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About Melanoma Skin Cancer

Overview

If you have been diagnosed with melanoma skin cancer or are worried about it, you likely have a lot of questions. Learning some basics is a good place to start.

- [What Is Melanoma Skin Cancer?](#)

Research and Statistics

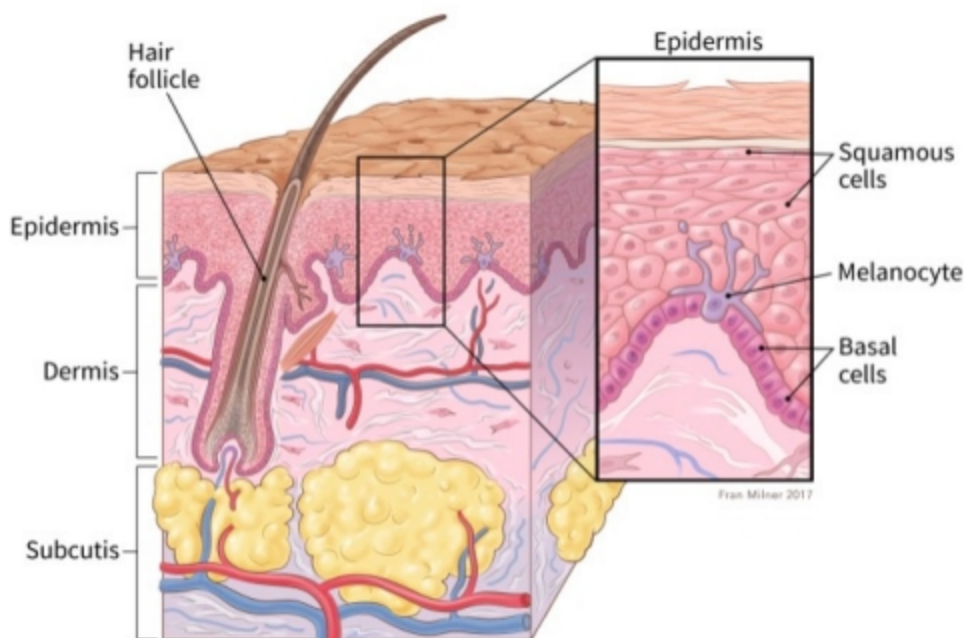
See the latest estimates for new cases of melanoma skin cancers in the US and what research is currently being done.

- [Key Statistics for Melanoma Skin Cancer](#)
 - [What's New in Melanoma Skin Cancer Research?](#)
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What Is Melanoma Skin Cancer?

Cancer starts when cells in the body begin to grow out of control. Cells in nearly any part of the body can become cancer, and can then spread to other areas of the body. To learn more about how cancers start and spread, see [What Is Cancer?](#)¹

Melanoma is a cancer that usually starts in a certain type of skin cell.



Types of skin cells

The 3 main types of cells in the top layer of the skin (called the *epidermis*) are:

- **Squamous cells:** These are flat cells in the outer part of the epidermis that 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 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. For most people, when skin is exposed to the sun, melanocytes make more of the pigment, causing the skin to tan or darken.

Melanoma skin cancers

Melanoma is a cancer that begins in the melanocytes. Other names for this cancer include *malignant melanoma* and *cutaneous melanoma*. Most melanoma cells still make melanin, so melanoma tumors are usually brown or black. But some melanomas do not

make melanin and can appear pink, tan, or even white.

Melanomas can develop anywhere on the skin, but 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.

Having darkly pigmented skin lowers your risk of melanoma at these more common sites, but anyone can get melanoma on the palms of the hands, soles of the feet, and under the nails. Melanomas in these areas make up a much larger portion of melanomas in African Americans than in whites.

Melanomas can also form in other parts of your body such as the [eyes](#)², mouth, genitals, and anal area, but these are much less common than melanoma of the skin.

Melanoma is much less common than basal cell and squamous cell skin cancers. But melanoma is more dangerous because it's much more likely to spread to other parts of the body if not caught early.

Other skin cancers

There are many other types of skin cancer. Skin cancers that are not melanomas are sometimes grouped as *non-melanoma skin cancers* because they develop from skin cells other than melanocytes. They tend to behave very differently from melanomas and are often treated with different methods.

Basal cell and squamous cell skin cancers

Basal cell and squamous cell cancers are by far the most common skin cancers, and actually are more common than any other form of cancer. Because they rarely spread (metastasize) to other parts of the body, basal cell and squamous cell skin cancers are usually less concerning and are treated differently from melanoma. These cancers are discussed in [Basal and Squamous Cell Skin Cancer](#).³

Less common skin cancers

Other types of non-melanoma skin cancer are much less common than basal and squamous cell cancers and are treated differently. They include:

- [Merkel cell carcinoma](#)⁴
- [Kaposi sarcoma](#)⁵

- [Cutaneous \(skin\) lymphoma](#)⁶
- **Skin adnexal tumors** (tumors that start in hair follicles or skin glands)
- [Various types of sarcomas](#)⁷

Together, these types account for less than 1% of all skin cancers.

Benign skin tumors

Many types of benign (non-cancerous) tumors can develop from different types of skin cells.

Benign tumors that start in melanocytes

A **mole** (nevus) is a benign skin tumor that develops from melanocytes. Almost everyone has some moles. Nearly all moles (nevi) are harmless, but having some types can raise your risk of melanoma. See [Risk Factors for Melanoma Skin Cancer](#)⁸ for more information about moles.

A **Spitz nevus** is a kind of mole that sometimes looks like melanoma. It's more common in children and teens, but it can also be seen in adults. These tumors are generally benign and don't spread. But sometimes doctors have trouble telling Spitz nevi from true melanomas, even when looking at them under a microscope. Therefore, they are often removed, just to be safe.

Benign tumors that develop from other types of skin cells

- **Seborrheic keratoses:** tan, brown, or black raised spots with a “waxy” texture
- **Hemangiomas:** benign blood vessel growths, often called *strawberry spots*
- **Lipomas:** soft growths made up of fat cells
- **Warts:** rough-surfaced growths caused by some types of human papilloma virus (HPV)

Most of these tumors rarely, if ever, turn into cancers. There are many other kinds of benign skin tumors, but most are not very common.

Hyperlinks

1. www.cancer.org/cancer/cancer-basics/what-is-cancer.html
2. www.cancer.org/cancer/eye-cancer.html

3. www.cancer.org/cancer/basal-and-squamous-cell-skin-cancer.html
4. www.cancer.org/cancer/merkel-cell-skin-cancer.html
5. www.cancer.org/cancer/kaposi-sarcoma.html
6. www.cancer.org/cancer/skin-lymphoma.html
7. www.cancer.org/cancer/soft-tissue-sarcoma.html
8. www.cancer.org/cancer/melanoma-skin-cancer/causes-risks-prevention/risk-factors.html

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See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

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Key Statistics for Melanoma Skin Cancer

Cancer of the skin is by far the most common of all cancers. Melanoma accounts for only about 1% of skin cancers but causes a large majority of skin cancer deaths.

How common is melanoma?

The American Cancer Society's estimates for melanoma in the United States for 2019 are:

- About 96,480 new melanomas will be diagnosed (about 57,220 in men and 39,260 in women).
- About 7,230 people are expected to die of melanoma (about 4,740 men and 2,490 women).

The rates of melanoma have been rising for the last 30 years.

Risk of getting melanoma

Melanoma is more than 20 times more common in whites than in African Americans. Overall, the lifetime risk of getting melanoma is about 2.6% (1 in 38) for whites, 0.1% (1 in 1,000) for blacks, and 0.58% (1 in 172) for Hispanics. The risk for each person can be affected by a number of different factors, which are described in [Risk Factors for Melanoma Skin Cancer](#)¹.

The risk of melanoma increases as people age. The average age of people when it is diagnosed is 63. But melanoma is not uncommon even among those younger than 30. In fact, it's one of the most common [cancers in young adults](#)² (especially young women).

Also see [Survival Rates for Melanoma Skin Cancer by Stage](#)³.

Visit the [American Cancer Society's Cancer Statistics Center](#)⁴ for more key statistics.

Hyperlinks

1. www.cancer.org/cancer/melanoma-skin-cancer/causes-risks-prevention/risk-factors.html
2. www.cancer.org/cancer/cancer-in-young-adults.html
3. www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/survival-rates-for-melanoma-skin-cancer-by-stage.html
4. <https://cancerstatisticscenter.cancer.org/>

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American Cancer Society. *Facts & Figures 2019*. American Cancer Society. Atlanta, Ga. 2019.

Last Medical Review: May 19, 2016 Last Revised: January 4, 2018

What's New in Melanoma Skin Cancer Research?

Research into the [causes](#)¹, [prevention](#)², and [treatment](#)³ of melanoma is being done in medical centers throughout the world.

Causes, prevention, and early detection

Sunlight and ultraviolet (UV) radiation

Recent studies suggest there may be 2 main ways that UV exposure is linked to melanoma, but there is likely some overlap.

The first link is to **sun exposure as a child and teenager**. People with melanoma often have an early history of sunburns or other intense sun exposures, although not everyone does. This early sun exposure may damage the DNA in skin cells (melanocytes), which starts them on a path to becoming melanoma cells many years later. Some doctors think this might help explain why melanomas often occur on the thighs (in women) and trunk (in men), areas that generally aren't exposed to the sun as much in adulthood.

The second link is to **melanomas that occur on the arms, neck, and face**. These areas are chronically exposed to sun, particularly in men.

Tanning booths might help either kind of melanoma to develop.

Researchers are studying if melanomas that develop from these types of UV exposure have different gene changes that might require them to be treated differently.

Public education

[Most skin cancers can be prevented](#)⁴. The best way to lower the number of skin cancers and the pain and loss of life from this disease is to educate the public, especially parents, about skin cancer risk factors and warning signs. It's important for health care professionals and skin cancer survivors to remind everyone about the dangers of too much [UV exposure](#)⁵ (both from the sun and from man-made sources such as tanning beds) and about how easy it can be to protect your skin from UV rays.

[Melanoma can often be found early](#)⁶, when it is most likely to be cured. Monthly skin

self-exams and awareness of the warning signs of melanomas may be helpful in finding most melanomas when they are at an early, curable stage.

The [American Academy of Dermatology \(AAD\)](#)⁷ sponsors annual free skin cancer screenings throughout the country. Many local American Cancer Society offices work closely with the AAD to provide volunteers for registration, coordination, and education efforts related to these free screenings. Look for information in your area about these screenings or call the American Academy of Dermatology for more information.

Along with recommending staying in the shade, the American Cancer Society uses a slogan popularized in Australia as part of its skin cancer prevention message in the United States. “Slip! Slop! Slap!®... and Wrap” is a catchy way to remember when going outdoors to slip on a shirt, slop on sunscreen, slap on a hat, and wrap on sunglasses to protect your eyes and the sensitive skin around them.

Melanoma genetic research

Scientists have made a great deal of progress in understanding how UV light damages DNA inside skin cells and how these changes can cause normal skin cells to become cancer cells.

Some people, though, inherit mutated (damaged) genes from their parents. For example, changes in the *CDKN2A (p16)* gene cause some melanomas that run in certain families. People who have a strong family history of melanoma should speak with a cancer genetic counselor or a doctor experienced in cancer genetics to discuss the possible benefits, limits, and downsides of [testing for changes in this gene](#)⁸.

