

# Skin Cancers

Skin cancer is by far the most common type of cancer. If you have skin cancer, it is important to know which type you have because it affects your treatment options and your outlook (prognosis). If you aren't sure which type of skin cancer you have, ask your doctor so you can get the right information.

## Types of Skin cancers

### 1) Basal and Squamous Cell Skin Cancer

These cancers are most often found in areas exposed to the sun, such as the head, neck, and arms, but they also can occur elsewhere. They are very common but are also usually very treatable. Here you can find out all about these cancers, including risk factors, symptoms, how they are found, and how they are treated.

#### What Are Basal and Squamous Cell Skin Cancers?

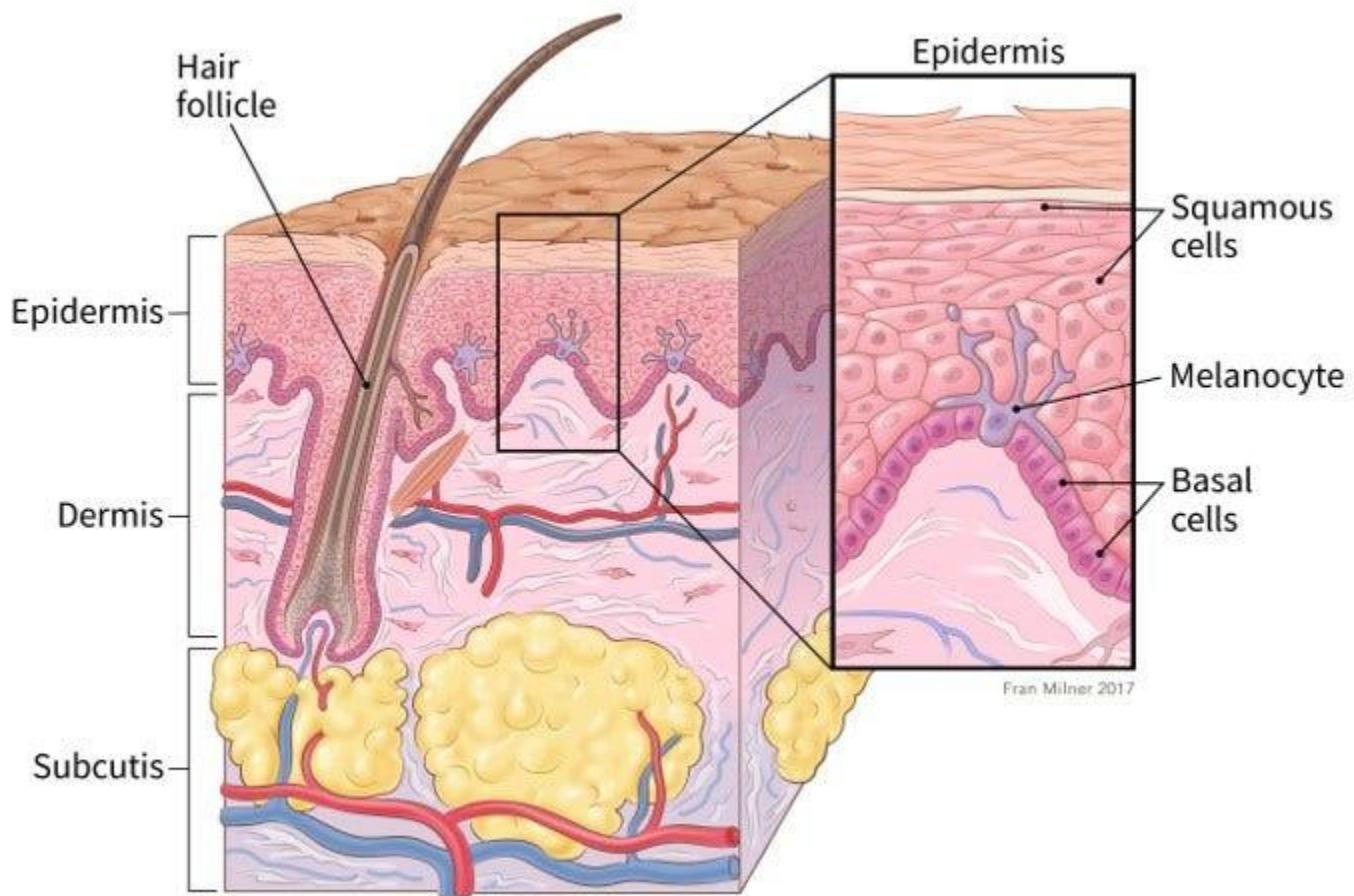
Basal and squamous cell skin cancers are the most common types of skin cancer. These cancers are often related to sun exposure.

Where do skin cancers start?

Most skin cancers start in the top layer of skin, called the *epidermis*. There are 3 main types of cells in this layer:

- **Squamous cells:** These are flat cells in the upper (outer) part of the epidermis, which are constantly shed as new ones form. When these cells grow out of control, they can develop into squamous cell skin cancer (also called **squamous cell carcinoma**).
- **Basal cells:** These cells are in the lower part of the epidermis, called the **basal cell layer**. These cells constantly divide to form new cells to replace the squamous cells that wear off the skin's surface. As these cells move up in the epidermis, they get flatter, eventually becoming squamous cells. Skin cancers that start in the basal cell layer are called **basal cell skin cancers** or **basal cell carcinomas**.
- **Melanocytes:** These cells make the brown pigment called **melanin**, which gives the skin its tan or brown color. Melanin acts as the body's natural sunscreen, protecting the deeper layers of the skin from some of the harmful effects of the sun. Melanoma skin cancer starts in these cells.

The epidermis is separated from the deeper layers of skin (the dermis and the subcutis) by a thin layer of tissue known as the **basement membrane**. When a skin cancer becomes more advanced, it generally grows through this barrier and into the deeper layers.



## Basal cell carcinoma

Basal cell carcinoma (BCC, also called **basal cell skin cancer**, or just **basal cell cancer**) is most common type of skin cancer. About 8 out of 10 skin cancers are basal cell carcinomas.

These cancers start in the basal cell layer, which is the lower part of the epidermis.

BCCs usually develop on sun-exposed areas, especially the face, head, neck, and arms. They tend to grow slowly. It's very rare for a basal cell cancer to spread to other parts of the body. But if BCC is left untreated, it can grow into nearby areas and invade the bone or other tissues beneath the skin.

If not removed completely, BCC can come back (recur) in the same place on the skin. People who have had basal cell skin cancers are also more likely to get new ones in other places.

## Squamous cell carcinoma

About 2 out of 10 skin cancers are squamous cell carcinomas (SCCs, also called **squamous cell skin cancers**, **cutaneous squamous cell cancers**, or just **squamous cell cancers**). These cancers start in the flat cells in the upper (outer) part of the epidermis.

SCCs commonly appear on sun-exposed areas of the body such as the face, ears, neck, lips, arms, and backs of the hands. They can also develop in scars or chronic skin sores elsewhere. They sometimes start in **actinic keratoses** (described below). Less often, they form in the skin of the genital area.

Squamous cell cancers can usually be removed completely (or treated in other ways), although they are much more likely than basal cell cancers to grow into deeper layers of skin and spread to other parts of the body.

Pre-cancerous and other skin conditions related to squamous cell carcinoma

### *Actinic keratosis (solar keratosis)*

Actinic keratosis (AK), also known as **solar keratosis**, is a pre-cancerous skin condition caused by too much exposure to the sun. AKs are usually small (less than 1/4 inch across), rough or scaly spots that may be pink-red or flesh-colored. Usually they start on the face, ears, backs of the hands, and arms of middle-aged or older people with fair skin, although they can occur on other sun-exposed areas. People who have them usually develop more than one.

AKs tend to grow slowly and usually do not cause any symptoms (although some might be itchy or sore). They sometimes go away on their own, but they may come back.

A small percentage of AKs may turn into squamous cell skin cancers. Most AKs do not become cancer, but it can be hard sometimes to tell them apart from true skin cancers, so doctors often recommend [treating](#) them. If they are not treated, you and your doctor should check them regularly for changes that might be signs of skin cancer.

### *Squamous cell carcinoma in situ (Bowen disease)*

Squamous cell carcinoma in situ, also called **Bowen disease**, is the earliest form of squamous cell skin cancer. “In situ” means that the cells of these cancers are still only in the epidermis (the upper layer of the skin) and have not invaded deeper layers.

Bowen disease appears as reddish patches. Compared with AKs, Bowen disease patches tend to be larger, redder, scalier, and sometimes crusted. Like AK, Bowen disease usually doesn’t cause symptoms, although it might be itchy or sore.

Like most other skin cancers (and AKs), these patches most often appear in sun-exposed areas. Bowen disease can also occur in the skin of the anal and genital areas (where it is known as **erythroplasia of Queyrat** or **Bowenoid papulosis**). This is often

related to sexually transmitted infection with human papillomaviruses (HPVs), the viruses that can also cause genital warts.

Bowen disease can sometimes progress to an invasive squamous cell skin cancer, so doctors usually recommend [treating](#) it. People who have these are also at higher risk for other skin cancers, so close follow-up with a doctor is important.

### *Keratoacanthoma*

Keratoacanthomas (KAs) are dome-shaped tumors that often have a crater-like area in the middle, like a volcano. These tumors tend to start on sun-exposed skin. They may start out growing quickly, but their growth usually slows down. Many keratoacanthomas shrink or even go away on their own over time without any treatment. But some continue to grow, and a few may even spread to other parts of the body.

Many doctors view keratoacanthomas as a type of squamous cell skin cancer, although not all doctors agree. These tumors can be hard to tell apart from SCC just by looking at them, and their growth is often hard to predict, so doctors usually advise removing or destroying them (similar to how SCCs are treated).

