



## Melanoma Skin Cancer Overview

The information that follows is an overview of this type of cancer. It is based on the more detailed information in our document, *Melanoma Skin Cancer*. This document and other information can be obtained by calling 1-800-227-2345 or visiting our Web site at [www.cancer.org](http://www.cancer.org).

### What is cancer?

The body is made up of trillions of living cells. Normal body cells grow, divide, and die in an orderly way. During the early years of a person's life, normal cells divide faster to allow the person to grow. 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 that normal cells cannot 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.

When cancer cells get into the bloodstream or lymph vessels, they can travel to other parts of the body. There they begin to grow and form new tumors that replace normal tissue. This process is called *metastasis* (muh-**tas**-tuh-sis).

No matter where a cancer may spread, it is always named for the place where it started. For instance, breast cancer that has spread to the liver is still called breast cancer, not liver cancer. Likewise, prostate cancer that has spread to the bone is called metastatic prostate cancer, not bone cancer.

Different types of cancer can behave very differently. For example, lung cancer and breast cancer are very different diseases. 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 cancerous. Tumors that aren't cancer are called *benign* (be-**nine**). Benign tumors can cause problems – they can grow very large and press on healthy organs and tissues. But they cannot 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.

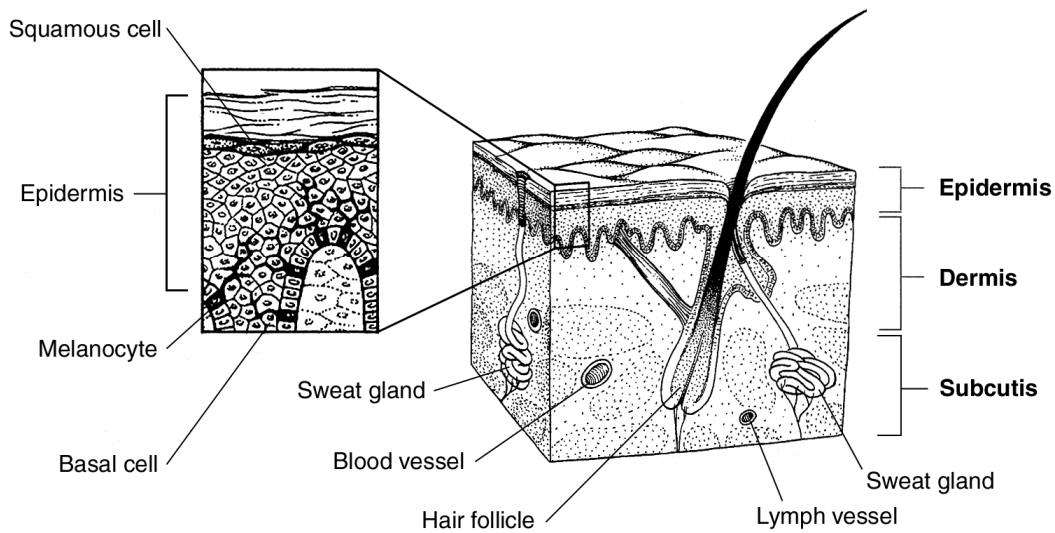
### Normal skin

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

- Covers and protects the organs inside the body
- Helps to keep out germs
- Helps keep in water and other fluids
- Helps control body temperature
- Protects the rest of the body from ultraviolet (UV) rays
- Helps the body make vitamin D

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

- Epidermis
- Dermis
- Subcutis



The top layer of the skin, the epidermis, is very thin and protects the deeper layers of skin and the organs. The bottom layer of the epidermis is made up of basal cells. These cells divide to form *keratinocytes*, which make a protein called keratin. This protein helps the skin protect the body.

The outermost part of the epidermis is called the *stratum corneum*, or horny layer. It is made of dead keratinocytes that are shed as new ones form. The cells in this layer are called *squamous cells*.

Another type of cell, the melanocyte, is also found in the epidermis. These cells make the brown pigment called melanin. Melanin gives the skin its tan or brown color and protects the deeper layers of the skin from some of the harmful effects of the sun. Melanocytes are the cells that can become melanoma.

A layer called the basement membrane separates the epidermis from the deeper layers of skin. The basement membrane is important because when a skin cancer becomes more advanced it grows through this barrier.