Diagnosis

Some newer approaches to diagnosing skin cancer don't require the removal of a skin sample. An example of such an “optical biopsy” is **reflectance confocal microscopy (RCM)**. This technique allows the doctor to look at an abnormal area of skin to a certain depth without cutting into the skin.

RCM is used widely in Europe, and it's now available in some centers in the US. It may be especially useful for people with many unusual moles, as it can cut down on the number of skin biopsies these people need. RCM might also be helpful in determining the edges of a melanoma, which could help during surgery.

This technique will likely become more widely available in the coming years.

Lab tests to help determine prognosis

Most melanomas found at an early stage can be cured with surgery. But a small portion of these cancers eventually spread to other parts of the body, where they can be hard to treat.

Recent research has shown that certain gene expression patterns in melanoma cells can help show if stage I or II melanomas are likely to spread. A lab test based on this research, known as *DecisionDx-Melanoma*, is now available. The test divides melanomas into 2 groups based on their gene patterns:

- Class 1 tumors have a low risk of spreading.
- Class 2 tumors have a higher risk of spreading.

This test might help tell if someone with early-stage melanoma should get additional treatment or if they need to be followed more closely after treatment to look for signs of recurrence.

Treatment

While early-stage melanomas can often be cured with [surgery](#)⁹, more advanced melanomas can be much harder to treat. But in recent years, newer types of immunotherapy and targeted therapies have shown a great deal of promise and have changed the treatment of this disease.

Immunotherapy

This type of treatment helps the body's immune system attack melanoma cells more effectively. Some forms of immune therapy are already used to treat some melanomas (see [Immunotherapy for Melanoma Skin Cancer](#)¹⁰).

Immune checkpoint inhibitors: Newer drugs such as pembrolizumab (Keytruda), nivolumab (Opdivo), and ipilimumab (Yervoy) block proteins that normally suppress the T-cell immune response against melanoma cells. These drugs have been shown to help some people with advanced melanomas live longer.

Researchers are now looking for ways to make these drugs work even better. One way to do this might be by combining them with other treatments, such as other types of immunotherapy or targeted drugs.

Researchers are also studying if these drugs can be helpful for earlier-stage melanomas. For example, some might be useful before or after surgery for some melanomas to help lower the chance that the cancer will come back.

Newer immune checkpoint inhibitors with slightly different targets are now being studied as well.

Melanoma vaccines: Vaccines to treat melanoma are being studied in [clinical trials](#)¹¹.

These vaccines are, in some ways, like the vaccines used to prevent diseases such as polio, measles, and mumps that are caused by viruses. Such vaccines usually contain weakened viruses or parts of a virus that can't cause the disease. The vaccine stimulates the body's immune system to destroy the more harmful type of virus.

In the same way, killed melanoma cells or parts of cells (antigens) can be used as a vaccine to try to stimulate the body's immune system to destroy other melanoma cells in the body. Usually, the cells or antigens are mixed with other substances that help boost the immune system as a whole. But unlike vaccines that are meant to prevent infections, these vaccines are meant to treat an existing disease.

Making an effective vaccine against melanoma has proven to be harder than making a vaccine to fight a virus. The results of studies using vaccines to treat melanoma have been mixed so far, but many newer vaccines are now being studied and may hold more promise.

Other immunotherapies: Other forms of immunotherapy are also being studied. Some early studies have shown that treating patients with high doses of chemotherapy and radiation therapy and then giving them tumor-infiltrating lymphocytes (TILs), which are immune system cells taken from tumors, can shrink melanoma tumors and possibly prolong life as well. Newer studies are looking at changing certain genes in the TILs before they are given to see if this can make them more effective at fighting the cancer. This approach has looked promising in early studies, but it's complex and is only being tested in a few centers.

Many studies are now looking to combine different types of immunotherapy, which may be more effective than any single treatment for advanced melanoma.

Targeted drugs

[Targeted therapy](#)¹² drugs target parts of melanoma cells that make them different from normal cells. These drugs work differently from standard chemotherapy drugs. They may work in some cases when chemotherapy doesn't. They may also have less severe

side effects.

Drugs that target cells with *BRAF* gene changes: About half of all melanomas have changes in the *BRAF* gene, which helps the cells grow. Drugs that target the BRAF protein, such as vemurafenib (Zelboraf) and dabrafenib (Tafinlar), as well as drugs that target the related MEK proteins, such as trametinib (Mekinist) and cobimetinib (Cotellic), have been shown to shrink many of these tumors. These drugs are now often used to treat advanced melanomas that test positive for the *BRAF* gene change. Researchers are now looking at whether these drugs might be helpful before or after surgery for some earlier stage melanomas.

Other, similar drugs are now being studied as well.

One of the drawbacks of these drugs is that usually work for only a limited time before the cancer starts growing again. But studies have shown that combining a BRAF inhibitor with a MEK inhibitor results in longer response times, and some side effects (such as the development of other skin cancers) might actually be *less* common with the combination.

Drugs that target cells with changes in the *C-KIT* gene: A small number of melanomas have changes in the *C-KIT* gene. This is more likely in melanomas that start on the palms of the hands, soles of the feet, under the nails, or in certain other places.

Clinical trials are now testing drugs such as imatinib (Gleevec), dasatinib (Sprycel), and nilotinib (Tasigna), which are known to target cells with changes in *C-KIT*.

Drugs that target other gene or protein changes: Several drugs that target other abnormal genes or proteins are now being studied in clinical trials as well. Some examples include axitinib (Inlyta), pazopanib (Votrient), and everolimus (Afinitor).

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

Hyperlinks

1. www.cancer.org/cancer/melanoma-skin-cancer/causes-risks-prevention/what-causes.html
2. www.cancer.org/cancer/melanoma-skin-cancer/causes-risks-prevention/prevention.html
3. www.cancer.org/cancer/melanoma-skin-cancer/treating.html
4. www.cancer.org/cancer/melanoma-skin-cancer/causes-risks-

- [prevention/prevention.html](#)
5. www.cancer.org/cancer/cancer-causes/radiation-exposure/uv-radiation.html
 6. www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/detection.html
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 12. www.cancer.org/cancer/melanoma-skin-cancer/treating/targeted-therapy.html
 13. <https://www.aad.org/>
 14. <https://www.aad.org/spot-skin-cancer>

Additional Resources

American Academy of Dermatology (AAD) Toll-free number: 1-888-462-3376 (1-888-462-DERM) Website: www.aad.org (www.aad.org)¹³ Spot Skin Cancer website: www.aad.org/spot-skin-cancer (www.aad.org/spot-skin-cancer)¹⁴

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

References

See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

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Melanoma Skin Cancer Causes, Risk Factors, and Prevention

Risk Factors

A risk factor is anything that affects your chance of getting a disease such as cancer. Learn more about the risk factors for melanoma skin cancer.

- [Risk Factors for Melanoma Skin Cancer](#)
- [What Causes Melanoma Skin Cancer?](#)
- [Genetic Counseling and Testing for People at High Risk of Melanoma](#)

Prevention

There is no sure way to prevent melanoma skin cancer. But there are things you can do that might lower your risk. Learn more.

- [Can Melanoma Skin Cancer Be Prevented?](#)
- [Skin Cancer Prevention and Early Detection¹](#)

Risk Factors for Melanoma Skin Cancer

A risk factor is anything that affects your chance 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, while others with this disease may have few or no known risk factors.

Still, 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](#)¹, when it's likely to be easier to treat.

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

Ultraviolet (UV) light exposure

Exposure to [ultraviolet \(UV\) rays](#)² 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 only 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 of skin cells. Skin cancers begin when this damage affects the DNA of genes that control skin cell growth.

The nature 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 are not constantly exposed to UV light. Some experts think that melanomas that start in these areas are different from those 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, under the nails, or on internal surfaces such as the mouth and vagina, 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 [Skin Cancer Prevention and Early Detection](#)³.

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. 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 also 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](#)⁴ 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 (also known as *familial atypical multiple mole melanoma syndrome*, or FAMMM): People with this inherited condition have many dysplastic nevi and at least one close relative who has had melanoma.

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](#)⁵ 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 10%, 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 in congenital nevi smaller than the palm of your hand is very low, while those that cover large portions of 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 patient 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.

Fair skin, freckling, and light hair

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

increased risk.

Family history of melanoma

Your risk of melanoma is higher if one or more of your first-degree relatives (parents, brothers, sisters, or children) has had melanoma. Around 10% of all 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 fair skin, certain gene changes (mutations) that run in a family, or a combination of factors.

Most experts don't recommend that people with a family history of melanoma have ⁶[genetic testing](#)⁷ to look for mutations, as it's not yet clear how helpful this is. Rather, experts advise that they do the following:

- Have regular skin exams by a dermatologist
- Thoroughly examine their own skin once a month
- Be particularly careful about sun protection and avoiding artificial UV rays (such as those from tanning booths)

Personal history of melanoma or other skin cancers

A person who has already had melanoma has a higher risk of getting melanoma again. 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 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 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](#)⁸, the virus that causes AIDS, often have weakened immune systems and are also at increased risk for melanoma.

Being older

Melanoma is more likely to occur in older people, but it is also found 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 have a higher rate of melanoma than women, 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 affects 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.

Hyperlinks

1. www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/detection.html
2. www.cancer.org/cancer/cancer-causes/radiation-exposure/uv-radiation.html
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See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

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What Causes Melanoma Skin Cancer?

Many [risk factors for melanoma](#) have been found, but it's not always clear exactly how they might cause cancer.

For example, while most moles never turn into a melanoma, some do. Researchers have found some gene changes inside mole cells that may cause them to become melanoma cells. But it's still not known exactly why some moles become cancerous while most don't.

DNA is the chemical in each of our cells that makes up our genes, which control how our cells function. We usually look like our parents because they are the source of our DNA. But DNA affects more than just how we look.

Some genes control when our cells grow, divide into new cells, and die:

- Genes that help cells grow, divide, and stay alive are called *oncogenes*.
- Genes that keep cell growth in check or cause cells to die at the right time are called *tumor suppressor genes*.

Cancers can be caused by DNA changes that turn on oncogenes or turn off tumor suppressor genes. Changes in several different genes are usually needed for a cell to become a cancer cell.

Ultraviolet (UV) rays are clearly a major cause of melanoma. UV rays can damage the DNA in skin cells. Sometimes this damage affects certain genes that control how skin cells grow and divide. If these genes no longer work properly, the affected cells may become cancer cells.

Most UV rays come from sunlight, but some can come from man-made sources such as tanning beds. Usually it's not clear exactly when the DNA damage from UV exposure occurs. Some of the damage may take place in the few years before the cancer appears. But much of it may be from exposures that happened many years earlier. Children and young adults often get a lot of intense sun exposure that might not result in cancer until many years or even decades later.

Most of the gene changes commonly seen in melanoma cells are not inherited. They are more likely the result of damage caused by sunlight. In some people, such as those with xeroderma pigmentosum (XP), the skin cells are not as able to repair damaged DNA. These people are more likely to develop melanoma.

Some melanomas occur in parts of the body that are rarely exposed to sunlight. These melanomas often have different gene changes than those in melanomas that develop in sun-exposed areas.

