Cancer

Cancer is the name given to a collection of related diseases. In all types of cancer, some of the body's cells begin to divide without stopping and spread into surrounding tissues.

Cancer can start almost anywhere in the human body, which is made up of trillions of cells. Normally, human cells grow and divide to form new cells as the body needs them. When cells grow old or become damaged, they die, and new cells take their place.

Cancer is a group of diseases involving abnormal cell growth with the potential to invade or spread to other parts of the body. These contrast with benign tumors, which do not spread.[8] Possible signs and symptoms include a lump, abnormal bleeding, prolonged cough, unexplained weight loss and a change in bowel movements. While these symptoms may indicate cancer, they can also have other causes. Over 100 types of cancers affect humans.

Tobacco use is the cause of about 22% of cancer deaths. Another 10% are due to obesity, poor diet, lack of physical activity or excessive drinking of alcohol. Other factors include certain infections, exposure toionizing radiation and environmental pollutants. In the developing world, 15% of cancers are due to infections such as Helicobacter pylori, hepatitis B, hepatitis C, human papillomavirus infection, Epstein–Barr virus and human immunodeficiency virus (HIV). These factors act, at least partly, by changing the genes of a cell. Typically, many genetic changes are required before cancer develops. Approximately 5–10% of cancers are due to inherited genetic defects from a person's parents. Cancer can be detected by certain signs and symptoms orscreening tests. It is then typically further investigated by medical imaging and confirmed by biopsy.

Many cancers can be prevented by not smoking, maintaining a healthy weight, not drinking too much alcohol, eating plenty of vegetables, fruits and whole grains, vaccination against certain infectious diseases, not eating too muchprocessed and red meat and avoiding too much sunlight exposure. Early detection through screening is useful for cervical and colorectal cancer. The benefits of screening in breast cancer are controversial. Cancer is often treated with some combination of radiation therapy, surgery, chemotherapy and targeted therapy. Pain and symptom management are an important part of care. Palliative care is particularly important in

people with advanced disease. The chance of survival depends on the type of cancer and extent of disease at the start of treatment. In children under 15 at diagnosis, the five-year survival rate in the developed world is on average 80%. For cancer in the United States, the average five-year survival rate is 66%.

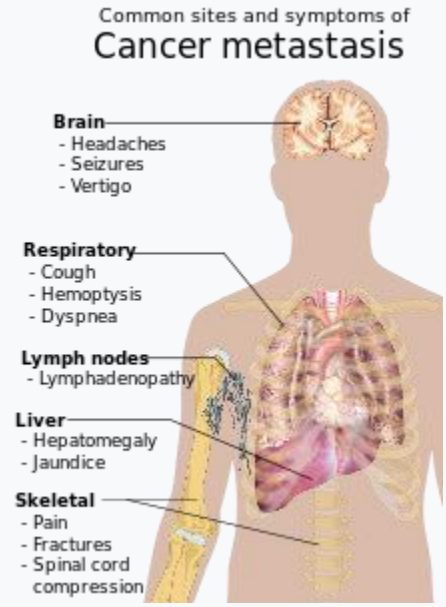
In 2015, about 90.5 million people had cancer. About 14.1 million new cases occur a year (not including skin cancer other than melanoma). It caused about 8.8 million deaths (15.7% of deaths). The most common types of cancer in males are lung cancer, prostate cancer, colorectal cancer and stomach cancer. In females, the most common types are breast cancer, colorectal cancer, lung cancer and cervical cancer. If skin cancer other than melanoma were included in total new cancer cases each year, it would account for around 40% of cases. In children, acute lymphoblastic leukemia and brain tumors are most common, except in Africa wherenon-Hodgkin lymphoma occurs more often. In 2012, about 165,000 children under 15 years of age were diagnosed with cancer. The risk of cancer increases significantly with age, and many cancers occur more commonly in developed countries. Rates are increasing as more people live to an old age and as lifestyle changes occur in the developing world. The financial costs of cancer were estimated at $1.16 trillion USD per year as of 2010.

Cancers are a large family of diseases that involve abnormal cell growth with the potential to invade or spread to other parts of the body. They form a subset of neoplasms. A neoplasm or tumor is a group of cells that have undergone unregulated growth and will often form a mass or lump, but may be distributed diffusely.

All tumor cells show the six hallmarks of cancer. These characteristics are required to produce a malignant tumor. They include:

- Cell growth and division absent the proper signals
- Continuous growth and division even given contrary signals
- Avoidance of programmed cell death
- Limitless number of cell divisions
- Promoting blood vessel construction
- Invasion of tissue and formation of metastases

The progression from normal cells to cells that can form a detectable mass to outright cancer involves multiple steps known as malignant progression.



Symptoms of cancer metastasisdepend on the location of the tumor.

When cancer begins, it produces no symptoms. Signs and symptoms appear as the mass grows or ulcerates. The findings that result depend on the cancer's type and location. Few symptoms are specific. Many frequently occur in individuals who have other conditions. Cancer is a "great imitator". Thus, it is common for people diagnosed with cancer to have been treated for other diseases, which were hypothesized to be causing their symptoms.

People may become anxious or depressed post-diagnosis. The risk of suicide in people with cancer is approximately double.

Local symptoms

Local symptoms may occur due to the mass of the tumor or its ulceration. For example, mass effects from lung cancer can block the bronchus resulting in cough or pneumonia; esophageal cancer can cause narrowing of the esophagus, making it difficult or painful to swallow; and colorectal cancer may lead to narrowing or blockages in the bowel, affecting bowel habits. Masses in breasts or testicles may produce observable lumps. Ulceration can cause bleeding that, if it occurs in the lung, will lead to coughing up blood, in the bowels to anemia or rectal bleeding, in the bladder to blood in the urine and in the uterus to vaginal bleeding. Although

localized pain may occur in advanced cancer, the initial swelling is usually painless. Some cancers can cause a buildup of fluid within the chest or abdomen.

