

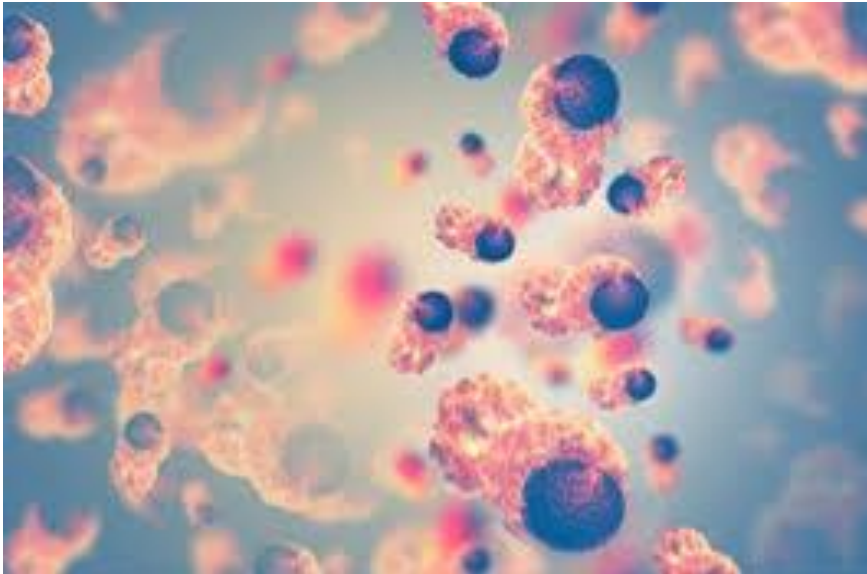


SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution



HUMAN DISEASE - CANCER



Dr.A.Sumithra,AoP, Dept., CSE

19GET277

BIOLOGY FOR ENGINEERS



WHAT IS CANCER?



“Cancer is a disease where cells grow out of control and invade, erode and destroy normal tissue”



- Cancer is a large group of diseases with one thing in common. They all happen when normal cells become cancerous cells that multiply and spread.
- Cancer is the second most common cause of death in the U.S. But fewer people are dying of cancer now than 20 years ago. Early detection and innovative treatments are curing cancer and helping people with cancer live longer. At the same time, medical researchers are identifying independent risk factors linked to developing cancer to help prevent people from developing cancer.

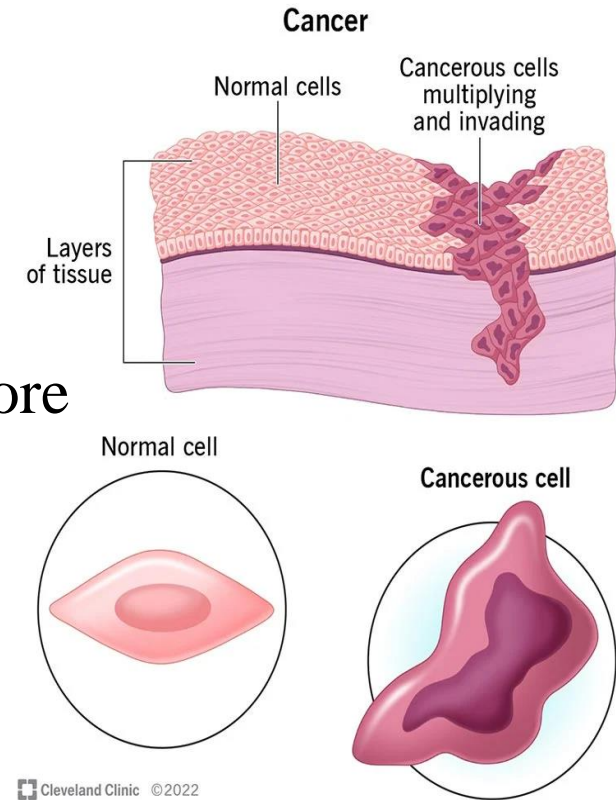


What is the difference between a normal cell and a cancerous cell?

- Normally, cells follow instructions provided by genes. Genes set down rules for cells to follow, such as when to start and stop growing.

Cancerous cells ignore the rules that normal cells follow.

- Normal cells divide and multiply in a controlled manner. Cancerous cells multiply uncontrollably.
- Normal cells are programmed to die (apoptosis). Cancerous cells ignore those directions.
- Normal cells for solid organs stay put. All cancerous cells are able to move around.
- Normal cells don't grow as fast as cancerous cells.



