



Melanoma

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CANCER CENTER

Overview

Key Points

- Melanoma is a disease in which malignant (cancer) cells form in melanocytes (cells that color the skin).
- There are different types of cancer that start in the skin.
- Melanoma can occur anywhere on the skin.
- Unusual moles, exposure to sunlight, and health history can affect the risk of melanoma.
- Signs of melanoma include a change in the way a mole or pigmented area looks.
- Tests that examine the skin are used to detect and diagnose melanoma.
- Certain factors affect prognosis (chance of recovery) and treatment options.

Melanoma Is a Disease in Which Malignant (Cancer) Cells Form in Melanocytes (Cells That Color 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). Skin cancer begins in the epidermis, which is made up of three kinds of cells:

- **Squamous cells:** Thin, flat cells that form the top layer of the epidermis.
- **Basal cells:** Round cells under the squamous cells.
- **Melanocytes:** Cells that make melanin and are found in the lower part of the epidermis. Melanin is the pigment that gives skin its natural color. When skin is exposed to the sun or artificial light, melanocytes make more pigment and cause the skin to darken.

The number of new cases of melanoma has been increasing over the last 40 years. Melanoma is most common in adults, but it is sometimes found in children and adolescents.



There Are Different Types of Cancer That Start in the Skin

There are two main forms of skin cancer: nonmelanoma and melanoma.

The most common types of skin cancer are basal cell carcinoma and squamous cell carcinoma. They are nonmelanoma skin cancers. Nonmelanoma skin cancers rarely spread to other parts of the body.

Melanoma is a rare form of skin cancer. It is more likely to invade nearby tissues and spread to other parts of the body than other types of skin cancer. When melanoma starts in the skin, it is called cutaneous melanoma.

Melanoma may also occur in mucous membranes (thin, moist layers of tissue that cover surfaces such as the lips). Melanoma can be found at the back of the eye. This is why eye exams are important.

Melanoma Can Occur Anywhere on the Skin

In men, melanoma is often found on the trunk (the area from the shoulders to the hips) or the head and neck. In women, melanoma forms most often on the arms and legs.

When melanoma occurs in the eye, it is called intraocular or ocular melanoma.

Unusual Moles, Exposure to Sunlight, and Health History Can Affect the Risk of Melanoma

Anything that increases your risk of getting a disease is called a risk factor. Having a risk factor does not mean that you will get cancer; not having risk factors does not mean that you will not get cancer. Talk with your doctor if you think you may be at risk.

Risk factors for melanoma include the following:

- Having a fair complexion, which includes the following:
 - Fair skin that freckles and burns easily, does not tan, or tans poorly.
 - Blue, green, or other light-colored eyes.
 - Red or blond hair.
- Being exposed to natural sunlight or artificial sunlight (such as from tanning beds).
- Being exposed to certain factors in the environment (in the air, your home or workplace, and your food and water). Some of the environmental risk factors for melanoma are radiation, solvents, vinyl chloride, and PCBs.
- Having a history of many blistering sunburns, especially as a child or teenager.
- Having several large or many small moles.
- Having a family history of unusual moles (atypical nevus syndrome).
- Having a family or personal history of melanoma.

- Being white.
- Having a weakened immune system.
- Having certain changes in the genes that are linked to melanoma.

Being white or having a fair complexion increases the risk of melanoma, but anyone can have melanoma, including people with dark skin.

Signs of Melanoma Include a Change in the Way a Mole or Pigmented Area Looks

These and other signs and symptoms could be signs of melanoma or other conditions.

- A mole that:
 - Changes in size, shape, or color.
 - Has irregular edges or borders.
 - Is more than one color.
 - Is asymmetrical (if the mole is divided in half, the 2 halves are different in size or shape).
 - Itches.
 - Oozes, bleeds, or is ulcerated (a hole forms in the skin when the top layer of cells breaks down and the tissue below shows through).
- A change in pigmented (colored) skin.
- Satellite moles (new moles that grow near an existing mole).