Systemic symptoms

General symptoms occur due to effects that are not related to direct or metastatic spread. These may include: unintentional weight loss, fever, excessive fatigue and changes to the skin. Hodgkin disease, leukemias and cancers of the liver or kidney can cause a persistent fever.

Some cancers may cause specific groups of systemic symptoms, termed paraneoplastic syndrome. Examples include the appearance of myasthenia gravis in thymomaand clubbing in lung cancer

When cancer develops, however, this orderly process breaks down. As cells become more and more abnormal, old or damaged cells survive when they should die, and new cells form when they are not needed. These extra cells can divide without stopping and may form growths called tumors. Many cancers form solid tumors, which are masses of tissue. Cancers of the blood, such as leukemias, generally do not form solid tumors. Cancerous tumors are malignant, which means they can spread into, or invade, nearby tissues. In addition, as these tumors grow, some cancer cells can break off and travel to distant places in the body through the blood or the lymph system and form new tumors far from the original tumor. Unlike malignant tumors, benign tumors do not spread into, or invade, nearby tissues. Benign tumors can sometimes be quite large, however. When removed, they usually don't grow back, whereas malignant tumors sometimes do. Unlike most benign tumors elsewhere in the body, benign brain tumors can be life threatening.

Cancer type

- Acute Lymphoblastic Leukemia (ALL)
- Acute Myeloid Leukemia (AML)
- Adolescents Cancer in
- Adrenocortical Carcinoma
- Childhood Adrenocortical Carcinoma
- AIDS-Relayed Cancers
- Kaposi Sarcoma (soft tissue sarcoma)

- AIDS-Related Lymphoma(Lymphoma)
- Primary CNS Lymphoma (Lymphoma)
- Anal Cancer
- Appendix Cancer
- Astrocytomas Childhood (Brain Cancer)
- Atypical Tetatoid /Rhabdoid Tumor, Childhood, Central Nervous System (Brain Cancer)
- Basal Cell Carcinoma of the Skin
- Bile Duct Cancer
- Bladder Cancer
- Childhood Bladder Cancer
- Bone Cancer(includes Ewing Sarcoma and Osteosarcoma and Malignant Fibrous Histiocytoma)
- Brain Tumors
- Brest Cancer
- Childhood Brest Cancer
- Bronchial Tumors
- Brukitt Lymphoma
- Carcinoid Tumor (Gastrointestinal)
- Childhood Carcinoid Tumor
- Carcinoma unknown primary
- Childhood Carcinoma unknown primary
- Cardiac (Heart) Tumors, Childhood
- Central Nervous System
- Atypical Teratoid/Rhabdoid Tumor, Childhood (brain cancer)
- Embryonal Tumors, Childhood (Brain Cancer)
- Germ Cell Tumor, Childhood (Brain Cancer)
- Primary CNS Lymphoma
- Cervical Cancer
- Childhood Cervical Cancer
- Childhood Cancers

- Cancers of Childhood,
- Cholangiocarcinoma
- Chordoma Childhood
- Chronic Lymphocytic Leukemia (CLL)
- Chronic Myelogenous Leukemia (CML)
- Chronic Myeloproliferative Neoplasma
- Colorectal Cancer
- Childhood Colorectal Cancer
- Craniopharyngioma, Childhood (Brain Cancer)
- Cutaneous T-cell Lympholoma
- Ductal Carcinoma in Situ (DCIS)
- Embryonal Tumors, Central Nervous System, Childhood (Brain Cancer)
- Endometrial Cancer (Uterine Cancer)
- Ependymoma Childhood (Brain Cancer)
- Esophageal Cancer
- Childhood Esophageal Cancer
- Esthesioneuroblastoma (Head and Neck Cancer)
- Ewing Sarcoma (Bone Cancer)
- Extracranial Germ Cell Tumor, Childhood
- Eye Cancer
- Childhood Intraocular Melanoma
- Intraocular Melanoma
- Retinoblastoma
- Fallopian Tube Cancer
- Fibrous Histiocytoma of Bone, Malignant and Osteosarcoma
- Gallbladder Cancer
- Gastric (Stomach) Cancer
- Childhood Gastric (Stomach) Cancer
- Gastrointestinal Carcinoid Tumor
- Gastrointestinal Stromal Tumors (GIST) (Soft Tissue Sarcoma)

- Childhood Gastrointestinal Stromal Tumors
- Germ Cell Tumors
- Childhood Central Nervous System Germ Cell Tumors (Brain Cancer)
- Childhood Extracranial Germ Cell Tumors
- Extragonadal Germ Cell Tumors
- Ovarian Germ Cell Tumors
- Testicular Cancer
- Gestational Trophoblastic Diseases
- Hairy cell Leukemia
- Head and Neck Cancer
- Heart Tumors, Childhood
- Hepatocellular (liver Cancer)
- Histiocytosis, Langerhans Cell
- Hodgkin Lymphoma
- Hypopharyngeal Cancer (Head and Neck Cancer)
- Intraocular Melanoma
- Childhood Intraocular Melanoma
- Islet Cell Tumors, Pancreatic Neuroendocrine Tumors
- Kaposi Sarcoma (Soft Tissue Sarcoma)
- Kidney (Renal Cell) Cancer
- Langerhans Cell Histiocytosis
- Laryngeal Cancer (Head and Neck Canxer)
- Leukemia
- Lip and Oral Cavity Cancer (Head and Neck Cancer)
- Liver Cancer
- Lung Cancer (Non-Small Cell and Small Cell)
- Childhood Lung Cancer
- Lymphoma
- Male Brest Cancer
- Malignant Fibrous Histiocytoma of Bone and Oesteosarcoma

