



Melanoma Skin Cancer Overview

This overview is based on the more detailed information in our document, *Melanoma Skin Cancer*. You can get this document and other information by calling us at 1-800-227-2345 or you can read it on our website at www.cancer.org.

What is cancer?

The body is made up of trillions of living cells. Normal body cells grow, divide into new cells, and die in an orderly way. During the early years of a person's life when they are growing, normal cells divide faster. After the person becomes an adult, most cells divide only to replace worn-out, damaged, or dying cells.

Cancer begins when cells in a part of the body start to grow out of control. There are many kinds of cancer, but they all start because of this out-of-control growth of abnormal cells.

Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells keep on growing and form new cancer cells. These cancer cells can grow into (invade) other tissues, something normal cells can't do. Being able to grow out of control and invade other tissues are what makes a cell a cancer cell.

In most cases the cancer cells form a tumor. But some cancers, like leukemia, rarely form tumors. Instead, these cancer cells are in the blood and bone marrow.

Sometimes cancer cells travel to other parts of the body. There they begin to grow and form new tumors. This process is called *metastasis*.

No matter where a cancer spreads, it is named (and treated) based on the place where it started. For instance, breast cancer that has spread to the liver is still breast cancer, not liver cancer. Likewise, prostate cancer that has spread to the bones is still prostate cancer, not bone cancer.

Different types of cancer can behave very differently. They grow at different rates and respond to different treatments. That is why people with cancer need treatment that is aimed at their own kind of cancer.

Not all tumors are cancer. Tumors that aren't cancer are called *benign*. Benign tumors can cause problems – they can grow very large and press on healthy organs and tissues. But they can't grow into other tissues. Because of this, they also can't spread to other parts of the body (metastasize). These tumors are almost never life threatening.

What is melanoma skin cancer?

Melanoma is a cancer that starts in a certain type of skin cell. To understand melanoma, it helps to know a little about the skin.

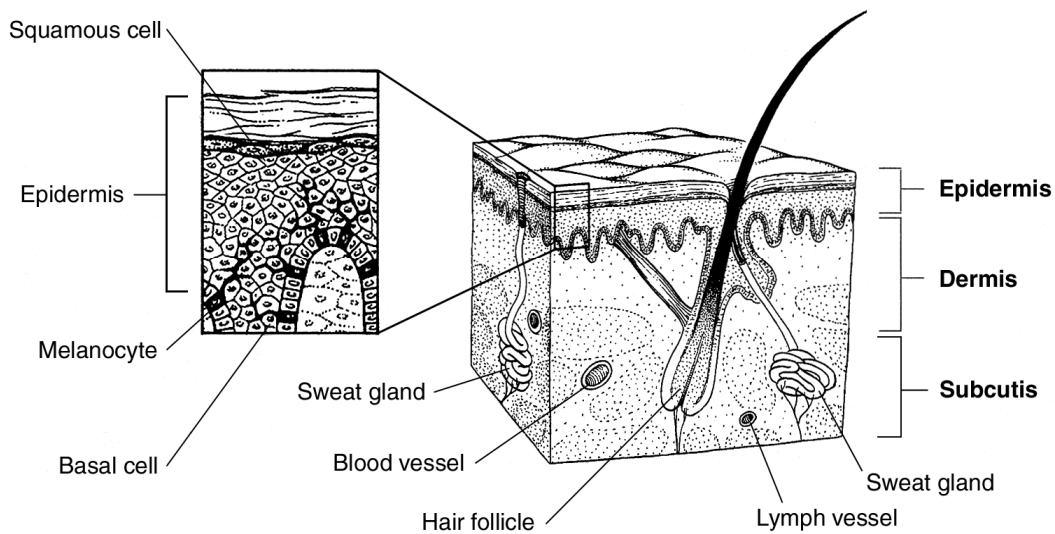
Normal skin

The skin is the largest organ in the body. It does many different things, such as:

- Covering and protecting the organs inside the body
- Helping to keep out germs
- Helping keep in water and other fluids
- Helping control body temperature
- Protecting the rest of the body from ultraviolet (UV) rays
- Helping the body make vitamin D

The skin has 3 layers. From the outside in, they are:

- **Epidermis:** This top layer of the skin is very thin. The flat cells at the top of this layer are called *squamous cells*. Below this are cells called *basal cells*. Cells called *melanocytes* are also in the epidermis. These cells make the brown pigment melanin, which gives the skin its tan or brown color. Melanocytes are the cells that can become melanoma.
- **Dermis:** This middle layer of the skin is much thicker than the epidermis. It contains hair shafts, sweat glands, blood vessels, and nerves.
- **Subcutis:** This deepest layer of the skin contains proteins and fat, which help keep in body heat and act as a shock absorber to help protect the body's organs from injury.



Skin tumors that are not cancer

Most skin tumors are not cancer (they are benign). These rarely, if ever, turn into cancer. Some of them include:

- Mole (also called a nevus) – a benign skin tumor that starts from melanocytes. Almost everyone has some moles. Nearly all of them are harmless, but some types can raise your risk of melanoma.
- Spitz nevus – a kind of mole that sometimes looks a lot like melanoma
- Seborrheic keratosis – a tan, brown, or black raised spot with a “waxy” texture
- Hemangioma – a benign blood vessel growth often called a strawberry spot or port wine stain
- Lipoma – a soft growth made up of fat cells
- Wart – a rough-surfaced growth caused by a virus

Melanoma skin cancers

Melanoma is a cancer that begins in the melanocytes. Because most of these cells still make melanin, melanoma tumors are often brown or black. But this is not always the case, and melanomas can also appear pink, tan, or even white.

Melanoma most often starts on the trunk (chest or back) in men and on the legs of women, but it can start in other places, too. Having dark skin lowers the risk of melanoma, but a person with dark skin can still get melanoma.

Melanoma is much less common than basal cell and squamous cell skin cancers (described below), but it is far more dangerous. It can almost always be cured in its early stages. But it is likely to spread to other parts of the body if it is not caught early.

Other skin cancers

Skin cancers that are not melanoma are sometimes grouped together as *non-melanoma skin cancers* because they start in skin cells other than melanocytes.

Basal cell and squamous cell cancers are much more common than melanoma. Because they rarely spread to other parts of the body, these cancers are often less worrisome and are treated differently than melanoma. They are discussed in our document *Skin Cancer: Basal and Squamous Cell*.

Merkel cell cancer is an uncommon type of skin cancer that can be hard to treat. It is discussed in our document *Skin Cancer: Merkel Cell Carcinoma*.

Still other types of non-melanoma skin cancers are discussed in our documents *Kaposi Sarcoma* and *Lymphoma of the Skin*.

How many people get melanoma skin cancer?

The American Cancer Society's estimates for melanoma skin cancer in the United States for 2014 are:

- About 76,100 new cases of melanoma
- About 9,710 deaths from melanoma

Skin cancer is the most common of all cancers. Melanoma accounts for less than 5% of skin cancers. But it causes most skin cancer deaths. The number of new cases of melanoma in the United States has been increasing for at least 30 years.

Overall, the lifetime risk of getting melanoma is about 1 in 50 for whites, 1 in 1,000 for blacks, and 1 in 200 for Hispanics. Unlike many other common cancers, melanoma occurs in both younger and older people. Rates keep on going up with age.

What are the risk factors for melanoma skin cancer?

We do not yet know exactly what causes melanoma skin cancer. But we do know that certain risk factors are linked to this disease. A risk factor is anything that affects your chance of getting a disease. Different cancers have different risk factors. Some risk factors, like smoking, can be changed. Others, like a person's age or family history, can't be changed.

But having a risk factor, or even several risk factors, does not mean that you will get the disease. And some people who get the disease may have few or no known risk factors. Even if a person with melanoma has a risk factor, it's often very hard to know what part that risk factor may have played in getting the cancer.

Scientists have found several risk factors that could make a person more likely to get melanoma.

UV (ultraviolet) light

Too much exposure to UV rays is a major risk factor for most melanomas. The main source of UV rays is the sun. Tanning lamps and beds are also sources of UV rays. People with high levels of UV exposure from these sources are at greater risk for all types of skin cancer.

The amount of UV exposure a person gets depends on the strength of the light, how long the skin is exposed, and whether the skin is covered with clothing or sunscreen.

To find out more about how to protect yourself and your family, see the section "Can melanoma skin cancer be prevented?"