## 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 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. Melanoma is much less common than basal cell and squamous cell skin cancers (described below), but it is far more dangerous.

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

## 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:

- Seborrheic keratoses – tan, brown, or black raised spots with a "waxy" texture, or rough surface
- Hemangiomas – benign blood vessel growths often called strawberry spots or port wine stains
- Lipomas – soft growths of benign fat cells
- Warts – rough-surfaced growths caused by a virus
- Moles (also called nevi) – benign skin tumors that start from melanocytes
- Spitz nevus – a kind of skin tumor that sometimes looks a lot like melanoma

## How many people get melanoma?

The American Cancer Society's most recent estimates for melanoma in the United States are for 2012:

- About 76,250 new cases of melanoma
- About 9,180 deaths from melanoma

Skin cancer is the most common of all cancers. Melanoma accounts for less than 5% of skin cancer cases. 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.

# What are the risk factors for melanoma?

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 controlled. Others, like a person's age or family history, can't be changed.

But risk factors don't tell us everything. Having a risk factor, or even several risk factors, does not mean that you will get the disease. And many people who get the disease may not have any known risk factors. Even if a person with melanoma has a risk factor, it is often very hard to know how much that risk factor may have contributed to the cancer.

## Risk factors for melanoma skin cancer

### UV (ultraviolet) light

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

The amount of UV exposure depends on the strength of the light, how long the skin was exposed, and whether the skin was covered with clothing or sunscreen. Many studies have linked melanoma in the trunk and legs to frequent sunburns (especially in childhood).

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

### Moles

A mole (the medical name is *nevus*) is a benign (not cancer) skin tumor. Certain types of moles increase a person's chance of getting melanoma. The chance of any single mole turning into cancer is very low. But a person who has many moles is more likely to develop melanoma. These people should have very thorough skin exams by a skin doctor (dermatologist). Many doctors suggest that they should also check their own skin every month. Good sun protection is always important.

### Fair 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**

Around 10% of people with melanoma have a close relative (mother, father, brother, sister, 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. Less often, it is 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)
- Learn to look at their own skin and know what it should look like
- Be very careful about sun exposure and avoid tanning beds

## **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 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, men have a higher rate of melanoma than women.

## **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 be prevented?**

Not all melanomas can be prevented, but there are things you can do that may 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. Avoid being outdoors in sunlight too long, especially in

the middle of the day when UV light is most intense. Be "sun safe" when you are outdoors. "Slip! Slop! Slap! ... and Wrap" is a catch phrase to remind you of the 4 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

## **Protect your skin with clothing**

Clothes vary in how much they can protect you. Long-sleeved shirts, long pants, or long skirts are the 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.

## **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. Many groups like the American Academy of Dermatology recommend using products with a sun protection factor (SPF) of 30 or more. Be sure to use enough – a palmful to cover your arms, legs, face, and neck. And put it on again every 2 hours and after swimming or sweating. Use sunscreen even on hazy or overcast days. For it to work best, sunscreen should be put on 20 to 30 minutes before you go outside.

Don't make the mistake of thinking that because you're using sunscreen, you can stay out in the sun longer. Sunscreen should not be used to gain extra time in the sun, because you will still end up with damage to your skin.

If you want a tan, one option is using a sunless tanning lotion. These make you look tan without the danger of UV damage. 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 provide very little protection from UV rays, so if you use one, you should still use sunscreen and protect yourself with clothing when going outside.

## **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.

## **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 the 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.

## **Avoid tanning beds and sunlamps**

Don't use tanning beds or sun lamps because they can damage your skin. There is growing evidence that they may increase your risk of getting melanoma, especially if use started before the age of 30.

## **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 using 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 brightly the sun shines where you live.

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, your doctor may want to watch them closely with regular exams and may advise you to do monthly skin self-exams. The doctor may want to remove some of them if they have certain features that suggest they may be changing into a melanoma.

## Genetic counseling and testing

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

There is a gene which has been found to have changed (mutated) in some families with high rates of melanoma. Because it's not clear how useful the test for this gene 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 may 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 found?

Melanoma can often be found early. Everyone can do things to find this cancer early, when it is most curable.