- Melanoma
- Childhood Melanom
- Melanoma, Intraocular (Eye)
- Childhood Intraocular Melanoma - see Unusual Cancers of Childhood
- Merkel Cell Carcinoma (Skin Cancer)
- Mesothelioma, Malignant
- Childhood Mesothelioma - see Unusual Cancers of Childhood
- Metastatic Cancer
- Metastatic Squamous Neck Cancer with Occult Primary (Head and Neck Cancer)
- Midline Tract Carcinoma With NUT Gene Changes
- Mouth Cancer (Head and Neck Cancer)
- Multiple Endocrine Neoplasia Syndromes - see Unusual Cancers of Childhood
- Multiple Myeloma/Plasma Cell Neoplasms
- Mycosis Fungoides (Lymphoma)
- Myelodysplastic Syndromes, Myelodysplastic/Myeloproliferative Neoplasms
- Myelogenous Leukemia, Chronic (CML)
- Myeloid Leukemia, Acute (AML)
- Myeloproliferative Neoplasms, Chronic
- Nasal Cavity and Paranasal Sinus Cancer (Head and Neck Cancer
- Nasopharyngeal Cancer (Head and Neck Cancer)
- Neuroblastoma
- Non-Hodgkin Lymphoma
- Non-Small Cell Lung Cancer
- Oral Cancer, Lip and Oral Cavity Cancer and Oropharyngeal Cancer (Head and Neck Cancer)
- Osteosarcoma and Malignant Fibrous Histiocytoma of Bone
- Ovarian Cancer
- Childhood Ovarian Cancer - see Unusual Cancers of Childhood
- Pancreatic Cancer
- Childhood Pancreatic Cancer - see Unusual Cancers of Childhood

- Pancreatic Neuroendocrine Tumors (Islet Cell Tumors)
- Papillomatosis (Childhood Laryngeal)
- Paraganglioma
- Childhood Paraganglioma - see Unusual Cancers of Childhood
- Paranasal Sinus and Nasal Cavity Cancer (Head and Neck Cancer)
- Parathyroid Cancer
- Penile Cancer
- Pharyngeal Cancer (Head and Neck Cancer)
- Pheochromocytoma
- Childhood Pheochromocytoma - see Unusual Cancers of Childhood
- Pituitary Tumor
- Plasma Cell Neoplasm/Multiple Myeloma
- Pleuropulmonary Blastoma - see Unusual Cancers of Childhood
- Pregnancy and Breast Cancer
- Primary Central Nervous System (CNS) Lymphoma
- Primary Peritoneal Cancer
- Prostate Cancer
- Rectal Cancer
- Recurrent Cancer
- Renal Cell (Kidney) Cancer
- Retinoblastoma
- Rhabdomyosarcoma, Childhood (Soft Tissue Sarcoma)
- Salivary Gland Cancer (Head and Neck Cancer)
- Sarcoma
- Childhood Rhabdomyosarcoma (Soft Tissue Sarcoma)
- Childhood Vascular Tumors (Soft Tissue Sarcoma)
- Ewing Sarcoma (Bone Cancer)
- Kaposi Sarcoma (Soft Tissue Sarcoma)
- Osteosarcoma (Bone Cancer)
- Soft Tissue Sarcoma

- Uterine Sarcoma
- Sézary Syndrome (Lymphoma)
- Skin Cancer
- Childhood Skin Cancer - see Unusual Cancers of Childhood
- Small Cell Lung Cancer
- Small Intestine Cancer
- Soft Tissue Sarcoma
- Squamous Cell Carcinoma of the Skin - see Skin Cancer
- Squamous Neck Cancer with Occult Primary, Metastatic (Head and Neck Cancer)
- Stomach (Gastric) Cancer
- Childhood Stomach (Gastric) Cancer - see Unusual Cancers of Childhood
- T-Cell Lymphoma, Cutaneous - see Lymphoma (Mycosis Fungoides and Sèzary Syndrome)
- Testicular Cancer
- Childhood Testicular Cancer - see Unusual Cancers of Childhood
- Throat Cancer (Head and Neck Cancer)
- Nasopharyngeal Cancer
- Oropharyngeal Cancer
- Hypopharyngeal Cancer
- Thymoma and Thymic Carcinoma
- Thyroid Cancer
- Transitional Cell Cancer of the Renal Pelvis and Ureter (Kidney (Renal Cell) Cancer)
- Unknown Primary, Carcinoma of
- Childhood Cancer of Unknown Primary - see Unusual Cancers of Childhood
- Unusual Cancers of Childhood
- Ureter and Renal Pelvis, Transitional Cell Cancer (Kidney (Renal Cell) Cancer
- Urethral Cancer
- Uterine Cancer, Endometrial
- Uterine Sarcoma
- Vaginal Cancer

- Childhood Vaginal Cancer - see Unusual Cancers of Childhood
- Vascular Tumors (Soft Tissue Sarcoma)
- Vulvar Cancer
- Wilms Tumor and Other Childhood Kidney Tumors
- Young Adults, Cancer in

Differences between Cancer Cells and Normal Cells

Cancer cells differ from normal cells in many ways that allow them to grow out of control and become invasive. One important difference is that cancer cells are less specialized than normal cells. That is, whereas normal cells mature into very distinct cell types with specific functions, cancer cells do not. This is one reason that, unlike normal cells, cancer cells continue to divide without stopping.