Moles

A mole (the medical name is *nevus*) is a benign (not cancer) skin tumor. The chance of any single mole turning into cancer is very low. But certain types of moles increase a person's chance of getting melanoma.

People who have many abnormal moles are more likely to develop melanoma. These people should have very thorough skin exams by a skin doctor (dermatologist). Many doctors also suggest these people should be shown how check their own skin every month. Good sun protection is always important.

Light-colored skin, freckles, and light hair

The risk of melanoma is more than 10 times higher for whites than for African Americans. Whites with red or blond hair, blue or green eyes, or fair skin that freckles or burns easily are at increased risk.

Family history of melanoma

Your risk of melanoma is higher if you have a close relative (parent, brother, sister, or child) who has had the disease. This could be because the family tends to spend more time in the sun, or because the family members have fair skin, or both. It may also be because of a gene change (mutation) that runs in the family.

People with a strong family history of melanoma should do these things:

- Have regular skin exams by a skin doctor (dermatologist)
- Look closely at their own skin once a month and report any changes to the doctor
- Be very careful about sun exposure and avoid tanning beds

(To find out more, see “Can melanoma skin cancer be prevented?”)

Having had melanoma in the past

A person who has already had melanoma has a higher risk of getting another one.

Weak immune system

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

Age

Melanoma is more likely to happen in older people. But it is a cancer that is also found in younger people. In fact, it is one of the most common cancers in people under 30.

Gender

In the United States, melanoma is generally more common in men than in women. But this varies by age. Before age 40, the risk is higher for women; after age 40 the risk is higher in men.

Xeroderma pigmentosum (XP)

This is a rare, inherited condition. People with XP are less able to repair damage caused by sunlight and are at greater risk of melanoma and other skin cancers at a young age.

Can melanoma skin cancer be prevented?

Not all melanomas can be prevented, but there are things you can do that might reduce your risk.

Limit UV exposure

The best way to lower the risk of melanoma is to limit your exposure to strong sunlight and other sources of UV light. Simply staying in the shade is one of the best ways to limit being exposed to UV rays. If you are going to be in the sun, “Slip! Slop! Slap!® ... and Wrap” is a catch phrase to remind you of some of the key steps you can take to protect yourself from UV rays.

- Slip on a shirt
- Slop on sunscreen
- Slap on a hat
- Wrap on sunglasses to protect the eyes and the skin around them

Stay in the shade

Look for shade, especially in the middle of the day, between the hours of 10 am and 4 pm, when the sun’s rays are strongest. If you are not sure about how strong the sun is, use the shadow test: if your shadow is shorter than you are, the sun’s rays are at their strongest, and you need to protect yourself. Keep in mind that sunlight (and UV rays) can come through clouds, reflect off water, sand, concrete, and snow, and can reach below the water’s surface, so protect your skin whenever you are outdoors.

Protect your skin with clothing

Clothes vary in how much they can protect you. Long-sleeved shirts and long pants or skirts are best. Dark colors are better than light colors. A tightly woven fabric protects better than loosely woven clothing. If you can see light through a fabric, UV rays can get through, too. Dry clothing is better than wet clothing.

Some clothing is made with built-in UV protection. There are also newer products that can increase the ultraviolet protection factor (UPF) value of clothes you already own.

Used like laundry detergents, they add a layer of UV protection to your clothes without changing the color or how the cloth feels. This can be useful, but it's not really clear how much it adds to helping protect you from UV rays, so it's still important to follow the other steps listed here.

Wear a hat

A hat with at least a 2- to 3-inch brim all around is good because it protects the neck, ears, eyes, forehead, nose, and scalp. A shade cap (which looks like a baseball cap with about 7 inches of fabric draping down the sides and back) is also good. These are often sold in sports and outdoor supply stores.

A baseball cap can protect the front and top of the head, but not the neck or the ears. Straw hats are not as good as ones that are made of tightly woven fabric.

Use sunscreen

Use sunscreen and lip balm. Broad spectrum products (which protect against different types of UV rays) with a sun protection factor (SPF) of 30 or more are recommended. Be sure to use enough – about a shot glass or a palmful to cover your arms, legs, face, and neck. And put it on again at least every 2 hours and after swimming or sweating. Use sunscreen even on days with light or broken cloud cover because UV rays still come through.

Don't make the mistake of thinking that because you're using sunscreen, you can stay out in the sun as long as you want. Sunscreens are a filter – they do not block all UV rays. If you spend enough time in the sun you will still end up with damage to your skin.

Wear sunglasses

Wrap-around sunglasses that absorb at least 99% of the UV rays help protect your eyes and the skin around your eyes. Look for sunglasses labeled as blocking UVA and UVB light.

Avoid tanning beds and sunlamps

Many people believe the UV rays of tanning beds are harmless. This is not true. Tanning lamps give out UVA and often UVB rays as well. Both of these can cause long-term skin damage and are linked to skin cancer. Tanning bed use has been linked with an increased risk of melanoma, especially if it's started before the age of 30. Most skin doctors and health groups advise against using tanning beds and sun lamps.

If you want a tan, one option is a sunless tanning lotion. These can make you look tan without the danger. You do not have to go out in the sun for these to work. The color tends to wear off after a few days. Most sunless tanning lotions don't protect very much

against UV rays. If you use one, you should still take other measures mentioned above to protect your skin when you are outside.

Some tanning salons offer a spray-on tan. A concern here is that the spray should not be inhaled or sprayed in or on the mouth, eyes, or nose. People who choose to get a spray tan should make sure to protect these areas.

Protect children from the sun

Be especially careful about sun protection for children. Children tend to spend more time outdoors and they burn more easily. Teach them to protect themselves from the sun as they get older. Babies younger than 6 months should be kept out of direct sunlight and protected from the sun with hats and clothing. Sunscreen may be used on small places of exposed skin only if there isn't enough shade or clothing.

A word about sunlight and vitamin D

Doctors are learning that vitamin D has many health benefits. It may even help to lower the risk for some cancers. Vitamin D is made by your skin when you are in the sun. How much vitamin D is made depends on many things, such as how old you are, how dark your skin is, and how strong the sunlight is.

At this time, doctors aren't sure what the best level of vitamin D is. When possible, it is better to get vitamin D from your diet or vitamins rather than from the sun. These sources do not increase risk for skin cancer.

To find out more about how to protect yourself and your family from UV rays, see our document *Skin Cancer Prevention and Early Detection*.

Check for abnormal moles and have them removed

If you have many moles or abnormal moles, your doctor may want to watch them closely with regular exams and may advise you to do monthly skin self-exams. (See the section "How is melanoma skin cancer found?"). The doctor may want to remove some of them if they have certain features that suggest they might change into a melanoma.

If you find a new, unusual, or changing mole, you should have it checked by your doctor.

Genetic counseling and testing for people at high risk

Gene changes (mutations) that increase melanoma risk can be passed down through families, but they account for only a small portion of melanomas. You *might* have inherited a gene mutation that increases your risk of melanoma if:

- Several members of one side of your family have had melanoma

- A family member has had more than one melanoma
- A family member has had both melanoma and pancreatic cancer
- You have had more than one melanoma

Genes have been found to have changed (mutated) in some families with high rates of melanoma. Because it's not clear how useful testing for these gene changes might be, most melanoma experts do not recommend genetic testing for people with a family history of melanoma at this time. Still, some people may choose to get tested.

Before getting any type of genetic testing, it's important to know ahead of time what the results may or may not tell you about your risk. Genetic testing is not perfect, and in some cases the tests might not give you solid answers. This is why meeting with a genetic counselor before testing is the first step in helping you decide if testing should be done.

How is melanoma skin cancer found?

Melanoma can often be found early. There are things everyone can do to find this cancer early, when it is most likely to be cured.

Skin self-exams

It's important to check your own skin about once a month. You should know the pattern of moles, freckles, and other marks on your skin so that you'll notice any changes.

Self-exam is best done in front of a full-length mirror. A hand-held mirror can be used for places that are hard to see. Look at all areas, such as your palms and soles, scalp, ears, nails, and your back (in men, about 1 of every 3 melanomas is found on the back). A family member can check those hard-to-see areas like your scalp and back.

For a more on how to do a skin self-exam, see our documents *Skin Cancer Prevention and Early Detection* and *Why You Should Know About Melanoma*.

What to look for

Unusual sores, lumps, blemishes, or changes in the way an area of the skin looks or feels may be a sign of melanoma or another type of skin cancer, or a warning that it might occur.