### 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. A family member can check your lower back or the back of your thighs.

Spots on the skin that change in size, shape, or color should be seen by a doctor right away. Any unusual sore, lump, blemish, marking, or change in the way an area of the skin looks or feels should also be checked by a doctor. It is sometimes hard to tell the difference between melanoma and a normal mole, so it is important to show your doctor any mole that you are unsure of. (For more details about skin self-exam, see our

documents called *Skin Cancer: Prevention and Early Detection* and *Why You Should Know About Melanoma*)

## What to look for

### 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. Several moles can appear at the same time.

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 *ABCD 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. ABCD 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 there may be patches of pink, red, white, or blue.

**D is for Diameter:** The spot is larger than about  $\frac{1}{4}$  inch (the size of a pencil eraser), but melanomas can be smaller than this.

Still, some melanomas do not 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

## Exam by a health professional

Part of a routine cancer check-up should include a skin exam by a doctor or trained health professional. 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.

### Medical history and physical exam

The doctor will likely ask about your symptoms and risk factors. This will include your age, when you first saw the mark on your skin, and whether it has changed in size or the way it looks and if it has caused 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 will be checked for other spots and moles. The doctor may also check nearby lymph nodes, like those in the groin, underarm, or neck. Enlarged lymph nodes might suggest the spread of a melanoma.

You may be referred to a doctor who is an expert in skin diseases (a dermatologist). 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 an area of concern 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 found 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.

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. A shave biopsy is useful for many types of skin diseases and in treating benign moles. But it is not often used if a melanoma is suspected. This is because the sample removed may not be thick enough to find out how deep the cancer goes into 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 rotates 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.

**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 wound 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 done.

After a biopsy, the skin sample is sent to a lab to be looked at under a microscope. The sample may also be sent to a doctor with special training in making diagnoses from skin samples (a dermatopathologist).

## Biopsies of melanoma that may have spread

Melanoma that has spread to other parts of the body (called metastatic melanoma) may not be found until long after the first melanoma was removed from the skin. Rarely, some melanomas spread so fast that a person could have a lot of cancer in the lymph nodes, lungs, brain, or other places while the first skin melanoma is still small.

Sometimes these tumors are found before the skin lesion 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 skin lesion. 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 quite 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. There are special tests that 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 can sometimes be used if the doctor thinks the melanoma has spread 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. The FNA is not used to diagnose a suspicious mole, but it may be used to biopsy large lymph nodes near a melanoma to find out if it has spread.

**Surgical (excisional) lymph node biopsy:** For this type of biopsy a swollen lymph node is removed through a small cut (incision). It is often done if a lymph node's size suggests spread of melanoma 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. This test can find the lymph nodes that drain lymph fluid from the area of the skin where the melanoma started.

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. These are the *sentinel lymph nodes*, called that because they "stand watch," so to speak, over the tumor. A small cut is made in the identified lymph node area. The lymph nodes are then checked to find which one(s) turned blue. When these lymph nodes have been found, they are taken out and 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.

## Imaging tests

Imaging tests are done to make 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:** If there is any reason to suspect that the melanoma has spread to the liver or other organs, the doctor might order CT scans. These can also spot spread to the lungs better than a standard chest x-ray. 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 get a kind of dye put into your vein, which helps better outline structures in your body. You may also be asked to drink 1 to 2 pints of a special liquid. This helps outline the intestines.

CT scans take longer than regular x-rays and you usually need to lie still on a table while they are being done. You might feel a bit confined by the ring in the table moves through when the pictures are being taken. *Spiral CT* is now used in many places. This type of CT scan uses a faster machine with a lower dose of radiation that gives more detailed pictures.

CT scans can also be used to guide the needle during a biopsy. For this, you will 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 that may bother some people. 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 is useful 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.

**Bone scan:** A bone scan is used to look for cancer that has spread to the bones. It is rarely used for melanoma. It is only done when other test results or symptoms suggest that the cancer may have spread to the bones. For a bone scan, a radioactive chemical is put into a vein. The substance collects in the bones where the cancer has spread, which can be seen with a special camera. These areas may be biopsied to see if they contain melanoma.

