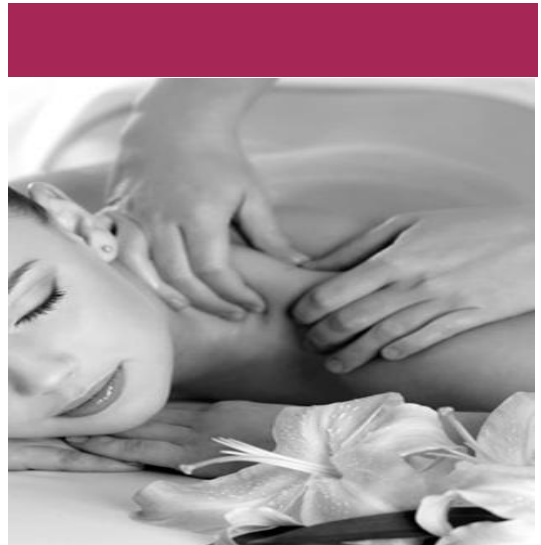


How Cancer Develops & Spreads

The human body is made up of millions of cells these are the building blocks of all our organs and tissues. Starting life as a single cell, each cell then makes a copy, replicating and dividing into two cells and then so on and so on. It is our genes that control the process of cell growth and **cell death** known as **apoptosis**.



Cancerous cells are cells gone wrong. In other words, they no longer respond to the signals of growth control or growth death (apoptosis). Cancer cells originate within the tissue and as they grow and divide, they begin to completely change and don't resemble normality. Overtime these cells become increasingly resistant to the controls that maintain normal tissue and as a result they divide more rapidly and become less dependent on signals from other cells. Cancer cells even evade. Despite the fact that they are abnormal cells which would normally make them prime targets for apoptosis.

In the late stages of cancer the cells break through the normal tissue boundaries and metastasize. They spread. They spread to new sites of the body. You've probably heard the term of secondary cancer and this can be when cancer has metastasized. For instance, someone with breast cancer, this may metastasize and spread in to the lungs or the liver. This would still be classed as breast cancer and not lung or liver cancer. It's just the cells have metastasized and spread to another area.. A pathologist would know by looking under the microscope at the cells what type of cancer it was.

Different types of cancer

The most common cancer which covers around about 90% of human cancers are **carcinomas** and malignancies of the epithelial cells. Epithelial tissues constantly renews and that makes them the best candidate for cells to go wrong as they replicate. Cancer spreads because genes mutate. Cancer is not spread through mechanical movement, massage or exercise. Massage therapists do not cause genes to mutate.

Sarcomas are solid tumours of the connective tissue and these are rarer cancers. 1%

Leukaemia's and lymphomas arise from the blood forming cells. Leukaemia is a result of immature white blood cells. This accounts for around 8% of human cancers.

5-10% of mutation cancer are from inherited genes such as breast, BRCY1 and B or C2 from stomach cancer, bowel, gastric and ovarian cancers.

90 to 95% of mutated cancers are acquired over time from exposures to toxins, chemicals ,pollution, diet and natural processes, growing old, viruses also are contributing factors.

Such as HPV and also previous cancer treatments which are using carcinogenic.

Working with chemicals all our life, such as green keepers on a golf course, working in factories, farmers spraying the fields. Cancer is a disease of ageing, it mutates over time. Cancer develops at 50 – 100 mutations, which takes time and that's why we see a lot of cancers when people are reaching the age of 50 or 60. It is also a disease of being overweight.



5 Key Properties That Make Cells Capable of Growth

1. They are genetically unstable. They will not listen to the signs and signals from the genes.
2. They are renegades cells, they do not follow any types of rules when it comes to receiving signals from the genes. They try to regulate cell signals from the genes that try to regulate cell division.
3. They avoid suicide by apoptosis. They do not follow the normal rules for cell death. They can survive longer than regular cells so they are more indestructible. The goal is for the cell to survive. What would normally kill a cell does not kill a cancerous cell.
4. They escape the home tissue so that means that they are invasive.
5. They survive and metastasize in to sites that are foreign and so they go visiting other areas of the body where it is a completely different environment from where the originated cell should be living, crossing over boundaries.

Stage 0 means abnormal cells are present but have not spread to nearby tissue. Also called carcinoma in situ.

Stage 1 usually means that a cancer is relatively small and contained within the area/organ/tissue it started in.

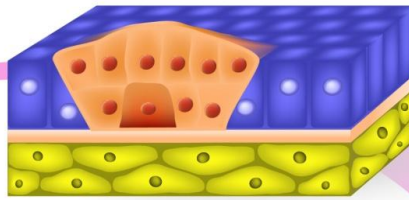
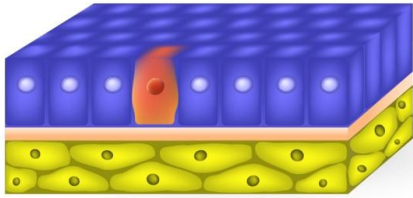
Stage 2 usually means the cancer has not started to spread into the surrounding tissue but the tumour is larger than stage 1. Sometimes stage 2 means that cancer cells have spread into the lymph nodes close to the tumour.

Stage 3 usually means the cancer is larger and may have started to spread into the surrounding tissues and there are cancer cells in the lymph nodes in the area.

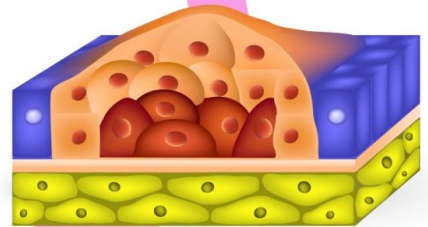
Stage 4 means the cancer has spread from where it started to another body organ. This is also called a secondary or metastatic cancer.

Hyperplasia

Cell with gene mutation

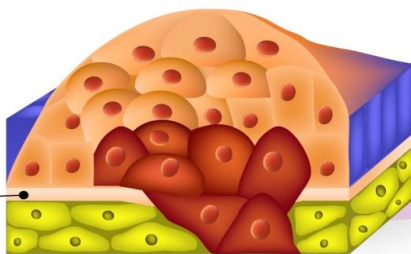


Carcinoma in situ



Invasive cancer

Basement membrane



Hypertrophy is the first stage where the normal cell starts to mutate.

Hyperplasia is when the cell number begins to increase. This is where the cell starts to mutate and becomes a mass in a confined area. These cells reproduce at a higher and faster rate. That first mutated cell is replicated over and over again. This means instead of the body replicating the original healthy cell, it replicates the mutated cell in bulk.

Metaplasia can occur in two different types of epithelial cells that meet. For instance at the junction where squamous cells meet glandular cells. These zones of metaplasia are areas where the body can make great change, and mutated or abnormal cells are commonly found. Zones of metaplasia are areas in the body where mutation or abnormal replication is very likely to occur. If the stimulant is removed that causes inflammation or irritation, such as chemicals or dietary issues are normal common triggers. Then this process can be reversible. If the cause of metaplasia is not removed then it can go on to mutate further and take on an abnormal growth pattern and become dysplasia.

Dysplasia cells are abnormal changes in the size and shape and organisation of the cells. This stage is related to hyperplasia and is often referred to as atypical hyperplasia. This is commonly found and encountered in the epithelial tissue. The term dysplasia does not indicate cancer and may not progress into cancer. It is a sign of precancerous cells which may be removed. Looking under a microscope, the cells do not resemble the original tissue. If the cells are still within the boundaries of the original tissue this is called an in situ cancer. If however more mutations happen it has the capability of being invasive, then it is referred to as cancer.