Normal moles

A normal mole is most often an evenly colored brown, tan, or black spot on the skin. It can be either flat or raised. It can be round or oval. Moles are usually less than $\frac{1}{4}$ inch

across, or about the width of a pencil eraser. Moles can be present at birth or they can appear later.

Once a mole has developed, it will most often stay the same size, shape, and color for many years. Some moles may fade away over time.

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

Possible signs and symptoms of melanoma

The most important warning sign for melanoma is a new spot on the skin or a spot that is changing in size, shape, or color. A spot that looks different from all of the other spots on your skin can also be a warning. If you have any of these warning signs, have your skin checked by a doctor.

The *ABCDE rule* can help you tell a normal mole from an abnormal mole. Moles that have any of these signs should be checked by a doctor. ABCDE stands for the following:

- **A is for Asymmetry:** One half of a mole or birthmark does not match the other.
- **B is for Border:** The edges are irregular, ragged, notched, or blurred.
- **C is for Color:** The color is not the same all over and may include shades of brown or black, or even patches of pink, red, white, or blue.
- **D is for Diameter:** The spot is larger than about $\frac{1}{4}$ inch across (the size of a pencil eraser), but melanomas can be smaller than this.
- **E is for Evolving:** The mole is changing in size, shape, or color.

Some melanomas don't fit the "rules" above. It may be hard to tell if the mole is normal or not, so you should show your doctor anything that you are unsure of.

Other warning signs are:

- A sore that does not heal
- Spread of color from the border of a spot to the skin around it
- Redness or a new swelling beyond the border
- Itchiness, tenderness, or pain
- Change in the surface of a mole – scaliness, oozing, bleeding, or a new bump or nodule

Be sure to show your doctor any areas that concern you and ask your doctor to look at areas that may be hard for you to see. Sometimes it's hard to tell the difference between melanoma and an ordinary mole, so it's important to show your doctor any mole that you are unsure of.

Exam by a health professional

Part of a routine cancer check-up should include a skin exam by a doctor or trained health professional. Regular skin exams are especially important for people who are at higher risk of melanoma, such as people with a strong family history or who have had melanoma before.

If there is any reason to suspect that you have a melanoma, your doctor will do more exams and tests to find out if it is melanoma or something else. You might also be referred to a doctor who is an expert in skin diseases (called a *dermatologist*) for some of these tests.

Medical history and physical exam

The doctor will likely ask about your symptoms and risk factors. This will include when you first saw the mark on your skin, if it has changed in size or the way it looks, and if it is causing any symptoms (pain, itching, bleeding, etc.). You may also be asked about whether anyone in your family has had skin cancer and about past UV light exposure.

During the exam, the doctor will note the size, shape, color, and texture of the area of concern, and whether there is bleeding or scaling. The rest of your body may be checked for other spots and moles. The doctor may also feel nearby lymph nodes under the skin, like those in the groin, underarm, or neck. Enlarged lymph nodes might suggest the spread of a melanoma.

The doctor might use a special magnifying lens and light source held near the skin. Sometimes a thin layer of oil is put on the skin. A picture of the spot may be taken. These tests, when used by a doctor who has experience with them, can improve the chances in finding melanomas early. They also often show that a spot on the skin is not cancer, so no more testing is needed.

Skin biopsy

If the doctor thinks a spot might be a melanoma, he or she will take a sample of the skin to look at under a microscope. This is called a *biopsy*. There are different ways to do a skin biopsy. The choice depends on the size of the area of concern and where it is on the body. All methods are likely to leave at least a small scar. Since different methods leave different types of scars, you should ask the doctor about this before the biopsy is done.

No matter which type of biopsy is done, as much of the area in question should be removed as possible so that an exact diagnosis can be made.

The skin around the area of the biopsy will be numbed before the biopsy. You will feel a little stinging as the medicine goes in, but you should not feel any pain during the biopsy.

Shave biopsy: After numbing the area, the doctor shaves off the top layers of the skin. Bleeding from the biopsy site is then stopped by applying an ointment or a small electric current to cauterize the wound.

A shave biopsy is useful for many types of skin diseases and in sampling moles when the risk of melanoma is very low. A shave biopsy is not usually done if the doctor strongly suspects melanoma unless the biopsy blade goes deep enough to get below the area in question. If it doesn't, it may not be thick enough to measure how deeply a melanoma has invaded the skin.

Punch biopsy: In a punch biopsy a deeper sample of skin is removed. The doctor uses a tool that looks like a tiny round cookie cutter. Once the skin is numbed, the doctor turns the tool on the surface of the skin until it cuts through all the layers of the skin and takes out a sample of tissue. The edges of the skin are often stitched together.

Incisional and excisional biopsies: If the doctor has to look at a tumor in the deeper layers of the skin, an incisional or excisional biopsy will be done. The skin will be numbed before the biopsy. A surgical knife is used to cut through the full thickness of skin. A wedge of skin is removed, and the edges of the cut are sewn together.

An incisional biopsy removes only part of the tumor. If the whole tumor is removed, it is called an excisional biopsy. Excisional biopsy is most often used when it can be done.

Biopsies of melanoma that may have spread

If melanoma has already been found on the skin, nearby lymph nodes or other areas may be biopsied to see if the cancer has spread.

Rarely, some melanomas spread so fast that a person could have cancer in the lymph nodes, lungs, brain, or other places while the first skin melanoma is still small. Sometimes these tumors are found before a spot on the skin is found. In other cases they may be found long after a skin melanoma has been removed, so it's not clear whether it is the same cancer. In still other cases, metastatic melanoma may be found without ever finding a melanoma on the skin. This may be because some skin lesions go away on their own (without any treatment) after some of their cells have spread to other parts of the body. Melanoma can also start in internal organs, but this is very rare.

If melanoma has spread widely throughout the body, it may not be possible to tell which tumor was the first one. When this happens, melanoma in those organs might be confused with a cancer starting in that organ. For example, melanoma that has spread to the lung

might be confused with a cancer that *starts* in the lung. Special lab tests can be done on biopsy samples to tell whether it is a melanoma or some other kind of cancer. This is important because different treatments are used for different cancers.

Fine needle aspiration biopsy (FNA): This kind of biopsy is not used to diagnose a suspicious mole, but it can sometimes be used if the doctor thinks the melanoma has spread to nearby lymph nodes or to organs like the lung or liver. A thin, hollow needle is used to remove very small tissue samples from the tumor. The test rarely causes much discomfort and does not leave a scar. But it may not always collect enough of a sample to tell if melanoma is present.

Surgical (excisional) lymph node biopsy: For this type of biopsy a swollen lymph node is removed through a small cut (incision). Numbing medicine is often put on the skin if the lymph node is near the surface of the body. But if the lymph node is deeper in the body, you may need to be made drowsy or even put into a deep sleep (using general anesthesia). It is often done if a lymph node's size suggests the melanoma has spread there but either an FNA was not done or it did not show any cancer cells.

Sentinel lymph node biopsy: If melanoma has been diagnosed and has any concerning features (such as being at least a certain thickness), a sentinel lymph node biopsy is often done to find out if the cancer has spread to nearby lymph nodes. If so, it could affect treatment options. This test can find the lymph nodes that drain lymph fluid from the area of the skin where the melanoma started. These *sentinel lymph nodes* are likely to be the first place the melanoma would go if it has spread.

To find the sentinel lymph nodes, the surgeon injects a radioactive liquid (and sometimes a blue dye) into the area of the melanoma. The lymph nodes are then checked for radioactivity to find which ones are the first to drain fluid from the skin near the melanoma. A small cut is made in the identified lymph node area. The lymph nodes are then checked to find which one(s) absorbed radiation and turned blue. When these lymph nodes have been found, they are taken out and sent to a lab to be looked at under a microscope. If cancer cells are found, the rest of the lymph nodes in this area are removed, too. If the sentinel nodes do not contain cancer cells, further lymph node surgery is not needed.

If a lymph node near a melanoma is very large, this test may not be needed. The enlarged node is simply biopsied.

Lab tests of biopsy samples

After a biopsy, the samples are sent to a lab to be looked at under a microscope. If the doctor can't tell for sure if the sample contains melanoma cells just by looking at it, special tests may be done on the cells to try to confirm the diagnosis.

If the samples do contain melanoma, the doctor will look at certain features such as the tumor thickness the portion of cells that are actively dividing. These features help define

the stage of the melanoma (see the section “How is melanoma of the skin staged?”), which in turn affects treatment options and the outlooks (prognosis) for the patient.