When melanomas run in families, gene changes (mutations) that greatly increase the risk of melanoma are often passed from one generation to the next. Familial (inherited) melanomas most often have changes in tumor suppressor genes such as *CDKN2A* (also known as *p16*) and *CDK4* that prevent them from doing their normal job of controlling cell growth. This could eventually lead to cancer.

Many other gene changes have been found in melanoma cells as well. Some of these have proven to be good targets for drugs to help treat this disease. For example, about half of all melanomas have a change in the *BRAF* oncogene that helps drive their growth. This change is not inherited. It seems to occur during the development of the melanoma. Several drugs that specifically target cells with this gene change are now used to treat these melanomas (see [Targeted Therapy for Melanoma Skin Cancer¹](#)).

Hyperlinks

1. www.cancer.org/cancer/melanoma-skin-cancer/treating/targeted-therapy.html

References

See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

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Can Melanoma Skin Cancer Be Prevented?

There is no sure way to prevent melanoma. Some [risk factors](#) such as your age, gender, race, 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](#)¹. 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 out 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. 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 [Skin Cancer Prevention and Early Detection](#)².

Watch for 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](#)³ are, 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](#)⁴ 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 and many other types of cancer. (For more information, see [HIV Infection, AIDS, and Cancer](#)⁵.)

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 that 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.

Hyperlinks

1. www.cancer.org/cancer/cancer-causes/radiation-exposure/uv-radiation.html
2. www.cancer.org/cancer/skin-cancer/prevention-and-early-detection.html

3. www.cancer.org/cancer/skin-cancer/galleries/skin-self-exam-gallery.html
4. www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/signs-and-symptoms.html
5. www.cancer.org/cancer/cancer-causes/infectious-agents/hiv-infection-aids.html

References

See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

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Genetic Counseling and Testing for People at High Risk of Melanoma

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

- Several members on 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

Some families with high rates of melanoma have mutations in genes such as *CDKN2A* (also known as *p16*). Tests for these gene changes are now available, although they are not widely recommended by doctors at this time. In part, this is because people with any of the factors above are already known to have a higher risk of melanoma regardless of whether they carry a mutated gene, so it's not clear how helpful the genetic testing results would be.

Still, people interested in learning whether they carry gene changes linked to melanoma

may want to think about taking part in genetic research that will advance progress in this field.

If you're considering genetic testing, it's very important to meet first with a genetic counselor or other health professional with knowledge of genetic testing. They can describe the tests to you and explain what the results may or may not tell you about your risk. Genetic testing is not perfect, and sometimes the tests might not provide clear answers. To learn more about genetic testing in general, see [Genes and Cancer](#)¹.

At this time, because it's not clear how useful the test results might be, most melanoma experts don't recommend genetic testing for people with a personal or family history of melanoma. Still, some people may choose to get tested. In any event, people with a family history of melanoma should ask their doctor about getting regular skin exams, learning to do [skin self-exams](#)², and being particularly careful about sun safety.

Hyperlinks

1. www.cancer.org/cancer/cancer-causes/genetics.html
2. www.cancer.org/cancer/skin-cancer/galleries/skin-self-exam-gallery.html

References

See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

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Melanoma Skin Cancer Early Detection, Diagnosis, and Staging

Detection and Diagnosis

Catching cancer early often allows for more treatment options. Some early cancers may have signs and symptoms that can be noticed, but that is not always the case.

- [Can Melanoma Skin Cancer Be Found Early?](#)
- [Skin Cancer Prevention and Early Detection¹](#)
- [Signs and Symptoms of Melanoma Skin Cancer](#)
- [Skin Cancer Galleries²](#)
- [Tests for Melanoma Skin Cancer](#)

Stages and Outlook (Prognosis)

After a cancer diagnosis, staging provides important information about the extent of cancer in the body and anticipated response to treatment.

- [Melanoma Skin Cancer Stages](#)
- [Survival Rates for Melanoma Skin Cancer](#)

Questions to Ask About Melanoma Skin Cancer

Get some questions you can ask your health care team to help you better understand your melanoma diagnosis and treatment options.

- [What Should You Ask Your Health Care Team About Melanoma Skin Cancer?](#)

Can Melanoma Skin Cancer Be Found Early?

Melanoma can often be found early, when it is most likely to be cured. Some people have a higher risk of getting melanoma than others, but it's important to know that *anyone* can get melanoma.

Skin self-exam

Although the American Cancer Society does not have guidelines for the early detection of skin cancer, knowing your own skin is important to finding skin cancer early. You should know the pattern of moles, blemishes, freckles, and other marks on your skin so that you'll notice any new moles or changes in existing moles.

Many doctors recommend checking your own skin, preferably once a month. [Skin self-exams](#)¹ are best done in a well-lit room in front of a full-length mirror. Use a hand-held mirror to help look at areas that are hard to see, such as the backs of your thighs. Examine all areas, including your palms and soles, scalp, ears, nails, and your back (in men, about 1 of every 3 melanomas occurs on the back). Friends and family members can also help you with these exams, especially for those hard-to-see areas, such as your scalp and back.

For a more thorough description of how to do a skin self-exam, see [Why You Should Know About Melanoma](#)², or visit our [Skin Self-exam Image Gallery](#)³.

See [Signs and Symptoms of Melanoma Skin Cancer](#) to know what to look for when examining your skin. Any spots on the skin that are new or changing in size, shape, or color should be seen by a doctor promptly. Be sure to show your doctor any areas that concern you, and ask your doctor to look at areas that may be hard for you to see.

Exam by a health care professional

Some doctors and other health care professionals do skin exams as part of routine health check-ups.

If your primary doctor finds any unusual moles or other suspicious areas, he or she may refer you to a dermatologist, a doctor who specializes in skin problems. Dermatologists can also do regular skin exams. Many dermatologists use a technique called *dermatoscopy* (also known as *dermoscopy*, *epiluminescence microscopy [ELM]*, or

surface microscopy) to look at spots on the skin more clearly. A photo of the spot may be taken as well. (See Tests for melanoma skin cancer for more information.)

Regular skin exams are especially important for [people who are at higher risk of melanoma](#)⁴, such as people with dysplastic nevus syndrome, people with a strong family history of melanoma, and people who have had melanoma before. If you have many moles, your doctor might advise taking full-body photos so your moles can be tracked over time and new ones can be seen more readily. (This is sometimes called *total body photography* or *mole mapping*.) Talk to your doctor about how often you should have your skin examined.

Hyperlinks

1. www.cancer.org/cancer/skin-cancer/galleries/skin-self-exam-gallery.html
2. [/content/dam/cancer-org/cancer-control/en/booklets-flyers/why-you-should-know-about-melanoma-handout.pdf](http://content.dam.cancer.org/cancer-control/en/booklets-flyers/why-you-should-know-about-melanoma-handout.pdf)
3. www.cancer.org/cancer/skin-cancer/galleries/skin-self-exam-gallery.html
4. www.cancer.org/cancer/melanoma-skin-cancer/causes-risks-prevention/risk-factors.html

References

See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

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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.

Normal moles

A normal mole is usually 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 generally less 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.

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

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 (known as the *ugly duckling sign*). If you have one of these warning signs, have your skin checked by a doctor.

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 the skin, or growths that look different from the rest of your moles.

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 and ask your doctor to look at areas that may be hard for you to see. 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.

To see examples of normal moles and melanomas, visit the [Skin Cancer Image Gallery](#)¹ on our website.

Hyperlinks

1. www.cancer.org/cancer/skin-cancer/galleries/skin-cancer-image-gallery.html

References

See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

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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 that might be skin 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 melanoma is found, other tests may be done to find out if it has spread to other areas of the body.

Medical history and physical exam

Usually the first step your doctor 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 skin cancer](#)¹, such as history of tanning and sunburns, and if you or anyone in your family has had skin cancer.

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.

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. Enlarged lymph nodes might suggest that melanoma could have spread there.

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.

Along with a standard physical exam, many dermatologists use a technique called *dermatoscopy* (also known as *dermoscopy*, *epiluminescence microscopy [ELM]*, or *surface microscopy*) to see spots on the skin more clearly. 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.

When used by an experienced dermatologist, this test can improve the accuracy of [finding skin cancers early](#). It can also often help reassure you that a spot on the skin is probably benign (non-cancerous) and doesn't need a biopsy.

Types of skin biopsies

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 one based on the size of the affected area, where it is on your body, and other factors. 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. 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.

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.

Shave (tangential) biopsy

For this type of biopsy, 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. This type of biopsy is not generally used if a melanoma is strongly suspected unless 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 removed and the edges of the biopsy site are often 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 cut through the full thickness of skin. A wedge or sliver of skin is removed for examination, and the edges of the cut are usually stitched together.

An incisional biopsy removes only a portion of the tumor. An excisional biopsy removes the entire tumor, and is usually the preferred method of biopsy for suspected melanomas if it can be done. But this is not always possible, so other types of biopsies may be needed.

“Optical” biopsies

Some newer types of biopsies, such as **reflectance confocal microscopy (RCM)**, can

be done without needing to remove samples of skin. To learn more, see [What's New in Melanoma Skin Cancer Research?](#)²

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](#)³ (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

FNA biopsy is not used on suspicious moles. But it may be used, for example, 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.

FNA biopsies are not as invasive as some other types of biopsies, but they 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 biopsy 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 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 nuclear medicine 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 a blue dye is injected in the same place as the radioactive substance. 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 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 removed and looked at as well. This is known as a *lymph node dissection* (see [Surgery for Melanoma Skin Cancer⁴](#)).

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 tests have names such as *immunohistochemistry* (IHC), *fluorescence in situ hybridization* (FISH), and *comparative genomic hybridization* (CGH).

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 features help determine the stage of the melanoma (see [Melanoma Skin Cancer Stages](#)), which in turn affects treatment options and prognosis (outlook).

Testing for gene changes: For people who have advanced melanoma, biopsy samples may be tested to see if the cells have mutations (changes) in certain genes, such as the *BRAF* gene. About half of melanomas have *BRAF* mutations. Some newer drugs used to treat advanced melanomas are only likely to work if the cells have *BRAF* mutations (see [Targeted Therapy for Melanoma Skin Cancer⁵](#)), so this test is important in helping to determine treatment options.

A newer lab test known as *DecisionDx-Melanoma* looks at certain gene expression patterns in melanoma cells to help show if early-stage melanomas are likely to spread. This can be used to help determine treatment options. To learn more, see [What's New in Melanoma Skin Cancer Research?⁶](#)

Imaging tests

[Imaging tests⁷](#) 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 in the body. They are not needed for 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 may be done to help determine if melanoma has spread to the lungs.

Computed tomography (CT) scan

The [CT scan](#)⁸ 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) scan

[MRI scans](#)⁹ use radio waves and strong magnets instead of x-rays to create detailed images of parts of your body. MRI scans are very helpful in looking at the brain and spinal cord.

Positron emission tomography (PET) scan

A [PET scan](#)¹⁰ 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, but it's not usually done in people with early-stage 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 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 affects 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 during treatment.

Hyperlinks

1. www.cancer.org/cancer/melanoma-skin-cancer/causes-risks-prevention/risk-factors.html
2. www.cancer.org/cancer/melanoma-skin-cancer/about/new-research.html
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What Should You Ask Your Health Care Team About Melanoma Skin Cancer?