## **Basal and Squamous Cell Skin Cancer Risk Factors**

It's important to know about the risk factors for skin cancer because there may be [things you can do that could lower your risk of getting it](#). If you are at higher risk because of certain factors, there are also [things you can do that might help find it early](#), when it's likely to be easier to treat.

### What is a risk factor?

A risk factor is anything that raises your risk of getting a disease such as cancer. Different cancers have different risk factors. Some risk factors, like smoking and excess sun exposure, can be changed. Others, like your age or family history, can't be changed.

Having a risk factor, or even many risk factors, does not mean that you will get skin cancer. Many people with risk factors for skin cancer never get it. And some people who do get it may have few or no known risk factors.

Several risk factors make a person more likely to get basal cell or squamous cell skin cancer.

- Ultraviolet (UV) light exposure

Exposure to [ultraviolet \(UV\) rays](#) is a major risk factor for most skin cancers. Sunlight is the main source of UV rays. Tanning beds are another source of UV rays.

While UV rays make up a very small portion of the sun's rays, they are the main cause of the damaging effects of the sun on the skin. UV rays damage the DNA (genes) inside

skin cells. Skin cancers can begin when this damage affects genes that control skin cell growth.

To learn more about UV exposure and what you can do to protect yourself and your loved ones, see [How Do I Protect Myself from Ultraviolet \(UV\) Rays?](#)

- Having light-colored skin

Anyone can get skin cancer, but people with light-colored skin have a much higher risk than people with naturally darker skin color. This is because the skin pigment melanin has a protective effect in people with darker skin. White people with fair (light-colored) skin that freckles or burns easily, blue or green eyes, and naturally red or blonde hair are at especially high risk.

**Albinism** is an inherited lack of protective skin pigment. People with this condition may have pink-white skin and white hair. They have a very high risk of getting sunburns and skin cancer, so they need to be extra careful to protect their skin.

- Being older

The risk of getting basal and squamous cell skin cancers rises as people get older. This is probably because of the buildup of sun exposure over time. But these cancers are becoming more common in younger people as well, probably because they are spending more time in the sun with their skin exposed.

- Being male

Men are more likely than women to get basal and squamous cell cancers of the skin. This is thought to be due mainly to getting more sun exposure.

- Exposure to certain chemicals

Being exposed to large amounts of [arsenic](#) increases the risk of developing skin cancer. Arsenic is an element found naturally in well water in some areas. It's also used in making some pesticides and in some other industries.

Workers exposed to coal tar, paraffin, and certain types of petroleum products may also have an increased risk of skin cancer.

- Radiation exposure

People who have had radiation treatment have a higher risk of developing skin cancer in the area where the radiation was focused. This is particularly a concern in children who have had radiation treatment for cancer.

- Previous skin cancer

People who have had a basal or squamous cell cancer have a much higher chance of developing another one.

- Long-term or severe skin inflammation or injury

Scars from severe burns, areas of skin over serious bone infections, and skin damaged by some severe inflammatory skin diseases are more likely to develop skin cancers (mostly squamous cell cancers), although this risk is generally small.

- Psoriasis treatment

Psoralens and ultraviolet light (PUVA) treatments given to some people with psoriasis (a chronic inflammatory skin disease) can increase the risk of developing squamous cell skin cancer and probably other skin cancers.

- Xeroderma pigmentosum (XP)

This very rare inherited condition reduces the ability of skin cells to repair DNA damage caused by sun exposure. People with this disorder often develop many skin cancers, starting in childhood.

Basal cell nevus syndrome (also known as nevoid basal cell carcinoma syndrome or Gorlin syndrome)

In this rare congenital (present at birth) condition, people develop many basal cell cancers over their lifetime. People with this syndrome may also have abnormalities of the jaw (and other bones), eyes, and nervous tissue.

Most often basal cell nevus syndrome is inherited from a parent. In families with this syndrome, those affected often start to develop basal cell cancers as children or teens. Exposure to UV rays can increase the number of tumors these people get.

- Other genetic syndromes

Several other genetic syndromes have also been linked with an increased risk of skin cancer. Examples include:

- Epidermolysis bullosa
- Fanconi anemia
- Muir-Torre syndrome
- Rothmund-Thomson syndrome
- Bloom syndrome
- Werner syndrome

- Having a weakened immune system

The immune system helps the body fight cancers of the skin and other organs. People with weakened immune systems (from certain diseases or medical treatments) are more likely to develop many types of skin cancer, including squamous cell cancer, [melanoma](#), and less common types such as [Kaposi sarcoma](#) and [Merkel cell carcinoma](#).

For example, people who get organ transplants are usually given medicines that weaken their immune system to help prevent their body from rejecting the new organ. This increases their risk of developing skin cancer. Skin cancers in people with weakened immune systems tend to grow faster and are often harder to treat.

Treatment with large doses of corticosteroid drugs can also weaken the immune system. This may also increase a person's risk of skin cancer.

People infected with [HIV](#), the virus that causes AIDS, often have weakened immune systems and also are at increased risk for basal and squamous cell cancers.

- HPV infection

[Human papillomaviruses \(HPVs\)](#) are a group of more than 150 viruses, many of which can cause papillomas, or warts. The warts that people commonly get on their hands and feet are not related to any form of cancer. But some HPV types, especially those that affect the genital and anal areas and the skin around the fingernails, are often related to squamous cell skin cancers in these areas.

- Smoking

[People who smoke](#) are more likely to develop squamous cell skin cancer, especially on the lips. Smoking is not a known risk factor for basal cell cancer.

## Basal and Squamous Cell Skin Cancer Symptoms

Skin cancer, including basal and squamous cell skin cancers, often don't cause bothersome symptoms until they have grown quite large. Then, skin cancer symptoms may include itching, bleeding, or even pain. But if you know what to look for, you can spot signs of skin cancer when it's still small and easier to treat.

### Skin cancer signs and symptoms

Not all skin cancers look the same. In fact, skin cancers can show up in many shapes and sizes. Sometimes they might even look like other non-cancerous skin conditions. It's important to check your skin regularly and ask your doctor about any of the following signs of skin cancer:

- A new, expanding, or changing growth, spot, or bump on the skin
- A sore that bleeds and/or doesn't heal after several weeks
- A rough or scaly red patch, which might crust or bleed
- A wart-like growth
- A mole (or other spot on the skin) that's new or changing in size, shape, or color
- A mole with an odd shape, irregular borders, or areas of different colors

### **Signs and symptoms of basal cell skin cancer**

Basal cell cancers (BCCs) usually develop on areas exposed to the sun, especially the face, head, neck, and arms, but they can occur anywhere on the body.

In people with lighter-colored skin, basal cell skin cancer can appear as:

- Small, pink or red, translucent, shiny, pearly bumps, which might have blue, brown, or black areas
- Pink growths with raised edges and a lower area in their center, which might contain abnormal blood vessels spreading out like the spokes of a wheel
- Flat, firm, pale or yellow areas, similar to a scar
- Raised reddish patches that might be itchy
- Open sores (which may have oozing or crusted areas) that don't heal, or that heal and then come back

BCCs are less common in people with darker skin color. When they do occur, they often have many of the same features (such as being translucent or shiny, or having raised edges), although they are often darker in color.

Basal cell cancers are often fragile and might bleed after shaving or after a minor injury. If you have a sore or cut that is taking longer than a week or so to heal, check with your doctor, because it could be a sign of basal cell skin cancer.

### **Signs and symptoms of squamous cell skin cancer**

In people with lighter-colored skin, squamous cell cancers (SCCs) tend to occur on sun-exposed areas of the body such as the face, ear, neck, lip, and back of the hands. These cancers are less common in people with darker skin color, in whom they're more likely to appear in areas that aren't often exposed to the sun.

Less often, SCCs can form in the skin of the genital area. They can also develop in scars or skin sores elsewhere.

These cancers can appear as:

- Rough or scaly red (or darker) patches, which might crust or bleed
- Raised growths or lumps, sometimes with a lower area in the center
- Open sores (which may have oozing or crusted areas) that don't heal, or that heal and then come back
- Wart-like growths

### **Other ways basal and squamous cell carcinomas can look**

Both basal and squamous cell skin cancers can also develop as a flat area showing only slight changes from normal skin.

These and other types of skin cancers can also look different from the descriptions above. This is why it's important to have a doctor check any new or changing skin growths, sores that don't heal, or other areas that concern you.

## Tests for Basal and Squamous Cell Skin Cancers

Most basal and squamous cell skin cancers are brought to a doctor's attention because of [signs or symptoms](#) a person is having.

If you have an abnormal area that might be skin cancer, your doctor will examine it and might do tests to find out if it is cancer or some other skin condition.

If you're being seen by your primary doctor and skin cancer is suspected, you may be referred to a **dermatologist** (a doctor who treats skin diseases).

If skin cancer is found and there's a chance it might have spread to other areas of the body, other tests might be done as well.

### Medical history and physical exam

Usually the first step is for your doctor to ask about your symptoms, such as when the mark first appeared on the skin, if it has changed in size or appearance, and if it has been painful, itchy, or bleeding. You might also be asked about your [risk factors for skin cancer](#) (including sunburns and tanning practices, if you or anyone in your family has had skin cancer, and if you have any other skin conditions).

During the physical exam, the doctor will note the size, shape, color, and texture of the area(s) in question, and whether it is bleeding, oozing, or crusting. The rest of your body may be checked for moles and other spots that could be related to skin cancer (or other skin conditions).

Along with a standard physical exam, some dermatologists use a technique called **dermoscopy** (also known as **dermatoscopy, epiluminescence microscopy [ELM] or surface microscopy**) to look at spots on the skin more closely. The doctor uses a dermatoscope, which is a special magnifying lens and light source held near the skin. Sometimes a thin layer of alcohol or oil is used with this instrument. The doctor may take a digital photo of the spot.