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

## Lab tests

**Tests of biopsy samples:** Samples from any biopsies you have will be sent to a lab, where a pathologist (a doctor with special training) will look at them under a microscope for melanoma cells. If the samples do contain melanoma, the pathologist will look at certain features such as the tumor thickness and mitotic rate (the portion of cells that are actively dividing). These features help tell the stage of the cancer, which in turn affects treatment options and prognosis (outlook).

**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. Some 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, liver, and kidneys are working during treatment.

## Staging of melanoma

Staging is the process of finding out how widespread the cancer is. This includes finding its size and whether it has spread to the lymph nodes or any other organs. The tests described in the "How is melanoma found?" section are used to help decide the stage of the melanoma. Staging is very important because the treatment and the outlook (prognosis) for recovery depend on the stage of the cancer.

Stages are labeled using 0 and the Roman numerals I through IV (1-4). 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.

There are really 2 types of staging for melanoma. The *clinical stage* is based on what is found in the physical exam, biopsy, x-rays, CT scans, and so on. The *pathological stage* uses all of this information plus what is found during 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.

## Thickness of the melanoma and mitotic rate

The thickness of the melanoma as seen in the skin biopsy is called the "T category." The thinner the melanoma, the better the outlook. For the most part, melanomas less than about  $\frac{1}{25}$  of an inch deep (about the size of a period or a comma) have a very small chance of spreading. Thicker melanomas have a greater chance of spreading. The thickness of the melanoma also guides the choice of treatment. To measure the thickness of the melanoma, the doctor uses a device something like a small ruler. This is called the *Breslow measurement*.

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.

In either case, the melanoma is said to have a worse prognosis if it is *ulcerated*; this means that the outermost layer of skin is missing.

## Survival rates for melanoma

Some people with cancer may want to know the survival rates for their type of cancer. Others may not find the numbers helpful, or may even not want to know them. Whether or not you want to read about survival rates is up to you.

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.

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 genetic changes in the cancer cells, the patient's age, other health issues, 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.

## How is melanoma 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 recommend treatment options. They may include one or more of the following:

- Surgery
- Chemotherapy
- Immunotherapy
- Radiation therapy

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

Think about your choices without feeling rushed. If there is anything that's not clear, ask to have it explained. The best choice depends mostly on the thickness of the tumor and the stage of the disease.

## Types of surgery for melanoma

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

### Simple excision

Thin melanomas can be cured by a fairly minor operation called *simple excision*. After the skin is numbed, the tumor is cut out, along with a small amount of normal skin at the edges (called the margin). The wound is then stitched closed. This surgery will leave a scar.

### Wide-excision (re-excision)

If melanoma was confirmed by biopsy, the area will need to be excised (removed) again. More skin will be cut away from the area around the melanoma and the tissue will be looked at under a microscope to make sure that no cancer cells are left in the skin.

If the cancer is on the face, a smaller amount of tissue may be removed. A method called *Mohs surgery* may be used. 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.

### Amputation

If the melanoma is on a finger or toe, the treatment may mean removing all or part of that finger or toe (amputation). At one time, some melanomas of the arms and legs were also treated by amputation, but this is no longer done.

### Lymph node dissection

In the past, a lymph node dissection was sometimes done to see if the melanoma had spread to the nodes. Today, a sentinel lymph node biopsy is done first because it is a smaller surgery that is less likely to cause side effects such as lymphedema (see below). A lymph node dissection may then be done later if needed.

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. (See the section "How is melanoma found?" for a description of sentinel lymph node biopsy.)

If the sentinel lymph node *does* show cancer, then the other nodes in that area might be removed. 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. 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 called *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.

## **Chemotherapy for melanoma**

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

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
- Increased chance of infection (from low white blood cell counts)
- Easy bruising or bleeding (from low blood platelets)
- Tiredness (from low red blood cells)

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.

Several types of chemo can be used to treat advanced melanoma. 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. Some studies suggest that 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 the arms or legs. 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 an artery of 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 bad side effects.

## Immunotherapy for melanoma

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 for advanced melanoma**

Ipilimumab (Yervoy) is a man-made version of an immune system protein (a monoclonal antibody). It is thought to boost the immune response against melanoma cells in the body. This drug works by basically removing the “brakes” on the body's immune system.