It's important to have honest, open discussions with your cancer care team. You should ask any question, no matter how small it might seem. Here are some questions you might want to ask:

When you're told you have melanoma

- How far has the melanoma spread within or beneath the skin? How thick is the melanoma?
- Has the melanoma spread to other parts of my body?
- Will I need any other [tests](#) before we can decide on treatment?
- Will I need to see any other types of doctors?
- If I need it, who can help me with concerns about the costs and insurance coverage for my diagnosis and treatment?

When deciding on a treatment plan

- How much experience do you have treating this type of cancer?
- What are my [treatment options](#)¹? What are the possible risks and benefits of each?
- Which treatment do you recommend? Why?
- What is the goal of the treatment?
- Should I get a [second opinion](#)²? How do I do that? Can you recommend a doctor or cancer center?
- How quickly do we need to decide on treatment?
- What should I do to be ready for treatment?
- How long will treatment last? What will it be like? Where will it be done?
- What risks or side effects should I expect? How long are they likely to last?
- Will I have a scar after treatment?
- Will treatment affect my daily activities?
- What are the chances of my cancer growing or recurring (coming back) with the treatment options we have discussed? What will we do if this happens?

During treatment

Once treatment begins, you'll need to know what to expect and what to look for. Not all of these questions may apply to you, but getting answers to the ones that do may be helpful.

- How will we know if the treatment is working?
- Is there anything I can do to help manage side effects?
- What symptoms or side effects should I tell you about right away?
- How can I reach you on nights, holidays, or weekends?
- Are there any limits on what I can do?
- Can you suggest a mental health professional I can see if I start to feel overwhelmed, depressed, or distressed?

After treatment

- What symptoms should I watch for?
- What are the chances of my cancer coming back?
- What are my chances of developing another skin cancer?
- Should I take special precautions to avoid sun exposure? What steps I can take to protect myself from the sun?
- What type of [follow-up](#)³ will I need after treatment?
- How will we know if the cancer has come back? What would my options be if that happens?
- Are my family members at risk for skin cancer? What should I tell them to do?

Along with these sample questions, be sure to write down your own questions. For instance, you might want more information about recovery times so you can plan your work or activity schedule. Or you might want to ask about [clinical trials](#)⁴ for which you may qualify.

Keep in mind that doctors aren't the only ones who can give you information. Other health care professionals, such as nurses and social workers, can answer some of your questions. To find out more about speaking with your health care team, see [The Doctor-Patient Relationship](#)⁵.

Hyperlinks

1. www.cancer.org/cancer/melanoma-skin-cancer/treating.html
2. www.cancer.org/treatment/finding-and-paying-for-treatment/choosing-your-treatment-team/seeking-a-second-opinion.html
3. www.cancer.org/cancer/melanoma-skin-cancer/after-treatment/follow-up.html
4. www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html
5. www.cancer.org/treatment/understanding-your-diagnosis/talking-about-cancer/the-doctor-patient-relationship.html

References

See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

Last Medical Review: May 19, 2016 Last Revised: May 20, 2016

Melanoma Skin Cancer Stages

After someone is diagnosed with melanoma, doctors will try to figure out if it has spread, and if so, how far. This process is called *staging*. The stage of a cancer describes how much cancer is in the body. It helps determine how serious the cancer is and [how best to treat it](#)¹. Doctors also use a cancer's stage when talking about survival statistics.

The earliest stage melanomas are called stage 0 (carcinoma in situ), and then range from stages I (1) through IV (4). As a rule, the lower the number, the less the cancer has spread. A higher number, such as stage IV, means cancer has spread more. And within a stage, an earlier letter means a lower stage. Although each person's cancer experience is unique, cancers with similar stages tend to have a similar outlook and are often treated in much the same way.

How is the stage determined?

The staging system most often used for melanoma is the American Joint Committee on Cancer (AJCC) **TNM** system, which is based on 3 key pieces of information:

The extent of the tumor (**T**): How deep has the cancer grown into the skin? Is the cancer ulcerated?

Tumor thickness: The thickness of the melanoma is called the *Breslow measurement*. In general, melanomas less than 1 millimeter (mm) thick (about 1/25 of an inch) have a very small chance of spreading. As the melanoma becomes thicker, it has a greater chance of spreading.

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

The spread to nearby lymph nodes (**N**): Has the cancer spread to nearby lymph nodes?

The spread (**metastasis**) to distant sites (**M**): Has the cancer spread to distant lymph nodes or distant organs such as the lungs or brain?

Numbers or letters after T, N, and M provide more details about each of these factors. Higher numbers mean the cancer is more advanced. Once a person's T, N, and M categories have been determined, this information is combined in a process called *stage grouping* to assign an overall stage. For more information see [Cancer Staging](#)².

The staging system in the table below uses the *pathologic stage* (also called the *surgical stage*). It is determined by examining tissue removed during an operation. Sometimes, if surgery is not possible right away or at all, the cancer will be given a *clinical stage* instead. This is based on the results of a physical exam, biopsy, and imaging tests. The clinical stage will be used to help plan treatment. Sometimes, though, the cancer has spread further than the clinical stage estimates, and may not predict the patient's outlook as accurately as a pathologic stage.

There are both clinical and pathologic staging systems for melanoma. Since most cancers are staged with the pathologic stage, we have included that staging system below. If your cancer has been clinically staged, it is best to talk to your doctor about your specific stage.

The table below is a simplified version of the TNM system. It is based on the most recent AJCC system, effective January 2018. It's important to know that melanoma cancer staging can be complex. If you have any questions about the stage of your cancer or what it means, please ask your doctor to explain it to you in a way you understand.

AJCC Stage	Melanoma Stage description	
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0	<p>The cancer is confined to the epidermis, the outermost skin layer.</p> <p>It has not spread to nearby lymph nodes or distant sites. This stage is also known as melanoma in situ.</p>	
I	<p>The cancer is no more than 2mm (2/25 of an inch) thick and might or might not be ulcerated. It has not spread to nearby lymph nodes or to distant sites.</p>	
II	<p>The cancer is at least 1.01 mm and may be thicker than 4.0 mm. It might or might not be ulcerated. It has not spread to nearby lymph nodes (N0) or to distant sites (M0).</p>	
IIIA	<p>The cancer is no more than 2.0 mm thick. It might or might not be ulcerated. It has spread to 3 or less lymph node(s), but it is so small that it is only seen under the microscope. It has not spread to distant sites.</p>	
IIIB	<p>There is no sign of the primary cancer AND:</p> <ul style="list-style-type: none"> • Has spread to only one lymph node OR • Has spread to very small areas of nearby skin (satellite tumors) or to skin lymphatic channels around the tumor (without reaching the lymph nodes). <p>It has not spread to distant sites.</p>	
	<p>OR</p> <p>The cancer is no more than 4.0 mm thick. It might or might not be ulcerated AND:</p> <ul style="list-style-type: none"> • Has spread to only one lymph node OR • Has spread to very small areas of nearby skin (satellite tumors) or to skin lymphatic channels around the tumor (without reaching the lymph nodes) OR • Has spread to 2 or 3 lymph nodes. <p>It has not spread to distant sites.</p>	
IIIC	<p>There is no sign of the primary cancer AND:</p> <ul style="list-style-type: none"> • Has spread to one or more lymph nodes OR • Has spread to very small areas of nearby skin (satellite tumors) or to skin lymphatic channels around the tumor (without reaching the lymph nodes) OR • Has spread to any lymph nodes that are clumped together. 	

It has not spread to distant sites.

OR

The cancer is no more than 4.0 mm thick. It might or might not be ulcerated **AND:**

- Has spread to one or more lymph nodes **OR**
- Has spread to very small areas of nearby skin (satellite tumors) or to skin lymphatic channels around the tumor (without reaching the lymph nodes) **OR**
- Has spread to lymph nodes that are clumped together.

It has not spread to distant sites.

OR

The cancer is between 2.1 and 4.0mm **OR** thicker than 4.0 mm. It might or might not be ulcerated **AND:**

- Has spread to one or more lymph nodes **OR**
- Has spread to very small areas of nearby skin (satellite tumors) or to skin lymphatic channels around the tumor (without reaching the lymph nodes) **OR**
- Has spread to lymph nodes that are clumped together.

It has not spread to distant sites.

OR

The cancer is thicker than 4.0 mm and is ulcerated **AND:**

- Has spread to no more than 3 lymph nodes **OR**
- Has spread to very small areas of nearby skin (satellite tumors) or to skin lymphatic channels around the tumor (without reaching the lymph nodes).

It has not spread to distant sites.

The cancer is thicker than 4.0 mm and is ulcerated **AND:**

- Has spread to 4 or more lymph nodes **OR**
- Has spread to very small areas of nearby skin (satellite tumors) or to skin lymphatic channels around the tumor (without reaching the lymph nodes) **OR**
- Has spread to lymph nodes that are clumped together.

It has not spread to distant sites.

IIID

IV

The cancer can be any thickness and might or might not be ulcerated. It might or might not have spread to nearby lymph nodes. It has spread to distant lymph nodes or organs such as the lungs, liver or brain.

Hyperlinks

1. www.cancer.org/cancer/melanoma-skin-cancer/treating.html
2. www.cancer.org/treatment/understanding-your-diagnosis/staging.html

References

American Joint Committee on Cancer. Melanoma of the Skin. In: *AJCC Cancer Staging Manual*. 8th ed. New York, NY: Springer; 2017:563.

See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

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Survival Rates for Melanoma Skin Cancer

Survival rates can give you an idea of what percentage of people with the same type and stage of cancer are still alive a certain amount of time (usually 5 years) after they were diagnosed. They can't tell you how long you will live, but they may help give you a better understanding of how likely it is that your treatment will be successful.

Keep in mind that survival rates are estimates and are often based on previous outcomes of large numbers of people who had a specific cancer, but they can't predict what will happen in any particular person's case. These statistics can be confusing and may lead you to have more questions. Talk with your doctor about how these numbers may apply to you, as he or she is familiar with your situation.

What is a 5-year relative survival rate?

A **relative survival rate** compares people with the same type and stage of cancer to people in the overall population. For example, if the **5-year relative survival rate** for a specific stage of melanoma of the skin is 90%, it means that people who have that cancer are, on average, about 90% as likely as people who don't have that cancer to live for at least 5 years after being diagnosed.

Where do these numbers come from?

The American Cancer Society relies on information from the SEER* database, maintained by the National Cancer Institute (NCI), to provide survival statistics for different types of cancer.

The SEER database tracks 5-year relative survival rates for melanoma skin cancer in the United States, based on how far the cancer has spread. The SEER database, however, does not group cancers by [AJCC TNM stages](#) (stage 1, stage 2, stage 3, etc.). Instead, it groups cancers into localized, regional, and distant stages:

- **Localized:** There is no sign that the cancer has spread beyond the skin where it started. This would include AJCC stage I and stage II cancers.
- **Regional:** The cancer has spread beyond the skin where it started to nearby structures or lymph nodes. This would include mainly stage III cancers in the AJCC system.
- **Distant:** The cancer has spread to distant parts of the body, such as the lungs, liver, or skin on other parts of the body. This would include stage IV cancers.

5-year relative survival rates for melanoma skin cancer

(Based on people diagnosed with melanoma between 2008 and 2014.)

