



Melanoma

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. Melanoma is the most serious type of cancer of the skin.

Each year in the United States, more than 53,600 people learn they have melanoma.

In some parts of the world, especially among Western countries, melanoma is becoming more common every year. In the United States, for example, the percentage of people who develop melanoma has more than doubled in the past 30 years.

The Skin

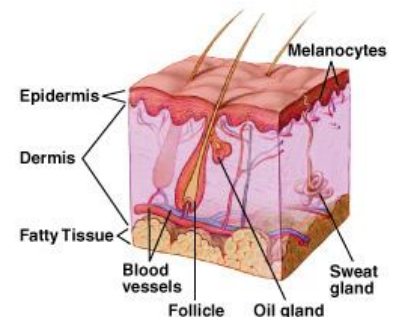
The skin is the body's largest organ. It protects against heat, sunlight, injury, and infection. It helps regulate body temperature, stores water and fat, and produces vitamin D.

The skin has two main layers: the outer epidermis and the inner dermis.

The epidermis is mostly made up of flat, scalelike cells called squamous cells. Round cells called basal cells lie under the squamous cells in the epidermis. The lower part of the epidermis also contains melanocytes.

The dermis contains blood vessels, lymph vessels, hair follicles, and glands. Some of these glands produce sweat, which helps regulate body temperature. Other glands produce sebum, an oily substance that helps keep the skin from drying out. Sweat and sebum reach the skin's surface through tiny openings called pores.

Melanocytes produce melanin, the pigment that gives skin its natural color. When skin is exposed to the sun, melanocytes produce more pigment, causing the skin to tan, or darken. Sometimes, clusters of melanocytes and surrounding tissue form noncancerous growths called moles. (Doctors also call a mole a nevus; the plural is nevi.) Moles are very common. Most people have between 10 and 40 moles. Moles may be pink, tan, brown, or a color that is very close to the person's normal skin tone. People who have dark skin tend to have dark moles. Moles can be flat or raised. They are usually round or oval and smaller than a pencil eraser. They may be present at birth or may appear later on—usually before age 40. They tend to fade away in older people. When moles are surgically removed, they normally do not return.



Understanding Cancer

Cancer begins in cells, the building blocks that make up tissues. Tissues make up the organs of the body. Normally, cells grow and divide to form new cells as the body needs them. When cells grow old, they die, and new cells take their place.

Sometimes this orderly process goes wrong. New cells form when the body does not need them, and old cells do not die when they should. These extra cells can form a mass of tissue called a growth or tumor. Not all tumors are cancer.

Tumors can be benign or malignant:

- Benign tumors are not cancer:
They are rarely life threatening.
Usually, benign tumors can be removed, and they seldom grow back.
Cells from benign tumors do not spread to tissues around them or to other parts of the body.
- Malignant tumors are cancer:
They are generally more serious and may be life threatening.
Malignant tumors usually can be removed, but they can grow back.
Cells from malignant tumors can invade and damage nearby tissues and organs. Also, cancer cells can break away from a malignant tumor and enter the bloodstream or lymphatic system. That is how cancer cells spread from the original cancer (the primary tumor) to form new tumors in other organs. The spread of cancer is called metastasis.
Different types of cancer tend to spread to different parts of the body.

How does melanoma occur?

Melanoma occurs when melanocytes (pigment cells) become malignant. Most pigment cells are in the skin; when melanoma starts in the skin, the disease is called cutaneous melanoma.

Melanoma may also occur in the eye (ocular melanoma or intraocular melanoma). Rarely, melanoma may arise in the meninges, the digestive tract, lymph nodes, or other areas where melanocytes are found. Melanomas that begin in areas other than the skin are not discussed in this booklet. The Cancer Information Service (1-800-4-CANCER) can provide information about these types of melanoma.

Melanoma is one of the most common cancers. The chance of developing it increases with age, but this disease affects people of all ages. It can occur on any skin surface. In men, melanoma is often found on the trunk (the area between the shoulders and the hips) or the head and neck. In women, it often develops on the lower legs. Melanoma is rare in black people and others with dark skin. When it does develop in dark-skinned people, it tends to occur under the fingernails or toenails, or on the palms or soles.