The doctor may also feel the nearby lymph nodes, which are bean-sized collections of immune system cells under the skin in certain areas. Some skin cancers can spread to lymph nodes. When this happens, the nodes might be felt as lumps under the skin.

### Skin biopsy

If the doctor thinks that a suspicious area might be skin cancer, the area (or part of it) will be removed and sent to a lab to be looked at under a microscope. This is called a **skin biopsy**. If the biopsy removes the entire tumor, it's often enough to cure basal and squamous cell skin cancers without further treatment.

There are different types of skin biopsies. The doctor will choose which one is best for you based on the suspected type of skin cancer, where it is on your body, its size, and other factors. Any biopsy will probably leave at least a small scar. Different methods can result in different scars, so if this is a concern, ask your doctor about possible scarring before the biopsy is done.

Skin biopsies are done using a local anesthetic (numbing medicine), which is injected into the area with a very small needle. You will probably feel a small prick and a little stinging as the medicine is injected, but you should not feel any pain during the biopsy.

#### Shave (tangential) biopsy

For a [shave biopsy](#), the doctor shaves off the top layers of the skin with a small surgical blade. Bleeding from the biopsy site is then stopped by applying an ointment or a chemical that stops bleeding, or by using a small electrical current to cauterize the wound.

#### Punch biopsy

For a [punch biopsy](#), the doctor uses a tool that looks like a tiny round cookie cutter to remove a deeper sample of skin. The doctor rotates the punch biopsy tool on the skin until it cuts through all the layers of the skin. The sample is then removed, and the edges of the biopsy site are often stitched together.

#### Excisional and incisional biopsies

To examine a tumor is larger or that may have grown into deeper layers of the skin, the doctor may use an [excisional](#) (or less often, an [incisional](#)) biopsy.

- An **excisional biopsy** removes the entire tumor.
- An **incisional biopsy** removes only a portion of the tumor.

For these types of biopsies, a surgical knife is used to cut through the full thickness of skin. A wedge or sliver of skin is removed for examination, and the edges of the wound are usually stitched together.

#### Examining the biopsy samples

All skin biopsy samples are sent to a lab, where a doctor called a **pathologist** looks at them with a microscope and may do other tests on them. Often, the samples are sent to a **dermatopathologist**, a doctor who has special training in looking at skin samples.

#### Lymph node biopsy

It isn't common for a basal or squamous cell cancer to spread beyond the skin, but if it does it usually goes first to nearby lymph nodes, which are bean-sized collections of immune cells. If your doctor feels lymph nodes under the skin near the tumor that are too large or too firm, a lymph node biopsy may be done to find out if cancer has spread to them. This might be done in different ways.

### Fine needle aspiration (FNA)

For an FNA, the doctor uses a syringe with a thin, hollow needle to remove very small fragments of the lymph node. The needle is smaller than the needle used for a blood test. A local anesthetic is sometimes used to numb the area first. This test rarely causes much discomfort and does not leave a scar.

FNAs are not as invasive as some other types of biopsies, but they may not always provide a large enough sample to find cancer cells.

### Surgical (excisional) lymph node biopsy

If an FNA doesn't find cancer in a lymph node but the doctor still suspects the cancer has spread there, the lymph node may be removed by surgery and examined. If the lymph node is just under the skin, this can often be done in a doctor's office or outpatient surgical center using local anesthesia. This will leave a small scar.

### Imaging tests

It's not common for squamous cell cancer to spread deeply below the skin or to other parts of the body, and even less common for basal cell cancers, so most people with these skin cancers don't need imaging tests.

But if your doctor thinks you might be at risk for the cancer spreading outside the skin, imaging tests such as an [MRI](#) or [CT scan](#) might be done.

## **Can Basal and Squamous Cell Skin Cancers Be Prevented?**

There is no sure way to prevent all basal and squamous cell skin cancers. Some [risk factors](#) such as your age, sex, race, and family history can't be controlled. But there are things you can do that could lower your risk of getting these and other skin cancers.

- Limit your exposure to ultraviolet (UV) rays

The most important way to lower your risk of basal and squamous cell skin cancers is to limit your exposure to [UV rays](#). Practice sun safety when you are outdoors.

### Look for shade

Simply staying in the shade is one of the best ways to limit your UV exposure.

### "Slip! Slop! Slap! ®... and Wrap"

This catchphrase can help you remember some of the key steps you can take to protect yourself from UV rays. If you are going to be in the sun:

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

- Avoid tanning beds and sun lamps

Just like UV rays from the sun, the UV rays of tanning beds are harmful. Tanning lamps give off UV rays, which can cause long-term skin damage and can contribute to skin cancer. Most skin doctors and health organizations recommend not using tanning beds and sun lamps.

- Protect children from the sun

Children tend to spend more time outdoors and can burn more easily, so they need special attention to protect their skin. Parents and other caregivers should protect children from excess sun exposure by using the steps above. Children also need to be taught about the dangers of too much sun exposure as they become more independent.

To learn more about UV exposure and what you can do to protect yourself and your loved ones, see [How Do I Protect Myself from Ultraviolet \(UV\) Rays?](#)

- Avoid harmful chemicals

Exposure to certain chemicals, such as [arsenic](#), can increase a person's risk of skin cancer. People can be exposed to arsenic from well water in some areas, pesticides and herbicides, some medicines and imported traditional herbal remedies, and in certain occupations (such as mining and smelting).

- Check your skin regularly

[Checking your skin regularly](#) may help you spot any new growths or abnormal areas and show them to your doctor before they even have a chance to turn into skin cancer. To learn more, see [Can Basal and Squamous Cell Skin Cancers be Found Early?](#)

- Don't smoke

Smoking has been linked to an increased risk of squamous cell skin cancer, as well as to many other types of cancer. If you are thinking about [quitting smoking](#) and need help, call the American Cancer Society for information and support at 1-800-227-2345.

- Avoid weakening your immune system (when possible)

Having a weakened immune system increases your risk of getting skin cancer. It can also make skin cancers harder to treat.

[Infection with HIV](#), the virus that causes AIDS, can weaken the immune system. You can lower your risk of skin cancer, as well as many other types of cancer, by avoiding known risk factors for HIV infection, such as intravenous (IV) drug use and having unprotected sex with many partners.

Some people, such as those with autoimmune diseases or who have had organ transplants, might need to take medicines meant to suppress their immune system. Other people might need medicines that weaken their immune system as a side effect, such as chemotherapy to treat cancer. For people who need these medicines, the

benefit from taking them will likely far outweigh the small increased risk of getting skin cancer.

Medicines to lower skin cancer risk

Some people at increased risk for skin cancer, such as people with [certain inherited conditions or a weakened immune system](#), might be helped by medicines that could lower their risk (known as **chemoprevention**).

Doctors are studying many drugs that might lower risk, although these are not commonly used at this time. To learn more, see [What's New in Basal and Squamous Cell Skin Cancer Research?](#)

## 2) Melanoma Skin cancer

### What Is Melanoma Skin Cancer?

Melanoma is a type of skin cancer that develops when melanocytes (the cells that give the skin its tan or brown color) start to grow out of control.

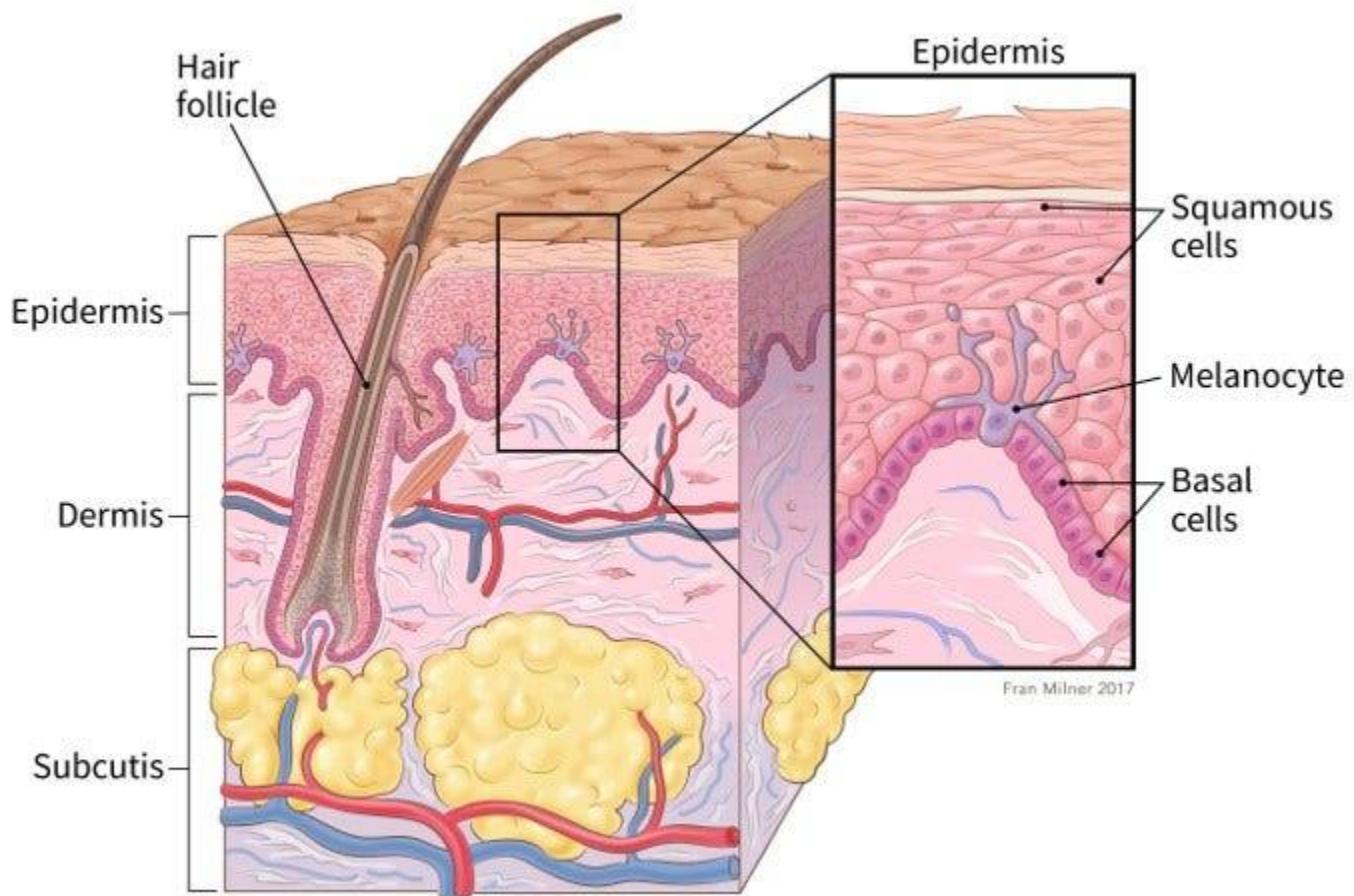
Melanoma is much less common than some other types of skin cancers. But melanoma is more dangerous because it's much more likely to spread to other parts of the body if not found and treated early.

