

Cancer

Human life begins as a single cell that divides millions of times. Cell division occurs throughout life as old dead cells are replaced by new ones. Sometimes the normal forces regulating cell growth are disrupted. Abnormal cells grow and spread to healthy cells. These *uncontrolled abnormal cell growths* are called **cancers**.

HEALTH TERMS

cancers
tumors
benign
malignant
metastasis
carcinogen
melanoma
biopsy
chemotherapy

HEALTH CONCEPTS

- Risk factors for cancer include heredity, environment, and lifestyle.
- There are seven warning signs of cancer.
- The earlier a cancer is diagnosed, the greater the range of treatment options that are available.



Tumors

All cancers are **tumors**, *masses of tissue*, but not all tumors are cancers. Some tumors are **benign**, or *noncancerous*. Noncancerous tumors are characterized by abnormal cells, but their growth is less aggressive than that of cancerous ones. Also, these tumors are surrounded by membranes that prevent them from spreading.

Malignant, or *cancerous*, tumors—by contrast—have no such membranes. Sometimes cancerous cells break away from a malignant tumor and move through **lymph** or blood vessels to other healthy tissues. This *spread of cancer from the point where it originated to other parts of the body* is known as **metastasis**.

hot link

lymph For more information on lymph and the role of the lymphatic system, see Chapter 17, page 393.

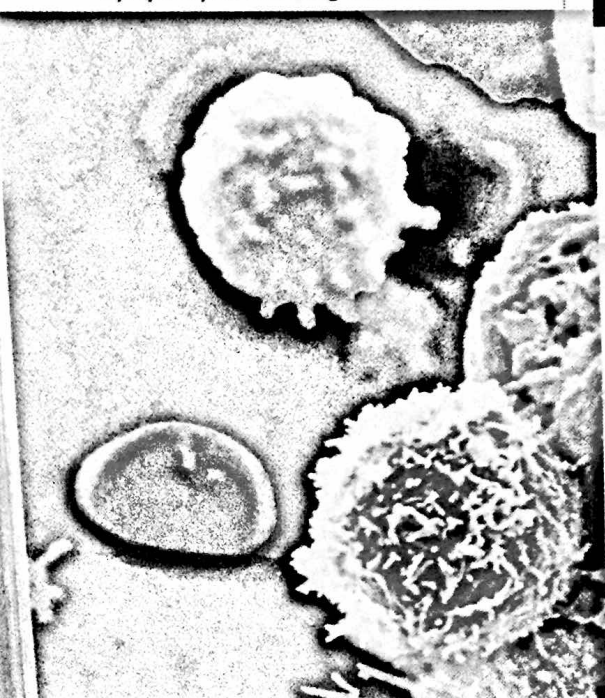


ABCD of Skin Care

Catching melanoma early can mean the difference between life and death. An important part of cancer prevention, therefore, is to periodically check any skin moles for the "ABCDs":

- **Asymmetry**—or unevenness;
- **Border**—look for telltale features such as notched, scalloped, or indistinct edges;
- **Color**—be alert for the following colors and patterns: tan and brown, black, or red and white; and
- **Diameter**—a mole larger than 6 mm should be reported to a physician.

Lymphocytes attacking cancer cell



Causes of Cancer

A number of risk factors have been associated with cancer, among them heredity, environment, and lifestyle. Some cases of cancers are caused by exposure to a **carcinogen** (kar-SIN-uh-jihn), a *cancer-causing substance in the environment*. Carcinogens include chemicals found in tobacco smoke, asbestos, and toxic wastes. Exposure to certain forms of radiation, including X rays, radon, and the sun's ultraviolet rays, is another known cause of cancer. Some viruses and contaminated water have also been found to be carcinogenic.

Not everyone is equally susceptible to the same carcinogens. You can control your exposure to and ingestion of many carcinogens.

Types of Cancer

Cancers are classified in two ways: by the part of the body where the cancer cells first develop, and by the type of body tissue within which the cancer begins.

Cancers that develop in *epithelial tissue*, tissue that forms the skin and linings of body organs, are called carcinomas (KAR-suh-NOH-muhs). Sarcomas are cancers that develop in connective and

Different Types of Cancer

BODY-SITE TYPE	ORGAN(S) MOST OFTEN AFFECTED	OCCURRENCE
Skin cancer	Skin	Most common type in the United States
Digestive system	Colon (large intestine) and rectum (excreting tract)	Most common type in United States next to skin cancer
Respiratory system	Larynx and lungs	Mainly occurs in men: increase in incidence of lung cancer in women
Breast	Breast	Mostly women
Reproductive system	<i>Males</i> —prostate gland <i>Female</i> —cervix, ovaries, uterus	
Blood and lymph system	Bone marrow, lymph (cancer of the bone marrow is called <i>leukemia</i>)	Occurs in men and women

supportive tissues such as bones, muscles, and tendons. Lymphomas are cancers that develop in the lymphatic system. Hodgkin's disease is a type of lymphoma.

