

Skin Cancer

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Cancer

Cancer is a group of more than 100 diseases. When cells in some areas of the body divide without control, the excess tissue that develops is called a tumor. Tumors may be cancerous and sometimes fatal, or they may be quite harmless. A cancerous growth is called a malignant tumor, or malignancy.



Cells of malignant tumors duplicate continuously and very often quickly and without control. One property of a malignant tumor is its ability to undergo metastasis, the spread of cancerous cells to other parts of the body. Initially, malignant cells invade surrounding tissues. As the cancer grows, it expands and begins to compete with normal tissues for space and nutrients. Eventually, the normal tissue decreases in size (atrophies) and dies.

When normal cells of the body divide and migrate (for example, skin cells that multiply to heal a superficial cut), their further migration is inhibited by contact on all sides with other skin cells. This is called contact inhibition. Malignant cells do not conform to the rules of contact inhibition; they have the ability to invade healthy body tissues with very few restrictions.

Following the nearby invasion, some of the malignant cells may detach from the initial tumor and invade a body cavity or enter the blood or lymph (fluid flowing through the lymphatic system to be returned to the blood). This latter condition can lead to widespread metastasis. In the next step in metastasis, those malignant cells that survive in the blood or lymph invade adjacent body tissues and establish secondary tumors.

In the final stage of metastasis, the secondary tumors become vascularized; that is, new networks of blood vessels develop to provide nutrients for their further growth. Any new tissue, whether it results from repairing a wound, normal growth or tumors, requires a blood supply. In all stages of metastasis, the malignant cells resist the anti-tumor defenses of the body. The pain associated with cancer develops when the growth puts pressure on nerves or blocks a passageway so that secretions build up pressure.

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Some cancers, such as blood cancers (leukemia), rarely form a tumor.

Normal Skin

The skin is an organ because it consists of different tissues that are joined to perform specific activities. It is the largest organ of the body in surface area and weight. In adults, the skin covers an area of about 2 square meters (22 square feet), and weighs 4.5 to 5 kg (10 to 11 pounds). It ranges in thickness from 0.5 to 4.0 mm, depending on location. The skin is not just a simple, thin coat that keeps the body together and provides protection. It performs several essential functions.

The skin has three layers – the epidermis, dermis and subcutis.

The top layer of the skin is the epidermis. The epidermis is very thin and serves to protect the deeper layers of skin and the organs. The epidermis itself has three layers: an upper, a middle and a bottom or basal layer composed of basal cells.

These basal cells divide to form keratinocytes (also called squamous cells), which make keratin, a substance that protects deeper layers from injury and microbial invasion and makes the skin waterproof.

Another type of cell, melanocytes, are also present in the epidermis. These cells produce the pigment called melanin. Melanin gives the tan or brown color to skin and helps protect the deeper layers of the skin from the harmful effects of the sun.

A layer called a basement membrane separates the epidermis from the deeper layers of skin.

The middle layer of skin is called the dermis. The dermis is much thicker than the epidermis. It contains hair shafts, sweat glands, blood vessels and nerves.

The last and deepest layer of the skin is called the subcutis. The subcutis keeps in heat and has a shock-absorbing function that helps protect the body's organs from injury.

Skin serves several functions:

1. Regulation of body temperature through control of sweat production.
2. Protection by acting as a barrier that protects underlying tissues from physical abrasion, bacterial invasion, dehydration and ultraviolet (UV) radiation.

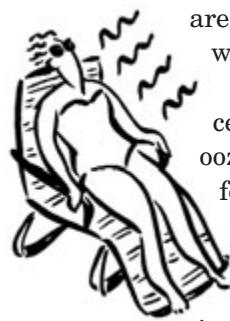
3. Sensation through abundant nerve endings and receptors that detect stimuli related to temperature, touch, pressure and pain.
4. Excretion through sweat of a small amount of salt and several organic compounds.
5. Immunity to foreign invaders is provided by certain cells of the epidermis that are important components of the immune system.
6. Blood reservoir in dermis of the skin that houses extensive networks of blood vessels that carry 8 to 10 percent of the total blood flow in a resting adult.
7. Synthesis of vitamin D begins with activation of a precursor molecule in the skin by UV rays in sunlight.