In addition, cancer cells are able to ignore signals that normally tell cells to stop dividing or that begin a process known as programmed cell death, or apoptosis, which the body uses to get rid of unneeded cells.

Cancer cells may be able to influence the normal cells, molecules, and blood vessels that surround and feed a tumor—an area known as the microenvironment. For instance, cancer cells can induce nearby normal cells to form blood vessels that supply tumors with oxygen and nutrients, which they need to grow. These blood vessels also remove waste products from tumors.

Cancer cells are also often able to evade the immune system, a network of organs, tissues, and specialized cells that protects the body from infections and other conditions. Although the immune system normally removes damaged or abnormal cells from the body, some cancer cells are able to “hide” from the immune system.

Tumors can also use the immune system to stay alive and grow. For example, with the help of certain immune system cells that normally prevent a runaway immune response, cancer cells can actually keep the immune system from killing cancer cells.

Cancer is a genetic disease—that is, it is caused by changes to genes that control the way our cells function, especially how they grow and divide.

Genetic changes that cause cancer can be inherited from our parents. They can also arise during a person's lifetime as a result of errors that occur as cells divide or because of damage to DNA caused by certain environmental exposures. Cancer-causing environmental exposures include substances, such as the chemicals in tobacco smoke, and radiation, such as ultraviolet rays from the sun. (Our Cancer Causes and Prevention section has more information.)

Each person's cancer has a unique combination of genetic changes. As the cancer continues to grow, additional changes will occur. Even within the same tumor, different cells may have different genetic changes.

In general, cancer cells have more genetic changes, such as mutations in DNA, than normal cells. Some of these changes may have nothing to do with the cancer; they may be the result of the cancer, rather than its cause.
The genetic changes that contribute to cancer tend to affect three main types of genes—proto-oncogenes, tumor suppressor genes, and DNA repair genes. These changes are sometimes called "drivers" of cancer.

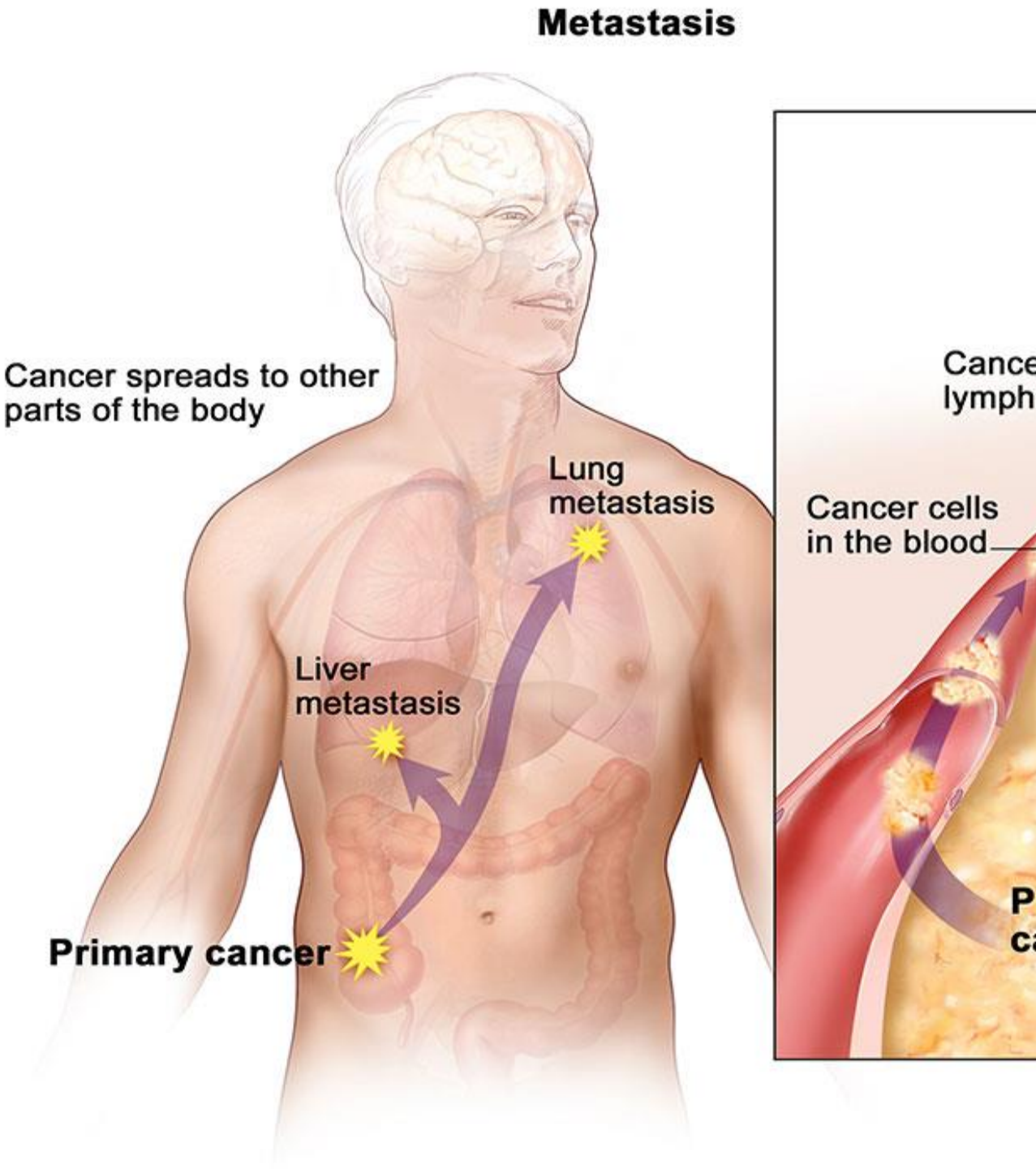
Proto-oncogenes are involved in normal cell growth and division. However, when these genes are altered in certain ways or are more active than normal, they may become cancer-causing genes (or oncogenes), allowing cells to grow and survive when they should not.

