Melanoma is an aggressive form of skin cancer. It accounts for fewer than 5% of all skin cancers. But it is responsible for the vast majority of skin cancer deaths.

Melanoma can usually be cured if it is removed before the tumor has gone deep into the skin. That’s why early detection and treatment is crucial. Once you’ve had melanoma, you are at increased risk for developing it again. You and your doctor should stay alert for any suspicious skin changes.

The following questions can help you talk with your doctor about melanoma.

Initial questions:

- Is the melanoma on the skin’s surface, or has it grown deeper?
- Do I need additional tests to see if the cancer has spread to my lymph nodes or other organs?
- What stage is the cancer?

Treatment:

- Will I need surgery?
- Will I need additional treatment? If yes, what are my options? How will these treatments help? Which one is right for me?
- What side effects am I most likely to have? What can I do to minimize them?

Prevention:

- How can I reduce my chances of developing another melanoma?
- Does my diagnosis mean my family is at a higher risk for melanoma? How can they protect themselves?
Melanoma is the uncontrolled growth of abnormal skin cells.

Melanoma forms in cells called melanocytes. These cells produce a dark pigment, called melanin, which colors the skin.

Often, melanocytes are part of pigmented spots on the skin called moles. Most moles never become a problem. But sometimes they can become cancerous.

People with light hair and eye color and fair skin are at an increased risk for melanoma. People with darker skin have a lower risk.

Most cases of melanoma likely result from sun damage. You should always protect yourself from the sun’s ultraviolet (UV) rays, regardless of your skin color (see “Preventing another melanoma,” page 14).

**Self–Skin Checks for Melanoma**

Self–skin checks are an important way to identify melanoma.

You can help detect early skin changes by taking a few minutes each month to inspect your skin (or asking your partner to).

When you or your partner examines your skin, check each mole for the following “ABCDEs.”

- **A** symmetry. One side looks different from the other.
- **B** order irregularity. The spot has a ragged or scalloped edge, or a lighter rim all around.
- **C** olor variations. An uneven mixture of brown, black, tan, pink, or red.
- **D** iameter. Bigger than 1/4 inch — about the size of an eraser at the tip of a pencil.
- **E** volution. Any changes over time, such as in size or shape.

If you observe any of these characteristics, see a dermatologist (skin specialist) right away so that he or she can examine the mole or growth.

Be sure to inspect every inch of your skin, even places that don’t get direct sunlight. That includes:

- scalp
- back
- chest
- underneath breasts
- backs of your arms and legs
- genitals
- bottoms of feet
- between fingers and toes
A skin biopsy is performed to confirm a diagnosis of melanoma.

**Diagnosis**

Before the biopsy, your doctor will check for enlarged lymph nodes near the mole. If you have a melanoma, enlarged lymph nodes can mean the cancer has spread.

During a biopsy, the doctor will remove a piece of the suspicious mole or growth. A doctor called a pathologist will examine it under a microscope.

If the tissue contains melanoma cells, your doctor will need to determine the thickness of the melanoma and how deep the cancer has grown below the skin’s surface. That’s the most important factor in predicting whether it can be cured.

**Staging**

If the cancer is advanced, the biopsy sample of your melanoma may be tested to see if it has one of the gene mutations common in melanoma.

All of this information will help your doctor to determine the most effective treatment for your cancer. After surgery to remove the initial melanoma, treatments for late-stage melanoma may include:

- surgery to remove melanoma that has spread to other organs
- targeted therapy
- radiation therapy
- immunotherapy
- chemotherapy

**Early-stage melanoma** is also called superficial spreading melanoma or melanoma in situ. This is a thin cancer that hasn’t invaded deeper layers of skin.

**Late-stage melanoma** is also called advanced or metastatic melanoma. This is a thicker cancer that has spread into deeper layers of skin.

**How far has the cancer spread?**

Melanomas deeper than 1 millimeter are more likely to have spread to other parts of the body. If this is the case, your doctor will need to determine:

- the cancer’s thickness
- the pattern of the cancer cells’ growth — whether they are growing sideways across the skin, or deeper down into the skin
- whether cancer is also present in lymph nodes, blood vessels, or nerves
- whether cancer has spread to other places on the skin, to other organs, or both

You may need one or more of the following tests to see whether melanoma has spread:

- blood tests
- chest x-ray
- computed tomography (CT) scan
- positron emission tomography (PET) scan
- magnetic resonance imaging (MRI) scan
- additional biopsies

Your doctor will assign the melanoma a stage:

- **Early-stage melanoma** is also called superficial spreading melanoma or melanoma in situ. This is a thin cancer that hasn’t invaded deeper layers of skin.
- **Late-stage melanoma** is also called advanced or metastatic melanoma. This is a thicker cancer that has spread into deeper layers of skin.
Deep or late-stage melanoma

People with late-stage melanoma will usually need surgery as well. In addition to removing the primary tumor, other procedures may include:

- **Sentinel node biopsy.** This is done to find out if the cancer has spread to nearby lymph nodes. For this procedure, a radioactive liquid is injected into the tumor. The liquid flows through the natural drainage pathway that connects the tumor to nearby lymph nodes. The drainage path can be tracked through imaging that picks up the radioactive liquid. The first lymph node along the path is called the sentinel node. This node is removed and examined for cancer cells. If the sentinel node has no cancer, the other nodes are most often cancer-free.

