

# What is Cancer?

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

## Part I.

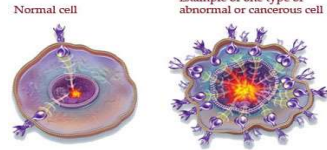


**What Is Cancer?** Cancer is the general name for a group of more than 100 diseases. **Cancer occurs when cells grow out of control.** Untreated cancers can cause **serious illness and death.**

**Normal cells in the body:** The body is made up of trillions of living cells.

**Normal body cells grow, divide, and die in an orderly fashion.**

During the early years of a person's life, normal cells divide faster to allow the person to grow. After the person becomes an adult, most cells divide only to replace worn-out or dying cells or to repair injuries.



**How cancer starts:** Cancer starts when cells in a part of the body start to grow out of control. **Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells continue to grow and form new, abnormal cells.** Cancer cells can also **invade (grow into) other tissues**, something that normal cells cannot do. Growing out of control and invading other tissues are what makes a cell a cancer cell.

## Questions:

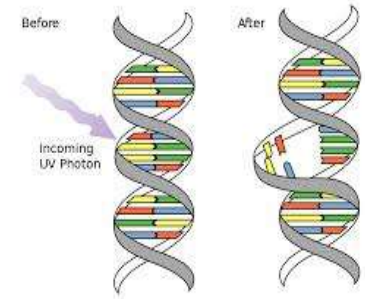
1. What is cancer? Write a general definition.
2. What happens if cancer is not treated?
3. Cancer cells are different from normal cells. What are the two ways that cancer cells **grow differently** from normal cells?

## Part II

**How Normal Cells Become Cancer Cells:** Cells become cancer cells because of DNA (deoxyribonucleic acid) damage. DNA is in every cell and it directs all the cell's actions. When DNA is damaged, the base pairs change, resulting in mutations. In a normal cell, when DNA gets damaged the cell either repairs the damage or the cell dies by going through checkpoints during the cell cycle. In cancer cells, the damaged DNA is not repaired, and the cell doesn't die like it should. Instead, the cell goes on making new cells that the body doesn't need, ignoring checkpoints during the normal cell cycle. These new cells all have the same abnormal DNA as the first cell does.

People can inherit abnormal DNA, but most DNA damage is caused by mistakes that happen while the normal cell is reproducing or by something in the environment. Sometimes the cause of the DNA damage may be something obvious like cigarette smoking or sun exposure. But it's rare to know exactly what caused any one person's cancer.

In most cases, the cancer cells form a tumor. Some cancers, like leukemia, rarely form tumors. Instead, these cancer cells involve the blood and blood-forming organs and circulate through other tissues where they grow.



**Left:** Healthy DNA **Right:** Damaged DNA

## Questions

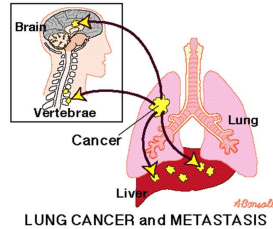
1. What cell part is damaged when cells become cancerous?
2. What is a mutation?
3. What is the purpose of checkpoints during the cell cycle?
4. What happens if cells do not go through these checkpoints?
5. How are some ways DNA could get damaged?

### Part III.

**How cancer spreads:** Cancer cells often travel to other parts of the body where they begin to grow and form new tumors. This happens when the cancer cells get into the body's bloodstream or lymph vessels. Over time, the tumors replace normal tissue. The process of cancer spreading is called *metastasis*.

**How cancers differ:** No matter where a cancer may spread, it's always named for the place where it started. For example, breast cancer that has spread to the liver is called metastatic breast cancer, not liver cancer. Likewise, prostate cancer that has spread to the bone is called metastatic prostate cancer, not bone cancer.

Different types of cancer can behave very differently. For instance, lung cancer and skin cancer are very different diseases. They grow at different rates and respond to different treatments. This is why people with cancer need different types of chemotherapy, radiation, and other treatments that are aimed at their kind of cancer.



### Questions:

1. How does cancer spread in the body?
2. Define metastasis.
3. How are cancers named?
4. Is the same type of cancer treatment always effective for brain tumors and liver cancer?

### Part IV:

**Tumors that are not cancer:** A tumor is a mass (group) of cells, however, not all tumors are cancerous. **Tumors that are cancerous are called *malignant*. Tumors that aren't cancer are called *benign*.** Benign tumors can cause problems – they can grow very large and press on healthy organs and tissues. But they cannot grow into (invade) other tissues. Because they can't invade, they also can't spread to other parts of the body (*metastasize*). These tumors are almost never life threatening.



*A baby with a malignant tumor on the side of her face.*



*A benign tumor is growing in this person's thumb.*

**How common is cancer?** Half of all men and one-third of all women in the US will develop cancer during their lifetimes. Today, millions of people are living with cancer or have had cancer. **The risk of developing many types of cancer can be reduced by changes in a person's lifestyle. For example, staying away from tobacco, limiting time in the sun, being physically active, and healthy eating can help prevent cancer.** There are also screening tests that can be done for some types of cancers so they can be found as early as possible – while they are small and before they have spread. In general, the earlier a cancer is found and treated, the better the chances are for living for many years.

### Questions:

1. What is a tumor?
2. What is the difference between benign and malignant tumors?
3. List two things you can do to reduce your chances of getting cancer.