Tumor suppressor genes are also involved in controlling cell growth and division. Cells with certain alterations in tumor suppressor genes may divide in an uncontrolled manner.

DNA repair genes are involved in fixing damaged DNA. Cells with mutations in these genes tend to develop additional mutations in other genes. Together, these mutations may cause the cells to become cancerous.

As scientists have learned more about the molecular changes that lead to cancer, they have found that certain mutations commonly occur in many types of cancer. Because of this, cancers are

sometimes characterized by the types of genetic alterations that are believed to be driving them, not just by where they develop in the body and how the cancer cells look under the microscope.



A cancer that has spread from the place where it first started to another place in the body is called metastatic cancer. The process by which cancer cells spread to other parts of the body is called metastasis.

Metastatic cancer has the same name and the same type of cancer cells as the original, or primary, cancer. For example, breast cancer that spreads to and forms a metastatic tumor in the lung is metastatic breast cancer, not lung cancer.

Under a microscope, metastatic cancer cells generally look the same as cells of the original cancer. Moreover, metastatic cancer cells and cells of the original cancer usually have some molecular features in common, such as the presence of specific chromosome changes.

Treatment may help prolong the lives of some people with metastatic cancer. In general, though, the primary goal of treatments for metastatic cancer is to control the growth of the cancer or to relieve symptoms caused by it. Metastatic tumors can cause severe damage to how the body functions, and most people who die of cancer die of metastatic disease.

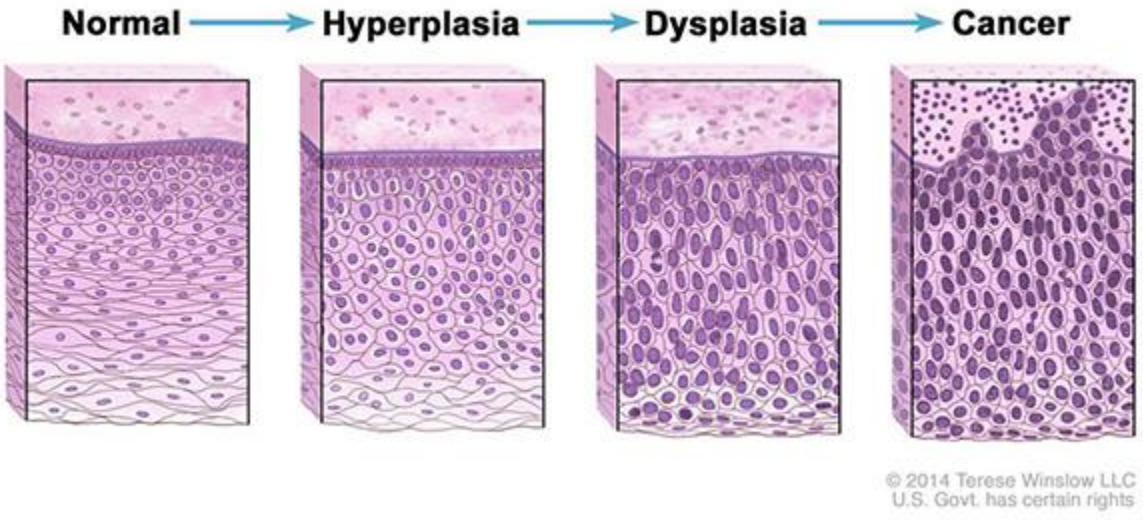
Not every change in the body's tissues is cancer. Some tissue changes may develop into cancer if they are not treated, however. Here are some examples of tissue changes that are not cancer but, in some cases, are monitored:

Hyperplasia occurs when cells within a tissue divide faster than normal and extra cells build up, or proliferate. However, the cells and the way the tissue is organized look normal under a microscope. Hyperplasia can be caused by several factors or conditions, including chronic irritation.

Dysplasia is a more serious condition than hyperplasia. In dysplasia, there is also a buildup of extra cells. But the cells look abnormal and there are changes in how the tissue is organized. In general, the more abnormal the cells and tissue look, the greater the chance that cancer will form.

Some types of dysplasia may need to be monitored or treated. An example of dysplasia is an abnormal mole (called a dysplastic nevus) that forms on the skin. A dysplastic nevus can turn into melanoma, although most do not.

An even more serious condition is carcinoma in situ. Although it is sometimes called cancer, carcinoma in situ is not cancer because the abnormal cells do not spread beyond the original tissue. That is, they do not invade nearby tissue the way that cancer cells do. But, because some carcinomas in situ may become cancer, they are usually treated.



There are more than 100 types of cancer. Types of cancer are usually named for the organs or tissues where the cancers form. For example, lung cancer starts in cells of the lung, and brain cancer starts in cells of the brain. Cancers also may be described by the type of cell that formed them, such as an epithelial cell or a squamous cell.

Carcinoma

Carcinomas are the most common type of cancer. They are formed by epithelial cells, which are the cells that cover the inside and outside surfaces of the body. There are many types of epithelial cells, which often have a column-like shape when viewed under a microscope.