Cleveland Clinic ©2022



Types of Cancer

- Bladder
- Breast
- Endometrial
- Leukemia
- Pancreatic
- Thyroid
- Lung
- Melanoma
- Kidney cancer
- Lymphoma
- Prostate
- Colon & rectal



How does cancer start in your body?

- Cancer starts when a gene or several genes mutate and create cancerous cells. These cells create cancer clusters, or tumors. Cancerous cells may break away from tumors, using your lymphatic system or bloodstream to travel to other areas of your body. Healthcare providers call this metastasis.
- **For example**, a tumor in your breast may spread to your lungs, making it hard for you to breathe. In some types of blood cancer, abnormal cells in your bone marrow make abnormal blood cells that multiply uncontrollably. Eventually, the abnormal cells crowd out normal blood cells.



What are cancer Symptoms?

Cancer is a complicated disease. You can have cancer for years without developing symptoms. Other times, cancer may cause noticeable symptoms that get worse very quickly. So there were some common cancer symptoms which includes,

- Unexplained weight loss
- Chronic tiredness
- Persistent pain
- Fever that occurs mostly at night
- Skin changes, particularly moles that change shape and size or new moles.



What causes cancer?

Cancer is a genetic disorder. It happens when genes that manage cell activity mutate and create abnormal cells that divide and multiply, eventually disrupting how your body works.

Cancer risk factors you can control

- **Smoking:** Smoking cigarettes and cigars and using e-cigarettes increases your chance of developing lung, pancreatic, esophageal and oral cancer.
- **Diet:** Eating high-fat or high-sugar foods can increase your risk for many types of cancer. You're also more vulnerable to disease if you don't get enough exercise.



- **Environment:** Exposure to toxins in your environment such as asbestos, pesticides and radon can eventually lead to cancer.
- **Radiation exposure:** Ultraviolet (UV) radiation from the sun significantly increases your risk of developing skin cancer. Over-exposure to radiation treatment can also be a risk factor.



How can I reduce my risk of developing cancer?

You can reduce your risk by changing some of your lifestyle which includes,

- If you smoke or use tobacco, try to stop. Ask a healthcare provider about smoking cessation programs that can help you quit tobacco.
- Follow a diet plan that's healthy for you. If you want help managing your weight, ask a healthcare provider about nutritional guidance and weight management programs.
- Add exercise to your daily routine. Exercise may boost your immune system so it provides more protection against cancer.
- Avoid toxins, including asbestos, radon and pesticides.
- Protect yourself against sun damage.
- Have regular cancer screenings.



What are the four stages of cancer?

Most cancers have four stages. The specific stage is determined by a few different factors, including the tumor's size and location.

- **STAGE I:** The cancer is localized to a small area and hasn't spread to lymph nodes or other tissues.
- **STAGE II:** The cancer has grown, but it hasn't spread.
- **STAGE III:** The cancer has grown larger and has possibly spread to lymph nodes or other tissues.
- **STAGE IV:** The cancer has spread to other organs or areas of your body. This stage is also referred to as metastatic or advanced cancer.



How is cancer stage determined?

- Healthcare providers use cancer staging systems to plan treatment and develop a prognosis or expected outcome. The TNM system is the most widely used cancer staging system. T stands for primary tumor. N stands for lymph nodes and indicates whether a tumor has spread to your lymph nodes. M stands for metastasis, when cancer spreads.



How do healthcare providers treat cancer?

Healthcare providers may use several different treatments, sometimes combining treatments based on your situation. Common cancer treatments include,

- **Chemotherapy:** Chemotherapy is one of the most common cancer treatments. It uses powerful drugs to destroy cancer cells. You may receive chemotherapy in pill form. In some cases, providers may be able to direct chemotherapy to the specific area affected.



- **Radiation therapy:** This treatment kills cancer cells with high dosages of radiation. Your healthcare provider may combine radiation therapy and chemotherapy.
- **Surgery:** Cancerous tumors that haven't spread may be removed with surgery. Your healthcare provider may recommend therapy. This treatment combines surgery with chemotherapy or radiation to shrink a tumor before surgery or to kill cancer cells that may remain after surgery.



Conclusion

Hence cancer is second leading cause of deaths following heart diseases one should care about its prevention before the occurrence of disease by various examinations and if disease is already exists then one should go for its regular treatment. Recent treatment mainly includes radiation therapy, cell based immunotherapy, genetherapy, chemotherapy are most widely used methods used for treatment of various types of cancers.



THANK YOU