells respond less effectively to the hormone insulin and this disrupts how your body processes sugar. Type 2 diabetes can be controlled by diet and exercise but there is no cure for it. The risks of developing cardiovascular disease and Type 2 diabetes can be reduced by eating a balanced diet of whole foods, things that aren't processed, and exercising regularly.

Next up is smoking. It's well known that smoking tobacco causes heart and lung diseases, things like lung cancer.

Let's take a moment to focus on the lungs.

Our lungs do two jobs for gas exchange: oxygen in and carbon dioxide out. Breathe in, breathe out.

When you breathe in air, it travels down the trachea. The trachea then splits into two branches, one for each lung, these are known as the bronchi. And then within each lung, the bronchi split into smaller and smaller tubes called bronchioles. At the very end of these tubes are air sacs called alveoli and this is where gas exchange happens. We've got millions and millions of alveoli in our lungs. So, remember trachea to bronchi, bronchi to bronchioles, bronchioles to alveoli.

The alveoli are surrounded by a network of capillaries. They have a very good blood supply, very thin walls and a large surface area. Oxygen travels across a concentration gradient out of the alveoli in our lungs, and into the blood where there is a low concentration of oxygen. At the same time, carbon dioxide diffuses out of the blood into the alveoli, to be breathed out of the body.

Alright so hopefully at this point you understand that you need your lungs in good working order.

There is no safe level of smoking and that includes passive smoking, being around people that are smoking. You can't say "yeah, if you only smoke one a month, you're good" or "but shisha filters all of the bad stuff out." Take it from me, miss that entirely, it's not worth it.

Next is excessive alcohol drinking. The liver processes alcohol and each time it does, some of the liver cells die. That's fine because it can regenerate itself. Excessive drinking over many years can prevent regeneration, leading to serious and permanent damage to your liver. Not just that, it can also lead to brain shrinkage, memory problems and psychiatric issues later down the line.

Lifestyle choices are especially important for pregnant people, because they can affect the unborn baby growing inside of them. Smoking and drinking when pregnant is not a good idea, because it reduces the oxygen that the baby needs during development, and this can lead to a whole load of issues pre- and post-birth.

Just because a risk factor might exist in someone's life, doesn't mean that they're going to get the disease or diseases associated with it. So just because someone doesn't exercise very much doesn't mean that they will definitely get heart disease.

This is the difference between causation and correlation.

Causation is the idea that something makes another thing happen. So with risk factors, chemicals that go into your body from smoking cause cancer.

But correlation is where there's some kind of relationship, but it's not necessarily cause and effect.

Like this relationship between ice-cream and the weather: people eat ice cream when it's hot, but that doesn't mean that ice cream makes the sun shine. This is an example of correlation rather than causation, like some risk factors

Non-communicable diseases also have human and financial costs.

I have a brain condition called nocturnal epilepsy, meaning that if it's not properly controlled, I can have seizures at night, and they can impact my sleep. But also, the medication has some annoying side effects. So the human cost is that it lowers my quality of life, it made school harder, and affects my mental and physical health today. A financial cost would be something like, I need to spend money to travel to the hospital for doctor's appointments.

So human costs are the impacts that disease has on human beings. Non-communicable diseases like asthma, heart disease and cancer can impact life expectancy, quality of life and mental health. Not to mention the impact on people around them, wider society and globally.

Financial cost is more simple to understand. It can be personal, like the ability to earn money being reduced, or on a larger scale, like with the NHS, our National Health Service of doctors, nurses, scientists, ambulances and people who work in hospitals. It has to spend lots of money researching and treating these non-communicable diseases.

Let's keep going with the risk factors but now, we're going to focus on risk factors relating to cancer.

First up, obesity. This has links to different cancers; it increases the chances of being diagnosed with bowel and liver cancer. And, as obesity is about eating too much food and having a poor diet, the organs that are affected are those involved in the digestive system. A poor diet often involves lots of processed foods - crisps, chocolate bars and sausage rolls - and not enough unprocessed foods, like fruits, vegetables, wholegrains and nuts.

Next is smoking. Smoking has been known to cause lung cancer since the 1950s, but it's also thought that it can increase the chance of being diagnosed with other cancers, such as those in the mouth and stomach. You might have seen pictures in your science lesson of a lung that's turned black due to the chemicals in cigarettes. It's not a good look.

Next up is UV, or ultraviolet, radiation. This is the energy released naturally by the sun, and artificially by things like sunbeds. You can't feel it. The sun is really good for the world, especially for plants, but too much exposure to UV radiation can damage the DNA in our skin cells, and if too much damage builds up it can lead to uncontrolled cellular division.

It's not saying that getting sunburnt once means you'll get skin cancer. But the more times you get sunburnt, the higher your risk. That's a big reason why it's important to use sunscreen, when you're outside and exposed to sunlight, even on cool days. And me, my wife, my friends, my family all use sunscreen. Because although dark skin is naturally more protective than fair skin, all skin types are susceptible to damage from UV rays.

So another thing to think about when it comes to developing cancer, has nothing to do with lifestyle choices, its genetics. Sometimes you can inherit genes that have specific mutations that increase the likelihood of developing breast or ovarian cancer, for example. And some women choose to have breast tissue removed if they have a high risk of developing breast cancer.

I'm Dr Alex Lathbridge and this is Bitesize Biology – catch up on BBC Sounds