Tests That Examine the Skin Are Used to Detect (Find) and Diagnose Melanoma

If a mole or pigmented area of the skin changes or looks abnormal, the following tests and procedures can help find and diagnose melanoma:

- **Skin exam:** A provider checks the skin for moles, birthmarks, or other pigmented areas that look abnormal in color, size, shape, or texture.
- **Biopsy:** A procedure to remove the abnormal tissue and a small amount of normal tissue around it. A pathologist looks at the tissue under a microscope to check for cancer cells. It can be hard to tell the difference between a colored mole and an early melanoma lesion. The tissue may be checked by a second pathologist. If the abnormal mole or lesion is cancer, the sample of tissue may also be tested for certain gene changes.

Certain Factors Affect Prognosis (Chance of Recovery) and Treatment Options

The prognosis (chance of recovery) and treatment options depend on the following:

- The thickness of the tumor and where it is in the body.
- How quickly the cancer cells are dividing.
- Whether there was bleeding or ulceration of the tumor.
- How much cancer is in the lymph nodes.
- The number of places cancer has spread to in the body.

- The level of lactate dehydrogenase (LDH) in the blood.
- Whether the cancer has certain mutations (changes) in a gene called BRAF.
- Your age and general health.

Tests to Find, Diagnose, and Monitor Melanoma

Not every person needs every test or procedure.

Physical Exam and History

Lymph node mapping and sentinel lymph node biopsy: Procedures in which a radioactive substance and/or blue dye is injected near the tumor. The substance or dye flows through lymph ducts to the sentinel node or nodes (the first lymph node or nodes where cancer cells are likely to spread). The surgeon removes only the nodes with the radioactive substance or dye. A pathologist views a sample of tissue under a microscope to check for cancer cells. If no cancer cells are found, it may not be necessary to remove more nodes.

CT scan (CAT scan): Computerized tomography, a procedure that makes a series of detailed pictures of areas inside the body taken from different angles. The pictures are made by a computer linked to an x-ray machine. A dye may be injected into a vein or swallowed to help the organs or tissues show up more clearly.

PET scan (positron emission tomography scan):

A procedure to find malignant tumor cells in the body. A small amount of radioactive glucose (sugar) is injected into a vein. The PET scanner rotates around the body and makes a picture of where glucose is being used in the body. Malignant tumor cells show up brighter in the picture because they are more active and take up more glucose than normal cells do.

MRI (magnetic resonance imaging) with gadolinium:

A procedure that uses a magnet, radio waves, and a computer to make a series of detailed pictures of areas inside the body, such as the brain. A substance called gadolinium is injected into a vein. The gadolinium collects around the cancer cells so they show up brighter in the picture. This procedure is also called nuclear magnetic resonance imaging (NMRI).

Blood chemistry studies: A procedure in which a blood sample is checked to measure the amounts of certain substances released into the blood by organs and tissues in the body. For melanoma, the blood is checked for an enzyme called lactate dehydrogenase (LDH). LDH levels that are higher than normal may be a sign of metastatic melanoma. The LDH can rise for many other reasons as well.

There Are Three Ways That Cancer Spreads in the Body

Cancer can spread through tissue, the lymph system, and the blood:

- **Tissue.** The cancer spreads from where it began by growing into nearby areas.
- **Lymph system.** The cancer spreads from where it began by getting into the lymph system. The cancer travels through the lymph vessels to other parts of the body.

- **Blood.** The cancer spreads from where it began by getting into the blood. The cancer travels through the blood vessels to other parts of the body.

When cancer spreads to another part of the body, it is called metastasis.

The metastatic tumor is the same type of cancer as the primary tumor. For example, if melanoma spreads to the lung, the cancer cells in the lung are actually melanoma cells. The disease is metastatic melanoma, not lung cancer.

The process used to find out if cancer has spread within the skin or to other parts of the body is called staging. The information gathered from the staging process determines the stage of the disease. Not all skin cancers need a staging work-up.

