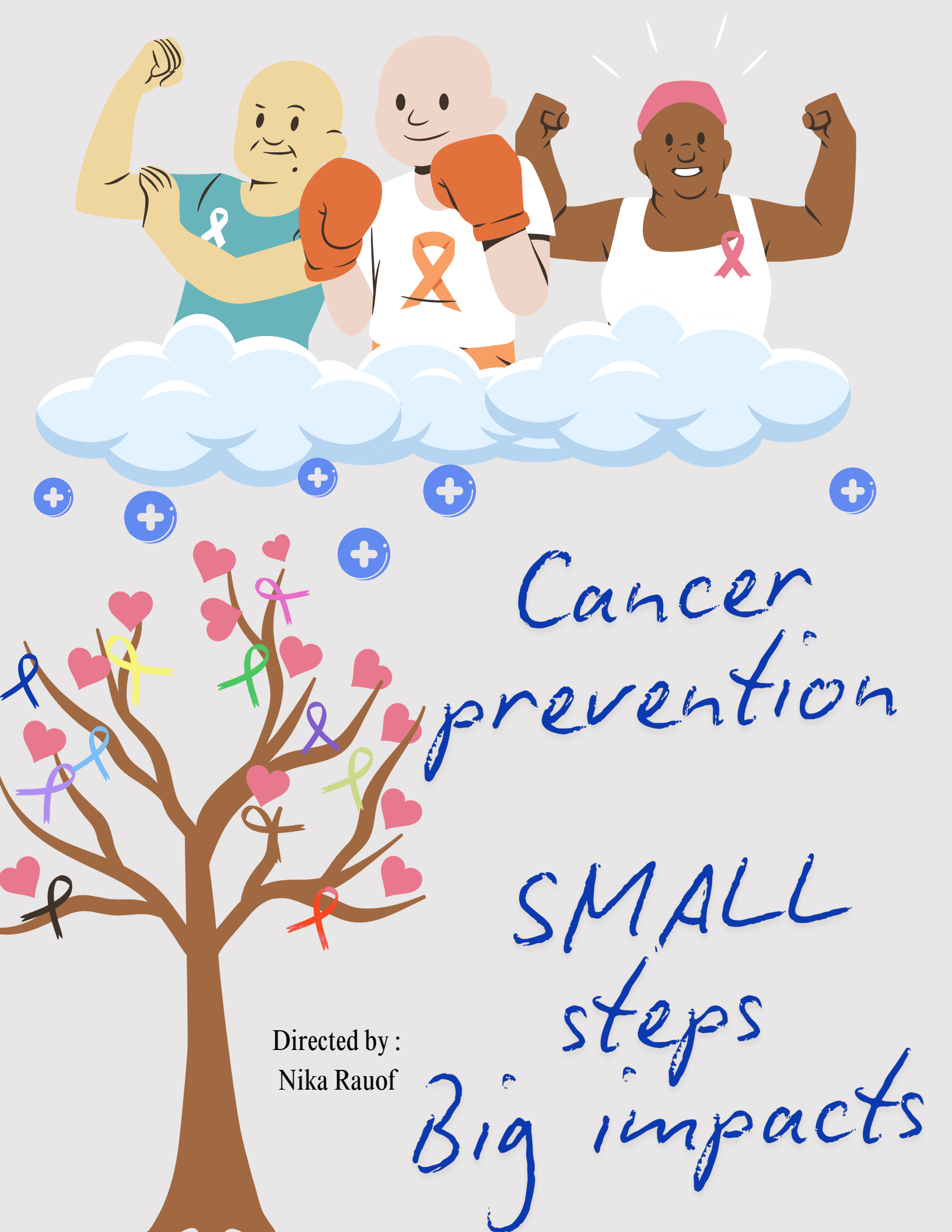




Cancer
prevention

SMALL
steps

Big impacts

Directed by :
Nika Rauof

Dear readers,

Welcome to this comprehensive guide on Cancer Prevention Methods

Nika is a teenager who is striving to become the Nika that she wants to be in the next 10 years, and this booklet is one of the big steps that she is taking throughout the process.

One of the most dangerous diseases in the world is cancer, and many parents, children, and families have lost their loved ones due to this disease. Losing a family member to cancer is a difficult and painful experience, leaving a lasting impact on those who loved them. One of my goals is to take part in curing cancer, and this booklet is the simplest way to serve my society.

My mission is to provide you with essential information and practical tips to help you reduce your risk of cancer and lead a healthier life. I hope you find this booklet both informative and helpful.

“I sincerely wish good health and well-being for each and every one of you.

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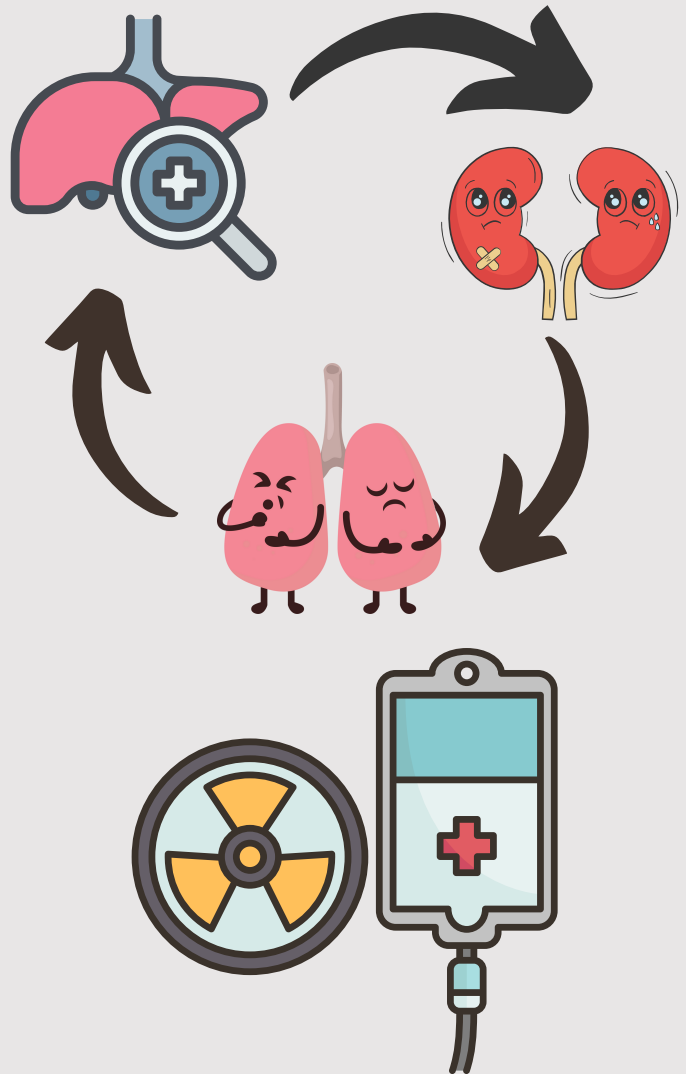
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more information



tips



Alert



This booklet contains Qr
code

What is cancer?

Cancer is a disease in which some of the body's cells grow uncontrollably and spread to other parts of the body.

Cancer can start almost anywhere in the human body. Normally, human cells grow and multiply through cell division to form new cells as the body needs them. Normally, when human cells grow old or become damaged, they die, and new cells will replace them.

Sometimes this orderly process breaks down, and abnormal or damaged cells grow and multiply when they should not.

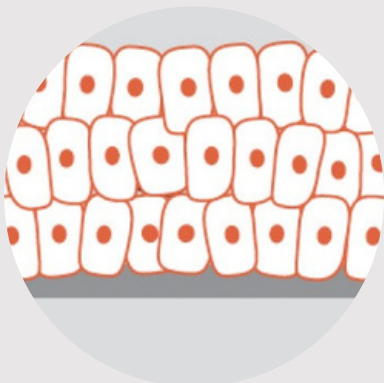
Every case of cancer is different in its own way, with its own set of genetic changes. Some cancers grow quickly while others can take years to become dangerous.

Globally, cancer is a significant health concern. According to the World Health Organization (WHO) 53,000 cases are diagnosed with cancer every day. If we break it down, it means that roughly 1 in 150 people worldwide are diagnosed with cancer every day.