### Where do skin cancers start?

Most skin cancers start in the top layer of skin, called the *epidermis*. There are 3 main types of cells in this layer:

- **Squamous cells:** These are flat cells in the upper (outer) part of the epidermis, which are constantly shed as new ones form.
- **Basal cells:** These cells are in the lower part of the epidermis, called the *basal cell layer*. These cells constantly divide to form new cells to replace the squamous cells that wear off the skin's surface. As these cells move up in the epidermis, they get flatter, eventually becoming squamous cells.
- **Melanocytes:** These are the cells that can become melanoma. They normally make a brown pigment called *melanin*, which gives the skin its tan or brown color. Melanin protects the deeper layers of the skin from some of the harmful effects of the sun.

The epidermis is separated from the deeper layers of skin by the **basement membrane**. When a skin cancer becomes more advanced, it generally grows through this barrier and into the deeper layers.



### Melanoma skin cancers

Melanoma is a cancer that begins in melanocytes.

Most melanomas start in the skin. Another name for these cancers is **cutaneous melanoma**.

Melanomas can start anywhere on the skin, but in people with lighter skin color they are more likely to start on the trunk (chest and back) in men and on the legs in women. The neck and face are other common sites.

People with darkly pigmented skin have a lower risk of melanoma at these more common sites.

### Types of melanoma skin cancer

There are different types of skin melanoma. The most common types are:

- **Superficial spreading melanoma:** This type makes up about 7 in 10 melanomas of the skin. These tumors tend to grow outward on the surface of the skin (at least at first), so they might be noticed as a dark spot on the skin that is changing shape and/or getting bigger. Some of these melanomas start in existing moles (see below), but others do not.
- **Nodular melanoma:** This type accounts for about 2 in 10 skin melanomas. These tumors often appear as a distinct, raised bump (nodule) on the skin that is often dark brown or black, but it can also be pink or red. This can make them hard to find early. Nodular melanomas tend to grow down into deeper layers of the skin fairly early, so they're often at a more advanced [stage](#) than superficial spreading melanomas by the time they are found.
- **Lentigo maligna melanoma:** This type of melanoma tends to occur in older people. It often first appears as an abnormally shaped tan or brown spot in an area that gets a lot of sun (such as the face, ears, or arms), and it tends to grow slowly (or change in other ways) over time.
- **Acral lentiginous melanoma (acral melanoma):** This type of melanoma starts in areas that don't get a lot of sun exposure, such as the palms of the hands, soles of the feet, or under the nails. Acral melanomas make up a large portion of melanomas in people with darker skin tones.

Melanomas in other parts of the body

Melanomas can also form in other parts of the body, such as:

- Inside the eye (known as [ocular melanomas](#)). Most of these start in the uvea (the middle layer of the eyeball) and are known as [uveal melanomas](#).
- Inside the nose, mouth, throat, genital, or anal area (known as [mucosal melanomas](#))

These are much less common than melanoma of the skin.

## Risk Factors for Melanoma Skin Cancer

It's important to know about the risk factors for melanoma because there may be [things you can do to lower your risk](#) of getting it. If you are at higher risk because of certain factors, there are also [things you can do that might help find it early](#), when it's likely to be easier to treat.

### What is a risk factor?

A risk factor is anything that raises your risk of getting a disease such as cancer. Different cancers have different risk factors. Some risk factors, like smoking and excess sun exposure, can be changed. Others, like your age or family history, can't be changed.

Having a risk factor, or even many risk factors, does not mean that you will get melanoma. Many people with risk factors never get melanoma. And some people who get it may have few or no known risk factors.

### **Several risk factors can make a person more likely to develop melanoma.**

- Ultraviolet (UV) light exposure

Exposure to ultraviolet (UV) rays is a major risk factor for most melanomas. Sunlight is the main source of UV rays. Tanning beds and sun lamps are also sources of UV rays.

While UV rays make up a very small portion of the sun's rays, they are the main cause of the damaging effects of the sun on the skin. UV rays damage the DNA (genes) inside skin cells. Skin cancers can begin when this damage affects the genes that control skin cell growth.

The pattern and timing of the UV exposure may play a role in melanoma development. For example, melanoma on the trunk (chest and back) and legs has been linked to frequent sunburns (especially in childhood). This might also have something to do with the fact that these areas aren't constantly exposed to UV light. Some research suggests that melanomas that start in these areas are different from those that start on the face, neck, and arms, where the sun exposure is more constant.

And different from either of these are melanomas on the palms of the hands, soles of the feet, or under the nails (known as **acral lentiginous melanomas**), or on internal surfaces such as the mouth and vagina (**mucosal melanomas**), where there has been little or no sun exposure.

To learn more about the effects of UV rays on the skin and what you can do to protect yourself and your loved ones, see [Ultraviolet \(UV\) Radiation](#) and [How Do I Protect Myself from Ultraviolet \(UV\) Rays?](#)

- Moles

A mole (also known as a *nevus*) is a benign (non-cancerous) pigmented tumor. Babies are not usually born with moles; they often begin to appear in children and young adults.

**Having many moles:** Most moles will never cause any problems, but someone who has many moles is more likely to develop melanoma.

**Atypical moles (dysplastic nevi):** These moles look a little like normal moles but have some features of melanoma. They are often larger than other moles and have an abnormal shape or color. (See [Signs and Symptoms of Melanoma Skin Cancer](#) for descriptions of how moles and melanomas look.) They can appear on skin that is exposed to the sun, as well as skin that is usually covered, such as on the buttocks or scalp.

Dysplastic nevi often run in families. A small percentage of dysplastic nevi may develop into melanomas. But most dysplastic nevi never become cancer, and many melanomas seem to arise without a pre-existing dysplastic nevus.

**Dysplastic nevus syndrome (atypical mole syndrome):** People with this inherited condition have many dysplastic nevi. If at least one close relative has had melanoma, this condition is referred to as **familial atypical multiple mole and melanoma (FAMMM) syndrome.**

People with this condition have a very high lifetime risk of melanoma, so they need to have very thorough, regular skin exams by a dermatologist (a doctor who specializes in skin problems). Sometimes full-body photos are taken to help the doctor recognize if moles are changing and growing. Many doctors recommend that these patients be taught to do monthly [skin self-exams](#) as well.

**Congenital melanocytic nevi:** Moles present at birth are called *congenital melanocytic nevi*. The lifetime risk of melanoma developing in congenital melanocytic nevi is estimated to be between 0 and 5%, depending on the size of the nevus. People with very large congenital nevi have a higher risk, while the risk is lower for those with small nevi. For example, the risk for melanoma is very low in congenital nevi that are smaller than the palm of the hand, while those that cover large portions of the back and buttocks (*bathing trunk nevi*) have significantly higher risks.

Congenital nevi are sometimes removed by surgery so that they don't have a chance to become cancer. Whether doctors advise removing a congenital nevus depends on several factors, including its size, location, and color. Many doctors recommend that congenital nevi that are not removed should be examined regularly by a dermatologist and that the person should be taught how to do monthly skin self-exams.

Again, the chance of any single mole turning into cancer is very low. However, anyone with lots of irregular or large moles has an increased risk for melanoma.

- Lighter skin, hair, and eye color

The risk of melanoma is much higher for people with lighter skin color than for people with darker skin.

Among people with lighter skin, those with red or blond hair, blue or green eyes, or skin that freckles or burns easily are at increased risk.

- Family history of melanoma

Your risk of melanoma is higher if one or more of your first-degree relatives (parents, brothers, sisters, or children) has had melanoma. Around 1 in 10 people with melanoma have a family history of the disease.

The increased risk might be because of a shared family lifestyle of frequent sun exposure, a family tendency to have lighter skin tone, certain gene changes (mutations) that run in a family, or a combination of these factors.

For some people with a strong family history of melanoma, doctors might advise [genetic counseling and testing](#) to see if they have gene mutations that increase their risk.

- Personal history of melanoma or other skin cancers

A person who has already had melanoma has a higher risk of getting melanoma again. In people who've had several melanomas or who've had melanoma at an early age, doctors might advise genetic counseling and testing to see if they have gene mutations that increase their risk.

People who have had basal or squamous cell skin cancers are also at increased risk of getting melanoma.

- Having a weakened immune system

A person's immune system helps the body fight off cancers of the skin and other organs. People with weakened immune systems (from certain diseases or medical treatments) are more likely to develop many types of skin cancer, including melanoma.