Skin Tumors

Skin cancer is the most common form of cancer in the United States. There are more than 1 million skin cancers diagnosed annually. There are three primary types of skin cancer: basal cell carcinoma, squamous cell carcinoma and melanoma. Cancer of the skin is the most common, accounting for nearly half of all cancers. Basal cell carcinoma and squamous cell carcinoma, the most common forms, are often grouped as nonmelanoma skin cancer.

Nonmelanoma Skin Cancer

Basal cell carcinoma is the most common form of skin cancer, accounting for about 75 percent of all new cases. It begins in the lowest layer of the epidermis, the basal cell layer. Basal cell carcinomas usually begin on areas exposed to the sun such as the head and neck. This type of cancer can have many different appearances: a red patch or irritated area; a small, pink pearly bump; a white or yellow scarlike area; a smooth growth with a dent in the center; or an open sore that bleeds or oozes. Basal cell carcinoma was once found mostly in middle-aged or older people. Now it is also seen in younger people, perhaps because people are spending more time in the sun.



Basal cell carcinoma is slow growing. It is highly unusual for a basal cell cancer to spread to distant parts of the body. However, if a basal cell cancer is not treated, it can grow into nearby areas and invade the bone or other tissues beneath the skin. Also, new

basal cell cancers can start elsewhere on the skin. Often patients who have one basal cell cancer will develop a new skin cancer within the next five years.

Squamous cell carcinomas, the second most common form of skin cancer, begin in the upper part of the epidermis and account for about 20 percent of all skin cancers. They usually appear on sun-exposed areas of the body such as the face, ear, neck, lips and backs of the hands. They can also begin within scars of skin ulcers elsewhere on the body. Less often, they form in the skin of the genital area.

Squamous cell carcinomas are more likely to invade tissues beneath the skin, and slightly more likely to spread to distant parts of the body, than are basal cell carcinomas. Even so, very few squamous cell skin carcinomas spread to lymph nodes and/or other organs.

There are also several other much less common types of nonmelanoma skin cancers. Together, these account for less than 1 percent of nonmelanoma skin cancers.

The American Cancer Society predicts there will be about 2,780 deaths from nonmelanoma skin cancer in 2008.

The relative five-year survival rate with early detection for people with basal cell carcinoma is greater than 99 percent and for squamous cell carcinoma it is 95 percent. The five-year survival rate refers to the percent of patients who live at least five years after their cancer is found.

Risk Factors for Nonmelanoma Skin Cancer

Too much exposure to strong sunlight:

People who are frequently exposed to strong sunlight without protection have a greater risk.

Fair skin: Whites have a 20 times higher risk than dark-skinned African Americans because of the protection offered by darker skin pigmentation. Whites with fair (light-colored) skin that freckles or burns easily are at especially high risk.

Men: Men are twice as likely as women to have basal cell cancers and three times as likely to have squamous cell cancers of the skin.

Worker exposure: Workers who are exposed to arsenic, industrial tar, coal, paraffin and certain types of oil may also have an increased risk for nonmelanoma skin cancer.

Radiation exposure: People who have had radiation treatment have a higher risk of developing

nonmelanoma skin cancer in the area that received the treatment.

Certain long-term severe skin problems:

Scars from severe burns, areas of skin over severe bone infections and skin damaged by certain severe skin diseases are more likely to develop nonmelanoma skin cancers, although this risk is generally small.

Treatment of psoriasis: Certain treatments given to some patients with psoriasis can increase the risk of getting squamous cell skin cancer.

Weak immune system: People with weakened immune systems are more likely to develop non-melanoma skin cancer.

Melanoma Skin Cancer

Melanoma is a malignant tumor that originates from melanocytes, the cells which produce the pigment melanin that colors our skin, hair and eyes and is heavily concentrated in most moles. Because most cancerous melanoma cells continue to produce melanin, melanoma tumors are often brown or black.

Melanoma is much less common than basal cell and squamous cell skin cancers, and it is almost always curable in its early stages. But it is much more likely than basal or squamous cell cancer to metastasize to other parts of the body.

Melanoma most often appears on the trunk of fair-skinned men and on the lower legs of fair-skinned women, but it can appear other places as well. Having darkly pigmented skin lowers the risk of melanoma, but it does not mean a person with dark skin will not develop melanoma. People with darker skin can have this cancer on the palms of the hands, soles of the feet and under the nails. Rarely, melanomas can form in parts of the body not covered by skin such as the mouth, eyes, vagina, large intestine and other internal organs.