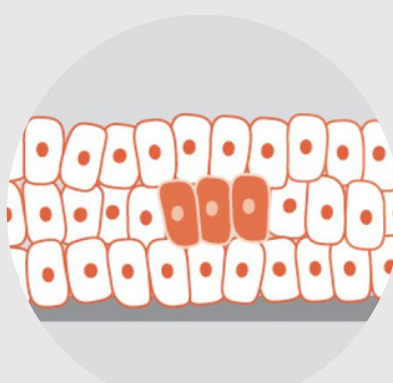


Common Types: The most common cancers in 2020 were breast (2.26 million cases), lung (2.21 million cases), colon and rectum (1.93 million cases), prostate (1.41 million cases), skin (non-melanoma) (1.20 million cases), and stomach (1.09 million cases)

normal cells



abnormal cells



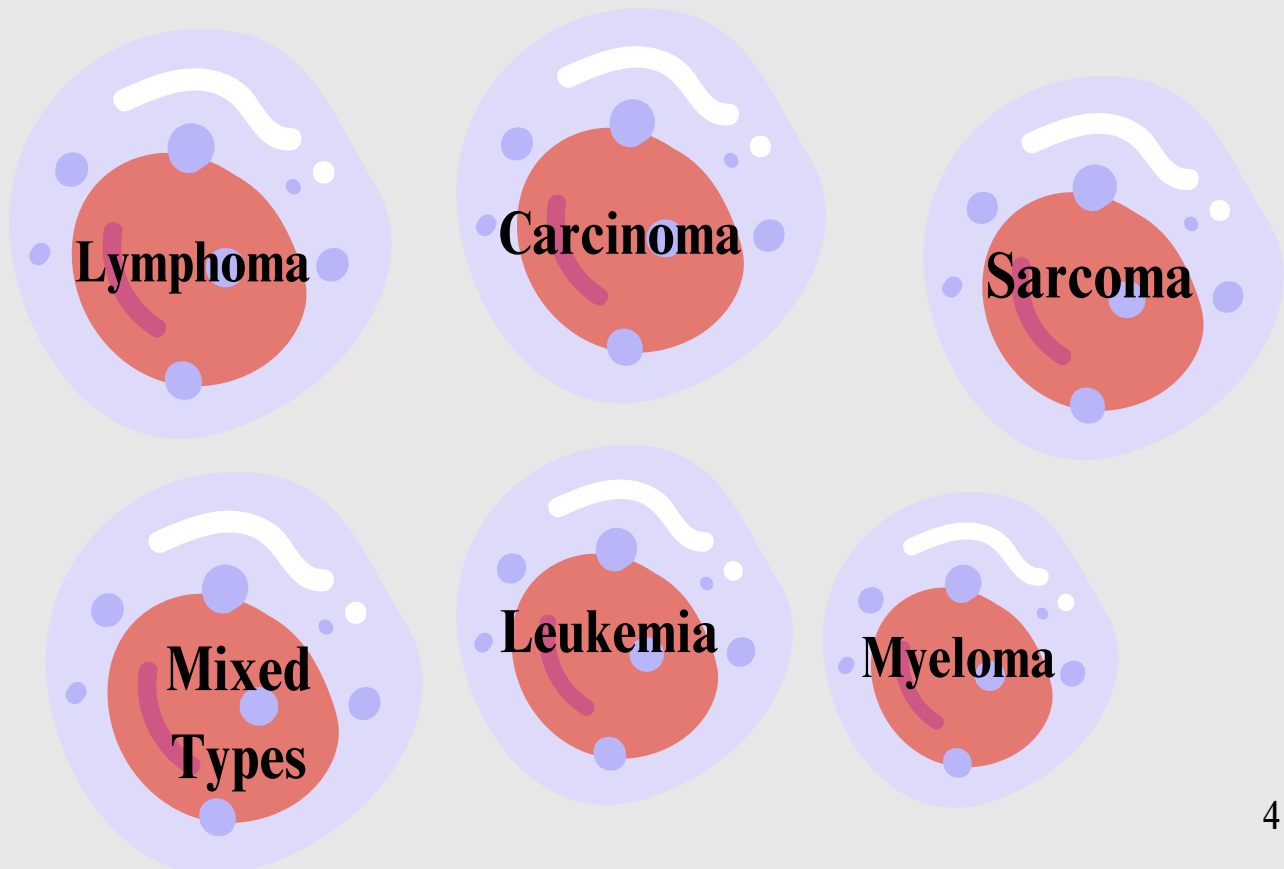
abnormal cells multiply



How are cancers classified



Histological Classification: The term "histological" refers to the study of the microscopic structure of tissues. In fact, histology is the science that examines the tissues of the body at the microscopic level to better understand their structure and function. This science helps doctors and researchers to identify abnormal changes in tissues and diagnose diseases.



CARCINOMA

The word carchinos comes from Greek mythology, and it was named after a crab called carquinos, which refers to a type of cancer that originates from epithelial tissues. Epithelial tissue is found throughout the body; it is present in the skin, as well as the inner lining of organs and internal passageways. Carcinomas are the most common type of cancer, accounting for 80% to 90% of all cancer diagnoses.

Carcinomas can occur in several places of the body such as:

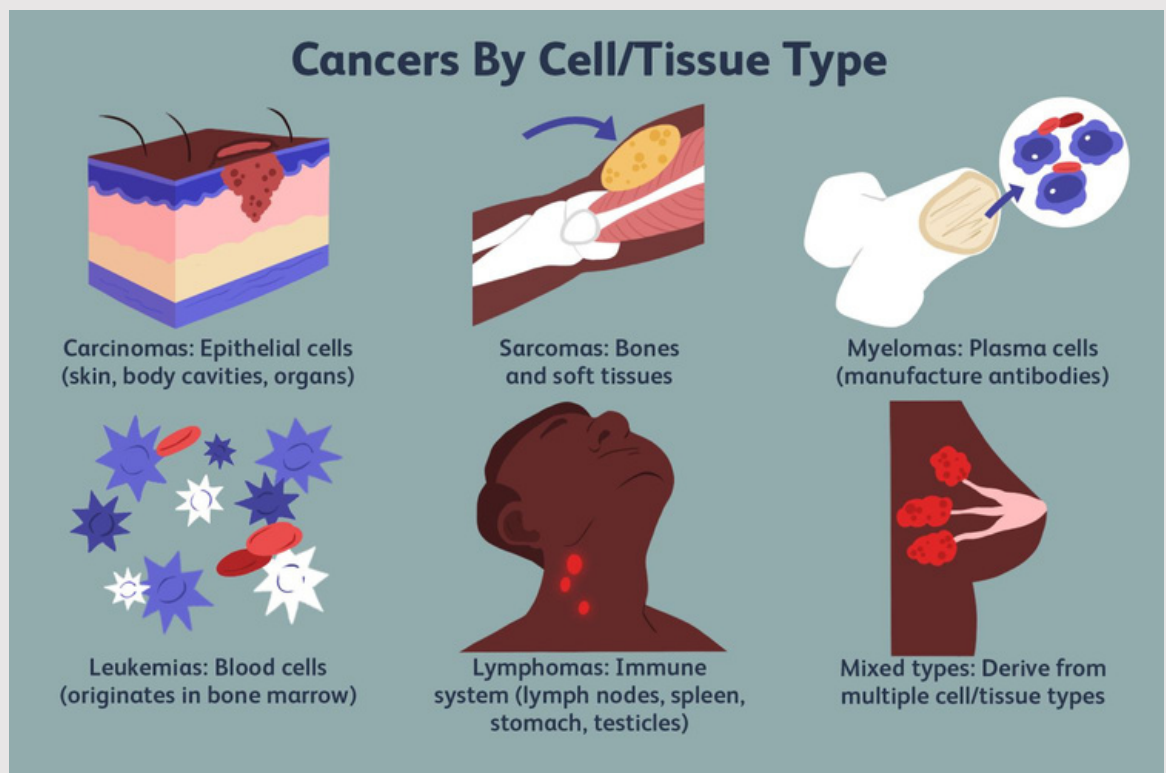
mouth

skin

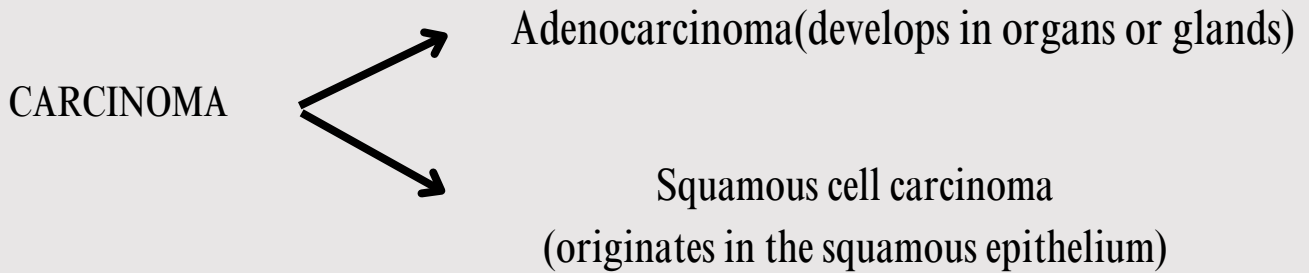
nose

throat

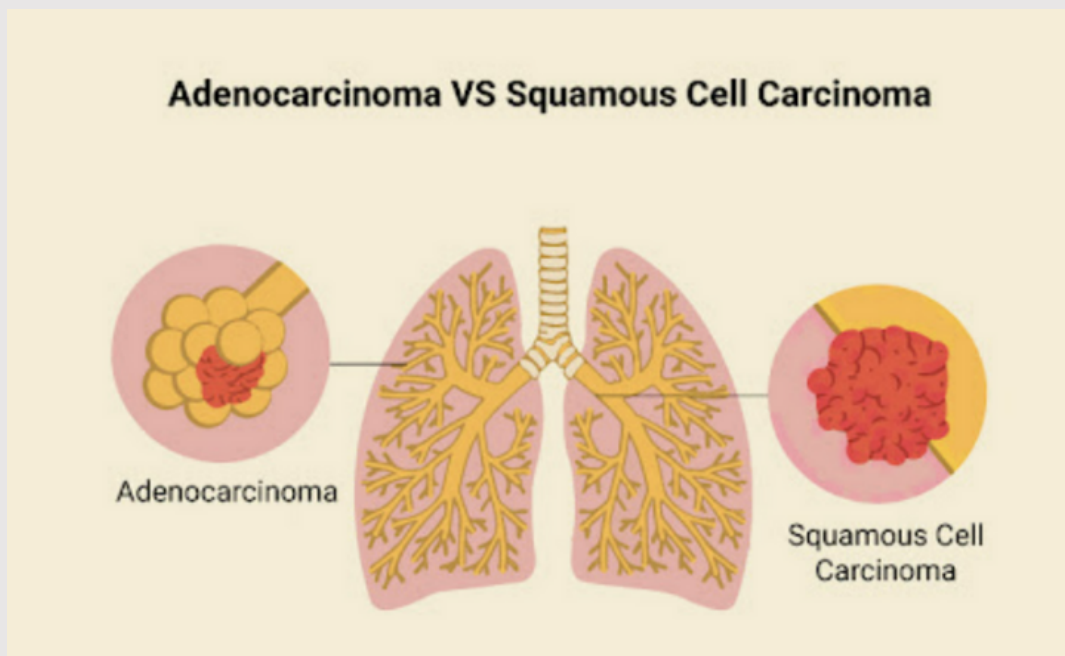
thyroid



CARCINOMA



Adenocarcinomas generally occur in mucus(Mucus is a slippery, gel-like substance produced by the mucous membranes in the body)membranes are first seen as a thickened plaque-like white mucosa. They often spread easily through the soft tissue where they occur. Squamous cell(Squamous cells are a type of epithelial cell that are flat and scale-like in appearance. They are found in the outer layer of the skin (epidermis) and also line various organs and structures within the body, such as the respiratory and digestive tracts)



SARCOMA

“Sarcoma is also a solid tumor “

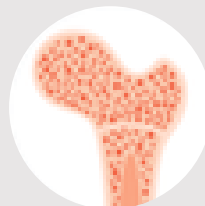
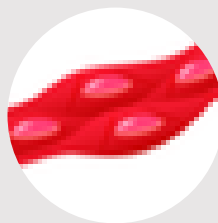
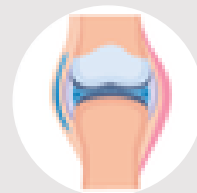
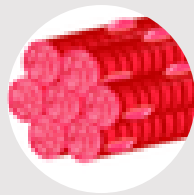
Sarcoma is a rare kind of cancer which refers to cancer that originates in supportive and connective tissues such as bones, tendons, cartilage, muscle, and blood vessels.

Sarcomas can also form in the surrounding tissue of several major organs such as bladder, kidney, liver, lungs and spleen . Generally occurring in young adults, the most common sarcoma often develops as a painful mass on the bone. Sarcoma tumors usually resemble the tissue in which they grow. Some common symptoms include a painless lump, weight loss, trouble breathing, bone pain, swelling, fatigue, and a limp if the sarcoma is in the leg.

How people get diagnosed with sarcoma:



Family history of the disease, genetic disorders, exposure to radiation, and bone disorders. Treatment options vary depending on the type and location of the sarcoma and may include surgery, radiation therapy, chemotherapy, targeted therapy, and immunotherapy.



MYELOMA

Myeloma is a type of blood cancer that originates in the plasma cells of bone marrow. Myeloma is often called multiple myeloma because most people (90%) have multiple bone lesions at the time it is diagnosed. Plasma cells produce antibodies and proteins which help for fighting infections.

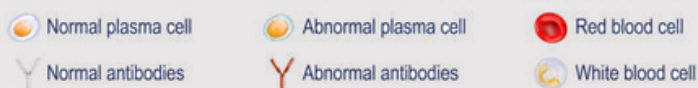
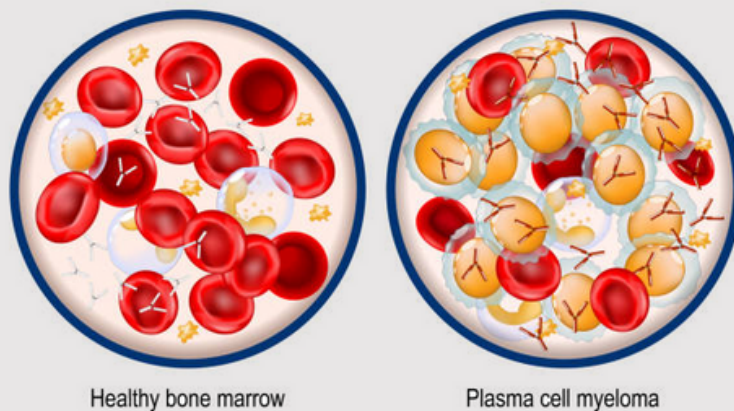
In myeloma, abnormal plasma cells multiply uncontrollably, crowding out healthy blood cells and producing abnormal antibodies that can cause various health problems.



Common symptoms of myeloma :

Bone pain, frequent infections, fatigue, anemia, kidney problems, and high levels of calcium in the blood. The exact cause of myeloma is not well understood, but risk factors include age, family history, exposure to certain chemicals, and a weakened immune system.

Treatment options for myeloma : Chemotherapy, targeted therapy, immunotherapy, radiation therapy, and stem cell transplant.

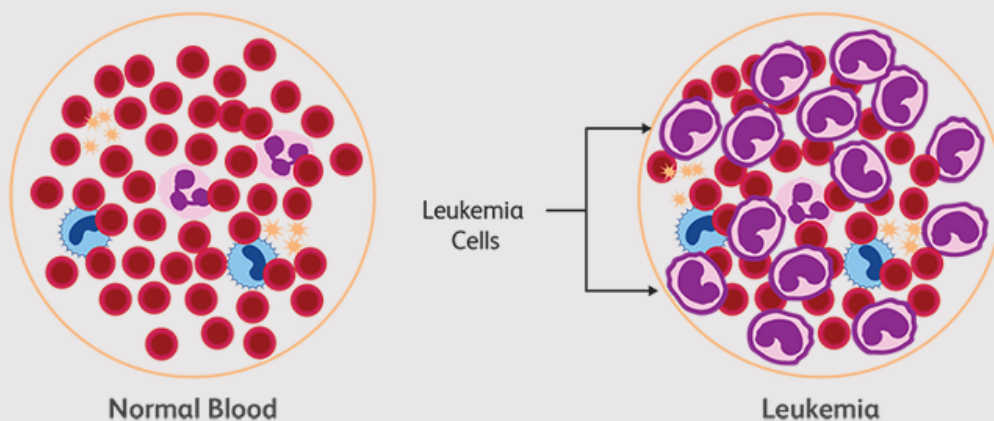


LEUKEMIA

Leukemias ("liquid cancers" or "blood cancers") are cancers of the bone marrow and blood. It involves the rapid production of abnormal white blood cells, which can crowd out normal blood cells and impair the body's ability to fight infections, carry oxygen, and control bleeding. There are several types of leukemia, including acute and chronic forms, each with different characteristics and treatment approaches. Leukemia also affects red blood cells and can cause poor blood clotting and fatigue due to anemia.