For advanced melanomas, tests may be done to see if the cancer cells have changes in genes such as the *BRAF* gene. This could help define which treatments might work. (See the section “Targeted therapy for melanoma skin cancer.”)

Imaging tests

Imaging tests are done to create pictures of the inside of the body. They are used to look for the spread of melanoma. They are not needed for people with very early melanoma, which is not likely to have spread. These tests may also be done to help find out how well treatment is working or to look for signs that the cancer has come back after treatment.

Chest x-ray: This test may be done to see if the cancer has spread to the lungs.

CT (computed tomography) scan: This test can help show if any lymph nodes are enlarged or if organs such as the lungs or liver have spots that might be from the spread of melanoma.

CT scans use many x-ray images that are combined by a computer to give a detailed, cross-sectional view of the body. You may be asked to drink a special liquid or get a kind of dye put into your vein, which can help better outline structures in your body.

A CT scanner has been described as a large donut, with a narrow table that slides in and out of the middle opening. You need to lie still on the table while the scan is being done. CT scans take longer than regular x-rays, and you might feel a bit confined by the ring while the pictures are being taken.

CT scans can also be used to guide a needle during a biopsy. For this, you stay on the CT scanning table while a biopsy needle is moved through the skin and toward the mass.

MRI (magnetic resonance imaging): This is like a CT scan except that it uses radio waves and strong magnets to make a picture of your insides. MRI scans are very helpful in looking at the brain and spinal cord.

They take longer than CT scans – often up to an hour. You may have to lie inside a narrow tube, which is confining and can upset some people. Newer, open MRI machines can sometimes be used instead. The MRI machine also makes loud buzzing and thumping noises, so some places provide headphones to block this out.

PET (positron emission tomography) scan: In this test, a special kind of radioactive sugar is put into a vein. The sugar collects in areas that have cancer, and a scanner can spot these areas. This test can be useful to see if the cancer has spread to lymph nodes or other parts of the body. It can also help when the doctor thinks the cancer has spread but doesn't know where. Doctors find it most useful in people with advanced stages of

melanoma. It is not very helpful in people with early stage melanoma. Some newer machines do PET scans and CT scans at the same time.

To learn more about these imaging tests, see our document *Imaging (Radiology) Tests*.

Blood tests

Blood tests aren't used to find melanoma, but some tests may be done before or during treatment, especially for more advanced melanomas.

Doctors often test for blood levels of a substance called lactate dehydrogenase (LDH) before treatment. If the melanoma has spread to distant parts of the body, a higher than normal level of LDH is a sign that the cancer may be harder to treat. This affects the stage of the cancer.

Some other tests of blood cell counts and blood chemistry levels may be done in a person who has advanced melanoma to see how well the bone marrow (where new blood cells are made), liver, and kidneys are working during treatment.

How is melanoma skin cancer staged?

The stage of a melanoma is a description of how widespread it is. The tests described in the "How is melanoma found?" section are used to help decide the stage of the melanoma. The stage is very important because it affects the treatment and the outlook (prognosis) for recovery.

Stages are labeled using 0 and the Roman numerals I through IV (1-4), often followed by letters. As a rule, the lower the number, the less the cancer has spread. A higher number, such as stage IV (4), means a more advanced cancer. The stage is based mainly on 3 key pieces of information:

- How far the main **tumor** has grown within the skin and other factors (see below).
- Whether the cancer has spread to nearby **lymph nodes**.
- Whether the cancer has **metastasized** (spread) to distant organs.

There are really 2 types of staging for melanoma. The *clinical stage* is based on what is found in the physical exam, skin biopsy, x-rays, CT scans, and so on. The *pathological stage* uses all of this information plus what is found during any biopsies of lymph nodes or other organs. So the clinical stage (which is done first) may be lower than the pathologic stage, which is found after the biopsy.

After looking at your test results, the doctor will tell you the stage of your cancer. Be sure to ask your doctor to explain your stage in a way you understand. This will help you decide on the best treatment for you.

Important factors for early-stage melanomas

For melanomas that have not spread, certain factors affect a person's outlook and are therefore part of the staging.

The **thickness** of the melanoma is measured from the skin biopsy sample. The thinner the melanoma, the better the outlook. For the most part, melanomas less than about $\frac{1}{25}$ of an inch thick have a very small chance of spreading. Thicker melanomas have a greater chance of spreading.

Another important aspect for tumors is the **mitotic rate**. To measure this, the doctor counts the number of cells that are in the process of dividing in a certain amount of melanoma tissue. A higher mitotic rate (having more cells that are dividing) means that the cancer is more likely to grow and spread.

Ulceration is a breakdown of the skin over the melanoma. Melanomas that are ulcerated tend to have a worse outlook.

Survival rates for melanoma skin cancer

Some people with melanoma may want to know the survival rates for people in their situation. Others may not find the numbers helpful, or may even not want to know them. If you do not you want to read the survival statistics below, skip to the next section.

These survival rates are based on patients who were part of the 2008 AJCC Melanoma Staging Database. These are *observed* survival rates. This means they include some people with melanoma who may have later died from other causes, such as heart disease. So the percentage of people surviving the melanoma itself may be higher.

The 5-year and 10-year survival rates refer to the portion of patients who live *at least* this long after their cancer is found. Of course, many people live much longer than 5 or 10 years (and many are cured).

Stage	5-year survival	10-year survival
IA	97%	95%
IB	92%	86%
IIA	81%	67%
IIB	70%	57%
IIC	53%	40%

IIIA	78%	68%
IIIB	59%	43%
IIIC	40%	24%
IV	15% to 20%	10% to 15%

While numbers provide an overall picture, keep in mind that every person's situation is unique and that statistics can't predict exactly what will happen in your case. Many factors other than the stage can also affect a person's outlook, such as the gene changes in the cancer cells and how well the cancer responds to treatment. Talk with your cancer care team if you have questions about your own chances of a cure, or how long you might survive your cancer. They know your situation best.

Other factors that affect survival

Other factors aside from stage may also affect survival. For instance, stage for stage, older people often have shorter survival times. The biggest drop begins at age 70. Melanoma is not common among African Americans, but when it does occur, survival times tend to be shorter than when it occurs in whites. Some studies have shown that melanoma tends to be more serious if it occurs on the sole of a foot or palm of the hand, or if it is in a nail bed. People with weakened immune systems, such as people who have had organ transplants or who are infected with HIV also are at greater risk of dying of their melanoma.

How is melanoma skin cancer treated?

This information represents the views of the doctors and nurses serving on the American Cancer Society's Cancer Information Database Editorial Board. These views are based on their interpretation of studies published in medical journals, as well as their own professional experience.

The treatment information in this document is not official policy of the Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor.

Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask him or her questions about your treatment options.

About treatment

Once melanoma has been found and staged, your cancer care team will discuss treatment options with you. Depending on your own case, you may have different types of doctors on your treatment team. These doctors may include:

- A dermatologist: a doctor who treats diseases of the skin.

- A surgical oncologist: a doctor who uses surgery to treat cancer.
- A medical oncologist: a doctor who treats cancer with medicines.
- A radiation oncologist: a doctor who treats cancer with radiation.

Many other experts may be involved in your care as well, such as nurses, dietitians, social workers, and others.

It's important to discuss all of your treatment options and their side effects with your treatment team to help decide what's best for you. If there's anything that's not clear, ask to have it explained. (See the section "What are some questions I can ask my doctor about melanoma skin cancer?" for some questions to ask.)

Based on the stage of the cancer and other factors, your treatment options may include:

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

Early stage melanomas can often be treated with surgery alone, but more advanced cancers often need other treatments. Sometimes more than one type of treatment is used.

When time allows, getting a second opinion is often a good idea. It can give you more information and help you feel good about the treatment plan you choose.

Types of surgery for melanoma skin cancer

Surgery is the main treatment for most melanomas. It can often cure early stage melanomas.

Wide-excision

If melanoma was diagnosed with a skin biopsy, the area will probably need to be excised (removed) again to help make sure all of the cancer has been removed. This fairly minor surgery will cure most thin melanomas.

After the skin is numbed, more skin will be cut away from the area around the melanoma, and the wound is then stitched closed. This will leave a scar. The removed tissue will be looked at under a microscope to make sure that no cancer cells are left in the skin.