For example, people who get organ transplants are usually given medicines that weaken their immune system to help prevent them from rejecting the new organ. This increases their risk of melanoma.

People infected with [HIV](#), the virus that causes AIDS, often have weakened immune systems and are also at increased risk for melanoma.

- Being older

The risk of melanoma increases as people age, but melanoma can also develop in younger people. In fact, melanoma is one of the most common cancers in people younger than 30 (especially younger women).

Melanoma that runs in families may occur at a younger age.

- Being male

In the United States, men are more likely than women to get melanoma, although this varies by age. Before age 50, the risk is higher for women; after age 50, the risk is higher in men.

- Xeroderma pigmentosum

Xeroderma pigmentosum (XP) is a rare, inherited condition that lowers skin cells' ability to repair damage to their DNA. People with XP have a high risk of developing melanoma and other skin cancers when they are young, especially on sun-exposed areas of their skin.

## **Signs and Symptoms of Melanoma Skin Cancer**

Unusual moles, sores, lumps, blemishes, markings, 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.

### **Possible signs and symptoms of melanoma**

- The most important warning sign of melanoma is **a new spot on the skin or a spot that is changing in size, shape, or color.**
- Another important sign is **a spot that looks different from all of the other spots on your skin.** (This is sometimes known as "the ugly duckling sign.")

If you have one of these warning signs, have your skin checked by a doctor.

What should a normal mole look like?

Most people have moles, and almost all moles are harmless. A normal mole is:

- Usually an evenly colored brown, tan, or black spot on the skin
- Either flat or raised
- Round or oval
- Generally smaller than 6 millimeters (about  $\frac{1}{4}$  inch) across (about the width of a pencil eraser)

Some moles can be present at birth, but most appear during childhood or young adulthood. New moles that appear later in life should be checked by a doctor.

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

It's important to recognize changes in a mole's size, shape, color, or texture. These changes could suggest a melanoma is developing.

### **The ABCDE rule for signs of melanoma**

The **ABCDE rule** is another guide to the usual signs of melanoma. Be on the lookout and tell your doctor about spots that have any of the following features:

- **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 different shades of brown or black, or sometimes with patches of pink, red, white, or blue.

- **D is for Diameter:** The spot is larger than 6 millimeters across (about  $\frac{1}{4}$  inch – the size of a pencil eraser), although melanomas can sometimes be smaller than this.
- **E is for Evolving:** The mole is changing in size, shape, or color.

Some melanomas don't fit these rules. It's important to tell your doctor about any changes or new spots on your skin, or growths that look different from the rest of your moles.

Other signs of melanoma on the skin

Other warning signs are:

- A sore that doesn't heal
- Spread of pigment from the border of a spot into surrounding skin
- Redness or a new swelling beyond the border of the mole
- Change in sensation, such as itchiness, tenderness, or pain
- Change in the surface of a mole – scaliness, oozing, bleeding, or the appearance of a lump or bump

Be sure to show your doctor any areas that concern you. It's sometimes hard to tell the difference between melanoma and an ordinary mole, even for doctors, so it's important to show your doctor any mole that you are unsure of.

Signs of hidden melanoma

While most melanomas start on sun-exposed skin, a small portion of melanomas start in places that aren't exposed to the sun. These might look different from melanomas on the skin. For example:

- **Under a fingernail or toenail (acral melanoma):** May appear as a dark line or streak in the nail.
- **On the palms or soles (acral melanoma):** May appear as a dark, irregular areas.
- **In the eye (uveal melanoma):** May appear as a dark spot in the colored part of the eye (iris).
- **In the mouth, nose, and genitals (mucosal melanoma):** May develop as dark spots or irregular areas in these tissues.

It's important to show a doctor anything that concerns you in these areas as well.

## Tests for Melanoma Skin Cancer

Most melanomas are brought to a doctor's attention because of [signs or symptoms](#) a person is having.

If you have an abnormal area on your skin that might be cancer, your doctor will examine it and might do tests to find out if it is melanoma, another type of skin cancer, or some other skin condition.

If you are being seen by your primary doctor and melanoma is suspected, you may be referred to a **dermatologist**, a doctor who specializes in skin diseases, who will look at the area more closely.

If melanoma is found, other tests might then be done to learn more about it, such as if it has spread to other areas of the body.

#### Medical history and physical exam

The first step your doctor usually takes is to ask about your symptoms, such as when the mark on the skin first appeared, if it has changed in size or appearance, and if it has been painful, itchy, or bleeding. You may also be asked about your possible [risk factors for melanoma skin cancer](#), such as your history of tanning and sunburns, and if you or anyone in your family has had melanoma or other skin cancers.

During the physical exam, your doctor will note the size, shape, color, and texture of the area(s) in question, and whether it is bleeding, oozing, or crusting. The rest of your body may be checked for moles and other spots that could be related to skin cancer (or other skin conditions).

The doctor may also feel the lymph nodes (small bean-sized collections of immune cells) under the skin in the neck, underarm, or groin near the abnormal area. When melanoma spreads, it often goes to nearby lymph nodes first, making them larger.

#### Special techniques to look at the skin

Dermatologists sometimes use special tools when trying to determine if an abnormal area might be a melanoma, and therefore if a skin biopsy (see below) is needed.

#### Dermoscopy

Dermatologists often use dermoscopy, also known as *dermatoscopy*, *epiluminescence microscopy [ELM]*, or *surface microscopy*, to get a closer look at abnormal spots on the skin. In this technique, the doctor uses a dermatoscope, which is a special magnifying lens and light source held near the skin. Sometimes a thin layer of alcohol or oil is put on the skin before using this instrument.

Dermoscopy allows doctors to look at a suspicious area more closely, even giving them the ability to see some structures below the surface of the skin that can't be seen with the naked eye.

Digital images of the area can also be taken during dermoscopy. These can be used to see if an area changes over time. In some systems, the images can be analyzed by a computer, which can help the doctor determine if the area might be a melanoma.

## Reflectance confocal microscopy (RCM)

RCM is another technique that lets the doctor look at an abnormal area of skin to a certain depth without having to cut into the skin. In this technique, a low-powered laser is aimed at the suspicious area. The light from the laser enters the upper layers of the skin and reflects off the structures there. A special microscope detects the light as it bounces back, which is used to create a detailed, three-dimensional image of the area. This can help the doctor determine if the area needs to be biopsied.

RCM may be especially useful for people with many unusual moles, as it can cut down on the number of skin biopsies these people might need. RCM might also be helpful in determining the edges of a melanoma, which could help during surgery.

Other methods that don't require cutting into the skin

Other approaches to help doctors get a better idea if an abnormal area is a melanoma are also being developed. For example:

- Some handheld **spectroscopic devices** detect reflections of different wavelengths of light or other forms of energy to help determine if an area is likely to be a melanoma.
- In another approach, known as **adhesive patch testing**, a sticky patch is placed over the area. When it's removed, some skin cells from the area come with it, which can then be tested for certain gene changes that are often linked with melanoma.

To learn more, see [What's New in Melanoma Skin Cancer Research?](#)

## Skin biopsy

If the doctor thinks a spot might be a melanoma, the suspicious area will be removed and sent to a lab to be looked at under a microscope. This is called a *skin biopsy*.

There are many ways to do a skin biopsy. The doctor will choose which one is best based on the size of the affected area, where it is on your body, and other factors. No matter which type of biopsy is done, it should remove as much of the suspected area as possible so that an accurate diagnosis can be made.

Any biopsy is likely to leave at least a small scar. Different methods can result in different types of scars, so ask your doctor about scarring before the biopsy.

Skin biopsies are done using a local anesthetic (numbing medicine), which is injected into the area with a very small needle. You will likely feel a small prick and a little stinging as the medicine is injected, but you should not feel any pain during the biopsy.

### Deep shave (tangential) biopsy

For this type of biopsy, also known as **saucerization**, the doctor shaves off the top layers of the skin with a small surgical blade. Bleeding from the biopsy site is stopped by applying an ointment, a chemical that stops bleeding, or a small electrical current to cauterize the wound.

A [shave biopsy](#) is useful in diagnosing many types of skin diseases and in sampling moles when the risk of melanoma is very low. If this type of biopsy is used for a suspected melanoma, it's important that the biopsy blade will go deep enough to get below the suspicious area. Otherwise, if it is a melanoma, the biopsy sample may not be thick enough to measure how deeply the cancer has invaded the skin.

### Punch biopsy

For a [punch biopsy](#), the doctor uses a tool that looks like a tiny, round cookie cutter to remove a deeper sample of skin. The doctor rotates the punch biopsy tool on the skin until it cuts through all the layers of the skin. The sample is then removed, and the edges of the biopsy site are often stitched together.

### Excisional and incisional biopsies

To examine a tumor that might have grown into deeper layers of the skin, the doctor may use an [excisional](#) (or less often, an incisional) biopsy.

- An **excisional biopsy** removes the entire tumor (along with a small margin of normal skin around it). This is usually the preferred method of biopsy for suspected melanomas if it can be done, although this isn't always possible.
- An **incisional biopsy** removes only a portion of the tumor.

For these types of biopsies, a surgical knife is used to make an elliptical or circular cut through the full thickness of skin. The skin is then removed for examination, and the edges of the cut are usually stitched together.

### Biopsies of melanoma that may have spread

Biopsies of areas other than the skin may be needed in some cases. For example, if melanoma has already been diagnosed on the skin, nearby lymph nodes may be biopsied to see if the cancer has spread to them.

Rarely, biopsies may be needed to figure out what type of cancer someone has. For example, some melanomas can spread so quickly that they reach the lymph nodes, lungs, brain, or other areas while the original skin melanoma is still very small.