SEER stage	5-year relative survival rate
Localized	98%
Regional	64%
Distant	23%
All SEER stages combined	92%

Understanding the numbers

- **These numbers apply only to the stage of the cancer when it is first diagnosed.** They do not apply later on if the cancer grows, spreads, or comes back after treatment.
- **These numbers don't take everything into account.** Survival rates are grouped based on how far the cancer has spread, but your age, overall health, how well the cancer responds to treatment, and other factors can also affect your outlook. For example, younger people tend to have a better outlook than older people, regardless of the stage. And people who have weakened immune systems, such as those who have had organ transplants or who are infected with HIV, are at greater risk of dying from their melanoma.
- **People now being diagnosed with melanoma may have a better outlook than these numbers show.** Treatments improve over time, and these numbers are based on people who were diagnosed and treated at least five years earlier.

*SEER = Surveillance, Epidemiology, and End Results

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Treating Melanoma Skin Cancer

If you've been diagnosed with melanoma, your cancer care team will discuss your treatment options with you. It's important to weigh the benefits of each treatment option against the possible risks and side effects.

How is melanoma skin cancer treated?

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

- [Surgery for Melanoma Skin Cancer](#)
- [Immunotherapy for Melanoma Skin Cancer](#)
- [Targeted Therapy for Melanoma Skin Cancer](#)
- [Chemotherapy for Melanoma Skin Cancer](#)
- [Radiation Therapy for Melanoma Skin Cancer](#)

Common treatment approaches

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

- [Treatment of Melanoma Skin Cancer, by Stage](#)

Who treats melanoma skin cancer?

Depending on your options, you may have different types of doctors on your treatment team. These doctors may include:

- A **dermatologist**: a doctor who treats diseases of the skin
- A **surgical oncologist** (or **oncologic surgeon**): a doctor who uses surgery to treat cancer
- A **medical oncologist**: a doctor who treats cancer with medicines such as chemotherapy, immunotherapy, or targeted therapy
- A **radiation oncologist**: a doctor who treats cancer with radiation therapy

Many other specialists may be involved in your care as well, including nurse practitioners, nurses, psychologists, social workers, rehabilitation specialists, and other health professionals.

- [Health Professionals Associated With Cancer Care¹](#)

Making treatment decisions

It's important to discuss all of your treatment options as well as their possible side effects with your treatment team to help make the decision that best fits your needs. Some important things to consider include:

- Your age and overall health
- The stage (extent) of your cancer
- The likelihood that treatment will cure your cancer or help in some other way
- The possible side effects from treatment

You may feel that you need to make a decision quickly, but it's important to give yourself time to absorb the information you have just learned. Ask questions if there is anything you're not sure about.

If time permits, it is often a good idea to seek a second opinion. A second opinion can give you more information and help you feel more confident about the treatment plan you choose.

- [What Should You Ask Your Health Care Team About Melanoma Skin Cancer?²](#)
- [Seeking a Second Opinion³](#)

Thinking about taking part in a clinical trial

Clinical trials are carefully controlled research studies that are done to get a closer look at promising new treatments or procedures. Clinical trials are one way to get state-of-

the art cancer treatment. In some cases they may be the only way to get access to newer treatments. They are also the best way for doctors to learn better methods to treat cancer. Still, they're not right for everyone.

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials.

- [Clinical Trials](#)⁴

Considering complementary and alternative methods

You may hear about alternative or complementary methods that your doctor hasn't mentioned to treat your cancer or relieve symptoms. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

Complementary methods refer to treatments that are used along with your regular medical care. Alternative treatments are used instead of a doctor's medical treatment. Although some of these methods might be helpful in relieving symptoms or helping you feel better, many have not been proven to work. Some might even be harmful.

Be sure to talk to your cancer care team about any method you are thinking about using. They can help you learn what is known (or not known) about the method, which can help you make an informed decision.

- [Complementary and Alternative Medicine](#)⁵

Help getting through cancer treatment

Your cancer care team will be your first source of information and support, but there are other resources for help when you need it. Hospital- or clinic-based support services are an important part of your care. These might include nursing or social work services, financial aid, nutritional advice, rehab, or spiritual help.

The American Cancer Society also has programs and services – including rides to treatment, lodging, and more – to help you get through treatment. Call our National Cancer Information Center at 1-800-227-2345 and speak with one of our trained specialists.

- [Find Support Programs and Services in Your Area](#)⁶

Choosing to stop treatment or choosing no treatment at all

For some people, when treatments have been tried and are no longer controlling the cancer, it could be time to weigh the benefits and risks of continuing to try new treatments. Whether or not you continue treatment, there are still things you can do to help maintain or improve your quality of life.

Some people, especially if the cancer is advanced, might not want to be treated at all. There are many reasons you might decide not to get cancer treatment, but it's important to talk to your doctors and you make that decision. Remember that even if you choose not to treat the cancer, you can still get supportive care to help with pain or other symptoms.

- [If Cancer Treatments Stop Working](#)⁷
- [Palliative or Supportive Care](#)⁸

The treatment information given here is not official policy of the American Cancer 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.

Surgery for Melanoma Skin Cancer

Surgery is the main treatment option for most melanomas, and usually cures early-stage melanomas.

Wide excision

When melanoma is diagnosed by skin biopsy, more surgery will probably be needed to help make sure the cancer has been removed (excised) completely. This fairly minor operation will cure most thin melanomas.

Local anesthesia is injected into the area to numb it before the excision. The site of the tumor is then cut out, along with a small amount of normal skin at the edges. The

normal, healthy skin around the edges of the cancer is called the *margin*. The wound is carefully stitched back together afterward. This will leave a scar.

The removed sample is then viewed with a microscope to make sure that no cancer cells were left behind at the edges of the skin that was removed.

Wide excision differs from an excisional biopsy. The margins are wider because the diagnosis is already known. The recommended margins vary depending on the thickness of the tumor. Thicker tumors need larger margins (both at the edges and in the depth of the excision).

The margins can also vary based on where the melanoma is on the body and other factors. For example, if the melanoma is on the face, the margins may be smaller to avoid large scars or other problems. Smaller margins might increase the risk of the cancer coming back, so be sure to discuss the options with your doctor.

Mohs surgery

In some situations, Mohs surgery might be an option. This type of surgery is used more often for some other types of skin cancer, but not all doctors agree on using it for melanoma.

Mohs surgery is done by a specially trained dermatologist or surgeon. In this procedure, the skin (including the melanoma) is removed in very thin layers. Each layer is then looked at with a microscope. If cancer cells are seen, the surgeon removes another layer of skin. The operation continues until a layer shows no signs of cancer. In theory, this allows the surgeon to remove the cancer while saving as much of the surrounding normal skin as possible.

Amputation

In uncommon situations where the melanoma is on a finger or toe and has grown deeply, part or all of that digit might need to be amputated.

Lymph node dissection

In this operation, the surgeon removes all of the [lymph nodes](#)¹ in the region near the primary melanoma. For example, if the melanoma is on a leg, the surgeon would remove the nodes in the groin region on that side of the body, which is where melanoma cells would most likely travel to first.

Once the diagnosis of melanoma is made from the skin biopsy, the doctor will examine the lymph nodes near the melanoma. Depending on the thickness and location of the melanoma, this may be done by physical exam, or by [imaging tests](#)² (such as CT or PET scans) to look at nodes that are not near the body surface.

If the nearby lymph nodes are abnormally hard or large, and a fine needle aspiration (FNA) biopsy or excisional biopsy finds melanoma in a node or nodes, a lymph node dissection is usually done.

If the lymph nodes are not enlarged, a sentinel lymph node biopsy may be done, particularly if the melanoma is thicker than 1 mm. (See [Tests for Melanoma Skin Cancer](#)³ for a description of this procedure.) If the sentinel lymph node does not contain cancer, then there is no need for a lymph node dissection because it's unlikely the melanoma has spread to the lymph nodes. If the sentinel lymph node contains cancer cells, removing the remaining lymph nodes in that area with a lymph node dissection is usually advised. This is called a *completion lymph node dissection*.

It's 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.

A full lymph node dissection can cause some long-term side effects. One of the most troublesome is called *lymphedema*. Lymph nodes in the groin or under the arm normally help drain fluid from the limbs. If they are removed, fluid may build up. This can cause limb swelling, which may or may not go away. If severe enough, it can cause skin problems and an increased risk of infections in the limb. Elastic stockings or compression sleeves can help some people with this condition. For more information, see our [Lymphedema](#)⁴ section.

Lymphedema, along with the pain from the surgery itself, is a main reason why lymph node dissection is not done unless the doctor feels it is really necessary. Sentinel lymph node biopsy, however, is unlikely to have this effect. It's important to discuss the risks of side effects with your doctor before having either of these procedures.

Surgery for metastatic melanoma

If melanoma has spread (metastasized) from the skin to other organs such as the lungs or brain, the cancer is very unlikely to be curable by surgery. Even when only 1 or 2 areas of spread are [found by imaging tests](#)⁵ such as CT or MRI scans, there are likely to be others that are too small to be found by these scans.

Surgery is sometimes done in these circumstances, but the goal is usually to try to control the cancer rather than to cure it. If 1 or even a few metastases are present and can be removed completely, this surgery may help some people live longer. Removing metastases in some places, such as the brain, might also help prevent or relieve symptoms and improve a person's quality of life.

If you have metastatic melanoma and surgery is a treatment option, talk to your doctor and be sure you understand what the goal of the surgery would be, as well as its possible benefits and risks.

Hyperlinks

1. www.cancer.org/cancer/cancer-basics/lymph-nodes-and-cancer.html
2. www.cancer.org/treatment/understanding-your-diagnosis/tests/imaging-radiology-tests-for-cancer.html
3. www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/how-diagnosed.html
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5. www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/how-diagnosed.html

References

See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

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Immunotherapy for Melanoma Skin Cancer

Immunotherapy is the use of medicines to stimulate a person's own immune system to recognize and destroy cancer cells more effectively. Several types of immunotherapy

can be used to treat melanoma.

Immune checkpoint inhibitors

These newer drugs have shown a lot of promise in treating advanced melanomas. An important part of the immune system is its ability to keep itself from attacking normal cells in the body. To do this, it uses “checkpoints”, which are proteins on immune cells that need to be turned on (or off) to start an immune response. Melanoma cells sometimes use these checkpoints to avoid being attacked by the immune system. But these drugs target the checkpoint proteins, helping to restore the immune response against melanoma cells.

PD-1 inhibitors

Pembrolizumab (Keytruda) and **nivolumab (Opdivo)** are drugs that target PD-1, a protein on immune system cells called *T cells* that normally help keep these cells from attacking other cells in the body. By blocking PD-1, these drugs boost the immune response against melanoma cells. This can often shrink tumors and help people live longer (although it’s not yet clear if these drugs can cure melanoma).

These drugs are given as an intravenous (IV) infusion every 2 or 3 weeks.

Side effects of these drugs can include [fatigue](#)¹, cough, [nausea](#)², [itching](#)³, [skin rash](#)⁴, [decreased appetite](#)⁵, [constipation](#)⁶, [joint pain](#)⁷, and [diarrhea](#)⁸.

Other, more serious side effects occur less often. These drugs work by basically removing the brakes from the body’s immune system. Sometimes the immune system starts attacking other parts of the body, which can cause serious or even life-threatening problems in the lungs, intestines, liver, hormone-making glands, kidneys, or other organs.

It’s very important to report any new side effects to your health care team promptly. If serious side effects do occur, treatment may need to be stopped and you may get high doses of corticosteroids to suppress your immune system.

