CONDITION

Cancer

Learn how cancer develops, possible symptoms and risk factors, how it is diagnosed and treated, and when to seek urgent medical care.

WHAT IT IS
Group of diseases with uncontrolled abnormal cell growth

BODY SYSTEM
Any body system

MAIN SYMPTOMS
New lump, unexplained weight loss, ongoing fatigue, unusual bleeding

WHAT CAUSES IT
DNA changes, sometimes inherited or exposure-related

HOW IT IS DIAGNOSED
Biopsy or specialized blood and bone marrow tests

MAIN TREATMENT
Surgery, radiation, systemic therapies, supportive care

CAN IT BE CURED?
Sometimes - depends on type, stage, response

IS IT AN EMERGENCY?
Sometimes - severe breathing difficulty or uncontrolled bleeding

LONG-TERM OUTLOOK
Varies greatly from monitoring to end-of-life care

Overview

Cancer is a group of diseases in which abnormal cells grow without normal control. These cells may invade nearby tissues. Some can also travel through the blood or lymph system and form tumors in other parts of the body. This spread is called metastasis .

Not every growth is cancer. A benign tumor does not invade nearby tissue or spread to distant organs. A malignant tumor is cancer and has the potential to invade or spread. Some cancers, including leukemia, may not form a solid tumor.

Cancer begins when changes in a cell's DNA disrupt the instructions that normally control growth, repair, and cell death. Cancer cells can continue dividing, avoid the body's normal defenses, and affect how tissues work. Cancer that spreads is still named for where it began. For example, breast cancer that reaches the lung is metastatic breast cancer, not lung cancer.

There are many types of cancer. Their behavior, treatment, and outlook can differ greatly. Some grow slowly and may only need monitoring for a time. Others need prompt treatment. The cancer's type, location, stage, cell features, and response to treatment all help guide care.

Finding certain cancers early may make them easier to treat. Screening tests look for cancer or precancerous changes before symptoms develop. Screening is available for only some cancers, and the right tests depend on age, health history, and individual risk.

Symptoms

Cancer can cause many symptoms, but most possible cancer symptoms are more often caused by noncancerous conditions. Symptoms also vary according to where a cancer starts, how large it is, and whether it affects other organs.

Possible warning signs include:

These symptoms do not diagnose cancer. Arrange a routine medical appointment if a new or unexplained symptom persists, returns, or worsens. A clinician can assess whether testing is needed.

Some symptoms require faster attention. Contact a medical professional promptly for significant new bleeding, rapidly worsening pain, new weakness or numbness, or persistent vomiting.

Call emergency services for severe trouble breathing, heavy uncontrolled bleeding, a seizure, sudden confusion, fainting, new one-sided weakness, or severe chest pain. A person receiving cancer treatment should follow the care team's instructions about fever. Fever during treatment can sometimes signal a serious infection and may need urgent assessment.

- A new lump, swelling, or thickened area
- Unexplained weight loss or reduced appetite
- Ongoing fatigue that does not improve with rest
- Persistent or worsening pain
- Unusual bleeding, bruising, or blood in urine or stool
- A lasting cough, hoarseness, or trouble swallowing
- A change in bowel or bladder habits
- A sore that does not heal
- A new skin change or a changing mole

- Repeated fevers or night sweats without a clear cause
- Yellowing of the skin or eyes, called jaundice

Causes and risk factors

Cancer results from DNA changes that allow cells to grow abnormally. These changes may develop over time, result from an exposure, or be inherited from a parent. In many people, there is no single identifiable cause.

A risk factor raises the chance of cancer but does not mean that cancer will develop. Some people with several risk factors never develop cancer, while others develop it without an obvious risk factor.

Important factors include:

Risk can sometimes be reduced by avoiding tobacco, limiting ultraviolet exposure, reducing alcohol use, staying physically active, and receiving recommended vaccines such as HPV and hepatitis B vaccines. Screening and genetic counseling may be appropriate for some people. These steps lower risk but cannot prevent every cancer.

- Age: DNA damage can build up over time, and many cancers become more common with age.
- Tobacco: Smoking and other forms of tobacco increase the risk of several cancers. Secondhand smoke also causes harmful exposure.
- Alcohol: Alcohol increases the risk of several cancers. Risk generally rises with greater use.
- Ultraviolet radiation: Sunlight and indoor tanning can damage skin-cell DNA.
- Infections: Certain infections can contribute to cancer. Examples include human papillomavirus, hepatitis B and C viruses, and Helicobacter pylori bacteria.
- Body weight and activity: Excess body fat and low physical activity are associated with higher risk for some cancers.
- Radiation and harmful substances: Ionizing radiation and some workplace or environmental exposures can increase risk.
- Family history and inherited variants: Some people inherit a gene change that raises their risk. Inheriting such a change does not mean cancer is certain.
- Immune system changes: A weakened immune system may increase the risk of certain cancers.

- Chronic inflammation: Long-term inflammation in some organs can contribute to cell damage.

Diagnosis

There is no single test that detects every cancer. Evaluation usually begins with a medical history and physical examination. The clinician may ask when symptoms began, whether they have changed, and whether cancer or related conditions occur in the family.