The Method Used to Stage Melanoma Is Based Mainly on the Thickness of the Tumor and Whether Cancer Has Spread to Lymph Nodes or Other Parts of the Body

The staging of melanoma depends on the following:

- The thickness of the tumor. The thickness is described using the Breslow scale.
- Whether the tumor is ulcerated (has broken through the skin).
- Whether the tumor has spread to the lymph nodes and if the lymph nodes are joined together (matted).
- Whether the tumor has spread to other parts of the body.

The Following Are Stages (Amounts of Disease) Are Used for Melanoma:

Stage 0 (Melanoma in Situ)

In stage 0, abnormal melanocytes are found in the epidermis. Stage 0 is also called melanoma in situ.

Stage I

In stage I, cancer has formed. Stage I is divided into stages IA and IB.

- **Stage IA:** In stage IA, the tumor is not more than 1 millimeter thick, with no ulceration.
- **Stage IB:** In stage IB, the tumor is either:
 - Not more than 1 millimeter thick and it has ulceration; or
 - More than 1 but not more than 2 millimeters thick, with no ulceration.

Stage II (2)

Stage II is divided into stages IIA, IIB, and IIC.

- **Stage IIA:** In stage IIA, the tumor is either:
 - More than 1 but not more than 2 millimeters thick, with ulceration; or
 - More than 2 but not more than 4 millimeters thick, with no ulceration.
- **Stage IIB:** In stage IIB, the tumor is either:
 - More than 2 but not more than 4 millimeters thick, with ulceration; or
 - More than 4 millimeters thick, with no ulceration.

- **Stage IIC:** In stage IIC, the tumor is more than 4 millimeters thick, with ulceration.

Stage III (3)

In stage III, the tumor may be any thickness, with or without ulceration. One or more of the following is true:

- Cancer has spread to one or more lymph nodes.
- Lymph nodes are joined together (matted).
- Cancer is in a lymph vessel between the primary tumor and nearby lymph nodes. The cancer is more than 2 centimeters away from the primary tumor.
- Very small tumors are found on or under the skin, not more than 2 centimeters away from the primary tumor.

Stage IV (4)

In stage IV, the cancer has spread to other places in the body, such as the lung, liver, brain, bone, soft tissue, or gastrointestinal (GI) tract. Cancer may have spread to places in the skin far away from where it first started.

Recurrent Melanoma

Recurrent melanoma is cancer that has recurred (come back) after it has been treated. The cancer may come back in the area where it first started or in other parts of the body, such as the lungs or liver.

Treatment Option Overview

Key Points to Learn in This Section

There are different types of treatment.

Five standard treatments are used:

- Surgery
- Chemotherapy
- Radiation therapy
- Immunotherapy
- Targeted therapy

Treatment for melanoma may cause side effects.

Clinical Trials:

You can enter clinical trials before, during, or after starting your cancer treatment.

Follow-up tests may be needed.

Five Types of Standard Treatments Are Used:

Surgery

Surgery to remove the tumor is the primary treatment of all stages of melanoma. A wide local excision is used to remove the melanoma and some of the normal tissue around it. Skin grafting (taking skin from another part of the body to replace the skin that is removed) may be done to cover the wound caused by surgery.

For some cancers, it is important to check whether cancer has spread to the lymph nodes. Lymph node mapping and sentinel lymph node biopsy are done to check for cancer in the sentinel lymph node (the first lymph node the cancer is likely to spread to from the tumor) during surgery. A radioactive substance and/or blue dye is injected near the tumor. The substance or dye flows through the lymph ducts to the lymph nodes. The first lymph node to receive the substance or dye is removed. A pathologist views the tissue under a microscope to look for cancer cells. If cancer cells are found, more lymph nodes will be removed and tissue samples will be checked for signs of cancer. This is called a lymphadenectomy.

Even if the doctor removes all the melanoma that can be seen at the time of surgery, some patients may be given chemotherapy after surgery to kill any cancer cells that are left. Chemotherapy given after surgery, to lower the risk that the cancer will come back, is called adjuvant therapy.