This drug is given as an IV (intravenous) infusion, usually once every 3 weeks for 4 treatments. In patients with melanomas that can't be removed by surgery or that have spread to other parts of the body, it has been shown to help people live an average of several months longer. Doctors are now looking at its use for earlier stage melanomas as well.

In some cases of patients on the drug, the immune system starts 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 high doses of corticosteroids to suppress your immune system.

### **Cytokines**

Cytokines are proteins that "turn on" the immune system. They can help shrink stage III and IV melanomas in about 10% to 20% of patients. Side effects may include flu-like symptoms like fever, chills, aches, and severe tiredness. One drug used can cause fluid to build up in the body so that the person swells up and can feel quite sick.

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. The cytokine interferon-alpha can be used as an added (*adjuvant*) therapy after surgery to help prevent these cells from spreading and growing. This treatment might help keep the melanoma from coming back quickly. But it is not yet clear if adjuvant interferon improves survival.

In order to work, though, 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). Unlike its bacterial "cousin," 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 is a drug that, when used as a cream, causes an immune response against skin cancer cells. For very early (stage 0) melanomas in sensitive areas on the face that may be disfigured 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.

## **Radiation therapy for melanoma**

Radiation therapy is treatment with high-energy rays (such as x-rays) to kill cancer cells or shrink tumors. 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 more intense. 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 therapy is not often used to treat the original 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 cannot all be removed by surgery.

Radiation can also be used to treat distant spread or to relieve symptoms of cancer that has spread to the brain or the bone. Radiation therapy 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. They might include sunburn-like skin problems and hair loss where the radiation enters the body, fatigue, nausea, and vomiting. Often these go away after treatment.

## **Clinical trials for melanoma**

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 your type of cancer. 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.

If you would like to take part in a clinical trial, you should 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 Web site at [www.cancer.org/clinicaltrials](http://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 Web site at [www.cancer.gov/clinicaltrials](http://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.

Clinical trials are one way to get state-of-the art cancer treatment. They are the only way for doctors to learn better methods to treat cancer. Still, they are not right for everyone.

You can get a lot more information on clinical trials, in our document called *Clinical Trials: What You Need to Know*. You can read it on our Web site or call our toll-free number and have it sent to you.

## Complementary and alternative therapies for melanoma

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 Web sites 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 is 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 of these 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.

## **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?**

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?

- Are there other tests that need to be done before we can decide on treatment?
- Are there other doctors I need to see?
- 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?
- What are the risks and benefits of treatment?
- How long will treatment last? What will it involve? Where will it be done?
- Will I have a scar after my treatment? What other side effects might I have?
- What should I do to be ready for 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?
- Do I need follow-up appointments to check for the cancer coming back or a new cancer?
- 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

For some people with melanoma, treatment may 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, chemo, 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.

## Follow-up care

If you have completed treatment, your doctors will still want to watch you closely. During these visits, your doctors will ask about symptoms, do physical exams, and maybe order blood tests or imaging tests (like CT scans or MRIs). Follow-up is needed to watch for treatment side effects and to check for cancer that has come back or spread.

Your follow-up should include regular skin and lymph node exams by yourself and by your doctor. How often you need follow-up visits depends on the stage of your melanoma when you were diagnosed.

The follow-up schedule for melanomas thinner than 1 mm often means physical exams every 3 to 12 months for many years. If these exams are normal, you can then get check-ups once a year. Your doctor may want to see you more often if you have many moles or a few moles that are not quite normal.

For thicker melanomas, the schedule might include physical exams every 3 to 6 months for 2 years, then every 3 to 12 months for the next few years. After that, exams are done at least once a year. Some doctors also do chest x-rays or other tests every 6 to 12 months, especially for people who had more advanced stage disease.

Patients with stage IV melanoma whose cancer has been completely removed usually have the same follow-up schedule as for those with thicker melanomas (see above). Patients with stage IV melanoma that doesn't go away have a follow-up schedule that is based on their own case.

A person who has had one melanoma may still be at risk for having another melanoma or a non-melanoma type of skin cancer. People cured of one melanoma should closely look at their skin every month and avoid too much sun.

If melanoma does come back, treatment will depend on the place of the cancer, 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 called *When Your Cancer Comes Back: Cancer Recurrence*.

