What is prevention?

Cancer prevention is action taken to lower the chance of getting cancer. By preventing cancer, the number of new cases of cancer in a group or population is lowered. Hopefully, this will lower the number of deaths caused by cancer.

To prevent new cancers from starting, scientists look at risk factors and protective factors. Anything that increases your chance of developing cancer is called a cancer risk factor; anything that decreases your chance of developing cancer is called a cancer protective factor.

Some risk factors for cancer can be avoided, but many cannot. For example, both smoking and inheriting certain genes are risk factors for some types of cancer, but only smoking can be avoided. Regular exercise and a healthy diet may be protective factors for some types of cancer. Avoiding risk factors and increasing protective factors may lower your risk but it does not mean that you will not get cancer.

Different ways to prevent cancer are being studied, including:

- Changing lifestyle or eating habits.
- Avoiding things known to cause cancer.
- Taking medicines to treat a precancerous condition or to keep cancer from starting.

General Information About Skin Cancer

Skin cancer is a disease in which malignant (cancer) cells form in the tissues of the skin. There are several types of skin cancer. Skin cancer is the most common cancer in the United States.

Skin cancer is a disease in which malignant (cancer) cells form in the tissues of the skin.

The skin is the body’s largest organ. It protects against heat, sunlight, injury, and infection. Skin also helps control body temperature and stores water, fat, and vitamin D. The skin has several layers, but the two main layers are the epidermis (upper or outer layer) and the dermis (lower or inner layer).
The epidermis is made up of 3 kinds of cells:

- **Squamous cells** are the thin, flat cells that make up most of the epidermis.
- **Basal cells** are the round cells under the squamous cells.
- **Melanocytes** are found throughout the lower part of the epidermis. They make melanin, the pigment that gives skin its natural color. When skin is exposed to the sun, melanocytes make more pigment, causing the skin to tan, or darken.

The dermis contains **blood** and **lymph vessels**, **hair follicles**, and **glands**.

See the following PDQ summaries for more information about skin cancer:

- [Skin Cancer Screening](http://www.nci.nih.gov/cancertopics/pdq/prevention/skin/patient/allpages/print)
- [Skin Cancer Treatment](http://www.nci.nih.gov/cancertopics/pdq/prevention/skin/patient/allpages/print)
- [Melanoma Treatment](http://www.nci.nih.gov/cancertopics/pdq/prevention/skin/patient/allpages/print)

There are several types of skin cancer.

The most common types of skin cancer are squamous cell carcinoma, which forms in the squamous cells and basal cell carcinoma, which forms in the basal cells. Squamous cell carcinoma and basal cell carcinoma are also called nonmelanoma skin cancers. **Melanoma**, which forms in the melanocytes, is a less common type of skin cancer.

Skin cancer can occur anywhere on the body, but it is most common in skin that is often exposed to sunlight, such as the face, neck, hands, and arms.

**Skin cancer is the most common cancer in the United States.**

The number of new cases of nonmelanoma skin cancer appears to be increasing every year. The number of new cases of melanoma has stayed about the same since the 1990s. Basal cell carcinoma and squamous cell
carcinoma are the most common types of skin cancer in the United States. These nonmelanoma skin cancers can usually be cured. Melanoma is more likely to spread to nearby tissues and other parts of the body and can be harder to cure. Finding and treating melanoma skin cancer early may help prevent death from melanoma.

**Skin Cancer Prevention**

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**Avoiding risk factors and increasing protective factors may help prevent cancer.**

Avoiding cancer risk factors such as smoking, being overweight, and lack of exercise may help prevent certain cancers. Increasing protective factors such as quitting smoking, eating a healthy diet, and exercising may also help prevent some cancers. Talk to your doctor or other health care professional about how you might lower your risk of cancer.

**Being exposed to ultraviolet radiation is a risk factor that may increase the risk of skin cancer.**

Studies suggest that being exposed to ultraviolet (UV) radiation and the sensitivity of a person’s skin to UV radiation are risk factors for skin cancer. UV radiation is the name for the invisible rays that are part of the energy that comes from the sun. Sunlamps and tanning booths also give off UV radiation.