Melanoma accounts for about 4 percent of skin cancer cases but causes about 79 percent of skin cancer deaths. The American Cancer Society estimates that about 62,480 new melanomas will be diagnosed in the United States during 2008. The number of new melanomas diagnosed in the U.S. is increasing. Since 1973, the incidence rate for melanoma (the number of new melanomas diagnosed per 100,000 people each year) has more than doubled from 5.7 to 13.8.

About 8,420 people in the U.S. are expected to die of melanomas during 2008. Since 1973, the mortality

rate for melanoma has increased by 44 percent, from 1.6 to 2.3 per 100,000 people. Mortality rates from melanoma are increasing most rapidly among white men ages 50 and above.

Risk Factors for Melanoma Skin Cancer

Moles: A mole (nevus) is a benign skin tumor. Moles are not usually present at birth, but begin to appear in children and teenagers. Having certain types of moles makes a person more likely to develop melanoma.

One type of mole that increases the risk of melanoma is called dysplastic nevus or atypical mole. Dysplastic nevi look a little like normal moles and a little like melanoma. The moles can appear in areas that are exposed to the sun as well as those areas that are usually covered, such as the buttocks and scalp. They are often larger than other moles. Some people have many dysplastic nevi, and they seem to run in families. People with lots of moles, and those who have some large moles, have an increased risk of melanoma.

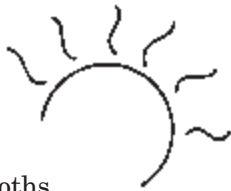
Fair skin: The risk of melanoma is 20 times higher for whites than for African Americans.

Family history: The risk of melanoma is greater if one or more of a person's close relatives (mother, father, brother, sister, child) have been diagnosed with melanoma.

Immune suppression: People who have been treated with medicines that suppress the immune system, such as organ transplant patients, have an increased risk of developing melanoma.

Too much exposure to ultraviolet (UV) radiation:

People with too much exposure to sunlight are at greater risk for all types of skin cancer, including melanoma. Tanning lamps and booths are another source of UV radiation.



Age: About half of all melanomas occur in people over the age of 50. However, young people (ages 20 to 30) can also have melanoma.

Diagnosis

Nonmelanoma and melanoma skin cancer can be found early. The American Cancer Society recommends a cancer-related checkup, including a skin examination, every three years for people between 20 and 40 years old and every year for anyone age 40 and older.

It is also important to check your own skin about once a month. You should know the pattern, freckles and other marks on your skin so you'll notice any changes. Self-examination is best done in front of a full-length mirror. A hand-held mirror can be used for areas that are hard to see. A family member can check areas that may be hard for you to see.

Spots on the skin that change in size, shape or color should be seen by a physician right away. Any unusual sore, lump, blemish, marking or change in the way an area of the skin looks or feels may be a sign of skin cancer.

Friends and family members can also help by telling one another about abnormal-appearing areas of skin. The key warning signs are a new growth, a spot or bump that's getting larger or a sore that doesn't heal within 3 months.

Basal cell carcinomas often appear as flat, scaly, red areas or as small, raised, shiny, waxy areas that may bleed following minor injury. You might see one or more irregular blood vessels or blue, brown or black areas.

Squamous cell carcinomas may appear as growing lumps, often with a rough surface, or as flat, reddish patches in the skin that grow slowly.

Both of these types of nonmelanoma skin cancer may develop as a flat area showing only slight changes from normal skin.

It's important to know the difference between melanoma and an ordinary mole. A normal mole is generally an evenly colored brown, tan or black spot on the skin. It can either be flat or raised. It can be round or oval. Moles are usually less than 1/4 inch in diameter, or about the width of a pencil eraser.

Once a mole has developed, it will usually stay the same size, shape and color for many years. Moles may eventually fade away in older people.

Most people have moles, and almost all moles are harmless. But it is important to recognize changes in a mole, such as its size, shape or color, that suggest a melanoma may be developing.

The list below points out some of the differences between normal moles and melanoma. Watch for these possible signs of melanoma.

- One half of the mole does not match the other half.
- The edges of the mole are ragged or notched.
- The color of the mole is not the same all over. There may be shades of tan, brown or black, and sometimes patches of red, blue or white.

- The mole is wider than about 1/4 inch (although physicians are now finding melanomas that are smaller).