A method called *Mohs surgery* may be used in some cases to remove a smaller amount of tissue. In this approach the cancer is removed in very thin layers until the tissue shows no signs of cancer. But not all doctors agree on the use of Mohs surgery for melanoma.

If the melanoma is on a finger or toe and has grown deeply, the treatment may require that all or part of that digit be removed.

Lymph node dissection

In the past, a lymph node dissection was sometimes done to see if the melanoma had spread to nearby lymph nodes. Today, a sentinel lymph node biopsy (see the section “How is melanoma of the skin found?”) is often done first because it is a smaller surgery that is less likely to cause side effects such as lymphedema (see below).

If the sentinel node does not show cancer, then the disease has most likely not spread to other nodes and there is no need to remove lymph nodes.

If the sentinel lymph node biopsy (or another type of lymph node biopsy) finds cancer, then a *lymph node dissection* will likely be done to remove the other nodes in that area. It is not clear if a lymph node dissection can cure melanomas that have spread to the nodes. This is still being studied. Still some doctors feel it might prolong a patient’s life and at least avoid the pain that may be caused by cancer growing in these lymph nodes.

Removing lymph nodes can cause some long-term side effects. One of the most troublesome is called *lymphedema*. Lymph nodes help drain fluid from the arms and legs. If the lymph nodes are removed, fluid can build up, leading to limb swelling. This side effect, along with the discomfort of the surgery itself, is the reason lymph nodes are not removed unless the doctor thinks it’s necessary. To find out more, see our document *Understanding Lymphedema (for Cancers Other Than Breast Cancer)*.

Surgery for melanoma that has spread

When the melanoma has spread from the skin to distant organs (such as the lungs or brain), the cancer is very unlikely to be cured by surgery. Even so, surgery is sometimes done because removing even a few areas of spread could help some people to live longer or have a better quality of life. If you have metastatic melanoma and your doctor recommends surgery, be sure you understand what the goal of the surgery would be.

Immunotherapy for melanoma skin cancer

Immunotherapy helps boost a person’s immune system to better attack the cancer. There are many types of immunotherapy used for people with advanced melanoma.

Ipilimumab, pembrolizumab, and nivolumab for advanced melanoma

Ipilimumab (Yervoy), pembrolizumab (Keytruda), and nivolumab (Opdivo) are man-made versions of a certain type of immune system protein (monoclonal antibodies). They can boost the immune response against melanoma cells in the body.

These drugs are given as IV (intravenous) infusions in patients with melanomas that can't be removed by surgery or that have spread to other parts of the body. Doctors are also looking at using these drugs for earlier stage melanomas as well.

Common side effects from these drugs can include feeling tired, nausea, diarrhea, joint pain, skin rash, and itching. In some cases, these drugs can cause the immune system to attack other parts of the body, which can cause serious problems. If problems do arise, treatment may need to be stopped and you may get drugs to suppress your immune system.

Cytokines for advanced melanoma

Cytokines are proteins in the body that “turn on” the immune system. Man-made versions of cytokines, such as interferon-alfa and interleukin-2 (IL-2), are sometimes used in patients with melanoma. They are given as intravenous (IV) infusions or as injections under the skin. They can help shrink advanced melanomas in some patients.

Side effects may include flu-like symptoms like fever, chills, aches, and severe tiredness. IL-2 in high doses can cause fluid to build up in the body so that the person swells up and can feel quite sick. It is given only in centers experienced with this type of treatment.

Interferon-alfa as adjuvant therapy

Patients with thicker melanomas often have cancer cells that have spread to other parts of the body. Even after it looks as if all the cancer has been removed, some of these cells may remain. Interferon-alfa can be used as an added (adjuvant) therapy after surgery to try to prevent these cells from spreading and growing. This might help keep the melanoma from coming back quickly, but it is not yet clear if it improves survival.

In order to work, high doses of interferon must be used. Many patients can't take the side effects of these high doses. Side effects may be fever, chills, aches, severe tiredness, and effects on the heart and liver. Patients having this treatment should be closely watched by a cancer doctor who has experience with this treatment.

BCG (Bacille Calmette-Guerin) vaccine

BCG is a germ related to the one that causes tuberculosis (TB). BCG does not cause serious disease in humans, but it does “turn on” the immune system. It is sometimes used to help treat stage III melanomas. It is given as a shot (injection) right into the tumors.

Imiquimod cream

Imiquimod (Zyclara) is a drug that is used as a cream to cause an immune response against skin cancer cells. For very early (stage 0) melanomas in sensitive areas on the face that may be scarred by surgery, some doctors may use imiquimod. The cream is used anywhere from once a day to 2 times a week for around 3 months. Some people may have serious skin reactions to this drug.

Not all doctors agree on whether it should be used for melanoma. Imiquimod is not used for more advanced melanomas.

Newer treatments

Some newer types of immunotherapy have shown promise in treating melanoma in early studies. At this time they are available only through clinical trials. (See “What’s new in research and treatment of melanoma skin cancer?”)

Targeted therapy for melanoma skin cancer

As doctors have found some of the gene changes that make melanoma cells different from normal cells, they have begun to develop drugs that attack these changes. These targeted drugs work in a different way from standard chemo drugs. Sometimes, they work when chemo doesn’t. They can also have less severe side effects. Doctors are still learning the best way to use these drugs to treat melanoma.

Drugs that target cells with changes in the *BRAF* gene

About half of all melanomas have changes (mutations) in the *BRAF* gene. These changes cause the gene to make more of the BRAF protein, which tells the melanoma cells to grow and divide quickly. Drugs that target this and related proteins can be used in patients with advanced melanoma who have a *BRAF* mutation. These drugs are not likely to work in patients whose melanomas have a normal *BRAF* gene.

For instance, the drugs vemurafenib (Zelboraf) and dabrafenib (Tafinlar) attack the BRAF protein directly. They are taken as pills. The most common side effects are joint pain, fatigue, hair loss, and rash. Less common but more serious side effects can also occur. Some people treated with these drugs get new skin cancers called *squamous cell carcinomas*, which can be treated by removing them.

The drug trametinib (Mekinist) attacks the MEK protein, which is related to the BRAF protein. It is also taken as a pill. Common side effects include rash, diarrhea, and swelling. Rare but serious side effects can also occur. This drug does not seem to shrink as many melanomas as the BRAF drugs, but it may work better when combined with

dabrafenib. In fact, some side effects (such as getting other skin cancers) are actually *less* common with the combination.

Drugs that target cells with changes in the *C-KIT* gene

A small portion of melanomas have changes in a gene called *C-KIT* that help them grow. These gene changes are more common in melanomas that start in certain parts of the body, such as:

- On the palms of the hands, soles of the feet, or under fingernails (known as *acral melanomas*)
- Inside the mouth or other mucosal (wet) areas
- In parts of the body that get a lot of sun

Some targeted drugs, such as imatinib (Gleevec) and nilotinib (Tasigna), can affect cells with changes in *C-KIT*. If you have a melanoma that started in one of these places, your doctor may test your melanoma cells for changes in the *C-KIT* gene, which might mean that one of these drugs could be helpful. Clinical trials are now studying this.

Drugs that target other changes are now being studied as well (see “What’s new in melanoma skin cancer research?”)

Chemotherapy for melanoma skin cancer

Chemotherapy (chemo) is the use of drugs to kill cancer cells. Usually the drugs are given into a vein or by mouth as a pill. Once the drugs enter the blood, they spread throughout the body. Chemo is often useful in treating cancer that has spread.

Chemo does not usually work as well for melanoma as it does for some other types of cancer, but it may relieve symptoms or help people with advanced disease live longer. Chemo is not often used as the first treatment since newer forms of immunotherapy and targeted drugs have become available.

Doctors give chemo in cycles, with each period of treatment followed by a pause for the body to rest. Each cycle usually lasts a few weeks.

Some chemo drugs can be given alone, while others are often combined. Using chemo drugs with one or more immunotherapy drugs may work better than using just one drug, but it’s not clear if this helps people live longer.

Isolated limb perfusion is a type of chemo sometimes used for treating melanomas on an arm or leg. This treatment separates the blood flow of the limb with cancer from the rest of the body for a short time. High doses of chemo are then put into the limb. This allows

high doses to be given to the area of the tumor without exposing the whole body to it, which would cause severe side effects.