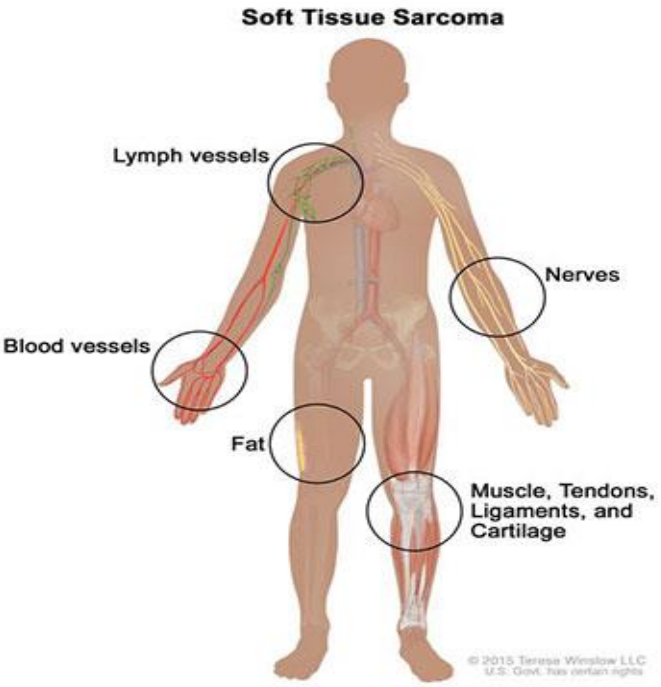
Carcinomas that begin in different epithelial cell types have specific names:

Adenocarcinoma is a cancer that forms in epithelial cells that produce fluids or mucus. Tissues with this type of epithelial cell are sometimes called glandular tissues. Most cancers of the breast, colon, and prostate are adenocarcinomas.

Basal cell carcinoma is a cancer that begins in the lower or basal (base) layer of the epidermis, which is a person's outer layer of skin.

Squamous cell carcinoma is a cancer that forms in squamous cells, which are epithelial cells that lie just beneath the outer surface of the skin. Squamous cells also line many other organs, including the stomach, intestines, lungs, bladder, and kidneys. Squamous cells look flat, like fish scales, when viewed under a microscope. Squamous cell carcinomas are sometimes called epidermoid carcinomas.

Transitional cell carcinoma is a cancer that forms in a type of epithelial tissue called transitional epithelium, or urothelium. This tissue, which is made up of many layers of epithelial cells that can get bigger and smaller, is found in the linings of the bladder, ureters, and part of the kidneys (renal pelvis), and a few other organs. Some cancers of the bladder, ureters, and kidneys are transitional cell carcinomas.



Sarcomas are cancers that form in bone and soft tissues, including muscle, fat, blood vessels, lymph vessels, and fibrous tissue (such as tendons and ligaments).

Osteosarcoma is the most common cancer of bone. The most common types of soft tissue sarcoma are leiomyosarcoma, Kaposi sarcoma, malignant fibrous histiocytoma,liposarcoma, and dermatofibrosarcoma protuberans.
Our page on soft tissue sarcoma has more information.

Cancers that begin in the blood-forming tissue of the bone marrow are called leukemias. These cancers do not form solid tumors. Instead, large numbers of abnormal white blood cells (leukemia cells and leukemic blast cells) build up in the blood and bone marrow, crowding out normal blood cells. The low level of normal blood cells can make it harder for the body to get oxygen to its tissues, control bleeding, or fight infections.

There are four common types of leukemia, which are grouped based on how quickly the disease gets worse (acute or chronic) and on the type of blood cell the cancer starts in (lymphoblastic or myeloid).

Lymphoma is cancer that begins in lymphocytes (T cells or B cells). These are disease-fighting white blood cells that are part of the immune system. In lymphoma, abnormal lymphocytes build up in lymph nodes and lymph vessels, as well as in other organs of the body.

There are two main types of lymphoma:

Hodgkin lymphoma – People with this disease have abnormal lymphocytes that are called Reed-Sternberg cells. These cells usually form from B cells.

Non-Hodgkin lymphoma – This is a large group of cancers that start in lymphocytes. The cancers can grow quickly or slowly and can form from B cells or T cells.

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Multiple myeloma is cancer that begins in plasma cells, another type of immune cell. The abnormal plasma cells, called myeloma cells, build up in the bone marrow and form tumors in bones all through the body. Multiple myeloma is also called plasma cell myeloma and Kahler disease.

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Melanoma

Melanoma is cancer that begins in cells that become melanocytes, which are specialized cells that make melanin (the pigment that gives skin its color). Most melanomas form on the skin, but melanomas can also form in other pigmented tissues, such as the eye.

There are different types of brain and spinal cord tumors. These tumors are named based on the type of cell in which they formed and where the tumor first formed in the central nervous system. For example, an astrocytic tumor begins in star-shaped brain cells called astrocytes, which help keep nerve cells healthy. Brain tumors can be benign (not cancer) or malignant (cancer).

Germ cell tumors are a type of tumor that begins in the cells that give rise to sperm or eggs.Neuroendocrine tumors form from cells that release hormones into the blood in response to a signal from the nervous system. These tumors, which may make higher-than-normal amounts of hormones, can cause many different symptoms. Neuroendocrine tumors may be benign or malignant.

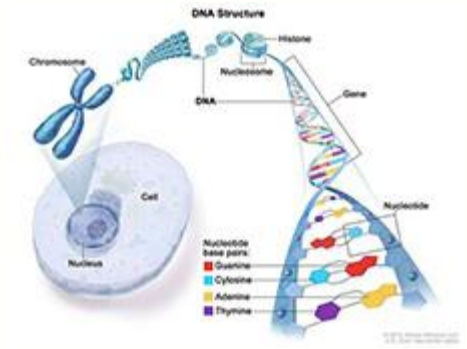
Carcinoid tumors are a type of neuroendocrine tumor. They are slow-growing tumors that are usually found in the gastrointestinal system (most often in the rectum and small intestine). Carcinoid tumors may spread to the liver or other sites in the body, and they may secrete substances such as serotonin or prostaglandins, causing carcinoid syndrome.