Examples of leukemia include:

- Myelogenous or granulocytic leukemia (malignancy of the myeloid and granulocytic white blood cell series)
- Lymphatic, lymphocytic, or lymphoblastic leukemia (malignancy of the lymphoid and lymphocytic blood cell series)
- Polycythemia vera or erythremia (malignancy of various blood cell products, but with red cells predominating)

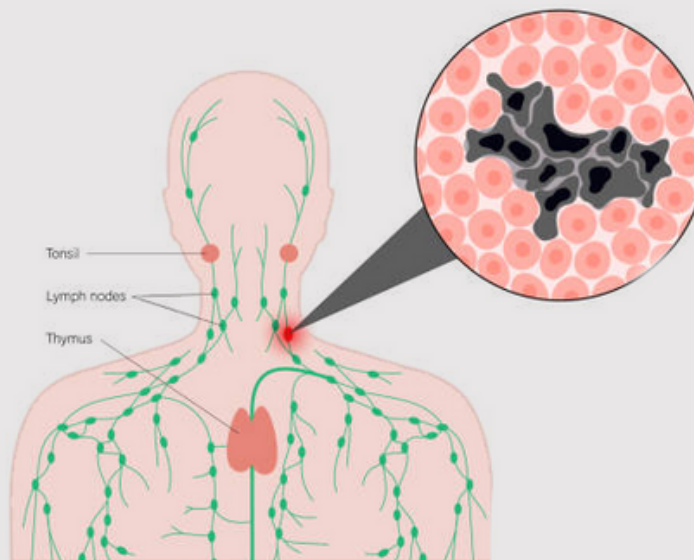


LYMPHOMA

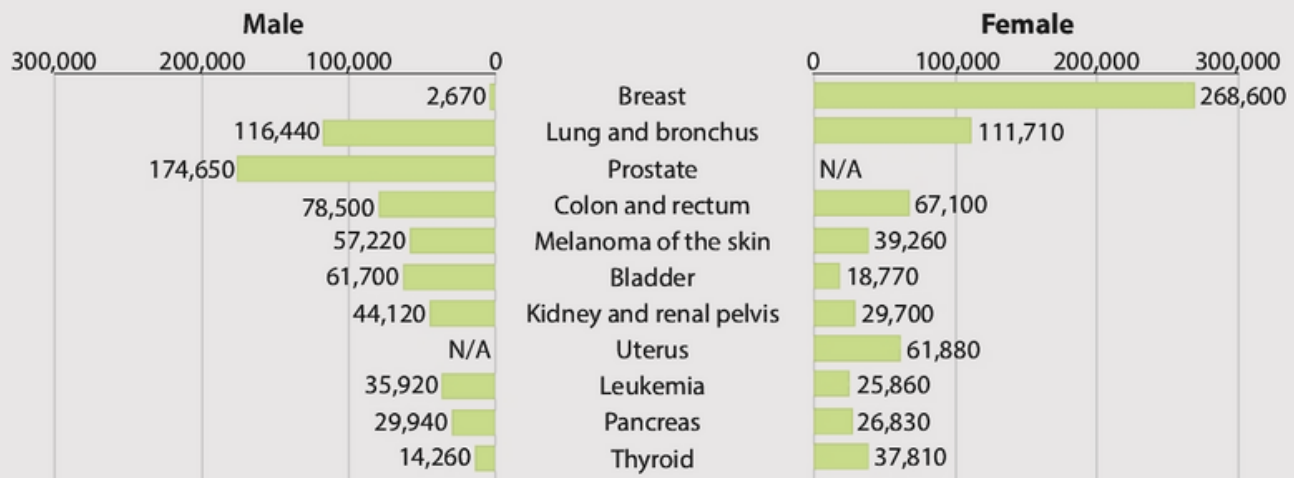
Lymphomas develop in the glands or nodes of the lymphatic system, a network of vessels, nodes, and organs (specifically the spleen, tonsils, and thymus) that purify bodily fluids and produce infection-fighting white blood cells, or lymphocytes. Unlike the leukemias which are sometimes called "liquid cancers," lymphomas are "solid cancers." Lymphomas may also occur in specific organs such as the stomach, breast or brain. These lymphomas are referred to as extranodal lymphomas



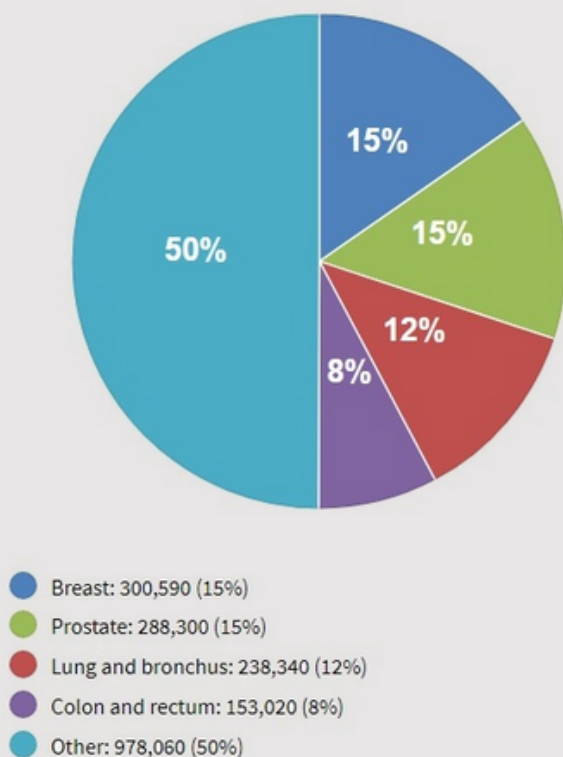
The lymphomas are subclassified into two categories: Hodgkin lymphoma and Non-Hodgkin lymphoma. The presence of Reed-Sternberg cells in Hodgkin lymphoma diagnostically distinguishes Hodgkin lymphoma from Non-Hodgkin lymphoma.



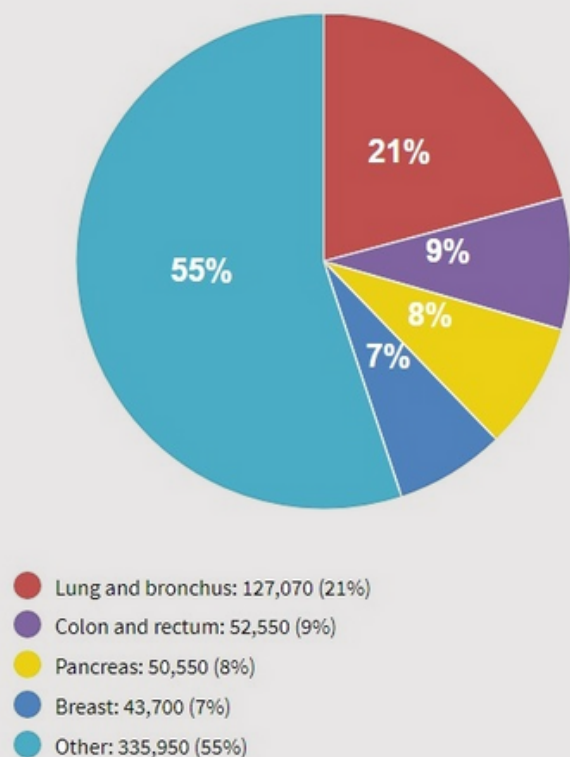
How common different types of cancer are