Skin Cancer

There are three types of skin cancer: melanoma, the *often deadly type of skin cancer*, the more curable basal cell, and squamous cell skin cancers. There are 100,000 new cases of melanoma every year. While there is an increased awareness about the dangers of exposure to the sun, people develop skin cancers because they fail to protect themselves by using sunscreens.



▼ **When it is used correctly, sunscreen protects your skin from the sun's ultraviolet rays.**

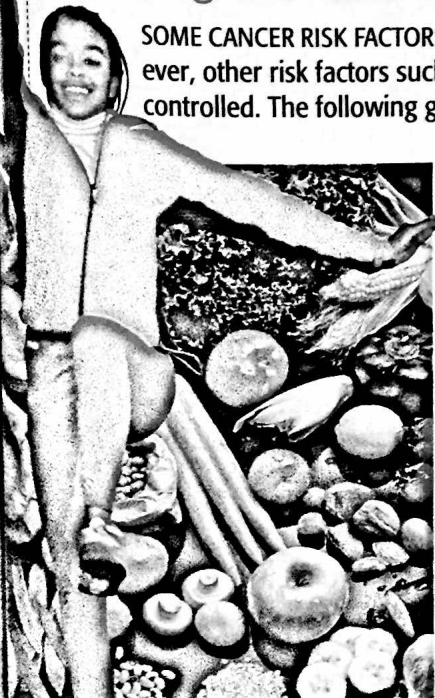
ACTIVITY Find which SPF (sun protection factor) found in sunscreen offers the greatest amount of protection from the sun's rays for the longest period of time. How often should you apply sunscreen while in the sun?

Building Health Skills

Reducing the Risks of Cancer

SOME CANCER RISK FACTORS such as age and family history cannot be changed. However, other risk factors such as eating patterns and use of known carcinogens can be controlled. The following guidelines can help lower your chances of developing cancer.

1. Be physically active.
2. Achieve and maintain a healthful weight.
3. Eat plenty of fruits, vegetables, and whole grains.
4. Reduce the amount of fat in the foods you eat, particularly from animal sources, to no more than 30 percent of your total daily calorie intake.
5. Limit your time in the sun. Use sunscreen when exposed to the sun for any length of time.
6. Avoid using all forms of tobacco and alcohol.
7. Know your body and recognize the warning signs of cancer. Visit your doctor immediately if you suspect a problem.



A Word of Caution About Cancer

Every individual should be alert to the seven warning signs of cancer. As a way of remembering these signs, you might note that their first letters, when combined, spell the word *caution*.

Change in bowel habit (either loose stools or constipation).

A sore that does not heal.

Unusual bleeding or discharge (as from the uterus, bladder, bowels, or with coughing).

Thickening or a lump in the breast or elsewhere (let your doctor decide what the lump means).

Indigestion or difficulty swallowing.

Obvious change in a wart or mole.

Nagging cough or hoarseness.

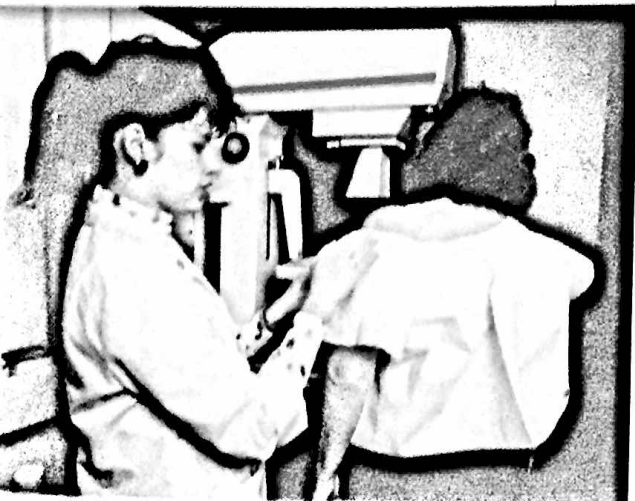
Other symptoms include fatigue and unexplained weight loss. If you experience any of these symptoms, contact your physician.

hot link

reproductive system For more information on the reproductive system and its care, see Chapter 19, page 434.

breast self-examination (BSE) For more information on how to perform breast self-examination, see Chapter 19, page 444.