Sometimes these tumors are found with imaging tests (such as CT scans) or other exams even before the melanoma on the skin is discovered. In other cases, they may be found long after a skin melanoma has been removed, so it's not clear if it's the same cancer.

In still other cases, melanoma may be found somewhere in the body without ever finding a spot 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, and if melanoma has spread widely throughout the body, it may not be possible to tell exactly where it started.

When melanoma has spread to other organs, it can sometimes be confused with a cancer starting in that organ. For example, melanoma that has spread to the lung might be confused with a [primary lung cancer](#) (cancer that starts in the lung).

Special lab tests can be done on the biopsy samples that can tell whether it is a melanoma or some other kind of cancer. This is important because different types of cancer are treated differently.

Biopsies of suspicious areas inside the body often are more involved than those used to sample the skin.

#### Fine needle aspiration (FNA) biopsy

Fine needle aspiration (FNA) isn't used to biopsy suspicious moles. But it may be used to biopsy large lymph nodes near a melanoma to find out if the melanoma has spread to them.

For this type of biopsy, the doctor uses a syringe with a thin, hollow needle to remove very small pieces of a lymph node or tumor. The needle is smaller than the needle used for a blood test. A local anesthetic is sometimes used to numb the area first. This test rarely causes much discomfort and does not leave a scar.

If the lymph node is just under the skin, the doctor can often feel it well enough to guide the needle into it. For a suspicious lymph node deeper in the body or a tumor in an organ such as the lung or liver, an imaging test such as ultrasound or a CT scan is often used to help guide the needle into place.

An FNA is not as invasive as some other types of biopsies, but it may not always collect enough of a sample to tell if a suspicious area is melanoma. In these cases, a more invasive type of biopsy may be needed.

#### Surgical (excisional) lymph node biopsy

This procedure can be used to remove an enlarged lymph node through a small incision (cut) in the skin. A local anesthetic (numbing medicine) is generally used if the lymph node is just under the skin, but the person may need to be sedated or even asleep (using general anesthesia) if the lymph node is deeper in the body.

This type of biopsy is often done if a lymph node's size suggests the melanoma has spread there but an FNA of the node wasn't done or didn't find any melanoma 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 (SLNB) is often done to see if the cancer has spread to nearby lymph nodes, which in turn might affect treatment options. This test can be used to find the lymph nodes that are likely to be the first place the melanoma would go if it has spread. These lymph nodes are called *sentinel nodes* (they stand sentinel, or watch, over the tumor, so to speak).

To find the sentinel lymph node (or nodes), a doctor injects a small amount of a radioactive substance into the area of the melanoma. After giving the substance time to travel to the lymph node areas near the tumor, a special camera is used to see if it collects in one or more sentinel lymph nodes. Once the radioactive area has been marked, the patient is taken for surgery, and usually a blue dye is injected in the same place the radioactive substance was injected. A small incision is then made in the marked area, and the lymph nodes are then checked to find which one(s) became radioactive and/or turned blue. These sentinel nodes are removed and looked at under a microscope.

If there are no melanoma cells in the sentinel nodes, no more lymph node surgery is needed because it is very unlikely the melanoma would have spread beyond this point. If melanoma cells are found in the sentinel node, the remaining lymph nodes in this area are typically removed and looked at as well. This is known as a *lymph node dissection*. (See [Surgery for Melanoma Skin Cancer](#).)

If a lymph node near a melanoma is abnormally large, a sentinel node biopsy probably won't be needed. The enlarged node is simply biopsied.

### Lab tests of biopsy samples

Samples from any biopsies will be sent to a lab, where a doctor called a **pathologist** will look at them under a microscope for melanoma cells. Often, skin samples are sent to a **dermatopathologist**, a doctor who has special training in looking at skin samples.

If the doctor can't tell for sure if melanoma cells are in the sample just by looking at it, special lab tests will be done on the cells to try to confirm the diagnosis. These might include:

- Immunohistochemistry (IHC)
- Fluorescence in situ hybridization (FISH)
- Comparative genomic hybridization (CGH)
- Gene expression profiling (GEP)
- Next-generation sequencing (NGS)

If melanoma is found in the samples, the pathologist will look at certain important features such as the tumor thickness and mitotic rate (the portion of cells that are actively dividing).

These tests and features can help determine the stage of the melanoma (see [Melanoma Skin Cancer Stages](#)), and they may also help determine how likely it is to spread. These can affect a person's treatment options and prognosis (outlook).

#### Molecular testing for certain gene changes

For some people with melanoma, biopsy samples (or blood samples) may be tested to see if the cancer cells have mutations (changes) in certain genes. This type of testing, sometimes referred to as [biomarker testing](#), might affect a person's treatment options, especially if the melanoma has spread.

For example, about half of melanomas have mutations in the *BRAF* gene. Some drugs used to treat advanced melanomas are only likely to work if the cells have *BRAF* gene mutations (see [Targeted Therapy for Melanoma Skin Cancer](#)), so this test is important in helping to determine treatment options.

Tests to look for changes in other genes that could affect treatment options might be done as well. These might include tests for changes in genes such as *C-KIT*, *NRAS*, *ALK*, *ROS1*, and the *NTRK* genes. These gene changes aren't common in melanomas, but some targeted drugs might be a treatment option if one of these changes is found.

#### Imaging tests

[Imaging tests](#) use x-rays, magnetic fields, or radioactive substances to create pictures of the inside of the body. They are used mainly to look for the possible spread of melanoma to lymph nodes or other organs. **These tests are not needed for most people with very early-stage melanoma, which is very unlikely to have spread.**

Imaging tests can also be done to help determine how well treatment is working or to look for possible signs of cancer coming back (recurring) after treatment.

#### Chest x-ray

This test might be done to help determine if melanoma has spread to the lungs, although a CT scan of the chest (see below) is often done instead.

#### Ultrasound

[Ultrasound](#) uses sound waves and their echoes to create images of the inside of your body on a computer screen. This test might be used to look at the lymph nodes near the tumor, especially if it's not clear if they're enlarged based on a physical exam. Ultrasound is typically fairly quick and easy to do, and it doesn't expose you to radiation.

**Ultrasound-guided needle biopsy:** Ultrasound can also be used to help guide a biopsy needle into a suspicious lymph node.

#### Computed tomography (CT) scan

A [CT scan](#) uses x-rays to make detailed, cross-sectional images of your body. Unlike a regular x-ray, CT scans can show the detail in soft tissues (such as internal organs).

This test can show if any lymph nodes are enlarged or if organs such as the lungs or liver have suspicious spots, which might be from the spread of melanoma.

**CT-guided needle biopsy:** CT scans can also be used to help guide a biopsy needle into a suspicious area within the body.

Magnetic resonance imaging (MRI)

MRIs use radio waves and strong magnets instead of x-rays to create detailed images of parts of your body. MRIs can be very helpful in looking at the brain and spinal cord.

Positron emission tomography (PET) scan

A PET scan can help show if the cancer has spread to lymph nodes or other parts of the body. It is most useful in people with more advanced stages of melanoma.

For this test, you are injected with a slightly radioactive form of sugar, which collects mainly in cancer cells. A special camera is then used to create a picture of areas of radioactivity in the body.

**PET/CT scan:** Many centers have special machines that do both a PET and CT scan at the same time (PET/CT scan). This lets the doctor compare areas of higher radioactivity on the PET scan with the more detailed appearance of that area on the CT scan.

Blood tests

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

Doctors often test a person's blood for levels of a substance called **lactate dehydrogenase (LDH)** before treatment. If the melanoma has spread to distant parts of the body, a high LDH level is a sign that the cancer may be harder to treat. This can affect the stage of the cancer. (See Melanoma Skin Cancer Stages.)

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 before and during treatment.

## Can Melanoma Skin Cancer Be Prevented?

There is no sure way to prevent melanoma. Some risk factors, such as your age, natural skin color, and family history, can't be controlled. But there are things you can do that could lower your risk of getting melanoma and other skin cancers.

- Limit your exposure to ultraviolet (UV) rays

The most important way to lower your risk of melanoma is to protect yourself from exposure to UV rays. Practice sun safety when you are outdoors.

## Seek shade

Simply staying in the shade is one of the best ways to limit your UV exposure.

## Slip! Slop! Slap!® and Wrap!

If you are going to be in the sun, this catchphrase can help you remember 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 sensitive skin around them.
  
- Avoid using tanning beds and sunlamps

Many people believe the UV rays of tanning beds are harmless. This is not true. Tanning lamps give off UV rays, which can cause long-term skin damage and can contribute to skin cancer. Tanning bed use has been linked with an increased risk of melanoma, especially if it is started before a person is 30 years old. Most dermatologists (skin doctors) and health organizations recommend not using tanning beds and sun lamps.

- Protect children from the sun

Children need special attention, since they tend to spend more time outdoors and can burn more easily. Parents and other caregivers should protect children from excess sun exposure by using the steps above. Children need to be taught about the dangers of too much sun exposure as they become more independent.

To learn more about sun safety

For more on how to protect yourself and your family from UV exposure, see [How Do I Protect Myself from Ultraviolet \(UV\) Rays?](#)

- Watch for new, changing, or abnormal moles

Checking your skin regularly may help you spot any new or abnormal moles or other growths and show them to your doctor before they even have a chance to turn into skin cancer.

Certain types of moles are more likely to develop into melanoma (see [Melanoma Skin Cancer Risk Factors](#)). If you have moles, depending on how they look, your doctor may want to watch them closely with regular exams or may remove some of them if they have features that suggest they might change into a melanoma.

Routine removal of many moles is not usually recommended as a way to prevent melanoma. Some melanomas develop from moles, but most do not. If you have many moles, getting careful, routine exams by a dermatologist, along with doing monthly [skin self-exams](#), might be recommended.