Risk factors for nonmelanoma and melanoma cancers are not the same:

- Nonmelanoma skin cancer: The total amount of time the skin is exposed to UV radiation may affect the risk of nonmelanoma skin cancer. Spending more time in the sun may increase the risk. People may have an increased risk of nonmelanoma skin cancer if their skin burns easily in the sun.

- Melanoma skin cancer: Being exposed to strong UV radiation for short periods (as with sunburns), especially in childhood and teen years, may increase the risk of melanoma. People may have an increased risk of melanoma from UV radiation if they burn easily in the sun or have freckles or a lot of moles.

**It is not known if protecting skin from sunlight and other UV radiation decreases the risk of skin cancer.**

It is not known if nonmelanoma skin cancer risk is decreased by staying out of the sun, using sunscreens, or wearing long sleeve shirts, long pants, sun hats, and sunglasses when outdoors.

Sunscreen may help decrease the amount of UV radiation to the skin. One study found that wearing sunscreen can help prevent actinic keratoses, scaly patches of skin that may become squamous cell carcinoma. However, the use of sunscreen has not been proven to lower the risk of melanoma skin cancer.

Although protecting the skin and eyes from the sun has not been proven to lower the chance of getting skin cancer, skin experts suggest the following:

- Use sunscreen that protects against UV radiation.
- Do not stay out in the sun for long periods of time, especially when the sun is at its strongest.
- Wear long sleeve shirts, long pants, sun hats, and sunglasses, when outdoors.
Cancer prevention clinical trials are used to study ways to prevent cancer.

Cancer prevention clinical trials are used to study ways to lower the risk of developing certain types of cancer. Some cancer prevention trials are conducted with healthy people who have not had cancer but who have an increased risk for cancer. Other prevention trials are conducted with people who have had cancer and are trying to prevent another cancer of the same type or to lower their chance of developing a new type of cancer. Other trials are done with healthy volunteers who are not known to have any risk factors for cancer.

The purpose of some cancer prevention clinical trials is to find out whether actions people take can prevent cancer. These may include eating fruits and vegetables, exercising, quitting smoking, or taking certain medicines, vitamins, minerals, or food supplements.

New ways to prevent skin cancer are being studied in clinical trials.

Clinical trials are taking place in many parts of the country. Information about clinical trials can be found in the Clinical Trials § section of the NCI Web site. Check for clinical trials in NCI’s PDQ Cancer Clinical Trials Registry for nonmelanoma skin cancer prevention trials § and melanoma prevention trials § that are now accepting patients.

Get More Information From NCI

Call 1-800-4-CANCER

For more information, U.S. residents may call the National Cancer Institute's (NCI's) Cancer Information Service toll-free at 1-800-4-CANCER (1-800-422-6237) Monday through Friday from 9:00 a.m. to 4:30 p.m. A trained Cancer Information Specialist is available to answer your questions.

Chat online

The NCI's LiveHelp® online chat service provides Internet users with the ability to chat online with an Information Specialist. The service is available from 9:00 a.m. to 11:00 p.m. Eastern time, Monday through Friday. Information Specialists can help Internet users find information on NCI Web sites and answer questions about cancer.

Write to us

For more information from the NCI, please write to this address:

NCI Public Inquiries Office
Suite 3036A
6116 Executive Boulevard, MSC8322
Bethesda, MD 20892-8322

Search the NCI Web site

The NCI Web site 8 provides online access to information on cancer, clinical trials, and other Web sites and organizations that offer support and resources for cancer patients and their families. For a quick search, use the search box in the upper right corner of each Web page. The results for a wide range of search terms will include a list of "Best Bets," editorially chosen Web pages that are most closely related to the search term entered.

There are also many other places to get materials and information about cancer treatment and services. Hospitals in your area may have information about local and regional agencies that have information on finances, getting to and from treatment, receiving care at home, and dealing with problems related to cancer treatment.

Find Publications
The NCI has booklets and other materials for patients, health professionals, and the public. These publications discuss types of cancer, methods of cancer treatment, coping with cancer, and clinical trials. Some publications provide information on tests for cancer, cancer causes and prevention, cancer statistics, and NCI research activities. NCI materials on these and other topics may be ordered online or printed directly from the NCI Publications Locator 2. These materials can also be ordered by telephone from the Cancer Information Service toll-free at 1-800-4-CANCER (1-800-422-6237).