Cancer cases 2024

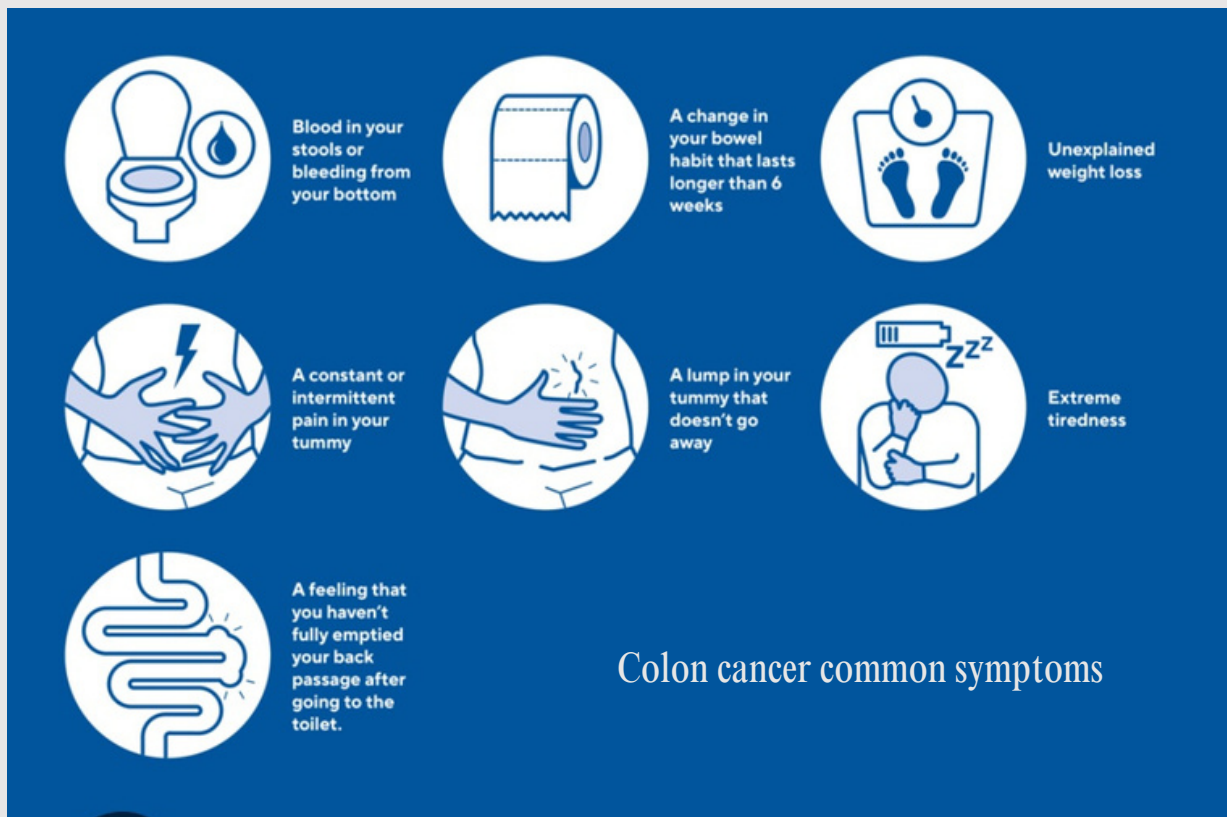
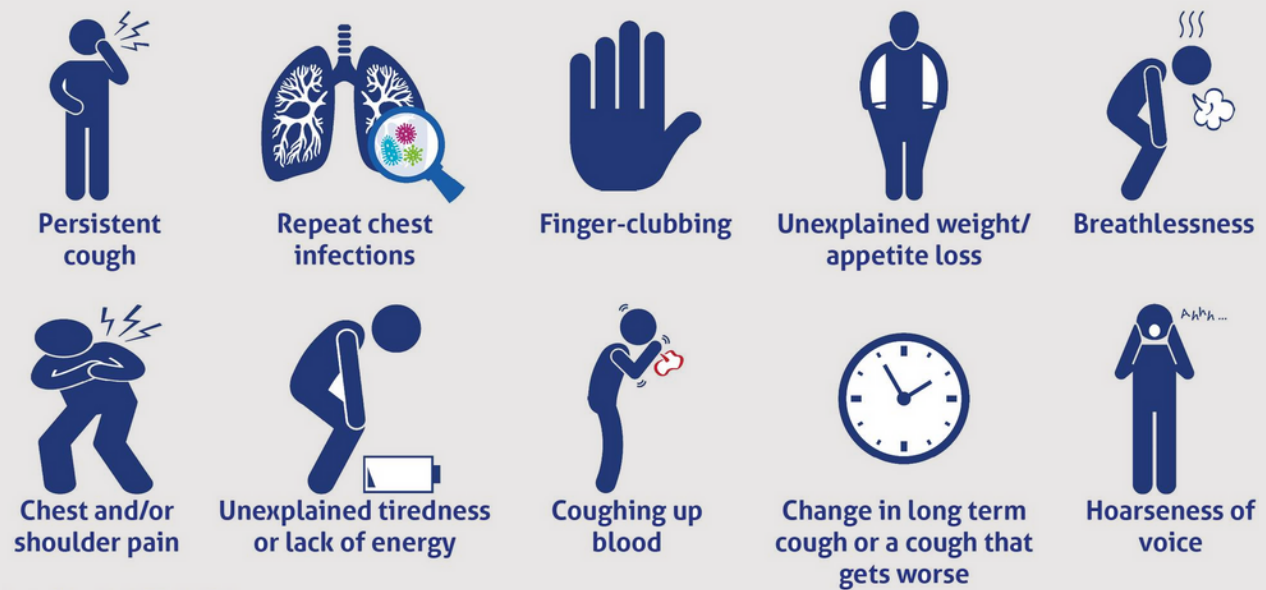


Cancer deaths 2024



What are the common cancer symptoms

Lung cancer common symptoms



What is TNM staging system

The TNM classification system is mainly used for breast, colon, and lung cancer.

The letter **T** stands for Tumor and indicates the size of the tumor.

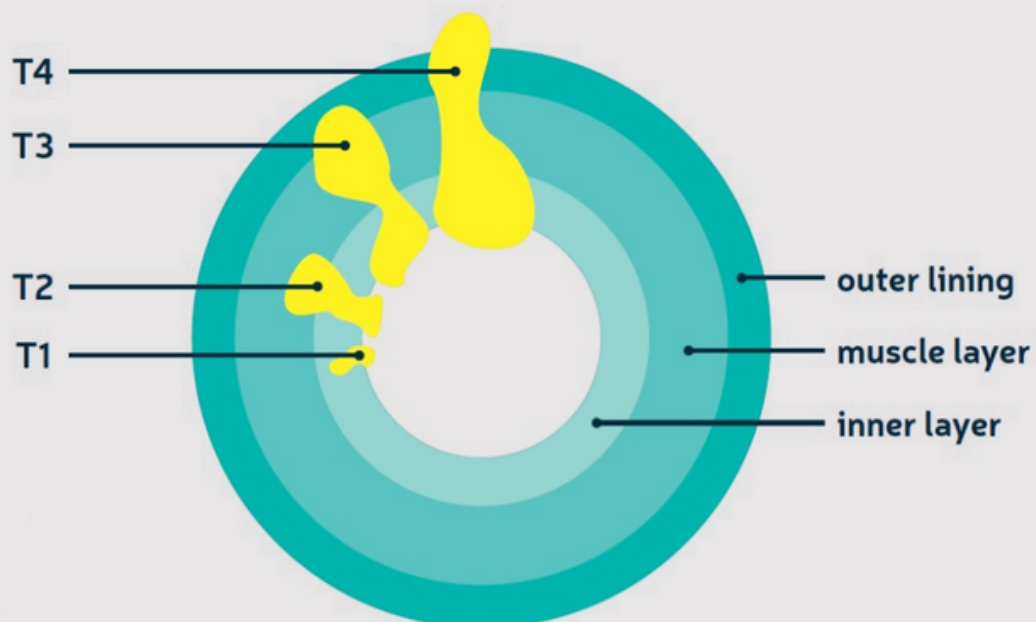
TX: The primary tumor cannot be evaluated and diagnosed.

T0: Signs of cancer are present, but no tumor is found.