When melanoma spreads, cancer cells may show up in nearby lymph nodes. Groups of lymph nodes are found throughout the body. Lymph nodes trap bacteria, cancer cells, or other harmful substances that may be in the lymphatic system. If the cancer has reached the lymph nodes, it may mean that cancer cells have spread to other parts of the body such as the liver, lungs, or brain. In such cases, the cancer cells in the new tumor are still melanoma cells, and the disease is called metastatic melanoma, not liver, lung, or brain cancer.

Who is at risk?

No one knows the exact causes of melanoma. Doctors can seldom explain why one person gets melanoma and another does not.

However, research has shown that people with certain risk factors are more likely than others to develop melanoma. A risk factor is anything that increases a person's chance of developing a disease. Still, many who do get this disease have no known risk factors.

Studies have found the following risk factors for melanoma:

Dysplastic nevi: Dysplastic nevi are more likely than ordinary moles to become cancerous. Dysplastic nevi are common, and many people have a few of these abnormal moles. The risk of melanoma is greatest for people who have a large number of dysplastic nevi. The risk is especially high for people with a family history of both dysplastic nevi and melanoma.

- Many (more than 50) ordinary moles: Having many moles increases the risk of developing melanoma.
- Fair skin: Melanoma occurs more frequently in people who have fair skin that burns or freckles easily (these people also usually have red or blond hair and blue eyes) than in people with dark skin. White people get melanoma far more often than do black people, probably because light skin is more easily damaged by the sun.
- Personal history of melanoma or skin cancer: People who have been treated for melanoma have a high risk of a second melanoma. Some people develop more than two melanomas. People who had one or more of the common skin cancers (basal cell carcinoma or squamous cell carcinoma) are at increased risk of melanoma.
- Family history of melanoma: Melanoma sometimes runs in families. Having two or more close relatives who have had this disease is a risk factor. About 10 percent of all patients with melanoma have a family member with this disease. When melanoma runs in a family, all family members should be checked regularly by a doctor.
- Weakened immune system: People whose immune system is weakened by certain cancers, by drugs given following organ transplantation, or by HIV are at increased risk of developing melanoma.
- Severe, blistering sunburns: People who have had at least one severe, blistering sunburn as a child or teenager are at increased risk of melanoma. Because of this, doctors advise that parents protect children's skin from the sun. Such protection may reduce the risk of melanoma later in life. Sunburns in adulthood are also a risk factor for melanoma.
- Ultraviolet (UV) radiation: Experts believe that much of the worldwide increase in melanoma is related to an increase in the amount of time people spend in the sun. This disease is also more common in people who live in areas that get large amounts of UV radiation from the sun. In the United States, for example, melanoma is more common in Texas than in Minnesota, where the sun is not as strong. UV radiation from the sun causes premature aging of the skin and skin damage that can lead to melanoma. Artificial sources of UV radiation, such as sunlamps and tanning booths, also can cause skin damage and increase the risk of melanoma. Doctors encourage people to limit their exposure to natural UV radiation and to avoid artificial sources.

Signs and Symptoms

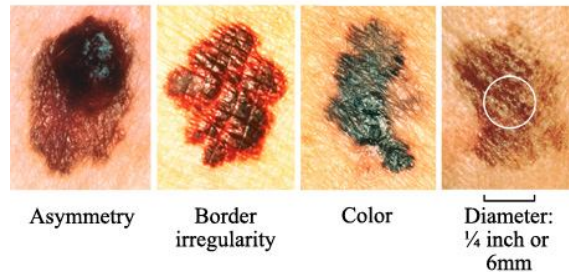
Often, the first sign of melanoma is a change in the size, shape, color, or feel of an existing mole. Most melanomas have a black or blue-black area. Melanoma also may appear as a new mole. It may be black, abnormal, or “ugly looking.”