**Changes to This Summary (06/08/2009)**

The PDQ cancer information summaries are reviewed regularly and updated as new information becomes available. This section describes the latest changes made to this summary as of the date above.

Editorial changes were made to this summary.

**Questions or Comments About This Summary**

If you have questions or comments about this summary, please send them to Cancer.gov through the Web site’s Contact Form 10. We can respond only to email messages written in English.

**About PDQ**

**PDQ is a comprehensive cancer database available on NCI's Web site.**

PDQ is the National Cancer Institute's (NCI's) comprehensive cancer information database. Most of the information contained in PDQ is available online at NCI's Web site 8. PDQ is provided as a service of the NCI. The NCI is part of the National Institutes of Health, the federal government's focal point for biomedical research.

**PDQ contains cancer information summaries.**

The PDQ database contains summaries of the latest published information on cancer prevention, detection, genetics, treatment, supportive care, and complementary and alternative medicine. Most summaries are available in two versions. The health professional versions provide detailed information written in technical language. The patient versions are written in easy-to-understand, nontechnical language. Both versions provide current and accurate cancer information.

**The PDQ cancer information summaries are developed by cancer experts and reviewed regularly.**

Editorial Boards made up of experts in oncology and related specialties are responsible for writing and maintaining the cancer information summaries. The summaries are reviewed regularly and changes are made as new information becomes available. The date on each summary ("Date Last Modified") indicates the time of the most recent change.

**PDQ also contains information on clinical trials.**

A clinical trial is a study to answer a scientific question, such as whether a certain drug or nutrient can prevent cancer. Trials are based on past studies and what has been learned in the laboratory. Each trial answers certain scientific questions in order to find new and better ways to help cancer patients and those who are at risk for cancer. During prevention clinical trials, information is collected about the effects of a new prevention method and how well it works. If a clinical trial shows that a new method is better than one currently being used, the new method may become "standard." People who are at high risk for a certain type of cancer may want to think about taking part in a clinical trial.

Listings of clinical trials are included in PDQ and are available online at NCI's Web site 11. Descriptions of the trials are available in health professional and patient versions. Many cancer doctors who take part in clinical trials are also listed in PDQ. For more information, call the Cancer Information Service 1-800-4-CANCER (1-800-422-6237).
Glossary Terms

actinic keratosis (ak-TIH-nik KAYR-uh-TOH-sis)

A thick, scaly patch of skin that may become cancer. Also called senile keratosis and solar keratosis.

basal cell (BAY-sul SEL)

A small, round cell found in the lower part (or base) of the epidermis, the outer layer of the skin.

basal cell carcinoma (BAY-sul SEL KAR-sih-NOH-muh)

A type of skin cancer that arises from the basal cells, small round cells found in the lower part (or base) of the epidermis, the outer layer of the skin.

blood

A tissue with red blood cells, white blood cells, platelets, and other substances suspended in fluid called plasma. Blood takes oxygen and nutrients to the tissues, and carries away wastes.

cancer (KAN-ser)

A term for diseases in which abnormal cells divide without control and can invade nearby tissues. Cancer cells can also spread to other parts of the body through the blood and lymph systems. There are several main types of cancer. Carcinoma is a cancer that begins in the skin or in tissues that line or cover internal organs. Sarcoma is a cancer that begins in bone, cartilage, fat, muscle, blood vessels, or other connective or supportive tissue. Leukemia is a cancer that starts in blood-forming tissue such as the bone marrow, and causes large numbers of abnormal blood cells to be produced and enter the blood. Lymphoma and multiple myeloma are cancers that begin in the cells of the immune system. Central nervous system cancers are cancers that begin in the tissues of the brain and spinal cord. Also called malignancy.

cell (sel)

The individual unit that makes up the tissues of the body. All living things are made up of one or more cells.

clinical trial (KLIH-nih-kul TRY-ul)

A type of research study that tests how well new medical approaches work in people. These studies test new methods of screening, prevention, diagnosis, or treatment of a disease. Also called clinical study.

cure

To heal or restore health; a treatment to restore health.

dermis (DER-mis)