Blood and urine tests may identify abnormal blood cells or signs that an organ is not working normally. Imaging tests, such as ultrasound, X-ray, computed tomography, magnetic resonance imaging, or positron emission tomography, can show suspicious areas. Endoscopy uses a thin instrument with a camera to examine areas such as the digestive tract or airways.

A biopsy is often needed to confirm cancer. During a biopsy, a sample of tissue or cells is removed and examined by a pathologist. Some blood cancers may instead be diagnosed through blood, bone marrow, and specialized laboratory tests.

If cancer is found, testing may describe its type, grade, and stage. Grade refers to how abnormal the cells look and may suggest how quickly they could grow. Stage describes the cancer's extent, including whether it has reached nearby lymph nodes or distant organs. Staging systems differ by cancer type.

Cancer cells may also be tested for genes, proteins, or other markers. These results can help identify treatments that are more likely to work. A tumor marker in blood usually cannot diagnose cancer by itself because noncancerous conditions can also affect marker levels.

People may choose to seek a second opinion, especially when the diagnosis is uncertain or several treatment options are available. A second opinion can confirm the pathology and provide another view of the treatment plan.

Treatment and management

Treatment is tailored to the specific cancer and the person's overall health and goals. The aim may be to eliminate the cancer, reduce the chance that it returns, control it for as long as possible, or relieve symptoms. Some slow-growing cancers can be managed with active surveillance, which means scheduled tests and visits without immediate treatment.

Surgery removes cancer from the body and is mainly used for tumors in a defined area. It may also remove nearby lymph nodes or tissue. Radiation therapy uses high-energy radiation to damage cancer cells in a targeted region.

Systemic treatments travel through the bloodstream. Chemotherapy interferes with rapidly dividing cells. Targeted therapy acts on specific features that cancer cells use to grow. Immunotherapy helps the immune system recognize or attack cancer. Hormone therapy blocks hormones that support certain breast, prostate, and other cancers. Some blood cancers may be treated with a stem cell transplant or cellular therapy.

People may receive one treatment or a combination. Treatment can occur before surgery to shrink a tumor, after surgery to lower the risk of recurrence, or as the main treatment. Benefits and side effects vary considerably.

Supportive care helps prevent or manage problems such as pain, nausea, infection, fatigue, poor nutrition, anxiety, and sleep difficulty. Rehabilitation may help with strength, speech, swallowing, or daily activities. People concerned about fertility or sexual health should raise these issues before treatment when possible.

Palliative care focuses on comfort, symptoms, and quality of life. It can be provided at any stage and alongside treatment intended to control or cure cancer. Hospice care is different: it generally supports people near the end of life when the main goal is comfort rather than cancer-directed treatment.

Clinical trials test new treatments or new ways of using established treatments. Participation is voluntary. The care team can explain the purpose, possible benefits, risks, alternatives, and costs of a relevant trial.

Tell the oncology team about all medicines, supplements, and complementary practices. Some products can interfere with treatment or increase side effects. Complementary care should not replace treatments shown to be effective.

Complications

Cancer may affect an organ directly, block a passage, weaken bones, press on nerves, or spread to other tissues. It can also contribute to pain, anemia, blood clots, infection, poor nutrition, or fluid buildup.

Treatment can cause short-term or lasting effects. Possible concerns include infection, bleeding, nerve problems, heart or lung effects, changes in thinking, early menopause, infertility, and development of another cancer. Risks depend on the treatment and are not the same for everyone.

Certain complications are emergencies. Seek immediate care for severe breathing difficulty, uncontrolled bleeding, a seizure, sudden confusion, signs of stroke, or loss of consciousness. New severe back pain with leg weakness, numbness, or loss of bladder or bowel control may

indicate pressure on the spinal cord and requires emergency assessment.

A person being treated for cancer should also contact the oncology team promptly for fever, shaking chills, inability to keep fluids down, new swelling or pain in one limb, or rapidly worsening symptoms.

Follow up

Follow-up continues during treatment and after it ends. Visits may include a symptom review, physical examination, blood tests, or imaging. The schedule depends on the cancer, treatment, risk of recurrence, and the person's health.

A survivorship care plan can summarize the diagnosis and treatment, possible late effects, follow-up schedule, and which clinician manages each part of care. Routine primary care remains important for vaccinations, heart health, bone health, mental health, and screening for other cancers.

Report new or persistent symptoms rather than waiting for the next planned visit. This does not mean that every symptom is a recurrence. Treatment effects and unrelated health conditions can cause similar problems.

Emotional recovery can take time. Fear of recurrence, changes in body image, financial stress, and difficulty returning to work are common concerns to discuss with the care team. Counseling, social work, rehabilitation, support groups, and practical assistance may help.

Use routine appointments for stable symptoms, test review, and long-term planning. Contact the care team sooner for fever during treatment, worsening pain, unusual bleeding, new neurologic symptoms, or difficulty eating or drinking. Use emergency services for severe or sudden symptoms such as major breathing difficulty, heavy bleeding, seizure, or loss of consciousness.

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