Cancer prevention is action taken to lower the risk of getting cancer. This can include maintaining a healthy lifestyle, avoiding exposure to known cancer-causing substances, and taking medicines or vaccines that can prevent cancer from developing.



Risk Factors for Cancer

Information about behaviors, exposures, and other factors that may influence the risk of cancer.



The Genetics of Cancer

Information about genetic changes, how they may be inherited or acquired during a person's life, and how they can increase cancer risk.



Cancer Prevention Overview (PDQ®)

General information about cancer prevention and descriptions of the concepts used in cancer-specific prevention summaries.



Causes and Prevention Research

Find research articles on cancer causes and prevention, which may include news stories, clinical trials, blog posts, and descriptions of active studies.

Cancer can cause many different symptoms. Most often these symptoms are not caused by cancer, but by benign tumors or other problems. If you have symptoms that last for a couple of weeks, your doctor will do a physical exam and order tests or other procedures to find out what is causing your symptoms.



Symptoms

Cancer can cause many different symptoms. Only a doctor can tell if your symptoms are caused by cancer or some other problem.

Staging

Staging is the process of determining details about your cancer, such as tumor size and if it has spread. The stage guides decisions about treatment.

Prognosis

Prognosis describes how serious your cancer is and your chances of survival. Learn about survival statistics and how they are used to estimate prognosis.

Treatments

Innovative research has fueled the development of new medications and treatment technologies.

Doctors usually prescribe treatments based on the type of cancer, its stage at diagnosis, and the person's overall health.

The side effects of chemotherapy include hair loss. However, advances in treatment are improving the outlook for people with cancer.

Below are examples of approaches to cancer treatment:

- Chemotherapy aims to kill cancerous cells with medications that target rapidly dividing cells. The drugs can also help shrink tumors, but the side effects can be severe.
- Hormone therapy involves taking medications that change how certain hormones work or interfere with the body's ability to produce them. When hormones play a significant role, as with prostate and breast cancers, this is a common approach.
- Immunotherapy uses medications and other treatments to boost the immune system and encourage it to fight cancerous cells. Two examples of these treatments are checkpoint inhibitors and adoptive cell transfer.
- Precision medicine, or personalized medicine, is a newer, developing approach. It involves using genetic testing to determine the best treatments for a person's particular presentation of cancer. Researchers have yet to show that it can effectively treat all types of cancer, however.

- Radiation therapy uses high-dose radiation to kill cancerous cells. Also, a doctor may recommend using radiation to shrink a tumor before surgery or reduce tumor-related symptoms.
- Stem cell transplant can be especially beneficial for people with blood-related cancers, such as leukemia or lymphoma. It involves removing cells, such as red or white blood cells, that chemotherapy or radiation has destroyed. Lab technicians then strengthen the cells and put them back into the body.
- Surgery is often a part of a treatment plan when a person has a cancerous tumor. Also, a surgeon may remove lymph nodes to reduce or prevent the disease's spread.
- Targeted therapies perform functions within cancerous cells to prevent them from multiplying. They can also boost the immune system. Two examples of these therapies are small-molecule drugs and monoclonal antibodies.

Doctors will often employ more than one type of treatment to maximize effectiveness.

Types

The most common type of cancer in the U.S. is breast cancer, followed by lung and prostate cancers, according to the National Cancer Institute, which excluded nonmelanoma skin cancers from these findings.



Smoking increases the risk of many different types of cancer.

Each year, more than 40,000 people in the country receive a diagnosis of one of the following types of cancer:

- Adrenal cancer
- Anal cancer
- Appendix cancer
- Bile duct cancer
- Bladder cancer
- Bone cancer
- Brain cancer
- Breast cancer
- Cervical cancer
- Colorectal cancer
- Esophageal cancer
- Gallbladder cancer
- Gestational trophoblastic disease
- Head and neck cancer
- Hodgkin lymphoma
- Intestinal cancer
- Kidney cancer
- Leukemia
- Liver cancer
- Lung cancer
- Melanoma
- Mesothelioma
- Multiple myeloma

- Neuroendocrine tumors
- Non-Hodgkin lymphoma
- Oral cancer
- Ovarian cancer
- Pancreatic cancer
- Prostate cancer
- Sinus cancer
- Skin cancer
- Soft tissue sarcoma
- Spinal cancer
- Stomach cancer
- Testicular cancer
- Throat cancer
- Thyroid cancer
- Uterine cancer
- Vaginal cancer

Other forms are less common. According to the National Cancer Institute, there are over 100 types of cancer.

Cancer development and cell division

Doctors classify cancer by:

- its location in the body
- the tissues that it forms in

For example, sarcomas develop in bones or soft tissues, while carcinomas form in cells that cover internal or external surfaces in the body. Basal cell carcinomas develop in the skin, while adenocarcinomas can form in the breast.

When cancerous cells spread to other parts of the body, the medical term for this is metastasis.

Cancer prevention

Cancer prevention is action taken to lower the risk of getting cancer. This can include maintaining a healthy lifestyle, avoiding exposure to known cancer-causing substances, and taking medicines or vaccines that can prevent cancer from developing.

Between 30-50% of all cancer cases are preventable. Prevention offers the most cost-effective long-term strategy for the control of cancer. National policies and programmes should be implemented to raise awareness, to reduce exposure to cancer risk factors and to ensure that people are provided with the information and support they need to adopt healthy lifestyles.

Worldwide, tobacco use is the single greatest avoidable risk factor for cancer mortality and kills approximately 6 million people each year, from cancer and other diseases. Tobacco smoke has more than 7000 chemicals, at least 250 are known to be harmful and more than 50 are known to cause cancer.

