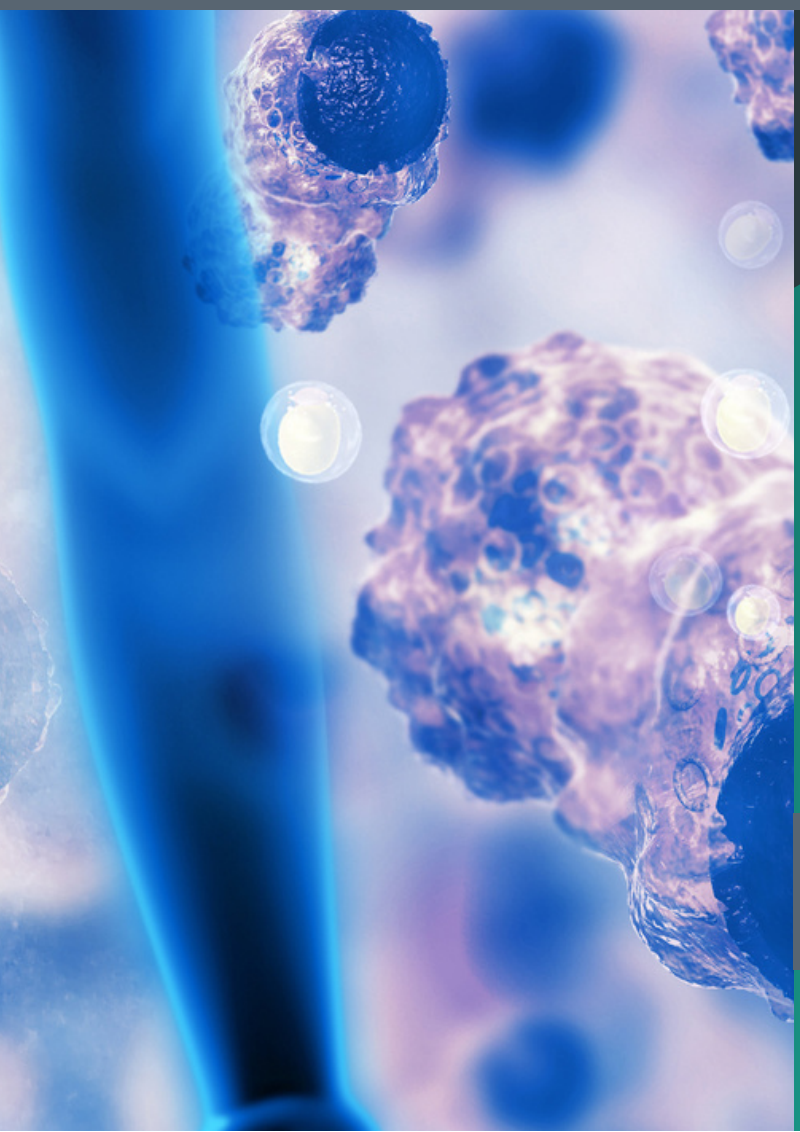
THE SCIENCE BEHIND

NEUROENDOCRINE CANCER

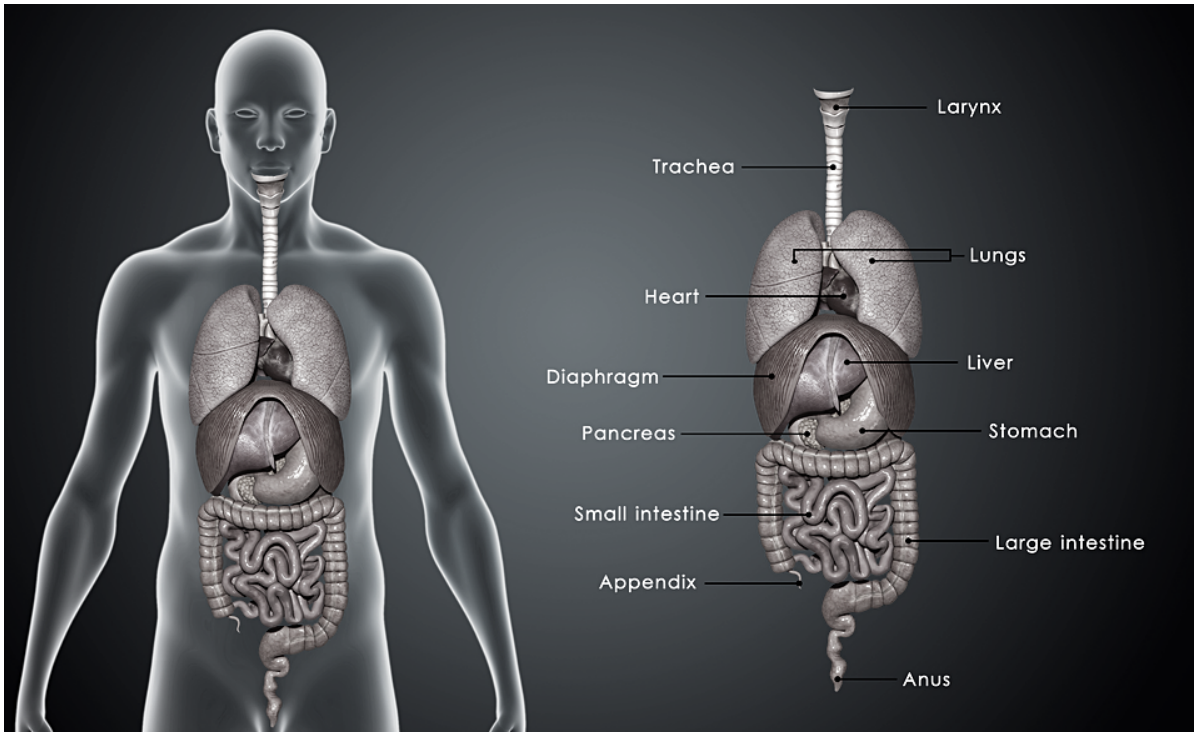
2023



www.neuroendocrinecancer.org.uk

Each year in the UK, around 6,000 people are diagnosed with a Neuroendocrine Cancer. It can occur in people of any age or gender and can develop in many places throughout the body - but what exactly is Neuroendocrine Cancer?

In this guide you can find up to date and reliable information about the Neuroendocrine and Endocrine System, causes and how Neuroendocrine Cancers are formed.



Neuroendocrine Cells

Our bodies are made up of billions of cells including neuroendocrine cells. In health, neuroendocrine cells, help regulate our bodily functions by releasing small molecules that circulate throughout the body and work as hormones or substances that have a similar effect. They are present in endocrine glands but can also be found, more diffusely, throughout the body, including just below the surface layer of the skin.

How are Neuroendocrine Cancers formed?

Cancer is a condition where cells within the body start to grow and reproduce uncontrollably. These cells can invade and destroy surrounding healthy tissue, including organs and some can spread to other parts of the body (metastasise).

Neuroendocrine cancers occur when neuroendocrine cells stop working normally and start to grow uncontrollably and / or function abnormally.

Normal cells

Normal cells have rules:

- They develop and grow in a controlled manner
- They do what they are programmed to do, then die off to be replaced by new cells – they have a life-span
- If damaged they try to repair themselves or die off
- They tend not travel to other parts of the body
- If they do grow beyond normal size – they tend to push against neighbouring cells, rather than through them.

Cancer cells

In cancer the control signals go wrong and the rules are forgotten!

- There is uncontrolled growth,
- Lack of cell repair and replacement or death, which can result in tumour formation of immature, abnormal (cancerous) cells
- They will travel to other parts of the body and settle (metastasise)
- If they have a particular function - this can become abnormal or altered
- When they do grow beyond their normal size they will invade neighbouring cells and structures (infiltration).