Tis: The primary tumor is limited and localized.

T1, T2, T3, and T4: The tumor is visible and has grown; as the numbers increase, the tumor is larger.

T stage



What is TNM staging system

The letter **N** stands for lymph node: It indicates the degree of involvement of lymph nodes.

NX: No involvement of lymph nodes.

N0: Lymph nodes are involved, but no cancer is found.

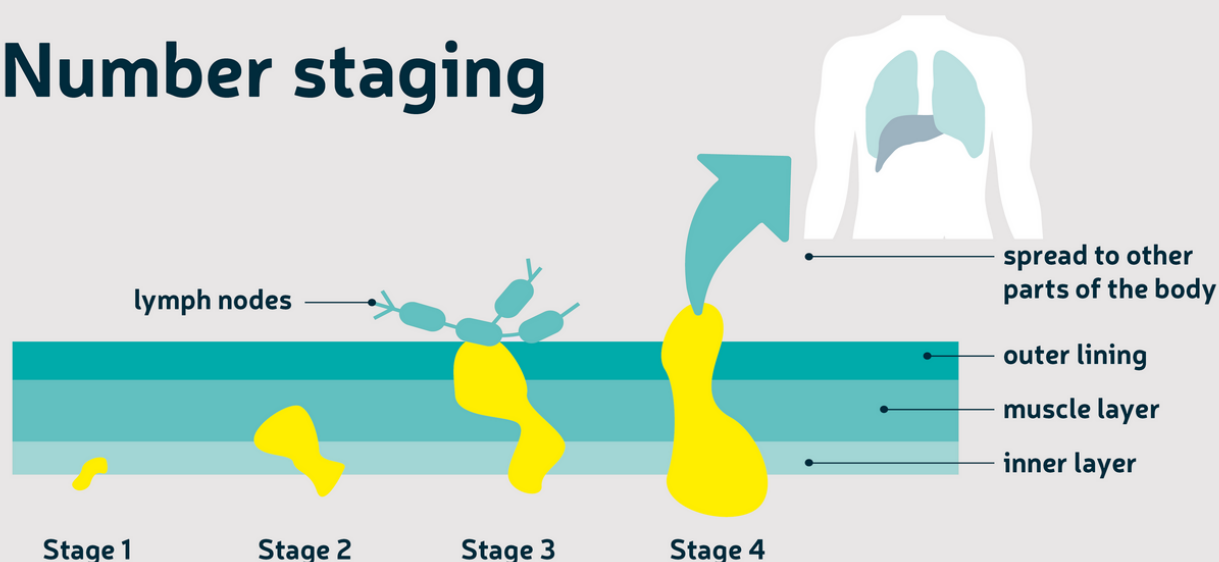
N1, N2, and N3: These indicate the extent of involvement of lymph nodes. The higher the number, the greater the spread of cancer to lymph nodes.

N1: Cancer has spread to 1 to 3 nearby lymph nodes.

N2: Cancer has spread to 4 to 9 nearby lymph nodes.

N3: Cancer has spread to 10 or more nearby lymph nodes.

Number staging



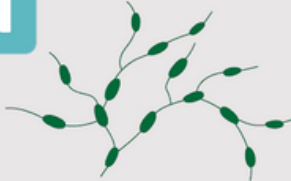
What is TNM staging system

The letter **M** stands for metastasis.

MX: is not identifiable.

MO: Evidence exists but no metastasis was found.

M1: Metastasis exists and is evident.

T 	N 	M 
Tumor size	Lymph Node Status	Metastasis
T-1: 0-2 centimeters	N-0: Surgeon can't feel any nodes	M-0: Tested nodes are cancer-free
T-2: 2-5 centimeters	N-1: Surgeon can feel swollen nodes	M-1: Tested nodes show cancer cells or micrometastasis
T-3: >5 centimeters	N-2: Nodes feel swollen and lumpy	
T-4: Tumor has broken through skin or attached to chest wall	N-3: Swollen nodes located near collarbone	

Cancer diagnosis methods

1-physical examination

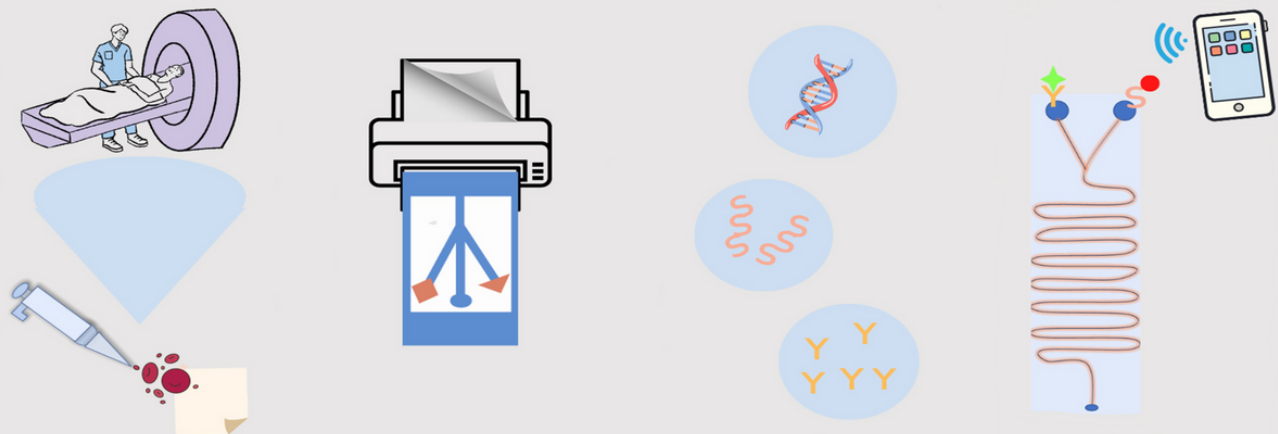
physical examination is often the first step in diagnosing a wide range of health issues, including cancer. During a physical exam, a healthcare provider performs a thorough check of your body for any signs or symptoms of disease. In a physical examination, the following factors are checked:

visual inspection , palpation ,percussion ,checking the lymph nodes.

2- Laboratory Tests: Blood, urine, and other body fluid tests can detect abnormalities that might indicate cancer.

3-Imaging Tests: Techniques like X-rays, CT scans, MRI, PET scans, and ultrasounds help visualize the inside of the body to detect tumors or other abnormalities.

4-Genetic and Genomic Testing: These tests look for specific genetic mutations that might indicate cancer or predict how aggressive it might be.



Cancer diagnosis methods

Cancer blood tests	
TEST	CANCER DETECTED
COMPLETE BLOOD COUNT (CBC)	Blood or immune system cancers like leukemia and lymphoma .
TUMOR MARKER BLOOD TESTS	CA-125 test: recurrence of cancers like ovarian and pancreatic . PSA (prostate-specific antigen) test: high levels of PSA which might indicate prostate cancer.
BLOOD PROTEIN TESTS	Blood cancers like leukemia , lymphoma and multiple myeloma .
CIRCULATING TUMOR CELL (CTC) TESTS	Predict outcomes in people with metastatic breast , prostate or colon cancers.
THE GALLERI TEST	Can detect over 50 different types of cancer using DNA.
PROTEOMICS-BASED PLASMA TEST	New blood test may show promise for the early detection of 18 different types of cancer .



Cancer blood tests are essential tools in diagnosing and managing cancer.