▼ **Regular mammogram checks provide early detection of breast cancer.**



Lung Cancer

The American Cancer Society reports that cigarette smoking is the single greatest cause of cancer in the United States today, accounting for 85 percent of lung cancer cases among males and 75 percent among females. Males who start smoking before the age of 15 are five times more likely to die of lung cancer than those who started after age 25. Among women, lung cancer has tripled in the last 20 years. This is a direct result of the increasing numbers of women who now smoke. Survival rate is only 13 percent.

Oral Cancer

Oral cancer affects the mouth and throat area. Risk factors for oral cancer include smoking of cigarettes, cigars, or a pipe, and the use of smokeless tobacco. These cancers form where tobacco has touched the person's lips, mouth, and throat tissues. Excessive use of alcohol is another risk factor for oral cancer.

Cancer of the Colon and Rectum

Cancer of the colon and rectum is the third most commonly occurring cancer in the United States today. This cancer usually develops in the lowest part of the colon, near the rectum. As the cancer grows larger, it either blocks the colon or causes bleeding, often during elimination. Cancers of this type are slow to spread. Seeking early medical help greatly increases a person's chance of survival. An eating plan low in fat and high in fiber decreases a person's risk of this cancer.

Reproductive Cancer

Most new cancer cases in the United States are found in the **reproductive system**—breast cancer in women and prostate cancer in men. In women, cancerous tumors can develop in the ovaries and uterus as well. Early detection through regular pelvic examinations and a Pap test has reduced the death rate from uterine and cervical cancers. **Breast self-examination (BSE)**, regular medical checkups, and mammography are ways that breast cancer is detected.

Prostate cancer can often be detected during a rectal exam. Cancer in males can also develop in the testes. Testicular cancer, the leading type of cancer among males aged 15 to 34, can be detected during regular testicular self-examination. Any lumps or thickening detected by a male or female through a reproductive self-examination should be reported to a doctor.

Leukemia

Leukemia is cancer of the blood-forming tissue in the bone marrow. In leukemia, immature white blood cells multiply too rapidly and crowd out mature white cells. This weakens the body's immune system. Although often thought of as primarily a childhood disease, leukemia strikes people of all ages and both genders. Childhood leukemia is very curable, with a success rate of 95 percent.

Detecting Cancer

Early detection of cancer is the most critical factor in combating the disease. Many types of cancer can be detected during a routine physical examination. This is one reason why regular physical check-ups are important. If a tumor is found, a physician may do a biopsy, *a laboratory analysis of a section of tissue taken from a site where abnormal cell growth is suspected*. Ultrasound, which uses sound waves, can be used to locate abnormal growths when they are small and more easily treatable. This diagnostic procedure can also help determine the best method of treatment.

Treating Cancer

Treatment of cancers is directed at confining and killing the cancerous cells. At present, this is accomplished by three basic approaches: surgery, radiation, and chemotherapy.

▼ **Due to constant improvements in medicine and technology, today cancer patients experience a high rate of recovery.**

ACTIVITY Explain ways you could support a friend or relative who is undergoing treatment for cancer.



Surgery

Surgery has been a standard method in removing tumors and affected areas. Today, with improved surgical techniques, cancer patients have a longer life expectancy and an improved quality of life. Whereas amputation used to be standard practice for treating cancer of arm and leg bones, now doctors are able to treat many such cancers by removing only the diseased bone tissue and transplanting healthy tissue from another part of the patient's body.

Radiation

Radiation energy from cobalt or radium can penetrate a tumor. The energy destroys the tumor cells by damaging DNA in the nuclei. DNA is the genetic material responsible for cell division. Radiation therapy is very successful in arresting—or slowing the growth of—certain kinds of cancer, such as cervical cancer. It is also very helpful in areas of the body where surgery is difficult, such as the head and neck.

Chemotherapy

Chemotherapy is *the use of anti-cancer medications in the treatment of cancer*. Its goal is to destroy malignant cells without excessive destruction of normal cells.

Chemotherapy works by interfering with cell division of the cancer cells and, by doing so, preventing the cancer from spreading. Unfortunately, some unpleasant side effects such as nausea and vomiting may occur with the use of these strong medicines. However, new techniques are allowing doctors to administer chemotherapy more safely and with fewer complications and side effects.