CTLA-4 inhibitor

Ipilimumab (Yervoy) is another drug that boosts the immune response, but it has a different target. It blocks CTLA-4, another protein on T cells that normally helps keep them in check.

This drug is given as an intravenous (IV) 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, this drug has been shown to help people live longer, although it's not clear if it can cure the melanoma.

The most common side effects from this drug include [fatigue](#)⁹, [diarrhea](#)¹⁰, [skin rash](#)¹¹, and [itching](#)¹².

Serious side effects seem to happen more often with this drug than with the PD-1 inhibitors. Like the PD-1 inhibitors, this drug can cause the immune system to attack other parts of the body, which can lead to serious problems in the intestines, liver, hormone-making glands, nerves, skin, eyes, or other organs. In some people these side effects can be life threatening.

It's very important to report any new side effects during or after treatment to your health care team promptly. If serious side effects do occur, you may need to stop treatment and take high doses of corticosteroids to suppress your immune system.

Cytokines (interferon-alfa and interleukin-2)

Cytokines are proteins in the body that boost the immune system in a general way. Man-made versions of cytokines, such as interferon-alfa and interleukin-2 (IL-2), are sometimes used in patients with melanoma. They are given as intravenous (IV) infusions, at least at first. Some patients or caregivers may be able to learn how to give injections under the skin at home.

For advanced melanomas: Both interferon-alfa and IL-2 can shrink advanced melanomas in about 10% to 20% of patients when used alone. These drugs may also be given along with [chemotherapy drugs](#) (known as *biochemotherapy*) for stage IV melanoma.

Side effects can include flu-like symptoms such as [fever](#)¹³, chills, [aches](#)¹⁴, [severe tiredness](#)¹⁵, drowsiness, and [low blood cell counts](#)¹⁶. Interleukin-2, particularly in high doses, can cause fluid to build up in the body so that the person swells up and can feel quite sick. Because of this and other possible serious side effects, high-dose IL-2 is given only in the hospital, in centers that have experience with this type of treatment.

After [surgery](#) for some earlier-stage melanomas: Thicker melanomas are more likely than thinner melanomas to come back in another part of the body after surgery, even if all of the cancer is thought to have been removed. Interferon-alfa can sometimes be used as an added (adjuvant) therapy after surgery to try to prevent this. This may delay

the recurrence of melanoma, but it's not yet clear if it improves survival.

High doses must be used for the interferon to be effective, but many patients can't take the side effects of high-dose therapy. These can include [fever](#)¹⁷, chills, aches, [depression](#)¹⁸, [feeling very tired](#)¹⁹, and effects on the heart and liver. Patients getting this drug need to be watched closely by a doctor who is experienced with this treatment.

When deciding whether to use adjuvant interferon therapy, patients and their doctors need to take into account the potential benefits and side effects of this treatment.

Oncolytic virus therapy

Viruses are a type of germ that can infect and kill cells. Some viruses can be altered in the lab so that they infect and kill mainly cancer cells. These are known as *oncolytic viruses*. Along with killing the cells directly, the viruses can also alert the immune system to attack the cancer cells.

Talimogene laherparepvec (Imlygic), also known as T-VEC, is an oncolytic virus that can be used to treat melanomas in the skin or lymph nodes that can't be removed with surgery. The virus is injected directly into the tumors, typically every 2 weeks. This treatment can sometimes shrink these tumors, but it hasn't been shown to shrink tumors in other parts of the body. It's also not clear if this treatment can help people live longer. Side effects can include flu-like symptoms and pain at the injection site.

Bacille Calmette-Guerin (BCG) vaccine

BCG is a germ related to the one that causes tuberculosis. BCG doesn't cause serious disease in humans, but it does activate the immune system. The BCG vaccine is sometimes used to help treat stage III melanomas by injecting it directly into tumors.

Imiquimod cream

Imiquimod (Zyclara) is a drug that is put on the skin as a cream. It stimulates a local immune response against skin cancer cells. For very early (stage 0) melanomas in sensitive areas on the face, some doctors may use imiquimod if surgery might be disfiguring. It can also be used for some melanomas that have spread along the skin. Still, not all doctors agree it should be used for melanoma.

The cream is usually applied 2 to 5 times a week for around 3 months. Some people have serious skin reactions to this drug. Imiquimod is not used for more advanced

melanomas.

Newer treatments

Some other types of immunotherapy have shown promise in treating melanoma in early studies. At this time they are available only through clinical trials (see [What's New in Melanoma Skin Cancer Research?](#)²⁰).

To learn more about this type of treatment, see [Cancer Immunotherapy](#)²¹.

Hyperlinks

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References

See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

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Targeted Therapy for Melanoma Skin Cancer

These drugs target parts of melanoma cells that make them different from normal cells. Targeted drugs work differently from standard [chemotherapy](#) drugs, which basically attack any quickly dividing cells. Sometimes, targeted drugs work when chemotherapy doesn't. They can also have less severe side effects. Doctors are still learning the best way to use these drugs to treat melanoma.

Drugs that target cells with *BRAF* gene changes

About half of all melanomas have changes (mutations) in the *BRAF* gene. Melanoma cells with these changes make an altered BRAF protein that helps them grow. Some drugs target this and related proteins, such as the MEK proteins.

If you have melanoma, a [biopsy](#)¹ sample of it might be tested to see if the cancer cells have a *BRAF* mutation. Drugs that target the BRAF protein (BRAF inhibitors) or the MEK proteins (MEK inhibitors) aren't likely to work in people whose melanomas have a normal *BRAF* gene.

Most often, if a person has a *BRAF* mutation and needs targeted therapy, they will get both a BRAF inhibitor and a MEK inhibitor, as combining these drugs often works better than either one alone.

BRAF inhibitors

Vemurafenib (Zelboraf), dabrafenib (Tafinlar), and encorafenib (Braftovi) are drugs that attack the BRAF protein directly.

These drugs shrink or slow the growth of tumors in some people whose metastatic melanoma has a *BRAF* gene change. They can also help some patients live longer, although the melanoma typically starts growing again eventually.

Dabrafenib can also be used (along with trametinib; see below) after [surgery](#) in people with [stage III](#)² melanoma, where it can help lower the risk of the cancer coming back.

These drugs are taken as pills or capsules, once or twice a day. Common side effects can include skin thickening, rash, itching, sensitivity to the sun, headache, fever, joint pain, fatigue, hair loss, and nausea. Less common but serious side effects can include heart rhythm problems, liver problems, kidney failure, severe allergic reactions, severe skin or eye problems, bleeding, and increased blood sugar levels.

Some people treated with these drugs develop new [squamous cell skin cancers](#)³. These cancers are usually less serious than melanoma and can be treated by removing them. Still, your doctor will want to check your skin often during treatment and for several months afterward. You should also let your doctor know right away if you notice any new growths or abnormal areas on your skin.

MEK inhibitors

The *MEK* gene works together with the *BRAF* gene, so drugs that block MEK proteins can also help treat melanomas with *BRAF* gene changes. MEK inhibitors include **trametinib (Mekinist)**, **cobimetinib (Cotellic)**, and **binimetinib (Mektovi)**.

These drugs are pills taken once or twice a day. Common side effects can include rash, nausea, diarrhea, swelling, and sensitivity to sunlight. Rare but serious side effects can include heart lung, or liver damage; bleeding or blood clots; vision problems; muscle damage; and skin infections.

Again, the most common approach is to combine a MEK inhibitor with a BRAF inhibitor. This seems to shrink tumors for longer periods of time than using either type of drug alone. Some side effects (such as the development of other skin cancers) are actually *less* common with the combination.

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

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

- On the palms of the hands, soles of the feet, or under the nails (known as *acral melanomas*)
- Inside the mouth or other mucosal (wet) areas
- In areas that get chronic sun exposure

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

Drugs that target different gene changes are also being studied in clinical trials (see [What's new in melanoma skin cancer research?](#)⁴).

Hyperlinks

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Chemotherapy for Melanoma Skin Cancer

Chemotherapy (chemo) uses drugs that kill cancer cells. The drugs are usually injected into a vein or taken by mouth as a pill. They travel through the bloodstream to all parts of the body and attack cancer cells that have already spread beyond the skin.

When might chemo be used?

Chemo can be used to treat advanced melanoma, but it's not often used as the first treatment since newer forms of [immunotherapy](#) and [targeted drugs](#) have become available. Chemo is usually not as effective for melanoma as it is for some other types of cancer, but it may relieve symptoms or extend survival for some patients.

Which chemo drugs are used to treat melanoma?

Several chemo drugs can be used to treat melanoma:

- Dacarbazine (also called DTIC)
- Temozolomide
- Nab-paclitaxel
- Paclitaxel
- Cisplatin
- Carboplatin
- Vinblastine

Some of these drugs are given alone, while others are often combined with other drugs. It's not clear if using combinations of drugs is more helpful than using a single drug, but it can add to the side effects.

Some studies suggest that combining chemo drugs with immunotherapy drugs such as interferon-alpha and/or interleukin-2 (see [Immunotherapy for Melanoma Skin Cancer](#)) might work better than a single chemo drug alone, although it's not clear if this helps people live longer. This type of treatment is also called *biochemotherapy* or *chemoimmunotherapy*.

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

Isolated limb perfusion: This is a way of giving chemotherapy that is sometimes used to treat advanced melanoma that is confined to an arm or leg. It is done during a surgical procedure. The blood flow of the arm or leg is separated from the rest of the body, and a high dose of chemotherapy is circulated through the limb for a short period of time. This lets doctors give high doses to the area of the tumor without exposing other parts of the body to these doses, which would otherwise cause severe side effects.

To do this, a tube is placed into the artery that feeds blood into the limb, and a second tube is placed into the vein that drains blood from it. The tubes are connected to a special machine in the operating room. A tourniquet is tied around the limb to make sure the chemo doesn't enter the rest of the body. Chemotherapy (usually with a drug called melphalan) is then infused into the blood in the limb through the artery. During the treatment session, the blood exits the limb through the tube in the vein, is heated by the machine (to help the chemo work better), and is then returned back to the limb through the tube in the artery. By the end of the treatment the drug is completely washed out of the limb, and the tubes are removed so that the circulation is returned to normal.

Possible side effects of chemotherapy

Chemo drugs can cause side effects. These depend on the type and dose of drugs given and how long they are used. The side effects of chemo can include::

- [Hair loss](#)¹
- [Mouth sores](#)²
- [Loss of appetite](#)³
- [Nausea and vomiting](#)⁴

- [Diarrhea or constipation](#)⁵
- Increased risk of [infection](#)⁶ (from having too few white blood cells)
- [Easy bruising or bleeding](#)⁷ (from having too few blood platelets)
- [Fatigue](#)⁸ (from having too few red blood cells)

These side effects usually go away once treatment is finished. There are often ways to lessen side effects. For example, drugs can help prevent or reduce nausea and vomiting. Be sure to ask your doctor or nurse about drugs to help reduce side effects.

Some chemo drugs can have other side effects. For example, some drugs can damage nerves, which can lead to symptoms (mainly in the hands and feet) such as pain, burning or tingling sensations, sensitivity to cold or heat, or weakness. This condition is called ⁹[peripheral neuropathy](#)¹⁰. It usually goes away once treatment is stopped, but for some people it can last a long time.