While chemo drugs kill cancer cells, they also damage some normal cells. This can lead to side effects. These side effects will depend on the type of drugs used, the amount taken, and the length of treatment. Short-term side effects might be:

- Hair loss
- Mouth sores
- Loss of appetite
- Nausea and vomiting
- Diarrhea or constipation
- Increased chance of infection (from having too few white blood cells)
- Easy bruising or bleeding (from having too few blood platelets)
- Tiredness (from having too few red blood cells)

Some chemo drugs can have other side effects. Most side effects go away once treatment is over. There are ways to lessen many of the side effects, so be sure to tell your doctor or nurse if you are having any of these problems.

For more about chemo, please see the “Chemotherapy” section of our website, or our document *Understanding Chemotherapy: A Guide for Patients and Families*.

Radiation therapy for melanoma skin cancer

Radiation therapy is treatment with high-energy rays (such as x-rays) to kill cancer cells. External beam radiation focuses radiation from outside the body on the skin tumor. The treatment is much like getting an x-ray, but the radiation is stronger. The treatment itself is painless. Each treatment lasts only a few minutes, but the setup time – getting you into place for treatment – usually takes longer.

Radiation is not often used to treat the tumor that started on the skin. But it may be used on nearby lymph node areas after surgery to try to prevent the cancer from coming back. It may also be used to treat cancer that has come back, either in the skin or lymph nodes if the cancer can't all be removed by surgery.

Radiation can also be used to relieve symptoms of cancer that has spread to the brain or the bones. Radiation used this way is not meant to cure the cancer, but it may help shrink it for a time to control some of the symptoms.

Side effects of radiation treatment depend on where it is aimed and can include:

- Sunburn-like skin problems
- Hair loss where the radiation enters the body
- Fatigue
- Nausea
- Loss of appetite and weight loss

Often these go away after treatment.

Radiation to the brain can sometimes cause memory loss, headaches, trouble thinking, or reduced sexual desire. Usually these symptoms are minor compared with those caused by a tumor in the brain, but they can affect your quality of life.

To learn more, please see the “Radiation Therapy” section of our website or our document *Understanding Radiation Therapy: A Guide for Patients and Families*.

Clinical trials for melanoma skin cancer

You may have had to make a lot of decisions since you’ve been told you have cancer. One of the most important decisions you will make is deciding which treatment is best for you. You may have heard about clinical trials being done for melanoma. Or maybe someone on your health care team has mentioned a clinical trial to you.

Clinical trials are carefully controlled research studies that are done with patients who volunteer for them. They are done to get a closer look at promising new treatments or procedures.

Clinical trials are one way to get state-of-the art cancer treatment. Sometimes they may be the only way to get some newer treatments. They are also the only way for doctors to learn better ways to treat cancer. Still, they are not right for everyone.

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials. You can also call our clinical trials matching service for a list of clinical trials that meet your medical needs. You can reach this service at 1-800-303-5691 or on our website at www.cancer.org/clinicaltrials. You can also get a list of current clinical trials by calling the National Cancer Institute’s Cancer Information Service toll-free at 1-800-4-CANCER (1-800-422-6237) or by visiting the NCI clinical trials website at www.cancer.gov/clinicaltrials.

There are requirements you must meet to take part in any clinical trial. If you do qualify for a clinical trial, it is up to you whether or not to enter (enroll in) it.

You can get a lot more information on clinical trials in our document *Clinical Trials: What You Need to Know*. You can read it on our website or call us (1-800-227-2345) to have it sent to you.

Complementary and alternative therapies for melanoma skin cancer

When you have cancer you are likely to hear about ways to treat your cancer or relieve symptoms that your doctor hasn't mentioned. Everyone from friends and family to Internet groups and websites may offer ideas for what might help you. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

What are complementary and alternative therapies?

It can be confusing because not everyone uses these terms the same way, and they are used to refer to many different methods. We use *complementary* to refer to treatments that are used *along with* your regular medical care. *Alternative* treatments are used *instead of* a doctor's medical treatment.

Complementary methods: Most complementary treatment methods are not offered as cures for cancer. Mainly, they are used to help you feel better. Some examples of methods that are used along with regular treatment are meditation to reduce stress, acupuncture to help relieve pain, or peppermint tea to relieve nausea. Some complementary methods are known to help, while others have not been tested. Some have been proven not to be helpful, and a few are even harmful.

Alternative treatments: Alternative treatments may be offered as cancer cures. These treatments have not been proven safe and effective in clinical trials. Some of these methods may be harmful, or have life-threatening side effects. But the biggest danger in most cases is that you may lose the chance to be helped by standard medical treatment. Delays or interruptions in your medical treatments may give the cancer more time to grow and make it less likely that treatment will help.

Finding out more

It's easy to see why people with cancer think about alternative methods. You want to do all you can to fight the cancer, and the idea of a treatment with few or no side effects sounds great. Sometimes medical treatments like chemotherapy can be hard to take, or they may no longer be working. But the truth is that most alternative methods have not been tested and proven to work in treating cancer.

As you think about your options, here are 3 important steps you can take:

- Look for “red flags” that suggest fraud. Does the method promise to cure all or most cancers? Are you told not to have regular medical treatments? Is the treatment a “secret” that requires you to visit certain providers or travel to another country?
- Talk to your doctor or nurse about any method you are thinking of using.
- Contact us at 1-800-227-2345 to learn more about complementary and alternative methods in general and to find out about the specific methods you are looking at. You can also read about them in the “Complementary and Alternative Medicine” section of our website.

The choice is yours

Decisions about how to treat or manage your cancer are always yours to make. If you want to use a non-standard treatment, learn all you can about the method and talk to your doctor about it. With good information and the support of your health care team, you may be able to safely use the methods that can help you while avoiding those that could be harmful.

What are some questions I can ask my doctor about melanoma skin cancer?

As you cope with cancer and cancer treatment, you need to have honest, open talks with your doctor. You should feel free to ask any question that’s on your mind, no matter how small it might seem. Here are some questions you might want to ask. Be sure to add your own questions as you think of them. Nurses, social workers, and other members of your treatment team may also be able to answer many of your questions.

- Would you please write down the exact type of skin cancer I have?
- How far has my melanoma spread within or beneath my skin?
- How thick is the melanoma?
- Do I need other tests before we can decide on treatment?
- Do I need to see any other doctors?
- How much experience do you have treating this type of cancer?
- What treatment choices do I have? What do you recommend and why?
- What is the goal of the treatment?
- How quickly do we need to decide on treatment?

- What should I do to be ready for treatment?
- What are the risks and benefits of treatment?
- How long will treatment last? What will it be like? Where will it be done?
- How will treatment affect my daily activities?
- What are the risks and side effects to the treatments you suggest?
- Will I have a scar after my treatment?
- What are the chances of my cancer coming back with the treatment you suggest? What would we do then?
- Should I take special care to avoid sun exposure?
- What type of follow-up will I need after treatment?
- Are my family members at risk for skin cancer? Should my family members be screened?

Add your own questions below:

Moving on after treatment for melanoma skin cancer

For many people with melanoma, treatment can remove or destroy the cancer. Finishing treatment can be both stressful and exciting. You may be relieved to finish treatment, but find it hard not to worry about cancer growing or coming back. (When cancer comes back after treatment, it is called a *recurrence*.) This is a very common concern in people who have had cancer.

It may take a while before your fears lessen. But it may help to know that many cancer survivors have learned to live with this uncertainty and are leading full lives. Our document called *Living With Uncertainty: The Fear of Cancer Recurrence* gives more detailed information on this.

For others, the melanoma may never go away completely. These people may get regular treatment with immunotherapy, targeted therapy, chemotherapy, or other treatments to try to help keep the cancer in check. Learning to live with cancer that does not go away can be difficult and very stressful. It has its own type of uncertainty. Our document *When Cancer Doesn't Go Away* talks more about this.

Follow-up care

If you have completed treatment, your doctors will still want to watch you closely. Follow-up is needed to watch for treatment side effects and to check for signs the cancer has come back or spread. This is a good time for you to ask your health care team any questions you need answered and to discuss any concerns you might have.

Your follow-up should include regular skin and lymph node exams by yourself and by your doctor. Along with these exams, imaging tests such as x-rays or CT scans may be recommended for some patients. How often you need follow-up visits depends on the stage of your melanoma when you were diagnosed and other factors.