Tobacco smoking causes many types of cancer, including cancers of the lung, oesophagus, larynx (voice box), mouth, throat, kidney, bladder, pancreas, stomach and cervix. Second-hand smoke, also known as environmental tobacco smoke, has been proven to cause lung cancer in non-smoking adults. Smokeless tobacco (also called oral tobacco, chewing tobacco or snuff) causes oral, oesophageal and pancreatic cancer. Nearly 80% of the 1 billion smokers in the world live in low- and middle-income countries.

- Tobacco smoking: causes cancers of the lung, oesophagus, larynx (voice box), mouth, throat, kidney, bladder, pancreas, stomach and cervix;
- Second-hand smoke (also known as environmental tobacco smoke): causes lung cancer in non-smoking adults; and
- Smokeless tobacco (also called oral tobacco, chewing tobacco or snuff): causes oral, oesophageal and pancreatic cancer.

Nearly 80% of the 1 billion smokers in the world live in low- and middle-income countries.

- Tobacco
- Tobacco and cancer: evidence and monitoring

Dietary modification is another important approach to cancer control. There is a link between overweight and obesity to many types of cancer such as oesophagus, colorectum, breast, endometrium and kidney. Diets high in fruits and vegetables may have an independent protective effect against many cancers. Regular physical activity and the maintenance of a healthy body weight, along with a healthy diet, considerably reduce cancer risk. In addition, healthy eating habits that prevent the development of diet-associated cancers will also lower the risk of other noncommunicable diseases.

- WHO global strategy on diet, physical activity and health
- IARC handbooks on weight control and physical activity

Alcohol use is a risk factor for many cancer types including cancer of the oral cavity, pharynx, larynx, oesophagus, liver, colorectum and breast. Risk of cancer increases with the amount of alcohol consumed. For several types of cancer, heavy drinking of alcohol combined with tobacco use substantially increases the risks of cancer. In 2010, alcohol-attributable cancers were estimated to be responsible for 337,400 deaths worldwide, predominantly among men.

- Alcohol
- WHO Global strategy to reduce harmful use of alcohol

In 2012, approximately 15% of all cancers were attributable to infectious agents such as helicobacter pylori, human papilloma virus (HPV), hepatitis B and C, and Epstein-Barr virus. The fraction of infection-attributable cancers varied between countries and development status, from less than 5% in Australia, Canada, New Zealand, the United States and select countries in western and northern Europe to more than 50% in some countries in sub-Saharan Africa. Two-thirds of infection-attributable cancers (1.4 million cases) occur in less developed countries. Vaccines are available for hepatitis B virus and some types of HPV and can reduce the risk of liver and cervical cancers, respectively.

- IARC monograph on biological agents

Pollution of air, water and soil with carcinogenic chemicals contributes to the cancer burden to differing degrees depending on the geographical settings. Outdoor air pollution is classified as carcinogenic, or cancer-causing, for humans. It has been estimated that outdoor air pollution contributed to 3.2 million premature deaths worldwide in 2012 including more than 200,000 lung cancer deaths. Additionally, over 4 million people die prematurely from illness attributable to the household air pollution from cooking with solid fuels, 6% of these deaths are from lung cancer. Indoor air pollution from coal fires doubles the risk of lung cancer, particularly among non-smoking women. Exposure to carcinogens also occurs via the contamination of food, such as aflatoxins or dioxins.

- Environmental pollution
- IARC publication on pollution and cancer

  More than 40 agents, mixtures and exposure circumstances in the working environment are carcinogenic to humans and are classified as occupational carcinogens. Occupational cancers are concentrated among specific groups of the working population, for whom the risk of developing a particular form of cancer may be much higher than for the general population. It is well documented that occupational carcinogens are causally related to lung cancer, mesothelioma, and bladder cancer. For example, mesothelioma (cancer of the outer lining of the lung or chest cavity) is to a large extent caused by work-related exposure to asbestos.

- Occupational health
- IARC monograph on chemical agents and related occupation

  Exposure to all types of ionizing radiation, from both natural and man-made sources, increases the risk of various types of malignancy including leukaemia and a number of solid tumours. Risks increase when the exposure occurs at a young age and also when the exposure amount is higher. Ultraviolet (UV) radiation, and in particular solar radiation, is carcinogenic to humans, causing all major types of skin cancer, such as basal cell carcinoma (BCC), squamous cell carcinoma (SCC) and melanoma. Avoiding excessive exposure, use of sunscreen and protective clothing are effective preventive measures. UV-emitting tanning devices are now also classified as carcinogenic to humans based on their association with skin and ocular melanoma cancers.

Radiation is used in medicine and can help save lives as well as prevent the need for more invasive procedures. However, inappropriate use may cause harm because of unnecessary and unintended radiation doses for patients. Radiologic tests and procedures should be appropriately prescribed and properly performed to reduce unnecessary radiation doses, particularly in children.

Residential exposure can also arise from radon, a naturally radioactive gas sometime present in soil and building materials increase risk of lung cancers. Radon levels in homes can be reduced by improving the ventilation and sealing floors and walls.

- Radiation, ionizing
- Ultraviolet radiation
- Medical radiation
- Radon and health
- IARC monograph on radiation
- Cancer control: Prevention
- Global Action Plan for the Prevention and Control of NCDs 2013-2020
- IARC World Cancer Report
- The IARC/EU code against cancer: 12 ways to reduce your cancer risk
- IARC handbook of cancer prevention series
- IARC obesity and cancer page
- IARC Monographs on the Evaluation of Carcinogenic Risks to humans

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