Other important signs of melanoma include changes in size, shape or color of a mole. Some melanomas do not fit the descriptions above, and it may be hard to tell if the mole is normal or not, so anything you are unsure of should be shown to your physician.

Sun Exposure

Excessive and unprotected exposure to the sun can result in premature aging and undesirable changes in skin texture. Such exposure also has been associated with various types of skin cancer, including melanoma, one of the most serious and deadly forms of such cancer.

DNA is the genetic material in our cells. It passes along genetic information to the next generation, making children resemble their parents, for example. In addition to information about hair color, facial features and other aspects of our outward appearance, DNA also contains information that tells the cells of our body how to grow and how to perform the metabolic activities needed for life.

UV radiation can damage DNA. Most melanomas have abnormalities in their chromosomes, which is where the DNA is found. This damage makes the DNA less able to control how and when cells grow and divide. In some situations, this results in the formation of a cancer. Most ultraviolet radiation comes from sunlight, but some may come from artificial sources, such as tanning booths. Some of this exposure may have occurred within the few years before the beginning of the cancer. However, much of it may be due to exposures that happened many years earlier. Children and young adults often receive a lot of intense ultraviolet sun exposure that may not result in an actual cancer for many years or even decades.

You should never get sunburned as sunburn increases the risk of skin cancer. The risk for sunburn is increased for:

- Persons with fair skin, blue eyes and red or blond hair
- Persons taking some medications including sulfa drugs, tetracyclines and some diuretics
- Persons exposed to industrial UV light sources
- Persons exposed to excessive outdoor sunlight

Protect yourself from the sun's UV rays by:

- Avoiding, when possible, outdoor activities during midday, when the sun's rays are strongest. In

Arkansas this usually means the hours between 10 a.m. and 4 p.m.

- Apply sunscreen and lipscreen to exposed body areas. As a rule of thumb, you should always use a broad spectrum sunscreen for blocking UVA as well as UVB rays and lipscreen with at least Sun Protection Factor (SPF) 30. Reapply sunscreen according to manufacturers' directions, especially during peak sun hours or after swimming or exercising.
- Wear loose-fitting clothing made from tightly woven fabric to cover and protect your skin. A typical t-shirt, while more practical than long-sleeved shirts and pants in some situations, offers less protection than SPF 15. A wet t-shirt offers much less protection than a dry one. Use a sunscreen with at least SPF 30 with t-shirts and clothes made with loosely woven fabrics.
- Wear a hat with a brim. If you wear a baseball cap, you should protect the back of your neck and your ears by using sunscreen with at least SPF 30, wearing other clothing or staying in the shade when possible.
- Wear sunglasses to protect your eyes and reduce the risk of cataracts. Wrap-around lenses work best because they also protect the tender skin around the eyes from sun exposure.
- Seek shade. You can reduce your risk of skin damage and skin cancer by seeking shade under an umbrella, tree or other shelter. Seek shade before – not after – you need relief from the sun.



It is important to remember children. According to the American Cancer Society, people receive up to 80 percent of their life's total exposure to UV light by the age of 18. Start early in promoting a healthy attitude about sun protection for your kids.

Here are some everyday actions from the American Cancer Society you can take now to

safeguard the children in your care against the dangers of the sun. Remember: Sun exposure occurs day after day, so think about protection from UV every day, even when it's hazy or cloudy.

- Take care when planning your children's activities. The best way to avoid UV exposure is to limit time in the sun, especially between the hours of 10 a.m. and 4 p.m., when the sun's rays are the strongest.
- Encourage children to play in the shade.
- Whenever possible, plan outdoor activities so as not to be in the sun during the middle of the day.
- When your children are outdoors, be sure their skin is protected. UV rays reflect off water, sand, snow and any light-colored surface, like concrete. UV rays also reach below the water's surface.
- Encourage your children to wear clothing that protects as much skin as possible from the sun. Make it fun to wear hats that completely shade their faces, necks and ears. To protect arms, legs and body, choose comfortable clothing made of tightly woven fabrics that you can't see through when held up to the light. Dark colors provide more protection than light colors.
- Use sunscreen every day on skin that is not protected by clothing or a hat. Choose a sunscreen of SPF 30 or higher. Sunscreen is not recommended for children less than 6 months old. Keep infants in the shade and covered up with comfortable clothing.



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