A person who has had one melanoma is still at risk for having another melanoma or another type of skin cancer. It's important for melanoma survivors to do regular self-exams of their skin and avoid too much sun. You should see your doctor if you find any new lump or change in your skin. You should also tell your doctor about any new symptoms that do not go away (for instance, pain, cough, tiredness, loss of appetite). Melanoma can sometimes come back many years after it was first treated.

If melanoma does come back, treatment will depend on where the cancer is, what treatments you've had before, and your overall health. For more information on how recurrent cancer is treated, see our document *Melanoma Skin Cancer*. For more details on dealing with a recurrence in general you may also want to see our document *When Your Cancer Comes Back: Cancer Recurrence*.

Seeing a new doctor

At some point after your cancer is found and treated, you may find yourself in the office of a new doctor. It's important that you be able to give your new doctor the exact details of your diagnosis and treatment. Gathering these details during and soon after treatment may be easier than trying to get them at some point in the future. Make sure you have this information handy and always keep copies for yourself:

- A copy of your pathology report from any biopsy or surgery
- Copies of imaging tests (CT or MRI scans, etc.), which can usually be stored digitally (on a DVD, etc.)
- If you had surgery, a copy of your operative report
- If you stayed in the hospital, a copy of the discharge summary that the doctor wrote when you were sent home
- If you had radiation treatment, a summary of the type and dose of radiation and when and where it was given

- If you had chemotherapy, targeted therapy, or immunotherapy, a list of your drugs, drug doses, and when you took them
- Contact information for doctors who have treated you and are familiar with your case

It is also important to keep health insurance. While you hope your cancer won't come back, it could happen. If it does, you don't want to have to worry about paying for treatment.

Lifestyle changes after melanoma

You can't change the fact that you have had cancer. What you can change is how you live the rest of your life – making choices to help you stay healthy and feel as well as you can. This can be a time to look at your life in new ways. Maybe you are thinking about how to improve your health over the long term. Some people even start during cancer treatment.

Make healthier choices

For many people, finding out they have cancer helps them focus on their health in ways they may not have given much thought in the past. Are there things you could do that might make you healthier? Maybe you could try to eat better or get more exercise. Maybe you could cut down on alcohol, or give up tobacco. Even things like keeping your stress level under control might help. Now is a good time to think about making changes that can have positive effects for the rest of your life. You will feel better and you will also be healthier.

You can start by working on those things that worry you most. Get help with those that are harder for you. For instance, if you are thinking about quitting smoking and need help, call the American Cancer Society at 1-800-227-2345. A tobacco cessation and coaching service can help increase your chances of quitting for good.

Eating better

Eating right can be hard for anyone, but it can get even tougher during and after some types of cancer treatment. Treatment may change your sense of taste. Nausea can be a problem. You may not feel like eating and lose weight when you don't want to. Or you might have gained weight that you can't seem to lose. All of these things can be very frustrating.

If treatment caused weight changes or eating or taste problems, do the best you can and keep in mind that these problems usually get better over time. You may find it helps to eat small portions every 2 to 3 hours until you feel better. You may also want to ask your cancer team about seeing a dietitian, an expert in nutrition who can give you ideas on how to deal with side effects of these treatments.

One of the best things you can do after cancer treatment is put healthy eating habits into place. You may be surprised at the long-term benefits of some simple changes, like increasing the variety of healthy foods you eat. Getting to and staying at a healthy weight, eating a healthy diet, and limiting your alcohol intake may lower your risk for a number of types of cancer, as well as having many other health benefits.

To learn more, see our document *Nutrition and Physical Activity During and After Cancer Treatment: Answers to Common Questions*.

Rest, fatigue, and exercise

Feeling tired (fatigue) is a very common problem during and after cancer treatment. This is not a normal type of tiredness but a bone-weary exhaustion that often doesn't get better with rest. For some people, fatigue lasts a long time after treatment and can keep them from staying active. But exercise can actually help reduce fatigue and the sense of depression that sometimes comes with feeling so tired.

If you are very tired, though, you will need to balance activity with rest. It is OK to rest when you need to. To learn more about fatigue, please see our document *Fatigue in People With Cancer*.

If you were very ill or weren't able to do much during treatment, it is normal that your fitness, staying power, and muscle strength declined. You need to find an exercise plan that fits your own needs. Talk with your health care team before starting. Get their input on your exercise plans. Then try to get an exercise buddy so that you're not doing it alone.

Exercise can improve your physical and emotional health.

- It improves your cardiovascular (heart and circulation) fitness.
- Along with a good diet, it can help you get to and stay at a healthy weight.
- It makes your muscles stronger.
- It reduces fatigue.
- It can help lower anxiety and depression.
- It can make you feel generally happier.
- It helps you feel better about yourself.

Long term, we know that getting regular physical activity plays a role in helping to lower the risk of some cancers, as well as having other health benefits.

Can I lower my risk of the melanoma growing or coming back?

Most people want to know if there are certain lifestyle changes they can make to reduce their risk of cancer growing or coming back. Unfortunately, for most cancers there isn't much solid evidence to guide people. This doesn't mean that nothing will help – it's just that for the most part this is an area that hasn't been well studied. Most studies have looked at lifestyle changes as ways of preventing cancer in the first place, not slowing it down or preventing it from coming back.

At this time, not enough is known about melanoma to say for sure if there are things you can do that will be helpful. We do know that people who have had melanoma are at higher risk for developing another melanoma or other type of skin cancer. Because of this, it is important to limit your exposure to UV rays (from the sun or tanning beds) and to continue to examine your skin every month for signs of melanoma coming back or any new skin cancers.

Healthy behaviors such as not smoking, eating well, being active, and staying at a healthy weight may also help, but no one knows for sure. But we do know that these types of changes can have positive effects on your health that can extend beyond your risk of cancer.

How about your emotional health after melanoma skin cancer?

During and after treatment, you may be surprised by the flood of emotions you go through. This happens to a lot of people. You may find that you think about the effect of your cancer on things like your family, friends, and career. Money may be a concern as the medical bills pile up. Unexpected issues may also cause concern – for instance, as you get better and need fewer doctor visits, you will see your health care team less often. This can be hard for some people.

This is a good time to look for emotional and social support. You need people you can turn to. Support can come in many forms: family, friends, cancer support groups, church or spiritual groups, online support communities, or private counselors.

The cancer journey can feel very lonely. You don't need to go it alone. Your friends and family may feel shut out if you decide not to include them. Let them in – and let in anyone else you feel may help. If you aren't sure who can help, call your American Cancer Society at 1-800-227-2345 and we can put you in touch with a group or resource that may work for you. You can also read our document *Distress in People With Cancer* or see the “Emotional Side Effects” section of our website for more information.

If treatment for melanoma skin cancer stops working

When a person has had many different treatments and the cancer has not been cured, over time the cancer tends to resist all treatment. At this time you may have to weigh the possible benefits of a new treatment against the downsides, like treatment side effects and clinic visits.

This is likely to be the hardest time in your battle with cancer – when you have tried everything within reason and it's just not working anymore. Your doctor might offer you new treatment, but you will need to talk about how likely the treatment is to improve your health or change your outlook for survival.

No matter what you decide to do, it is important for you to feel as good as possible. Make sure you are asking for and getting treatment for pain, nausea, or any other problems you may have. This type of treatment is called *palliative treatment*. It helps relieve symptoms but is not meant to cure the cancer.

At some point you may want to think about hospice care. Most of the time it is given at home. Your cancer may be causing symptoms or problems that need to be treated. Hospice focuses on your comfort. You should know that while getting hospice care often means the end of treatments such as chemo and radiation, having hospice care doesn't mean you can't have treatment for the problems caused by your cancer or other health issues. It just means that the purpose of your care is to help you live life as fully as possible and to feel as well as you can. You can learn more about this in our document *Hospice Care*.

Staying hopeful is important, too. Your hope for a cure may not be as bright, but there is still hope for good times with family and friends – times that are filled with joy and meaning. Pausing at this time in your cancer treatment gives you a chance to focus on the most important things in your life. Now is the time to do some things you've always wanted to do and to stop doing the things you no longer want to do. Though the cancer may be beyond your control, there are still choices you can make.

You can learn more about the changes that occur when treatment stops working, and about planning ahead for yourself and your family, in our documents *Advanced Cancer* and *Nearing the End of Life*.

What's new in melanoma skin cancer research?

Research into the causes, prevention, and treatment of melanoma is being done in many medical centers around the world.

Causes, prevention, and finding melanoma early

Sunlight and UV rays

Recent studies suggest there may be 2 ways that UV rays causes melanoma.