Be sure to talk with your cancer care team about what to expect in terms of side effects. While you are getting chemo, report any side effects to your medical team so that they can be treated promptly. In some cases, the doses of chemo may need to be reduced or treatment may need to be delayed or stopped to prevent side effects from getting worse.

To learn more, see the [Chemotherapy](#)¹¹ section of our website.

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See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

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Radiation Therapy for Melanoma Skin Cancer

Radiation therapy uses high-energy rays (such as x-rays) or particles to kill cancer cells.

When might radiation therapy be used?

Radiation therapy is not often used to treat melanoma on the skin, although it's sometimes used if [surgery](#) is not an option for some reason.

Radiation can also be used after surgery for an uncommon type of melanoma known as *desmoplastic melanoma*.

Sometimes, radiation is given after surgery in the area where lymph nodes were removed, especially if many of the nodes contained cancer cells. This is to try to lower the chance that the cancer will come back.

Radiation can also be used to treat melanoma that has come back after surgery, either in the skin or lymph nodes, or to help treat distant spread of the disease.

Radiation therapy is often used to relieve symptoms caused by the spread of the melanoma, especially to the brain or bones. Treatment with the goal of relieving symptoms is called *palliative therapy*¹. Palliative radiation therapy is not expected to cure the cancer, but it might help shrink it or slow its growth for a time to help control some of the symptoms.

How is radiation therapy given?

The type of radiation most often used to treat melanoma, known as *external beam radiation therapy*, focuses radiation from a source outside of the body on the cancer.

The treatment schedule can vary based on the goal of treatment and where the melanoma is. Before treatments start, your radiation team will take careful measurements to find the correct angles for aiming the radiation beams and the proper dose of radiation. This planning session is called *simulation*.

Treatment is much like getting an x-ray, but the radiation is stronger. The procedure itself is painless. Each treatment lasts only a few minutes, although the setup time – getting you into place for treatment – usually takes longer.

Stereotactic radiosurgery (SRS)

SRS is a type of radiation therapy that can sometimes be used for tumors that have spread to the brain. (Despite the name, there is no actual surgery.) High doses of radiation are aimed precisely at the tumor(s) in one or more treatment sessions. There are 2 main ways to give SRS:

- In one version, a machine called a Gamma Knife[®] focuses about 200 beams of radiation on the tumor from different angles over a few minutes to hours. The head is kept in the same position by placing it in a rigid frame.
- In another version, a linear accelerator (a machine that creates radiation) that is controlled by a computer moves around the head to deliver radiation to the tumor from many different angles over a few minutes. The head is kept in place with a head frame or a plastic face mask.

These treatments can be repeated if needed.

Stereotactic body radiation therapy (SBRT)

This approach is similar to SRS (using a linear accelerator), but it can be used to treat

tumors in other parts of the body.

Possible side effects of radiation therapy

Side effects of radiation are usually limited to the area getting radiation. Common side effects can include:

- Sunburn-like [skin problems](#)²
- [Changes in skin color](#)³
- [Hair loss](#)⁴ where the radiation enters the body
- [Fatigue](#)⁵
- [Nausea](#)⁶ (if radiation is aimed at the abdomen)

Often these go away after treatment. When radiation is given with [chemotherapy](#), the side effects are often worse.

Radiation therapy to the brain can sometimes cause [memory loss, headaches, trouble thinking](#)⁷, or [reduced sexual desire](#)⁸. Usually these symptoms are minor compared with those caused by a tumor in the brain, but they can still affect your quality of life.

To learn more about radiation, see the [Radiation Therapy](#)⁹ section of our website.

Hyperlinks

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See all references for Melanoma Skin Cancer www.cancer.org/cancer/melanoma-skin-cancer/references.html

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Treatment of Melanoma Skin Cancer, by Stage

The type of treatment(s) your doctor recommends will depend on the [stage¹](#) and location of the melanoma and on your overall health. This section lists the options usually considered for each stage of melanoma.

Treating stage 0 melanoma

Stage 0 melanomas have not grown deeper than the top layer of the skin (the epidermis). They are usually treated by [surgery](#) (wide excision) to remove the melanoma and a small margin of normal skin around it. The removed sample is then sent to a lab to be looked at with a microscope. If cancer cells are seen at the edges of the sample, a repeat excision of the area may be done.

Some doctors may consider the use of imiquimod cream (Zyclara) or [radiation therapy](#) instead of surgery, although not all doctors agree with this.

For melanomas in sensitive areas on the face, some doctors may use [Mohs surgery](#) or even imiquimod cream if surgery might be disfiguring, although not all doctors agree with these uses.

Treating stage I melanoma

Stage I melanoma is treated by wide excision ([surgery](#) to remove the melanoma as well as a margin of normal skin around it). The margin of normal skin removed depends on the thickness and location of the melanoma.

Some doctors may recommend a [sentinel lymph node biopsy](#), especially if the melanoma is stage IB or has other characteristics that make it more likely to have spread to the lymph nodes. You and your doctor should discuss this option.

If cancer cells are found on the sentinel lymph node biopsy, a lymph node dissection (removal of all lymph nodes near the cancer) is often recommended, but it's not clear if this improves survival. Some doctors may recommend adjuvant (additional) treatment with interferon after the lymph node surgery. Other drugs or perhaps vaccines might be options as part of a [clinical trial](#)² to try to lower the chance the melanoma will come back.

Treating stage II melanoma

Wide excision ([surgery](#) to remove the melanoma and a margin of normal skin around it) is the standard treatment for stage II melanoma. The amount of normal skin removed depends on the thickness and location of the melanoma.

Because the melanoma may have spread to lymph nodes near the melanoma, many doctors recommend a [sentinel lymph node biopsy](#) as well. This is an option that you and your doctor should discuss. If it is done and the sentinel node contains cancer cells, then a lymph node dissection (where all the lymph nodes in that area are surgically removed) will probably be done at a later date.

For some patients (such as those with lymph nodes containing cancer), doctors may advise treatment with interferon after surgery (adjuvant therapy). Other drugs or perhaps vaccines may also be recommended as part of a [clinical trial](#)³ to try to lower the chance the melanoma will come back.

Treating stage III melanoma

These cancers have already reached the lymph nodes when the melanoma is first diagnosed. [Surgical treatment](#) for stage III melanoma usually requires wide excision of the primary tumor as in earlier stages, along with lymph node dissection.

After surgery, adjuvant treatment with [immunotherapy](#) (such as nivolumab [Opdivo] or pembrolizumab [Keytruda) or [targeted therapy](#) (for cancers with *BRAF* gene changes) may help lower the risk of the melanoma coming back. Other drugs or perhaps vaccines

may also be recommended as part of a [clinical trial](#)⁴ to try to reduce the chance the melanoma will come back. Another option is to give [radiation therapy](#) to the areas where the lymph nodes were removed, especially if many of the nodes contain cancer.

If melanomas are found in nearby lymph vessels in or just under the skin (known as *in-transit tumors*), they should all be removed, if possible. Other options include injections of the T-VEC vaccine (Imlygic), Bacille Calmette-Guerin (BCG) vaccine, interferon, or interleukin-2 (IL-2) directly into the melanoma; radiation therapy; or applying imiquimod cream. For melanomas on an arm or leg, another option might be isolated limb perfusion (infusing the limb with a heated solution of [chemotherapy](#)). Other possible treatments might include [targeted therapy](#), [immunotherapy](#), chemotherapy, or a combination of immunotherapy and chemotherapy (biochemotherapy).

Some patients might benefit from newer treatments being tested in clinical trials. Many patients with stage III melanoma might not be cured with current treatments, so they may want to think about taking part in a [clinical trial](#)⁵.

Treating stage IV melanoma

Stage IV melanomas are often hard to cure, as they have already spread to distant lymph nodes or other areas of the body. Skin tumors or enlarged lymph nodes causing symptoms can often be removed by [surgery](#) or treated with [radiation therapy](#).

Metastases in internal organs are sometimes removed, depending on how many there are, where they are, and how likely they are to cause symptoms. Metastases that cause symptoms but cannot be removed may be treated with radiation, immunotherapy, targeted therapy, or chemotherapy.

The treatment of widespread melanomas has changed in recent years as newer forms of immunotherapy and targeted drugs have been shown to be more effective than chemotherapy.

[Immunotherapy](#) drugs called *checkpoint inhibitors* such as pembrolizumab (Keytruda), nivolumab (Opdivo), and ipilimumab (Yervoy) have been shown to help some people with advanced melanoma live longer. These drugs can sometimes have serious side effects, so patients who get them need to be watched closely. [Other types of immunotherapy](#)⁶ might also help, but these are only available through clinical trials.

In about half of all melanomas, the cancer cells have changes in the *BRAF* gene. If this gene change is found, treatment with newer [targeted therapy](#) drugs – typically a combination of a BRAF inhibitor and a MEK inhibitor – might be helpful. They might be

tried before or after the newer immunotherapy drugs, but they aren't used at the same time. Like the checkpoint inhibitors, these drugs can help some people live longer, although they haven't been shown to cure these melanomas.

A small portion of melanomas have changes in the *C-KIT* gene. These melanomas might be helped by targeted drugs such as imatinib (Gleevec) and nilotinib (Tasigna), although, again, these drugs aren't known to cure these melanomas.

Immunotherapy using interferon or interleukin-2 can help a small number of people with stage IV melanoma live longer. Higher doses of these drugs seem to be more effective, but they can also have more severe side effects, so they might need to be given in the hospital.

Chemotherapy can help some people with stage IV melanoma, but other treatments are usually tried first. Dacarbazine (DTIC) and temozolomide (Temodar) are the chemo drugs used most often, either by themselves or combined with other drugs. Even when chemotherapy shrinks these cancers, the cancer usually starts growing again within several months.

Some doctors may recommend biochemotherapy, which is a combination of chemotherapy and either interleukin-2, interferon, or both. This can often shrink tumors, which might make patients feel better, although it has not been shown to help patients live longer.

It's important to carefully consider the possible benefits and side effects of any recommended treatment before starting it.

Because stage IV melanoma is hard to cure with current treatments, patients may want to think about taking part in a [clinical trial](#)⁷. Many studies are now looking at new targeted drugs, immunotherapies, chemotherapy drugs, and combinations of different types of treatments.

Even though stage IV melanoma is often hard to cure, a small portion of people respond very well to treatment and survive for many years after diagnosis.

Treating recurrent melanoma

Treatment of melanoma that comes back after initial treatment depends on the stage of the original melanoma, what treatments a person has already had, where the melanoma comes back, and other factors.

Melanoma might come back in the skin near the site of the original tumor, sometimes even in the scar from the surgery. In general, these local (skin) recurrences are treated with surgery similar to what would be recommended for a primary melanoma. This might include a sentinel lymph node biopsy. Depending on the thickness and location of the tumor, other treatments may be considered, such as isolated limb perfusion [chemotherapy](#); [radiation therapy](#); or local [immunotherapy](#) treatments such as tumor injection with the T-VEC vaccine (Imlygic), BCG vaccine, interferon, or interleukin-2. Systemic treatments such as [immunotherapy](#), [targeted therapy](#), or [chemotherapy](#) might also be options.

If nearby lymph nodes weren't removed during the initial treatment, the melanoma might come back in these lymph nodes. Lymph node recurrence is treated by lymph node dissection if it can be done, sometimes followed by treatments such as interferon or radiation therapy. If [surgery](#) is not an option, radiation therapy or systemic treatment (immunotherapy, targeted therapy, or chemo) can be used.