The inner layer of the two main layers of the skin. The dermis has connective tissue, blood vessels, oil and sweat glands, nerves, hair follicles, and other structures. It is made up of a thin upper layer called the papillary dermis, and a thick lower layer called the reticular dermis.

diet

The things a person eats and drinks.

epidermis (EH-pih-DER-mis)
The outer layer of the two main layers of the skin.

gene

The functional and physical unit of heredity passed from parent to offspring. Genes are pieces of DNA, and most genes contain the information for making a specific protein.

gland

An organ that makes one or more substances, such as hormones, digestive juices, sweat, tears, saliva, or milk. Endocrine glands release the substances directly into the bloodstream. Exocrine glands release the substances into a duct or opening to the inside or outside of the body.

hair follicle (FOL-i-kul)

A shaft or opening on the surface of the skin through which hair grows.

infection

Invasion and multiplication of germs in the body. Infections can occur in any part of the body and can spread throughout the body. The germs may be bacteria, viruses, yeast, or fungi. They can cause a fever and other problems, depending on where the infection occurs. When the body’s natural defense system is strong, it can often fight the germs and prevent infection. Some cancer treatments can weaken the natural defense system.

lymph vessel (limf ...)

A thin tube that carries lymph (lymphatic fluid) and white blood cells through the lymphatic system. Also called lymphatic vessel.

medicine (MEH-dih-sin)

Refers to the practices and procedures used for the prevention, treatment, or relief of symptoms of a disease or abnormal conditions. This term may also refer to a legal drug used for the same purpose.

melanin (MEH-luh-nin)

A pigment that gives color to skin and eyes and helps protect it from damage by ultraviolet light.

melanocyte (mel-AN-o-site)

A cell in the skin and eyes that produces and contains the pigment called melanin.

melanoma (MEH-luh-NOH-muh)

A form of cancer that begins in melanocytes (cells that make the pigment melanin). It may begin in a mole (skin melanoma), but can also begin in other pigmented tissues, such as in the eye or in the intestines.

mineral (MIH-neh-rul)

In medicine, a mineral is a nutrient that is needed in small amounts to keep the body healthy. Mineral nutrients include the elements calcium, magnesium, and iron.

mole

A benign (not cancer) growth on the skin that is formed by a cluster of melanocytes (cells that make a substance called melanin, which gives color to skin and eyes). A mole is usually dark and may be raised from the skin. Also called nevus.
NCI

NCI, part of the National Institutes of Health of the United States Department of Health and Human Services, is the Federal Government's principal agency for cancer research. It conducts, coordinates, and funds cancer research, training, health information dissemination, and other programs with respect to the cause, diagnosis, prevention, and treatment of cancer. Access the NCI Web site at http://www.cancer.gov. Also called National Cancer Institute.

nonmelanoma skin cancer (... non-MEH-luh-NOH-muh skin KAN-ser)

Skin cancer that forms in basal cells or squamous cells but not in melanocytes (pigment-producing cells of the skin).

organ

A part of the body that performs a specific function. For example, the heart is an organ.

overweight

Being too heavy for one’s height. Excess body weight can come from fat, muscle, bone, and/or water retention. Being overweight does not always mean being obese.

PDQ

PDQ is an online database developed and maintained by the National Cancer Institute. Designed to make the most current, credible, and accurate cancer information available to health professionals and the public, PDQ contains peer-reviewed summaries on cancer treatment, screening, prevention, genetics, complementary and alternative medicine, and supportive care; a registry of cancer clinical trials from around the world; and directories of physicians, professionals who provide genetics services, and organizations that provide cancer care. Most of this information, and more specific information about PDQ, can be found on the NCI's Web site at http://www.cancer.gov/cancertopics/pdq. Also called Physician Data Query.

pigment

A substance that gives color to tissue. Pigments are responsible for the color of skin, eyes, and hair.

precancerous (pre-KAN-ser-us)

A term used to describe a condition that may (or is likely to) become cancer. Also called premalignant.

prevention (pree-VEN-shun)

In medicine, action taken to decrease the chance of getting a disease or condition. For example, cancer prevention includes avoiding risk factors (such as smoking, obesity, lack of exercise, and radiation exposure) and increasing protective factors (such as getting regular physical activity, staying at a healthy weight, and having a healthy diet).