If you find a new, unusual, or changing mole, you should have it checked by a doctor experienced in recognizing skin cancers. See [Signs and Symptoms of Melanoma Skin Cancer](#) for descriptions of what to look for.

- Avoid weakening your immune system (when possible)

Having a weakened immune system increases your risk of getting melanoma and other types of skin cancer.

Infection with HIV, the virus that causes AIDS, can weaken the immune system. Avoiding known risk factors for HIV infection, such as intravenous (IV) drug use and having unprotected sex with many partners, might lower your risk of skin cancer, as well as many other types of cancer. (For more information, see [HIV Infection, AIDS, and Cancer](#).)

Some people need to take medicines to suppress their immune system. This includes people who have had organ transplants and some people with autoimmune diseases. People with cancer also sometimes need to take medicines such as chemotherapy, which can lower their immune function. For these people, the benefit from taking these medicines will likely far outweigh the small increased risk of getting skin cancer.

### 3) Merkel Cell skin cancer

#### What Is Merkel Cell Carcinoma (MCC)?

Merkel cell carcinoma (MCC) is a rare type of skin cancer. Merkel cells are thought to be a type of skin **neuroendocrine cell**, because they share some features with nerve cells and hormone-making cells. Merkel cells are very close to nerve endings in the skin. They help us sense light touch, which lets us do things like feel the fine details on an object's surface.

#### Merkel cell carcinoma (MCC)

Merkel cell skin cancer (carcinoma) starts when the Merkel cells in the skin start to grow out of control. It tends to grow quickly and can spread to other parts of the body.

Merkel cell carcinoma is also sometimes called **neuroendocrine carcinoma of the skin**. Another name for MCC is **trabecular carcinoma** (or trabecular cancer).

MCC is much less common than most other types of skin cancer, but it's one of the most dangerous types. It's much more likely than common skin cancers (squamous and basal cell skin cancers) to spread to other parts of the body, and it can be hard to treat if it has spread.

Merkel cell carcinomas can start anywhere on the skin, but most often they start on skin that's exposed to the sun, like the face (the most common site), neck, and arms. A very small portion start in other parts of the body, such as inside the nose or esophagus.

Merkel cell tumors often look like firm, pink, red, or purple lumps or bumps on the skin. They usually don't hurt, but they tend to grow quickly and can sometimes open up as ulcers or sores

### **Merkel Cell Carcinoma (MCC) Risk Factors**

Having a risk factor for Merkel cell carcinoma (MCC), or even many risk factors, doesn't mean that you will get it. Most people with risk factors never get MCC, while others with this disease may have few or no known risk factors.

#### **What is a risk factor?**

A risk factor is anything that raises your chance of getting a disease such as cancer. Different cancers have different risk factors. Some risk factors, like smoking and sun exposure, can be controlled. Others, like your age or family history, can't be changed.

These are some known risk factors for Merkel cell carcinoma:

- Merkel cell polyomavirus (MCV) infection

The Merkel cell polyomavirus (MCV) is found in the cancer cells of about 8 out of 10 people with Merkel cell carcinoma. MCV is a common virus. Most people are infected with it at some point (often as children). But the infection doesn't cause symptoms, and it rarely leads to MCC. Because of this, there are no recommended screening tests or treatments for MCV infection.

MCV was first discovered in 2008, and scientists are still learning about this virus. For example, it's not clear how exactly how it might cause MCC, or why there are so few cases of MCC when infection with MCV is very common.

- Ultraviolet (UV) light exposure

Exposure to ultraviolet (UV) rays is thought to be a major risk factor for most skin cancers, including MCC. UV rays damage the DNA inside skin cells. When ongoing damage affects the DNA of genes that control skin cell growth, skin cancer can develop.

#### **From the sun**

Sunlight is the main source of UV rays. Most MCCs start on areas of the body often exposed to the sun, such as the face, neck, and arms. People who get a lot of sun exposure are at greater risk for MCC. UV rays make up only a very small portion of the sun's rays, but they are the main cause of the skin damage caused by the sun.

### From tanning beds

Tanning beds are another source of UV rays. MCC is a rare cancer, and no studies have looked for a link between MCC and tanning bed use. But it stands to reason that more exposure to UV rays might increase the risk.

### From psoriasis treatments

Some people with psoriasis (a long-lasting inflammatory skin disease) are given medicines called psoralens along with UV light treatments, known as PUVA treatments. This can increase the risk of Merkel cell carcinoma.

To learn more about the effects of UV rays on the skin and what you can do to protect yourself and your loved ones, see [How Do I Protect Myself from Ultraviolet \(UV\) Rays?](#)

- Having light-colored skin

The risk of Merkel cell cancer is much higher for White people than for Black or Hispanic people. Nearly all (more than 9 out of 10) MCCs are diagnosed in White people. This is probably because darker skin has a protective effect against the damaging effects of UV rays.

- Being older

The risk of Merkel cell carcinoma goes up as people get older. In fact, this cancer is very rare in people under the age of 50. About 8 out of 10 people with MCC are over age 70.

This increased risk may be related to skin damage caused by sun exposure over time and the fact that people's immune systems tend to become weaker as they get older.

- Being male

Men are about twice as likely as women to develop Merkel cell carcinoma. The reason for this isn't clear, but it might be because men tend to get more sun exposure.

- Having a weakened immune system

The immune system defends the body against germs such as viruses. It also seems to help the body fight cancer. People with weakened immune systems (from certain diseases or medical treatments) are more likely to develop some types of cancer, including Merkel cell carcinoma. For example:

- **People who get organ transplants** usually are given drugs that weaken (suppress) their immune system to help keep them from rejecting the new organ. This increases their risk of developing MCC.
- **People with HIV**, the virus that causes AIDS, often have weakened immune systems and are also at increased risk for MCC.
- **People with some types of blood cancers**, such as [chronic lymphocytic leukemia \(CLL\)](#) or certain [lymphomas](#), tend to have weakened immune systems. This can be from the cancer itself, or from its treatment. People with these cancers are more likely to get MCC.

MCCs in people with weakened immune systems tend to grow faster and are more likely to be life-threatening.

## Signs and Symptoms of Merkel Cell Carcinoma

[Merkel cell carcinoma \(MCC\)](#) usually starts on areas of skin exposed to the sun, especially the face, neck, arms, and legs, but it can occur anywhere on the body.

The first sign of Merkel cell carcinoma **is often [a single pink, red, or purple shiny bump](#) that usually doesn't hurt**. Sometimes the skin on the top of the tumor breaks open and bleeds.

These tumors tend to grow quickly. They might spread as new lumps in the nearby skin. They might also reach nearby [lymph nodes](#) (small collections of immune system cells throughout the body). Over time, the lymph nodes might grow large enough to be seen or felt as lumps under the skin (usually in the neck or under the arm).

Merkel cell carcinoma is rare, and it can look like many other, more common types of skin cancer or other skin problems when it first appears. Because of this, doctors might not suspect MCC at first, and [the diagnosis is often made only after the tumor is biopsied](#).

It's very important to have any new, growing, or changing lumps, bumps, or spots on your skin checked by a doctor as soon as possible, so that the cause can be found and treated, if needed. The earlier any type of skin cancer is found, the easier it's likely to be to treat it.

## Tests for Merkel Cell Carcinoma

Most skin cancers, including Merkel cell carcinoma (MCC), are brought to a doctor's attention because a person has noticed a change in an area of skin.

If you have an abnormal area that might be skin cancer, your doctor will examine it and order tests to find out if it's cancer or some other skin problem. If Merkel cell carcinoma is diagnosed, you will probably need other tests as well to learn more about it, including if it has spread.

### Medical history and physical exam

First, you will be asked about your [symptoms](#), such as when you first noticed the change on your skin, if it has changed in size or how it looks, and if it has been painful, itchy, or bleeding. You might also be asked about your possible [risk factors](#) (including sun exposure and immune system problems) and if you or anyone in your family has had skin cancer.

During the physical exam, the area(s) in question will be looked at. The rest of your body will also be checked for spots that could be related to skin cancer.

Nearby [lymph nodes](#), which are bean-sized collections of immune cells in the body, will also be checked. [Merkel cell carcinoma](#) (and some other skin cancers) can sometimes spread to the lymph nodes. When this happens, the lymph nodes swell and might be felt as lumps under the skin.

#### Referral to a skin specialist

If you're first seen by your primary care doctor and skin cancer is suspected, you may be referred to a **dermatologist**, a doctor who specializes in skin diseases. This doctor will look at the area more closely.

Along with doing a standard physical exam, the dermatologist might use a technique called **dermoscopy** (also called **dermatoscopy, epiluminescence microscopy [ELM], or surface microscopy**) to look at spots on the skin more closely. The doctor uses a dermatoscope, which is a special magnifying lens and light source that's held near the skin. Sometimes a thin layer of alcohol or oil is used on the skin with this instrument. The doctor may take digital photos of the spot, too.

#### Skin biopsy

If the doctor thinks that a suspicious area might be Merkel cell cancer or another type of skin cancer, the area (or part of it) will be removed. This is called a **skin biopsy**. The biopsy sample is then sent to a lab, here it's tested and looked at with a microscope.

There are different ways to do a skin biopsy. The doctor will choose one based on factors such as the suspected type of skin cancer, where it is on your body, and its size. Different methods can result in different scars, so ask your doctor about possible scarring before the biopsy is done.

Skin biopsies usually are done after a local anesthetic (numbing medicine) is injected into the area with a very small needle. You'll probably feel a small prick and a little stinging as the medicine goes in, but you shouldn't feel any pain during the biopsy.

(For animated views of some of these procedures, see [Skin Biopsy and Treatment Procedures](#).)