Surgery to remove cancer that has spread to the lymph nodes, lung, gastrointestinal (GI) tract, bone, or brain may be done to improve the patient's quality of life by controlling symptoms.

Chemotherapy

Chemotherapy is a cancer treatment that uses drugs to stop the growth of cancer cells, either by killing the cells or by stopping them from dividing.

- **Systemic chemotherapy:** When chemotherapy is taken by mouth or injected into a vein or muscle, the drugs enter the bloodstream and can reach cancer cells throughout the body.
- **Regional chemotherapy:** When chemotherapy is placed directly into the cerebrospinal fluid, an organ, or a body cavity such as the abdomen, the drugs mainly affect cancer cells in those areas.

One type of regional chemotherapy is hyperthermic isolated limb perfusion. With this method, anticancer drugs go directly to the arm or leg the cancer is in. The flow of blood to and from the limb is temporarily stopped with a tourniquet. A warm solution with the anticancer drug is put directly into the blood of the limb. This gives a high dose of drugs to the area where the cancer is.

The way the chemotherapy is given depends on the type and stage of the cancer being treated.

Radiation Therapy

Radiation therapy is a cancer treatment that uses high-energy x-rays or other types of radiation to kill cancer cells or keep them from growing. There are two types of radiation therapy:

- **External radiation therapy** uses a machine outside the body to send radiation toward the cancer.
- **Internal radiation therapy** uses a radioactive substance sealed in needles, seeds, wires, or catheters that are placed directly into or near the cancer.

The way the radiation therapy is given depends on the type and stage of the cancer being treated. External radiation therapy is used to treat some melanomas. Radiation Therapy may relieve symptoms and improve quality of life (palliative therapy).

Immunotherapy

Immunotherapy is a treatment that uses the patient's immune system to fight cancer. Substances made by the body or made in a laboratory are used to boost, direct, or restore the body's natural defenses against cancer. This type of cancer treatment is also called biotherapy or biologic therapy.

Targeted Therapy

Targeted therapy is a type of treatment that uses drugs or other substances to attack cancer cells. Targeted therapies usually cause less harm to normal cells than chemotherapy or radiation therapy do.

Clinical Trials

Clinical trials are done to find out if new cancer treatments are safe and effective or better than the standard treatment.

People who take part in a clinical trial may receive:

- The standard drugs alone or
- The standard drugs plus the new treatment being studied

Many of today's standard treatments for cancer are based on earlier clinical trials.

Ask if there is a clinical trial right for you.

Taking part in a clinical trial helps improve the way cancer will be treated in the future. Even when clinical trials do not lead to effective new treatments, they often answer important questions and help move research forward.

Some clinical trials only include people who have not yet received treatment. Other trials test treatments for those whose cancer has not gotten better. There are also clinical trials that test new ways to stop cancer from coming back or reduce the side effects of cancer treatment.

As Treatment Progresses

Some tests may be repeated to see how well your treatment is working. Decisions about whether to continue, change, or stop treatment may be based on the results of these tests.

A plan for your long-term care will be shared with your primary care provider.

To Learn More About Melanoma

- **American Cancer Society**
<https://www.cancer.org/>
- **National Cancer Institute**
<https://www.cancer.gov/>
- **National Comprehensive Cancer Network
Guidelines for Patients**
<https://www.nccn.org/patients/guidelines/cancers.aspx>
- **MedlinePlus**
<https://medlineplus.gov/>
- **American Academy of Dermatology**
<https://www.aad.org/public>

Common Questions

What does the pathology report tell me?

What is the stage of my cancer?

What are my goals for treatment?

What are my treatment choices?

What kind of support services are available for me about finances, emotions, spiritual questions, etc.?

My Health Care Team	Contact Information
Navigator:	
Medical Oncologist:	
Pharmacy:	
Radiation Oncologist:	
Nutritionist/Dietitian:	
Surgeon/Dermatologist:	
Primary Care Doctor:	
Counselor/Therapist:	
Other:	
Other:	

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<https://www.cancer.gov/types/skin/patient/melanoma-treatment-pdq>

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