The first way is linked to a lot of sun exposure and sunburns as a child or teen. This early sun exposure may cause changes in the DNA of skin cells that starts them on a path to becoming melanoma cells many years later. Some doctors think this is why melanomas often start on the legs and trunk – places that aren't often exposed to the sun in adulthood.

The second way is linked to melanomas that start on the arms, neck, and face. These areas are often exposed to sun, particularly in men.

Tanning booths may also help either kind of melanoma start.

Researchers are looking to see if melanomas that start as a result of these types of UV exposure have different gene changes that would mean they should be treated differently.

Public education

Most skin cancers can be prevented. The best way to reduce the number of skin cancer cases is to educate the public, especially parents, about skin cancer risk factors and warning signs.

It is also important to find melanoma early, when it is most likely to be cured. Check your skin every month and be aware of the warning signs of melanoma.

The American Academy of Dermatology (AAD) sponsors free skin cancer screenings around the country every year. Many local American Cancer Society offices work with the AAD to help with these screenings. The phone number and web address for the AAD are listed in the “How can I learn more?” section.

Along with recommending staying in the shade, the American Cancer Society uses the slogan, “Slip! Slop! Slap! ... and Wrap.” It is a catchy way to remind yourself to slip on a shirt, slop on sunscreen, slap on a hat, and wrap on sunglasses when you are going to be outdoors.

DNA research

Scientists have made a lot of progress during the past few years in learning how UV light harms DNA. But some inherited changes in DNA can make a person more likely to get melanoma. People who have a strong family history of melanoma should talk to a cancer genetic counselor or a doctor who knows about cancer genetics to discuss the pros and cons of genetic testing.

Staging

Advances in research are also being used in staging cancer. Very sensitive new tests can better find the spread of melanoma to lymph nodes. These tests might help doctors know which patients could be helped with treatments like immunotherapy after surgery. But some doctors worry that this test can sometimes suggest that a person has cancer spread when they really don't. For now, the test is only being used in research studies.

Treatment

Early-stage melanomas can often be cured with surgery, but more advanced melanomas are often much harder to treat because standard cancer treatments such as chemotherapy don't work very well. Newer types of treatment have shown a great deal of promise in treating more advanced melanomas.

Drugs that block PD-1 and PD-L1

Melanoma cells may use natural pathways in the body to help avoid the immune system. For instance, they often have a protein called PD-L1 on their surface that helps them evade the immune system. New drugs that block the PD-L1 protein (or the PD-1 protein on immune cells called T cells) can help the immune system spot the melanoma cells and attack them. Studies of these new drugs are now being done.

Melanoma vaccines

Weakened melanoma cells (or certain substances found in these cells) can be given to a patient to try to make the body's immune system kill the cancer cells. This is something like the way we use vaccines to destroy viruses that cause polio, measles, and mumps. But making a vaccine against a tumor like melanoma is harder than making a vaccine to fight a virus. Clinical trials are going on to test the value of treating people with advanced melanoma using vaccines, sometimes combined with other treatments. The results of these studies have been mixed so far, but newer vaccines may hold more promise.

Other immunotherapies

Other forms of immunotherapy are also being studied. Some early studies have shown that treating patients with high doses of chemotherapy and radiation therapy and then giving them immune system cells found in tumors can shrink melanoma tumors and perhaps prolong life as well.

Another potential approach to treatment is to combine different types of immunotherapy, which may be more effective than any single treatment for advanced melanoma.

Targeted drugs

New drugs that attack gene changes in melanoma cells are being studied.

A gene called *BRAF* is changed in the cells of about half of all melanomas. Drugs that target this gene, such as vemurafenib (Zelboraf) and dabrafenib (Tafinlar), are now used to treat some advanced melanomas.

The *MEK* gene is in the same signaling pathway inside cells as the *BRAF* gene. Trametinib (Mekinist) is a drug that blocks *MEK*. It has been shown to cause some melanomas with *BRAF* mutations to shrink.

An approach now being used is to combine a *BRAF* drug with a *MEK* drug to try to cause tumors to shrink for a longer time.

Certain types of melanomas sometimes have changes in a gene called *C-KIT*. Some targeted drugs are already used to treat other cancers with changes in *C-KIT*. Clinical trials are now looking to see if these drugs might help people with these types of melanoma.

Several other drugs that target other abnormal genes or proteins, such as sorafenib (Nexavar), bevacizumab (Avastin), pazopanib (Votrient), and everolimus (Afinitor), are now being studied in clinical trials as well. Researchers are also looking at combining some of these targeted drugs with other types of treatments, such as chemotherapy or immunotherapy.

To learn more about melanoma skin cancer

From your American Cancer Society

The following related information may also be helpful to you. These materials may be ordered from our toll-free number, 1-800-227-2345.

Dealing with diagnosis and treatment

Health Professionals Associated With Cancer Care

Talking With Your Doctor (also in Spanish)

After Diagnosis: A Guide for Patients and Families (also in Spanish)

Nutrition for the Person With Cancer During Treatment: A Guide for Patients and Families (also in Spanish)

Coping With Cancer in Everyday Life (also in Spanish)

Living with cancer

Living With Uncertainty: The Fear of Cancer Recurrence

When Your Cancer Comes Back: Cancer Recurrence

Distress in People With Cancer

Anxiety, Fear, and Depression

Understanding cancer treatments

Understanding Cancer Surgery: A Guide for Patients and Families (also in Spanish)

Understanding Chemotherapy: A Guide for Patients and Families (also in Spanish)

Understanding Radiation Therapy: A Guide for Patients and Families (also in Spanish)

[Immunotherapy](#)

Targeted Therapy

[Clinical Trials: What You Need to Know](#)

Cancer treatment side effects

Caring for the Patient With Cancer at Home: A Guide for Patients and Families (also in Spanish)

Guide to Controlling Cancer Pain (also in Spanish)

Nausea and Vomiting

Anemia in People With Cancer

Fatigue in People With Cancer

Family and caregiver concerns

Talking With Friends and Relatives About Your Cancer (also in Spanish)

What It Takes to Be a Caregiver

Helping Children When a Family Member Has Cancer: Dealing With Diagnosis (also in Spanish)

Work, insurance, and finances

In Treatment: Financial Guidance for Cancer Survivors and Their Families (also in Spanish)

Health Insurance and Financial Assistance for the Cancer Patient (also in Spanish)

Working During Cancer Treatment

Returning to Work After Cancer Treatment

Skin cancer causes and prevention

A Parent's Guide to Skin Protection (also available in Spanish)

Skin Cancer: Prevention and Early Detection

Sun Basics: Skin Protection Made Simple (information for children aged 8 to 14)

Why You Should Know About Melanoma (also in Spanish)

Ultraviolet (UV) Radiation

Your American Cancer Society also has books that you might find helpful. Call us at 1-800-227-2345 or visit our bookstore online at cancer.org/bookstore to find out about costs or to place an order.

National organizations and websites*

Along with the American Cancer Society, other sources of information and support include:

American Academy of Dermatology (AAD)

Toll-free number: 1-888-462-3376 (1-888-462-DERM)

Website: www.aad.org

For information on melanoma, a skin cancer risk assessment, a locator for free skin cancer screenings, and a dermatologist locator

Environmental Protection Agency

Website: www.epa.gov/sunwise/

Has free sun safety information and a UV Index app that you can check using your zip code

Melanoma Research Foundation

Toll-free number: 1-877-673-6460

Website: www.melanoma.org

For more on melanoma and chat rooms, patient stories, and bulletin boards – all to support and educate anyone affected by melanoma

National Cancer Institute

Toll-free number: 1-800-422-6237 (1-800-4-CANCER)

Website: www.cancer.gov

Offers accurate, up-to-date information about cancer to patients, their families, and the general public

Skin Cancer Foundation

Toll-free number: 1-800-754-6490 (1-800-SKIN-490)

Website: www.skincancer.org

Has pictures and descriptions of skin cancers, information and educational materials, and newsletters

**Inclusion on this list does not imply endorsement by the American Cancer Society.*

No matter who you are, we can help. Contact us anytime, day or night, for cancer-related information and support. Call us at **1-800-227-2345** or visit www.cancer.org.

Last Medical Review: 2/19/2014

Last Revised: 12/23/2014

2014 Copyright American Cancer Society

For additional assistance please contact your American Cancer Society
1-800-227-2345 or www.cancer.org