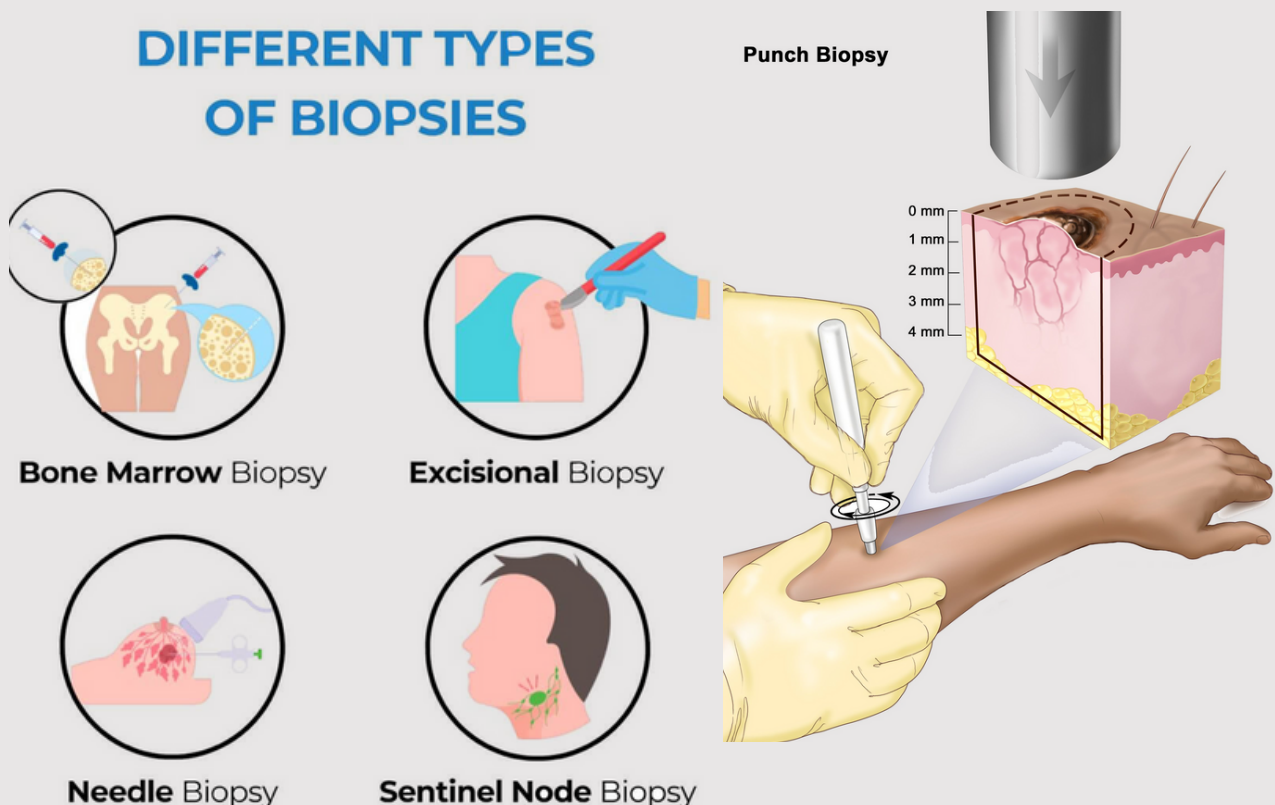
While they may not directly detect cancer, they provide crucial information about your overall health and help identify potential issues.

Cancer diagnosis methods

Biopsy

A biopsy is a procedure to remove a piece of tissue or a sample of cells from your body so that it can be tested in a laboratory. You may undergo a biopsy if you're experiencing certain signs and symptoms or if your health care provider has identified an area of concern. A biopsy can determine whether you have cancer or another condition.

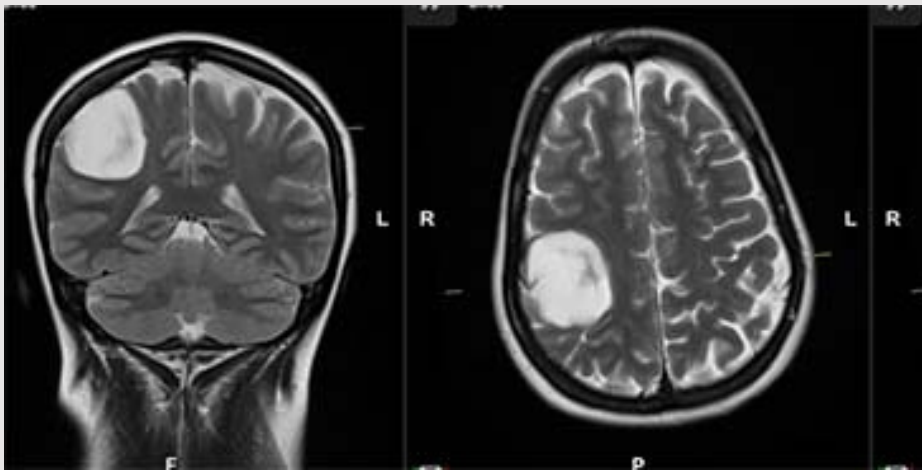
Imaging tests, such as CT scans or MRIs, are helpful in detecting masses or irregular tissue, but they alone can't tell the difference between cancerous cells and cells that aren't cancerous. For most cancers, the only way to make a diagnosis is to perform a biopsy to collect cells for closer examination.



Review of cancer patient cases

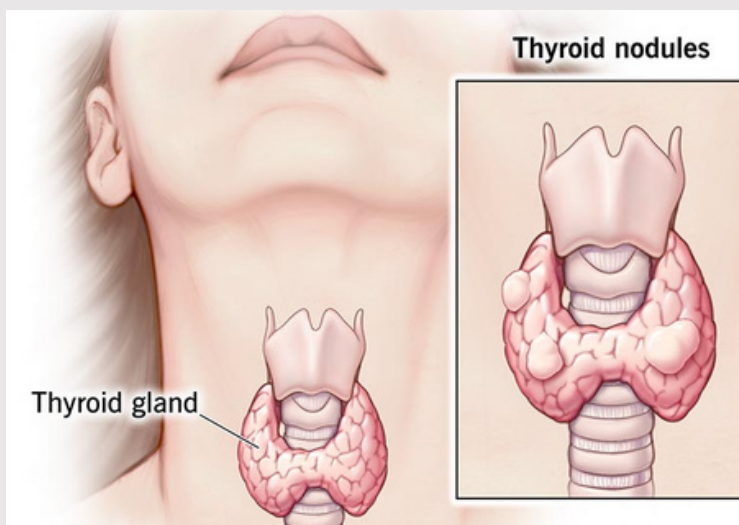
CASE 1

A person who experiences headaches, dizziness, nausea, vomiting, and visual disturbances, with headaches so severe that they wake the person from sleep, may be prone to brain cancer. For this individual, the first step is not a blood test but rather an MRI or CT scan.



CASE 2

For a person with a thyroid lump, the first step is a blood test (to check thyroid hormones and a thyroid scan). For this individual, a biopsy is necessary, specifically a fine-needle aspiration (FNA).

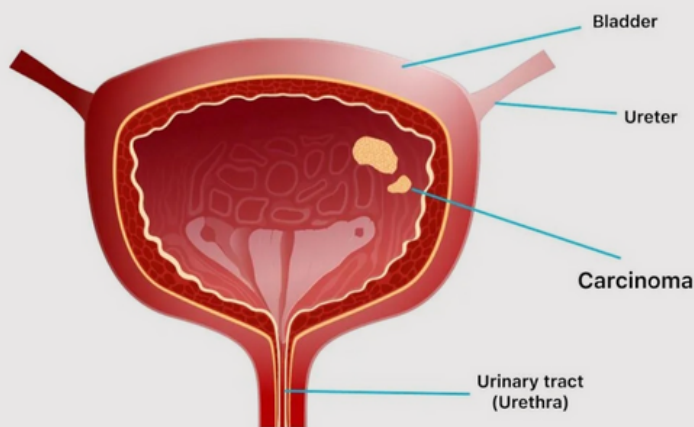


Review of cancer patient cases

CASE 3

For a middle-aged man who has urinary symptoms such as terminal dribbling at the end of urination or urinary residue . The first step is a blood test for prostate-specific antigen (PSA) and an ultrasound. If the test and ultrasound confirm prostate cancer, surgery is necessary. However, if there is only a suspicion of cancer, a prostate biopsy is required.

What is Bladder Cancer?



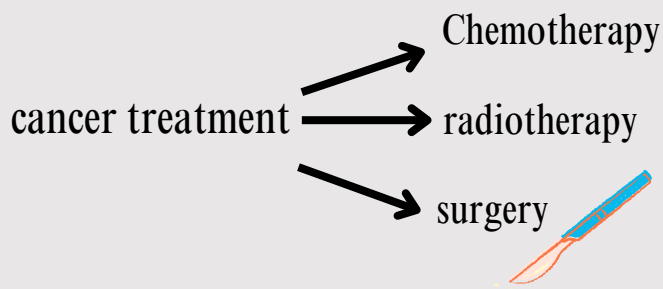
CASE 4

If a lump is felt in the breast, the first step is a breast ultrasound. If the results are suspicious, a biopsy is needed.