- **Lymph node dissection.** If cancer is found in the sentinel node, the lymph nodes in the area near the melanoma are usually removed. This procedure is called a lymph node dissection. However, it’s not clear whether removing all the lymph nodes improves survival. Although this procedure can remove spreading cancer cells, it also removes cells that are fighting the cancer.

- **Surgery to remove metastases.** When cancer has spread to one or two other sites, surgical removal can relieve symptoms and may improve survival.
Radiation therapy uses high-energy rays to destroy cancer cells.

For melanoma, radiation therapy may be used

- in addition to the primary treatment, to lower the risk that the cancer will come back. It may be given
  - after surgery, if there is a high risk of recurrence in that part of the body
  - if additional surgery is needed but not possible because of the location of the cancer
  - if the cancer has spread to nearby lymph nodes
  - after immunotherapy (see "Immunotherapy," page 12)

- to treat melanoma that has spread to the brain, spine, or lungs. Stereotactic radiosurgery (SRS) and stereotactic body radiation therapy (SBRT) are techniques that allow high-dose radiation to be precisely targeted to specific sites in the body. That means less healthy tissue is harmed by radiation, which means fewer side effects.

- for palliative care. Radiation therapy may help reduce pain and other symptoms in people with late-stage melanoma.

Radiation therapy is rarely used as a primary treatment for melanoma.
IMMUNOTHERAPY

Immunotherapy drugs kill cancer cells by boosting your natural immune response.

Immunotherapy, also known as biological therapy, is primarily used to treat melanoma that has spread. It works by stimulating your immune system to vigorously attack and destroy cancer cells.

Immunotherapy drugs are usually given intravenously (through a vein) or with an injection. How often you need treatment depends on the drug you take.

You may get immunotherapy:

- after surgery, to help keep melanoma from returning
- to shrink tumors that can’t be removed with surgery, in order to prolong life and ease symptoms
- together with chemotherapy, to shrink tumors even faster (this is called biochemotherapy)

Current clinical trials are evaluating the effectiveness of new types of immunotherapy.

CHEMOTHERAPY

Chemotherapy uses drugs to kill cancer cells.

It is primarily used to treat late-stage melanoma. When treating melanoma, chemotherapy may be used locally or systemically.

Local chemotherapy

This procedure, called isolated limb perfusion (ILP), provides chemotherapy to only one region of the body. It is used to treat melanoma that is confined to an arm or a leg.

The doctor secures a band at the top of the limb that contains the cancer. This blocks circulation to the rest of the body. Chemotherapy is given through an IV lower in the limb. For a short time, the chemotherapy drugs circulate within the affected limb. Healthy cells in the rest of the body aren’t harmed by the chemotherapy.

Systemic chemotherapy

In systemic treatment, chemotherapy drugs flow unrestricted through the bloodstream to kill cancer cells throughout the body. This therapy is used to treat late-stage melanoma when targeted therapy or immunotherapy is no longer helping. Systemic chemotherapy is usually given through a vein.

Combining different chemotherapy drugs, or combining chemotherapy with targeted therapy or immunotherapy, may be more effective than single-drug chemotherapy for late-stage melanoma.
Protecting yourself from the sun can help to prevent another skin cancer.

Having one melanoma increases your risk for having another. After treatment, you need to take steps to help prevent a recurrence.

**Sun safety**

Sunlight exposes your skin to ultraviolet A (UVA) and ultraviolet B (UVB) rays. Both contribute to skin cancer.

The sun’s rays are most intense between 10 a.m. and 2 p.m. If you’re going to be spending time outside, try to do so in the early morning or late afternoon. Stay in the shade when possible, and be aware of reflected light from water, sand, and snow (in winter).

**Sunscreen**

Use a sunscreen with the following features:

- broad-spectrum protection against UVA and UVB rays
- sun protection factor (SPF) of 30 or higher
- water-resistant for up to 40 or 80 minutes

Once you buy the right sunscreen, apply it properly:

- Apply sunscreen before you go outside.
- Apply enough and reapply frequently. Use 1 ounce of sunscreen (enough to fill a shot glass) to cover your body and face.

**Cover up with clothes**

The right clothing can also help protect you from the sun. For the best protection, wear

- dark-colored, long-sleeved shirts; long pants; or long skirts with a tight weave.
- clothes with a UV protection factor (UPF) label. The higher the UPF number, the better it shields your skin.
- a hat with a wide brim to protect your ears, eyes, forehead, nose, and scalp.

**Skin checks**

Regularly and thoroughly check your skin for irregularities. (See “Self–skin checks for melanoma,” page 5.) Have your skin checked regularly by a doctor as well.

**Are tanning beds safe?**

No. In fact, tanning beds are worse for your skin than regular exposure to the sun. Tanning beds can have UV radiation that is 10 to 15 times more powerful than the midday sun. People who frequently go to tanning salons can end up getting up to five times the dose of UV radiation that people get from normal sun exposure in a year.
Harvard Health Publications and Harvard Medical School content should not be used for diagnosis or treatment, or as a substitute for visits to your medical provider. Always seek the advice of your health care provider if you have questions regarding your health or any medical condition.

©2016 Harvard University. All Rights Reserved.

Harvard Health Publications and Harvard Medical School do not endorse drug products.

MEL-H0416