Melanoma can also come back in distant parts of the body. Almost any organ can be affected. Most often, the melanoma will come back in the lungs, bones, liver, or brain. Treatment for these recurrences is generally the same as for stage IV melanoma (see above). Melanomas that recur on an arm or leg may be treated with isolated limb perfusion chemotherapy.

Melanoma that comes back in the brain can be hard to treat. Single tumors can sometimes be removed by surgery. Radiation therapy to the brain (stereotactic radiosurgery or whole brain radiation therapy) may help as well. Systemic treatments (immunotherapy, targeted therapy, or chemo) might also be tried.

As with other stages of melanoma, people with recurrent melanoma may want to think about taking part in a [clinical trial](#)⁸.

The treatment information given here is not official policy of the American Cancer 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.

Hyperlinks

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After Melanoma Skin Cancer Treatment

Living as a Cancer Survivor

For many people, cancer treatment often raises questions about next steps as a survivor.

- [Living as a Melanoma Skin Cancer Survivor](#)
- [Second Cancers After Melanoma Skin Cancer](#)

Living as a Melanoma Skin Cancer Survivor

For many people with melanoma, [treatment](#)¹ can remove or destroy the cancer. Completing 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 *recurrent cancer* or a *recurrence*.) This is very common if you've had cancer.

For others, melanoma may never go away completely. These people may get regular treatment with immunotherapy, targeted therapy, chemotherapy, or other treatments to try to help keep the cancer under control for as long as possible. Learning to live with [cancer that does not go away](#)² can be difficult and very stressful.

Ask your doctor for a survivorship care plan

Talk with your doctor about developing a survivorship care plan for you. This plan might include:

- A suggested schedule for follow-up exams and tests
- A schedule for other tests you might need in the future, such as early detection (screening) tests for other types of cancer, or tests to look for long-term health effects from your cancer or its treatment
- A list of possible late- or long-term side effects from your treatment, including what to watch for and when you should contact your doctor
- Diet and physical activity suggestions

Follow-up after melanoma

Even if you've completed treatment, your doctors will still want to watch you closely. Along with the risk of the melanoma coming back, people who have had melanoma have a high risk of developing another one, so it's very important to keep all follow-up appointments. During these visits, your doctors will ask about any problems you are having and may do [exams and lab tests or imaging tests to look for signs of cancer](#)³ or [treatment side effects](#)⁴.

Some treatment side effects might last a long time or might not even show up until years after you have finished treatment. Your doctor visits are a good time to ask questions and talk about any changes or problems you notice or concerns you have.

Exams and tests

Your follow-up schedule should include regular skin and lymph node exams by yourself and by your doctor. How often you need follow-up doctor visits depends on the [stage](#)⁵ of your melanoma when you were diagnosed and other factors. In addition to the exams, imaging tests such as x-rays or CT scans may be recommended for some patients.

A typical follow-up schedule for people with early-stage melanomas that were removed completely generally calls for physical exams every 6 to 12 months for several years. If these exams are normal, the time between your doctor visits may be extended. Your doctor may recommend more frequent exams if you have many moles or atypical moles.

For thicker melanomas or those that had spread beyond the skin, a typical schedule might include physical exams every 3 to 6 months for several years. After that, exams

might be done less often. Imaging tests such as chest x-rays or CT scans might be done as well, especially for people who had more advanced stage disease.

It's also important for melanoma survivors to do regular [self-exams of their skin](#)⁶ and lymph nodes. Most doctors recommend this at least monthly. You should see your doctor if you find any new lump or change in your skin. You should also report any new symptoms (for example, pain, cough, fatigue, loss of appetite) that don't go away. Melanoma can sometimes come back many years after it was first treated.

People with melanoma that doesn't go away completely with treatment will have a follow-up schedule that is based on their specific situation.

Keeping health insurance and copies of your medical records

Even after treatment, it's very important to keep [health insurance](#)⁷. Tests and doctor visits cost a lot, and even though no one wants to think of their cancer coming back, this could happen.

At some point after your cancer treatment, you might find yourself seeing a new doctor who doesn't know about your medical history. It's important to keep copies of your medical records to give your new doctor the details of your diagnosis and treatment. Learn more in [Keeping Copies of Important Medical Records](#)⁸.

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

If you have (or have had) melanoma, you probably want to know if there are things you can do that might lower your risk of the cancer coming back, or of getting a new skin cancer.

At this time, not enough is known about melanoma to say for sure if there are things you can do that will be helpful. We do know that people who have had melanoma are at higher risk for developing another melanoma or other type of skin cancer. Because of this, it's very important to [limit your exposure to UV rays](#)⁹ (from the sun or tanning beds) and to continue to [examine your skin every month](#)¹⁰ for [signs of melanoma coming back or possible new skin cancers](#)¹¹. Skin cancers that are found early are typically much easier to treat than those found at a later stage.

Adopting healthy behaviors such as [not smoking](#)¹², [eating well](#)¹³, [being active](#)¹⁴, and [staying at a healthy weight](#)¹⁵ might help as well, but no one knows for sure. However, we do know that these types of changes can have positive effects on your health that can extend beyond your risk of melanoma or other cancers.

About dietary supplements

So far, no [dietary supplements](#)¹⁶ (including vitamins, minerals, and herbal products) have been shown to clearly help lower the risk of melanoma progressing or coming back. This doesn't mean that no supplements will help, but it's important to know that none have been proven to do so.

Dietary supplements are not regulated like medicines in the United States – they do not have to be proven effective (or even safe) before being sold, although there are limits on what they're allowed to claim they can do. If you are thinking about taking any type of nutritional supplement, talk to your health care team. They can help you decide which ones you can use safely while avoiding those that might be harmful.

If the cancer comes back

If melanoma does come back at some point, your treatment options will depend on where the cancer is, what treatments you've had before, and your overall health. For more on how recurrent cancer is treated, see [Treatment of Melanoma Skin Cancer by Stage](#)¹⁷. For more general information on dealing with a recurrence, you might also want to read our section about [Understanding Recurrence](#)¹⁸.

Could I get a second cancer after melanoma treatment?

People who've had melanoma can still get other cancers. In fact, melanoma survivors are at higher risk for getting some other types of cancer. Learn more in [Second Cancers After Melanoma Skin Cancer](#).

Getting emotional support

Some amount of feeling depressed, anxious, or worried is normal when melanoma is a part of your life. Some people are affected more than others. But everyone can benefit from help and support from other people, whether friends and family, religious groups, support groups, professional counselors, or others. Learn more in [Life After Cancer](#)¹⁹.

Hyperlinks

1. www.cancer.org/cancer/melanoma-skin-cancer/treating.html
2. www.cancer.org/treatment/survivorship-during-and-after-treatment/when-cancer-doesnt-go-away.html

3. www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/how-diagnosed.html
4. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html
5. www.cancer.org/cancer/skin-cancer/galleries/skin-self-exam-gallery.html
6. www.cancer.org/treatment/finding-and-paying-for-treatment/understanding-health-insurance.html
7. www.cancer.org/treatment/survivorship-during-and-after-treatment/be-healthy-after-treatment/keeping-copies-of-important-medical-records.html
8. www.cancer.org/healthy/be-safe-in-sun.html
9. www.cancer.org/cancer/skin-cancer/galleries/skin-self-exam-gallery.html
10. www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/signs-and-symptoms.html
11. www.cancer.org/healthy/stay-away-from-tobacco.html
12. www.cancer.org/healthy/eat-healthy-get-active/eat-healthy.html
13. www.cancer.org/healthy/eat-healthy-get-active/get-active.html
14. www.cancer.org/healthy/eat-healthy-get-active/take-control-your-weight.html
15. www.cancer.org/treatment/treatments-and-side-effects/complementary-and-alternative-medicine/dietary-supplements.html
16. www.cancer.org/cancer/melanoma-skin-cancer/treating/by-stage.html
17. www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence.html
18. www.cancer.org/treatment/survivorship-during-and-after-treatment/be-healthy-after-treatment/life-after-cancer.html

References

See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

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Second Cancers After Melanoma Skin

Cancer

Cancer survivors can be affected by a number of things, but often a major concern is facing cancer again. If a cancer comes back after treatment it is called a *recurrence*. But some cancer survivors may develop a new, unrelated cancer later. This is called a *second cancer*.

Unfortunately, being treated for melanoma doesn't mean you can't get another type of cancer. Survivors of skin melanoma can get any type of second cancer, but they have an increased risk of certain cancers, including:

- Another [skin cancer](#)¹, including melanoma (this is different from the first cancer coming back)
- [Salivary gland cancer](#)²
- [Small intestine cancer](#)³
- [Breast cancer](#)⁴ (in women)
- [Prostate cancer](#)⁵
- [Kidney cancer](#)⁶
- [Thyroid cancer](#)⁷
- [Soft tissue cancer](#)⁸
- [Non-Hodgkin lymphoma \(NHL\)](#)⁹

The most common second cancer seen in survivors of skin melanoma is another skin cancer.

Follow-up after melanoma treatment

After completing treatment for melanoma, you should still [see your doctor regularly](#) and have regular skin exams. Let them know about any new symptoms or problems, because they could be caused by the cancer coming back or by a new disease or second cancer.

Melanoma survivors should also follow the [American Cancer Society guidelines for the early detection of cancer](#)¹⁰, such as those for colorectal and lung cancer. Most experts don't recommend any other testing to look for second cancers unless you have symptoms.

Can I lower my risk of getting a second cancer?

There are steps you can take to lower your risk and stay as healthy as possible. For example, it's important to [limit your exposure to UV rays](#)¹¹, which can increase your risk for many types of skin cancer. It's also important to [stay away from tobacco products](#)¹². Smoking increases the risk of many cancers.

To help maintain good health, melanoma survivors should also:

- Get to and stay at a [healthy weight](#)¹³
- Be [physically active](#)¹⁴
- Eat a [healthy diet](#)¹⁵, with an emphasis on plant foods
- Limit [alcohol](#)¹⁶ to no more than 1 drink per day for women or 2 per day for men

These steps may also lower the risk of other health problems.

See [Second Cancers in Adults](#)¹⁷ for more information about causes of second cancers.

Hyperlinks

1. www.cancer.org/cancer/skin-cancer.html
2. www.cancer.org/cancer/salivary-gland-cancer.html
3. www.cancer.org/cancer/small-intestine-cancer.html
4. www.cancer.org/cancer/breast-cancer.html
5. www.cancer.org/cancer/prostate-cancer.html
6. www.cancer.org/cancer/kidney-cancer.html
7. www.cancer.org/cancer/thyroid-cancer.html
8. www.cancer.org/cancer/soft-tissue-sarcoma.html
9. www.cancer.org/cancer/non-hodgkin-lymphoma.html
10. www.cancer.org/healthy/find-cancer-early/cancer-screening-guidelines/american-cancer-society-guidelines-for-the-early-detection-of-cancer.html
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12. www.cancer.org/healthy/stay-away-from-tobacco.html
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15. www.cancer.org/healthy/eat-healthy-get-active/eat-healthy.html
16. www.cancer.org/cancer/cancer-causes/diet-physical-activity/alcohol-use-and-cancer.html
17. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/second-cancers-in-adults.html

References

See all references for Melanoma Skin Cancer (www.cancer.org/cancer/melanoma-skin-cancer/references.html)

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