protective factor (proh-TEK-tiv FAK-ter)

Something that may decrease the chance of getting a certain disease. Some examples of protective factors for cancer are getting regular physical activity, staying at a healthy weight, and having a healthy diet.

risk factor (... FAK-ter)

Something that increases the chance of developing a disease. Some examples of risk factors for cancer are age, a family history of certain cancers, use of tobacco products, being exposed to radiation or certain chemicals, infection with certain viruses or bacteria, and certain genetic changes.
scientist

A person who has studied science, especially one who is active in a particular field of investigation.

skin cancer (skin KAN-ser)

Cancer that forms in tissues of the skin. There are several types of skin cancer. Skin cancer that forms in melanocytes (skin cells that make pigment) is called melanoma. Skin cancer that forms in basal cells (small, round cells in the base of the outer layer of skin) is called basal cell carcinoma. Skin cancer that forms in squamous cells (flat cells that form the surface of the skin) is called squamous cell carcinoma. Skin cancer that forms in neuroendocrine cells (cells that release hormones in response to signals from the nervous system) is called neuroendocrine carcinoma of the skin. Most skin cancers form in older people on parts of the body exposed to the sun or in people who have weakened immune systems.

squamous cell (SKWAY-mus sel)

Flat cell that looks like a fish scale under a microscope. These cells cover inside and outside surfaces of the body. They are found in the tissues that form the surface of the skin, the lining of the hollow organs of the body (such as the bladder, kidney, and uterus), and the passages of the respiratory and digestive tracts.

squamous cell carcinoma (SKWAY-mus sel KAR-sih-NOH-muh)

Cancer that begins in squamous cells, which are thin, flat cells that look like fish scales. Squamous cells are found in the tissue that forms the surface of the skin, the lining of the hollow organs of the body, and the passages of the respiratory and digestive tracts. Also called epidermoid carcinoma.

sunscreen

A substance that helps protect the skin from the sun's harmful rays. Sunscreens reflect, absorb, and scatter both ultraviolet A and B radiation to provide protection against both types of radiation. Using lotions, creams, or gels that contain sunscreens can help protect the skin from premature aging and damage that may lead to skin cancer.

supplementation

Adding nutrients to the diet.

tissue (TISH-oo)

A group or layer of cells that work together to perform a specific function.

ultraviolet radiation (UL-tru-VY-oh let RAY-dee-AY-shun)

Invisible rays that are part of the energy that comes from the sun. Ultraviolet radiation also comes from sun lamps and tanning beds. It can damage the skin and cause melanoma and other types of skin cancer. Ultraviolet radiation that reaches the Earth's surface is made up of two types of rays, called UVA and UVB rays. UVB rays are more likely than UVA rays to cause sunburn, but UVA rays pass deeper into the skin. Scientists have long thought that UVB radiation can cause melanoma and other types of skin cancer. They now think that UVA radiation also may add to skin damage that can lead to skin cancer and cause premature aging. For this reason, skin specialists recommend that people use sunscreens that reflect, absorb, or scatter both kinds of ultraviolet radiation. Also called UV radiation.

vitamin (VY-tuh-min)

A nutrient that the body needs in small amounts to function and stay healthy. Sources of vitamins are plant and animal food products and dietary supplements. Some vitamins are made in the human body from food products. Vitamins are either fat-soluble (can dissolve in fats and oils) or water-soluble (can dissolve in water). Excess fat-soluble vitamins are stored in the body’s fatty tissue, but excess water-
soluble vitamins are removed in the urine. Examples are vitamin A, vitamin C, and vitamin E.

**vitamin D (VY-tuh-min ...)**

A nutrient that the body needs in small amounts to function and stay healthy. Vitamin D helps the body use calcium and phosphorus to make strong bones and teeth. It is fat-soluble (can dissolve in fats and oils) and is found in fatty fish, egg yolks, and dairy products. Skin exposed to sunshine can also make vitamin D. Not enough vitamin D can cause a bone disease called rickets. It is being studied in the prevention and treatment of some types of cancer. Also called cholecalciferol.

**Table of Links**

11. http://cancer.gov/clinical_trials