#### Deep shave (tangential) biopsy

This biopsy procedure, also known as **saucerization**, shaves off the top layers of the skin with a small surgical blade. Any bleeding is then stopped by putting either an ointment or a chemical that stops bleeding on it, or by using a small electrical current to seal (cauterize) the wound.

A [shave biopsy](#) is useful in diagnosing many types of skin diseases, especially if the doctor thinks an abnormal area isn't likely to be a serious skin cancer such as Merkel cell carcinoma or [melanoma](#). If this type of biopsy is used, it's important that the biopsy blade goes deep enough to get below the tumor.

### Punch biopsy

For a [punch biopsy](#), a tool that looks like a tiny round cookie cutter is used to remove a deeper sample of skin. The doctor rotates the punch biopsy tool on the skin until it cuts through all the layers of the skin. The sample is then removed, and the edges of the biopsy site are stitched together.

### Incisional and excisional biopsies

To examine a tumor that might have grown into deeper layers of the skin, the doctor may use an incisional or [excisional biopsy](#). For these types of biopsies, a surgical knife is used to make an elliptical or circular cut through the full thickness of skin. A wedge or sliver of skin is removed, and the edges of the cut are stitched together.

- An **incisional biopsy** removes only part of the tumor.
- An **excisional biopsy** removes the entire tumor and is usually preferred for a suspected Merkel cell cancer, if it can be done.

### Lymph node biopsy

Merkel cell cancer often spreads to nearby lymph nodes, so it's very important to find out if the lymph nodes contain cancer cells. If MCC has already been diagnosed on the skin, nearby lymph nodes will usually be biopsied to see if the cancer has spread to them.

The type of biopsy used depends on how likely it is that the cancer has reached the nearby lymph nodes:

- If the nearby lymph nodes feel normal and look normal on imaging tests, a **sentinel lymph node biopsy** is likely to be done.
- If exams or imaging tests suggest that nearby lymph nodes might contain cancer (for example, if the nodes are larger than normal), then a **needle biopsy** or **surgical biopsy** is more likely to be done. This is often done with the help of an imaging test (see below), such as an ultrasound, CT scan, or fluoroscopy (continuous x-ray).

### Sentinel lymph node biopsy (SLNB)

A [sentinel lymph node biopsy](#) is a surgical procedure that is used to find the lymph nodes that are likely to be the first place Merkel cell cancer would spread to. These lymph nodes are called **sentinel nodes**.

To find the sentinel lymph node (or nodes), a small amount of a radioactive substance is injected into the area of the tumor. After giving the substance time to travel to the lymph node areas near the tumor, a special camera is used to see if it collects in one or more sentinel lymph nodes.

Once the radioactive area has been marked, the patient is taken for surgery, and usually a blue dye is injected in the same place the radioactive substance was injected. A small incision is then made in the marked area, and the lymph nodes are then

checked to find which one(s) became radioactive and/or turned blue. These sentinel nodes are removed by the surgeon and sent to a pathology lab, where they are examined to see if Merkel cell cancer is present.

For more on when this test is done and what the results could mean, see [Surgery for Merkel Cell Carcinoma](#).

### Needle biopsy

If a lymph node near a Merkel cell cancer tumor is abnormally large, the doctor can use a needle biopsy to find out if the cancer has spread to that node. Needle biopsies are less invasive than some other types of biopsies, but they may not always take out enough of a tissue sample to find cancer cells.

There are 2 main types of needle biopsies.

- In a **fine needle aspiration (FNA)** biopsy, the doctor uses a syringe with a very thin, hollow needle (thinner than the ones used for blood tests) to pull out (aspirate) cells and small pieces of tissue.
- In a **core biopsy**, a larger needle is used to remove one or more small cylinders (cores) of tissue. Core biopsies remove larger samples than FNA biopsies.

With either type of biopsy, numbing medicine (a local anesthetic) is sometimes used first. These biopsies rarely cause much discomfort and usually don't leave a scar.

If the lymph node is just under the skin, the doctor can sometimes feel it well enough to guide the needle into it. If not, or if the lymph node is deeper in the body, an imaging test, like an ultrasound or CT scan, is often used to guide the needle into the right place.

### Surgical (excisional) lymph node biopsy

This type of biopsy might be done if a lymph node's size suggests the cancer has spread there but a needle biopsy of the node can't be done for some reason. An excisional biopsy might also be used if a needle biopsy didn't find any cancer cells, but the doctor still suspects the cancer has spread there.

In this type of biopsy, the doctor takes out the enlarged lymph node through a small cut (incision) in the skin. This may be done in a doctor's office or in an outpatient surgical center. Numbing medicine (local anesthetic) is generally used if the lymph node is near the surface of the body, but a person may need to be sedated or even asleep (using general anesthesia) if the lymph node is deeper in the body.

### Lab tests of biopsy samples

All biopsy samples will be sent to a lab, where a **pathologist** (a doctor who is specially trained to diagnose disease) will look at them under a microscope and do tests for Merkel cell cancer (or other types of cancer). The biopsy samples are usually sent to a **dermatopathologist**, a doctor who has special training in looking at skin samples.

If the doctor can't tell for sure if the sample contains MCC just by looking at it, special lab tests may be done on the cells to try to confirm the diagnosis. One of the tests commonly used for MCC is called **immunohistochemistry (IHC)**. It looks for certain proteins on the cancer cells, such as CK-20.

If MCC is found in the skin biopsy sample, the pathologist will also look at certain important features such as the tumor thickness, the portion of cells that are actively dividing (mitotic rate), and whether the tumor has invaded the tiny blood vessels or lymph vessels in the sample. These features could help determine a person's outlook (prognosis) and treatment options.

#### Imaging tests

[Imaging tests](#) use x-rays, magnetic fields, or radioactive substances to create pictures of the inside of the body. They can be used to see if Merkel cell cancer has spread to lymph nodes or to other organs in the body.

Imaging tests can also be done to help see how well treatment is working or to look for possible signs of cancer coming back (recurring) after treatment.

#### Computed tomography (CT) scan

[CT scans](#) use x-rays to make detailed, cross-sectional images of your body. Unlike a regular x-ray, CT scans can show details in soft tissues (such as internal organs). This test can show if lymph nodes are enlarged or if other organs have suspicious spots, which might be from the spread of MCC.

**CT-guided needle biopsy:** CT scans can also be used to help guide a biopsy needle into a suspicious area deep inside the body.

#### Magnetic resonance imaging (MRI)

[MRIs](#) use radio waves and strong magnets instead of x-rays to create detailed images of the inside of your body. This test is very helpful in looking for cancer that has spread to the brain and/or spinal cord.

#### Positron emission tomography (PET) scan

A [PET](#) scan can help show if the cancer has spread to lymph nodes or other parts of the body. This test looks for areas where cells are using more energy (which might be a sign of cancer), rather than just showing if areas look abnormal based on their size or shape.

**PET/CT or PET/MRI scan:** Often a PET scan is combined with a CT scan or MRI scan, using special machines that can do both at the same time. This lets the doctor compare areas of higher cell activity on the PET scan with the more detailed pictures of that area on the CT or MRI scan. This type of imaging scan is often preferred in patients with MCC.

## Blood tests

Blood tests aren't used to diagnose Merkel cell carcinoma, but some tests may be done before, during, or after treatment, especially for more advanced MCCs.

For example, tests of **blood cell counts** and **blood chemistry levels** are often done in people with MCC to see how well their bone marrow (where new blood cells are made), liver, and kidneys are working before and during treatment.

People with Merkel cell cancer might also have their blood tested for **antibodies to the Merkel cell polyomavirus (MCV)** around the time they start treatment. For those who have antibodies to MCV, the levels should fall over time if treatment is working. On the other hand, rising antibody levels after treatment can be a sign that the cancer has come back (recurred).

## Can Merkel Cell Carcinoma (MCC) Be Prevented?

Merkel cell carcinoma (MCC) is uncommon, and some risk factors for MCC, such as your age, sex, and skin color can't be controlled. Still, there are some things you can do that might help lower your risk of getting [more common types of skin cancer](#)

- Limit your exposure to ultraviolet (UV) rays

The most important way to lower your risk of skin cancers (including MCC) is to limit your [exposure to UV rays](#). Practice sun safety when you are outdoors.

### Seek shade

Simply staying in the shade is one of the best ways to limit your UV exposure.

### Protect your skin with clothing

When you are out in the sun, wear clothing to cover your skin.

### Use sunscreen

Apply sunscreen generously, making sure to cover all parts of your body that aren't covered by clothing, including your face, ears, neck, arms, the tops of your feet, and your scalp and hairline. Protect your lips by using lip balm with sunscreen.

### Wear a wide-brimmed hat

A hat with at least a 2- to 3-inch brim all around is ideal for sun protection.

### Wear sunglasses that block UV rays

UV-blocking sunglasses are important for protecting the delicate skin around the eyes, as well as the eyes themselves.

### Don't use tanning beds or sunlamps

Tanning lamps give off UV rays, which can cause long-term skin damage and can contribute to skin cancer.

- Keep your immune system strong

Having a weakened immune system increases the risk of getting Merkel cell cancer, as well as other types of skin cancer. The immune system can be weakened by:

#### HIV infection

Infection with HIV, the virus that causes AIDS, can weaken the immune system. Avoiding known risk factors for HIV infection, such as intravenous (IV) drug use and having unprotected sex with many partners, might lower your risk of skin cancers such as MCC, as well as other types of cancer. To learn more, see [HIV Infection and Cancer](#).

#### Organ transplants and autoimmune diseases

Some people need to take medicines to suppress their immune system. This includes people who have had organ transplants and some people with autoimmune diseases.

- Chemotherapy

People with cancer also sometimes need to take medicines such as chemotherapy, which can lower their immune function. For these people, the benefit from taking these medicines will likely far outweigh the small increased risk of getting skin cancer.