If you have a question or concern about something on your skin, see your doctor. Do not use the following pictures to try to diagnose it yourself. Pictures are useful examples, but they cannot take the place of a doctor's examination.

Thinking of “ABCD” can help you remember what to watch for:

- Asymmetry—The shape of one half does not match the other.

- Border—The edges are often ragged, notched, blurred, or irregular in outline; the pigment may spread into the surrounding skin.
- Color—The color is uneven. Shades of black, brown, and tan may be present. Areas of white, grey, red, pink, or blue also may be seen.
- Diameter—There is a change in size, usually an increase. Melanomas are usually larger than the eraser of a pencil (1/4 inch or 6 millimeters).



Melanomas can vary greatly in how they look. Many show all of the ABCD features. However, some may show changes or abnormalities in only one or two of the ABCD features. Melanomas in an early stage may be found when an existing mole changes slightly, for example, when a new black area forms. Newly formed fine scales and itching in a mole also are common symptoms of early melanoma. In more advanced melanoma, the texture of the mole may change. For example, it may become hard or lumpy. Melanomas may feel different from regular moles. More advanced tumors may itch, ooze, or bleed. But melanomas usually do not cause pain. A skin examination is often part of a routine checkup by a health care provider. People also can check their own skin for new growths or other changes. Changes in the skin, such as a change in a mole, should be reported to the health care provider right away. The person may be referred to a dermatologist, a doctor who specializes in diseases of the skin. Melanoma can be cured if it is diagnosed and treated when the tumor is thin and has not deeply invaded the skin. However, if a melanoma is not removed at its early stages, cancer cells may grow downward from the skin surface and invade healthy tissue. When a melanoma becomes thick and deep, the disease often spreads to other parts of the body and is difficult to control. People who have had melanoma have a high risk of developing a new melanoma. People at risk for any reason should check their skin regularly and have regular skin exams by a health care provider.

How is melanoma diagnosed?

If the doctor suspects that a spot on the skin is melanoma, the patient will need to have a biopsy. A biopsy is the only way to make a definite diagnosis. In this procedure, the doctor tries to remove all of the suspicious-looking growth. This is an excisional biopsy. If the growth is too large to be removed entirely, the doctor removes a sample of the tissue. The doctor will never "shave off" or cauterize a growth that might be melanoma.

A biopsy can usually be done in the doctor's office using local anesthesia. A pathologist then examines the tissue under a microscope to check for cancer cells. Sometimes it is helpful for more than one pathologist to check the tissue for cancer cells.

How is melanoma staged?

If the diagnosis is melanoma, the doctor needs to learn the extent, or stage, of the disease before planning treatment. Staging is a careful attempt to learn how thick the tumor is, how deeply the melanoma has invaded the skin, and whether melanoma cells have spread to nearby lymph nodes or other parts of the body. The doctor may remove nearby lymph nodes to check for cancer cells. (Such surgery may be considered part of the treatment because removing cancerous lymph nodes may help control the disease.) The doctor also does a careful physical exam and, if the tumor is thick, may order chest x-rays, blood tests, and scans of the liver, bones, and brain.

The following stages are used for melanoma:

- Stage 0: In stage 0, the melanoma cells are found only in the outer layer of skin cells and have not invaded deeper tissues.
- Stage I: Melanoma in stage I is thin:
The tumor is no more than 1 millimeter (1/25 inch) thick. The outer layer (epidermis) of skin may appear scraped. (This is called an ulceration).
Or, the tumor is between 1 and 2 millimeters (1/12 inch) thick. There is no ulceration.
The melanoma cells have not spread to nearby lymph nodes.
- Stage II: The tumor is at least 1 millimeter thick:
The tumor is between 1 and 2 millimeters thick. There is ulceration.
Or, the thickness of the tumor is more than 2 millimeters. There may be ulceration.
The melanoma cells have not spread to nearby lymph nodes.
- Stage III: The melanoma cells have spread to nearby tissues:
The melanoma cells have spread to one or more nearby lymph nodes.
Or, the melanoma cells have spread to tissues just outside the original tumor but not to any lymph nodes.
- Stage IV: The melanoma cells have spread to other organs, to lymph nodes, or to skin areas far away from the original tumor.
- Recurrent: Recurrent disease means that the cancer has come back (recurred) after it has been treated. It may have come back in the original site or in another part of the body.