For blood cancer or leukemia, which affects both children and the elderly, the first step is a blood test to examine blood cells (CBC differential). Then, a bone marrow biopsy is performed.



Cancer treatment methods



Depending on the type of tumor and its stage of progression, different cancer treatment methods are suggested.

Radiotherapy

Radiation therapy, also known as radiotherapy, uses high-energy particles or waves (like X-rays, gamma rays, electron beams, or protons) to destroy or damage cancer cells. It works by making small breaks in the DNA inside cells, preventing them from growing and dividing.

Surgery

Surgery involves physically removing cancer from the body. It's often used when cancer is localized to one area and hasn't spread. The goal is to remove the tumor and some surrounding healthy tissue to ensure all cancer cells are eliminated



Chemotherapy

If the tumor is large, it cannot be surgically removed from the start.

Initially, radiotherapy and to some extent chemotherapy are used to shrink the tumor, and then surgery is performed. However, if the tumor is small, it is usually possible to perform surgery first and then use chemotherapy and radiotherapy to completely eliminate the tumor

Diagnosis: Cancer can be diagnosed through two main methods

- 1- When cancer has direct or indirect symptoms.
- 2- When, based on the patient's history, such as personal history (e.g., smoking and alcohol use) or family conditions or hereditary cancer history, a screening test is requested for the patient.



Genetics

One of the important factors in the development of various cancers is genetics. For example, translocation of chromosomes 9 and 22 predisposes individuals to chronic myeloid leukemia (CML), which is known as the Philadelphia chromosome.

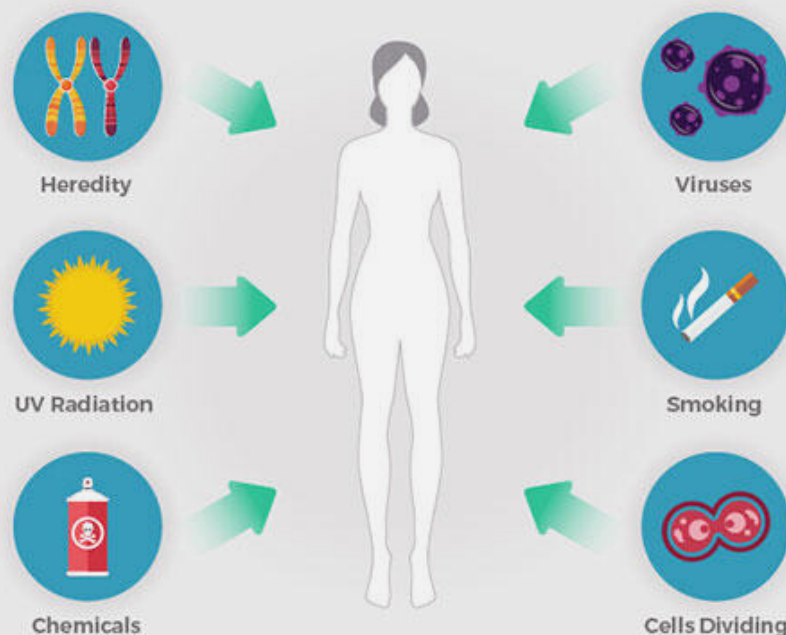
Overexpression of BRCA genes predisposes individuals to breast cancer
The HER2 gene predisposes individuals to ovarian cancer.

Genetic Testing and Cancer Risk

Genetic testing can identify inherited mutations that increase cancer risk. This information can help individuals make informed decisions about their health, such as increased screening or preventive measures.

Family Cancer Syndromes

Some families have a higher risk of certain cancers due to inherited genetic mutations. These are known as hereditary cancer syndromes, such as familial adenomatous polyposis (FAP) and Lynch syndrome



Cancer Prevention methods

"What simple things in life increase your risk of cancer?"



People who have diabetes are at risk for pancreatic cancer.

In most singers, particularly opera singers, cancer of the larynx or vocal cords is prevalent, and symptoms such as coughing, hoarseness, and harshness of voice are commonly observed.

Eating too many foods with nitrite preservatives, like processed meats, can increase your risk of stomach and colon cancer. These preservatives can turn into harmful substances called nitrosamines in your body, which are known to cause cancer. Long-term exposure to high levels of these preservatives might also cause other health problems, such as stomach issues and allergies.

Working with chemicals increases the risk of developing brain support cell cancer (glioblastoma multiforme(GBM)).

Bacteria like Chlamydia can serve as a precursor to cervical cancer.

Cancer Prevention methods

The H. pylori bacteria, in cases of increased stomach acid, may contribute to the development of stomach cancer.

Employees in the oil industry, along with those exposed to petroleum substances for extended periods, are at an increased risk of developing a type of blood cancer known as multiple myeloma.

The causative agent of gonorrhea, a sexually transmitted infection, can serve as a precursor to bladder and prostate cancer. The bacterial agent responsible for this is Neisseria gonorrhoeae. Gonorrhea can cause symptoms like painful urination, abnormal discharge, and if left untreated, can lead to more serious health issues, including infertility

Using contraceptive pills (birth control pills) can increase the risk of developing uterine and breast cancer.

The human papillomavirus (HPV) or genital warts can cause cervical cancer.

Cancer Prevention methods

There are bacteria that can increase the risk of lymph node cancer, such as Campylobacter, another type of Helicobacter, and another type of Chlamydia.

The causative agent of syphilis (Treponema pallidum) may cause gallbladder and prostate cancer(Syphilis is a sexually transmitted infection caused by the bacterium Treponema pallidum. It progresses through stages and can cause serious health issues if left untreated.)

Epstein-Barr virus (EBV) causes nasopharyngeal cancer, which is located at the back of the throat and nose(EBV can cause other symptoms such as rash, swollen liver, and spleen).

Extended use of headphones or working in noisy environments can increase the risk of developing a type of cancer in the auditory nerve (acoustic neuroma). This type of cancer is accompanied by symptoms such as hearing loss and tinnitus (ringing in the ears).

Look after yourself after cancer

Note that After cancer treatment, supportive therapy is needed

1- Evaluation of cancer formation and recurrence should be done through relevant cancer screening. For example, in one of the most common cancers, which is breast cancer, it is necessary to perform breast ultrasound, mammography, and CEA(Carcinoembryonic Antigen)test every 6 months.

2- CEA test : The CEA test, or Carcinoembryonic Antigen test, measures the level of a specific protein in the blood. This protein can be elevated in certain types of cancer, such as colorectal, breast, lung, and pancreatic cancers. It's often used to monitor treatment response and check for cancer recurrence, rather than for initial diagnosis.

3- General body rehabilitation: A cancer patient may experience weakening of the bone marrow, hair follicles, and digestive tract due to the use of radiation therapy and chemotherapy. As a result, they need appropriate supplements, nutritious food, and various vitamins.



References

- <https://www.bowelcanceruk.org.uk/>
- <https://www.cancer.org.au/>
- <https://www.cancer.gov/>
- <https://www.cancercenter.com/>
- <https://www.cdc.gov/>
- <https://www.check4cancer.com/>
- <https://www.health.harvard.edu/>
- <https://hope4cancer.com/>
- <https://www.lifeshellhospital.com/>
- <https://www.leading-medicine-guide.com/en>
- <https://www.mayoclinic.org/>
- <https://my.clevelandclinic.org/>
- <https://stanfordhealthcare.org/>
- <https://sustainableeconomyng.com/>
- <https://www.testing.com/>
- <https://www.uhnm.nhs.uk/>
- <https://www.verywellhealth.com/>
- <https://www.wcrf.org/>

Cancer Prevention: Small Steps, Big Impacts

As we conclude this booklet on cancer prevention, remember that even the smallest steps can lead to significant impacts on your health and well-being. By being informed about cancer, understanding its symptoms, and adopting preventive measures, you are taking proactive steps towards a healthier life.

While cancer is one of the most important health challenges worldwide, increasing awareness and proactive measures can significantly reduce its impact. By educating ourselves and others, recognizing early symptoms, and making informed lifestyle choices, we contribute to the collective effort against this disease.

Thank you for taking the time to read this guide. I hope you found the information valuable and empowering. Together, we can make a difference in the fight against cancer.

“Wishing you good health and well-being”