It is important for melanoma skin cancer survivors to do regular skin self-exams. 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 come back as many as 10 years (or, rarely, even longer) after it was first treated.

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.

## 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 is important that you be able to give your new doctor the exact details of your diagnosis and treatment. Make sure you have this information handy and always keep copies for yourself:

- A copy of your pathology report from any biopsy or surgery
- If you had surgery, a copy of your operative report
- If you were 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 chemo or immunotherapy, a list of your drugs, drug doses, and when you took them

## 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 thought much about 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 the 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.

### **Eating better**

Eating right can be hard for anyone, but it can get even tougher during and after 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 may 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 these treatment side effects.

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.

## **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 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.
- It makes your muscles stronger.
- It reduces fatigue.
- It lowers 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 cancer 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 is

little 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. 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 avoid too much sun exposure and to continue to examine your skin every month for signs of any new skin cancers.

Healthy behaviors such as not smoking, eating well, 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?

Once your treatment ends, 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. Or you may begin to think about the changes that cancer has brought to your relationship with your spouse or partner. 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 who 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.

## If treatment for melanoma 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 may 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 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.

## **What's new in melanoma research?**

Research into the causes, prevention, and treatment of melanoma is going on 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 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 link is 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 develop.

#### **Public education**

Most skin cancer 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 completely 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 ACS offices work with the AAD to help with these screenings. Their phone number and Web address are listed in the "How can I learn more?" section.

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. Changes in DNA can cause normal skin cells to become cancer. 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 when they really don't. For now, the test is only being used in research studies.

## **Treatment**

### **Immune therapy**

New ways of boosting the immune system to fight cancer are being studied. Researchers are working on vaccines aimed at making a person's immune cells attack the melanoma cells.

Other forms of immunotherapy are also being studied. A recent small study showed that treating patients with immune system cells found in tumors could shrink melanoma tumors and possibly prolong life, too. Another study found that a type of white blood cell (T cells) that had their genes altered in the lab could cause tumors to shrink in a small number of patients. More studies of these treatments are 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 with vaccines, sometimes combined with cytokine therapy as well. The results of these studies have been mixed so far, but newer vaccines may hold more promise.

## **Targeted drugs**

New drugs that attack genes that are not normal are being studied. One example is a gene called BRAF. This gene is changed in the cells of about half of all melanomas. Drugs that target the activity of this gene are being developed and studied in clinical trials. Drugs that target other gene or protein changes are also being studied in clinical trials.

Researchers are also looking at using some of these targeted drugs along with other types of treatments, such as chemo or immunotherapy.

## **More information about melanoma**

### **From your American Cancer Society**

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

Melanoma Skin Cancer Detailed Guide (also in Spanish)

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

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

Clinical Trials: What You Need to Know

Immunotherapy

Living With Uncertainty: The Fear of Cancer Recurrence

Pain Control: A Guide for Those With Cancer and Their Loved Ones (also in Spanish)

Skin Cancer Prevention and Early Detection

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

Surgery (also in Spanish)

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

Understanding Lymphedema (for Cancers Other Than Breast Cancer)

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

When Your Cancer Comes Back: Cancer Recurrence

Why You Should Know About Melanoma (also in Spanish)

## National organizations and Web sites\*

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

### **American Academy of Dermatology**

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

Web site: [www.aad.org](http://www.aad.org)

### **Environmental Protection Agency**

Web site: [www.epa.gov/eftpages/humasunprotection.html](http://www.epa.gov/eftpages/humasunprotection.html)

### **Melanoma Research Foundation**

Toll free number: 1-800-673-1290

Web site: [www.melanoma.org](http://www.melanoma.org)

Melanoma Patients Information Page: [www.melanoma.org/community/mpip-melanoma-patients-information-page](http://www.melanoma.org/community/mpip-melanoma-patients-information-page)

### **National Cancer Institute**

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

Web site: [www.cancer.gov](http://www.cancer.gov)

### **Skin Cancer Foundation**

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

Web site: [www.skincancer.org](http://www.skincancer.org)

*\*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](http://www.cancer.org).

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For additional assistance please contact your American Cancer Society  
1 · 800 · ACS-2345 or [www.cancer.org](http://www.cancer.org)