What is the treatment?

People with melanoma may have surgery, chemotherapy, biological therapy, or radiation therapy. Patients may have a combination of treatments.

Surgery is the usual treatment for melanoma. The surgeon removes the tumor and some normal tissue around it. This procedure reduces the chance that cancer cells will be left in the area. The width and depth of surrounding skin that needs to be removed depends on the thickness of the melanoma and how deeply it has invaded the skin:

- The doctor may be able to completely remove a very thin melanoma during the biopsy. Further surgery may not be necessary.
- If the melanoma was not completely removed during the biopsy, the doctor takes out the remaining tumor. In most cases, additional surgery is performed to remove normal-looking tissue around the tumor (called the margin) to make sure all melanoma cells are removed. This is often necessary, even for thin melanomas. If the melanoma is thick, the doctor may need to remove a larger margin of tissue.

If a large area of tissue is removed, the surgeon may do a skin graft. For this procedure, the doctor uses skin from another part of the body to replace the skin that was removed.

Lymph nodes near the tumor may be removed because cancer can spread through the lymphatic system. If the pathologist finds cancer cells in the lymph nodes, it may mean that the disease has also spread to other parts of the body. Two procedures are used to remove the lymph nodes:

- Sentinel lymph node biopsy—The sentinel lymph node biopsy is done after the biopsy of the melanoma but before the wider excision of the tumor. A radioactive substance is injected near the melanoma. The surgeon follows the movement of the substance on a computer screen. The first lymph node(s) to take up the substance is called the sentinel lymph node(s). (The imaging study is called lymphoscintigraphy. The procedure to identify the sentinel node(s) is called sentinel lymph node mapping.) The surgeon removes the sentinel node(s) to check for cancer cells.

If a sentinel node contains cancer cells, the surgeon removes the rest of the lymph nodes in the area. However, if a sentinel node does not contain cancer cells, no additional lymph nodes are removed.

- Lymph node dissection—The surgeon removes all the lymph nodes in the area of the melanoma.

Therapy may be given after surgery to kill cancer cells that remain in the body. This treatment is called adjuvant therapy. The patient may receive biological therapy.

Surgery is generally not effective in controlling melanoma that has spread to other parts of the body. In such cases, doctors may use other methods of treatment, such as chemotherapy, biological therapy, radiation therapy, or a combination of these methods.

Followup Care

Melanoma patients have a high risk of developing new melanomas. Some also are at risk of a recurrence of the original melanoma in nearby skin or in other parts of the body.

To increase the chance of detecting a new or recurrent melanoma as early as possible, patients should follow their doctor's schedule for regular checkups. It is especially important for patients who have dysplastic nevi and a family history of melanoma to have frequent checkups. Patients also should examine their skin. They should follow their doctor's advice about how to reduce their chance of developing another melanoma. The chance of recurrence is greater for patients whose melanoma was thick or had spread to nearby tissue than for patients with very thin melanomas. Followup care for those who have a high risk of recurrence may include x-rays, blood tests, and scans of the chest, liver, bones, and brain.

The NCI has prepared a booklet for people who have completed their treatment to help answer questions about followup care and other concerns. Facing Forward Series: Life After Cancer Treatment provides tips for getting the most out of medical visits. It describes the kinds of help people may need.

This information is from:



Information specialists at the NCI's [Cancer Information Service](#) at 1-800-4-CANCER can answer questions about melanoma and can send NCI materials. They can also send up-to-date treatment information from NCI's [PDQ®](#) database. In addition, many NCI publications and fact sheets are on the Internet at <http://www.cancer.gov/publications>. People in the United States and its territories may use this Web site to order publications. This Web site also explains how people outside the United States can mail or fax their requests for NCI publications.