Hormones

The type of hormone (or similar substance) neuroendocrine cells release depends on what part of the body they are in, for example:

In the digestive system the substances released help to break down food in our gut and move food through the small and large bowel – helping both nutritional uptake and eliminating waste.

In the adrenal glands they can control our 'fight or flight response' – which can affect blood pressure, heart rate – which may also make us feel anxious.

In the brain they can affect social bonding, sleep and sleep-wake pattern.

In the respiratory system these substances help with the development of our lungs and to regulate breathing.

Symptoms

Cancers of the Neuroendocrine System can therefore produce a number of different symptoms – depending on which neuroendocrine cells are affected and how abnormal they have become in terms of size, position and/or what they release. Although science has identified some causes, associations and risks of developing cancer, such as:

- Internal: for example, a faulty gene – as seen in breast cancer and BRCA gene.
- External: for example, exposure to a carcinogen (cancer-causing agent) such as smoking or exposure to certain chemicals.

Causes

There is no single specific cause, association or risk factor for all Neuroendocrine Cancers – though High Grade disease – that is Neuroendocrine Carcinoma – MAY share similar associations or risks to more common cancers affecting a particular site of the body – for example sun exposure and Merkel Cell.

The History of Neuroendocrine Cancer

Neuroendocrine Cancer was first described as a specific disease in the mid-1800's. In 1907, the term 'Carcinoid' was applied – from the German word for "cancer-like". This term became very popular amongst the medical community of the time, as it was believed that neuroendocrine cancer behaved very differently to common cancers. It was thought that all neuroendocrine cancers were very indolent, that is, very slow growing and unlikely to spread or behave in the same way as other malignancies.

By the 1950's however, it was clear that these 'Carcinoids' could indeed behave like common cancers, and that whilst many may grow slowly, they shared other cancers' ability to spread to other parts of the body, and some could grow as rapidly.