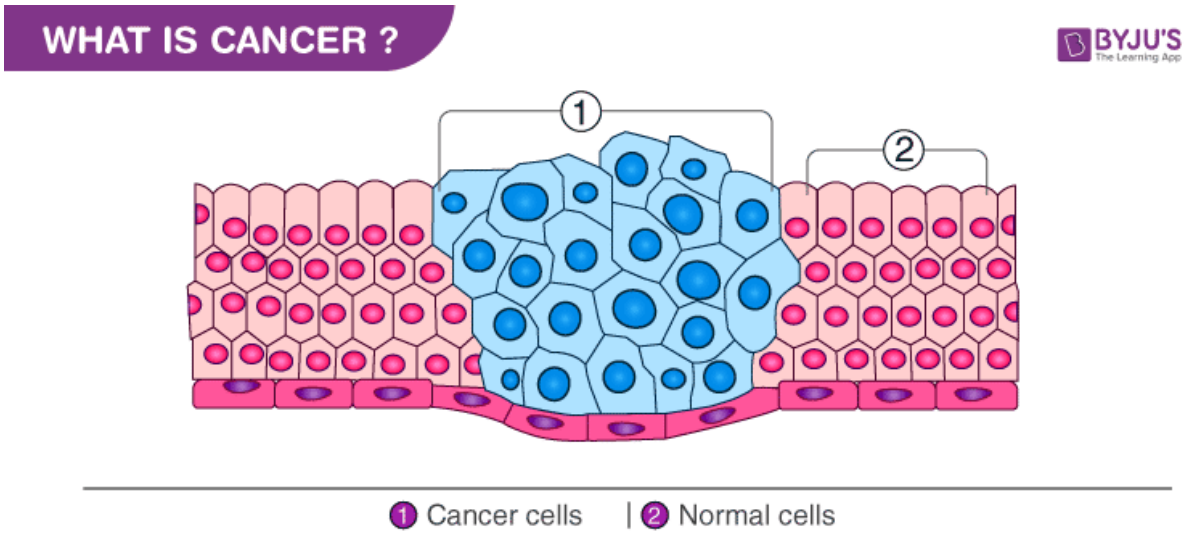
**Cancer**

Cancer is one of the most feared diseases in the world and it affects over 11 lakh people every year in India alone. Worldwide, more than 10 million people succumb to this disease every year. Let us explore what is cancer, the causes of cancer, symptoms, diagnosis, and treatment of cancer.

In humans, cell differentiation and proliferation are highly manipulated and regularized by the cell division mechanism. Uncontrolled cell division occurs when a process called ***contact inhibition*** fails. In healthy organisms, during this process, when cells come in contact with other cells, the process of cell replication ceases.

As a result, contact inhibition becomes a powerful anti-cancer mechanism, but it is lost in cancer cells. Hence, most types of cancer have tumours (except for cancers of the blood).




It is often presumed that all tumours are cancerous – but this is a misconception. A tumour becomes cancerous only when it spreads to other parts of the body

# Types of Tumour

A tumour is classified into one of these three types based on its ability to undergo metastasis (spreading):

**Benign Tumour**

These tumours are localized at a particular location in the body. Moreover, it does not spread to the other parts of the body and is generally harmless. However, when a benign tumour occurs in areas such as the brain, it can turn fatal. Treatment often involves surgery and it does not grow back.

### Malignant Tumour

These tumours are cancerous – meaning that they will grow quickly and spread to other normal tissues of the body. This ability to spread is called **metastasis.** Usually, cancer cells metastasize when it gets into the bloodstream or the lymph nodes and form secondary tumours across various sites in the body.

### Premalignant Tumour

This type of tumour may be benign but is observed to have the characteristics of a malignant tumour. It may not have metastasized yet, but it has the potential to turn cancerous. In other words, a premalignant tumour is a type of tumour that has an increased risk of becoming cancer. Benign tumours become premalignant and eventually, malignant.

## Types of Cancer

From a medical perspective, cancer types can be classified based on the type of cell they originated from. Therefore cancer can be classified into:

### Carcinoma

The most common form of cancer, it originates from the epithelial cells

### Sarcoma

Originates from the connective tissues such as cartilage, fat and bone tissues.

### Melanoma

Originates from melanocytes, which are a type of cell that contains pigments.

#### Lymphoma & Leukaemia

Originates from the cells that comprise blood (such as b lymphocytes or white blood cells)

## Causes of Cancer

Many factors are attributed to causing cancer. The most probable factors include:

1. **Physical factors** – Ionizing radiation, such as X-rays and gamma rays
2. **Chemical factors** – Such as tobacco and smoke
3. **Biological factors** – Viral oncogenes, proto-oncogenes and cellular oncogenes

The above factors are called carcinogens.

## Diagnosis of Cancer

The detection and diagnosis of cancer are very important before it spreads to other parts of the body. Identification of cancer genes is pivotal to prevent cancer.

The following methods are used to detect cancer –

1. Biopsy.
2. Histopathological studies of tissue.
3. Radiography technique.
4. Computed tomography.
5. Magnetic resonance imaging.
6. Molecular biology techniques.

## Treatment of Cancer

Commonly, three types of treatment are available for cancer.

1. **Surgery** – Surgically removing localized cancerous mass (Effective for benign tumours)
2. **Radiation therapy** – In this therapy, radiation is used to kill the cancer cells.
3. **Chemotherapy** – Chemotherapeutic drugs are used to kill cancer cells.

Many chemical drugs have side effects in cancer patients like hair loss. So, interferons are injected into cancer patients to develop immunity against these side effects.