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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 Drugs 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 physician assistants (PAs), nurse practitioners (NPs), nurses, psychologists, social workers, rehabilitation specialists, and other health professionals.

- [Health Professionals Associated With Cancer Care<sup>1</sup>](#)

## **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.

- [Questions to Ask About Melanoma Skin Cancer<sup>2</sup>](#)
- [Seeking a Second Opinion<sup>3</sup>](#)

## **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](#)<sup>4</sup>

### **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](#)<sup>5</sup>

### **Help getting through cancer treatment**

People with cancer need support and information, no matter what stage of illness they may be in. Knowing all of your options and finding the resources you need will help you make informed decisions about your care.

Whether you are thinking about treatment, getting treatment, or not being treated at all, you can still get supportive care to help with pain or other symptoms. Communicating with your cancer care team is important so you understand your diagnosis, what treatment is recommended, and ways to maintain or improve your quality of life.

Different types of programs and support services may be helpful, and can be 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.

- [Palliative Care](#)<sup>6</sup>
- [Find Support Programs and Services in Your Area](#)<sup>7</sup>

### **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](#)<sup>8</sup>

*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.*

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## **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](#)<sup>1</sup>, 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 around the edges (called the *margin*). The wound is usually 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](#)<sup>2</sup>. 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 (also known as Mohs micrographic surgery, or MMS) 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 doctor removes another layer of skin. This is repeated until a layer shows no signs of cancer. This is a slow process, often taking several hours, but it means that more normal skin near the tumor can be saved, which can help the area look better after surgery.

## 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](#)<sup>3</sup> in the region near the primary melanoma tumor. 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](#)<sup>4</sup> (such as ultrasound or 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](#)<sup>5</sup> 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 can be **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 [Lymphedema](#)<sup>6</sup>.

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](#)<sup>7</sup> 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 your doctor suggests surgery as a treatment option, 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/melanoma-skin-cancer/detection-diagnosis-staging/how-diagnosed.html](http://www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/how-diagnosed.html)
2. [www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/how-diagnosed.html](http://www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/how-diagnosed.html)
3. [www.cancer.org/cancer/cancer-basics/lymph-nodes-and-cancer.html](http://www.cancer.org/cancer/cancer-basics/lymph-nodes-and-cancer.html)
4. [www.cancer.org/treatment/understanding-your-diagnosis/tests/imaging-radiology-tests-for-cancer.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/imaging-radiology-tests-for-cancer.html)
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6. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/lymphedema.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/lymphedema.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

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.

These drugs are given as an intravenous (IV) infusion, typically every 2 or 3 weeks. They can be used to treat melanomas that can't be removed by surgery or that have spread to other parts of the body. They can also be used after surgery (as **adjuvant** treatment) for melanomas that have reached the lymph nodes, to try to lower the risk of the cancer coming back.

Side effects of these drugs can include fatigue, cough, nausea, itching, skin rash, decreased appetite, constipation, joint pain, and diarrhea.

Other, more serious side effects occur less often. These drugs work by basically removing one of the safeguards that keeps the body's immune system in check. 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. It can be used to treat melanomas that can't be removed by surgery or that have spread to other parts of the body. It might also be used for less advanced melanomas after surgery (as an **adjuvant** treatment) in some situations, to try to lower the risk of the cancer coming back.

When used alone, this drug doesn't seem to shrink as many tumors as the PD-1 inhibitors, and it tends to have more serious side effects, so usually one of those other drugs is used first. Another option in some situations might be to combine this drug with one of the PD-1 inhibitors, which can increase the chance of shrinking the tumors (slightly more than a PD-1 inhibitor alone), but can also increase the risk of side effects.

The most common side effects from this drug include fatigue, diarrhea, skin rash, and

itching. 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. For 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.

## Interleukin-2 (IL-2)

Interleukins are proteins in the body that boost the immune system in a general way. Man-made versions of **interleukin-2 (IL-2)** are sometimes used to treat 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:** IL-2 can sometimes shrink advanced melanomas when used alone. It is not used as much as in the past, because the immune checkpoint inhibitors are more likely to help people and tend to have fewer side effects. But IL-2 might be an option if these drugs are no longer working.

Side effects of IL-2 can include flu-like symptoms such as fever, chills, aches, severe tiredness, drowsiness, and low blood cell counts. In high doses, IL-2 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.

**For some earlier-stage melanomas:** Melanomas that have reached the nearby lymph nodes are more likely to come back in another part of the body, even if all of the cancer is thought to have been removed. IL-2 can sometimes be injected into the tumors (known as *intralesional therapy*) to try to prevent this. Side effects are similar but tend to be milder when IL-2 is injected directly into the tumor.

When deciding whether to use IL-2, 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, and might also shrink tumors in other parts of the body.

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 can be used to help treat stage III melanomas by injecting it directly into tumors, although it isn't used very often.

## **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 might also be an option for some melanomas that have spread along the skin.

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. Other studies are now looking at combining different types of immunotherapy to see if it might help them work better. (See [What's New in Melanoma Skin Cancer Research?](#)<sup>1</sup>)

## **More information about immunotherapy**

To learn more about how drugs that work on the immune system are used to treat cancer, see [Cancer Immunotherapy](#)<sup>2</sup>.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>3</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/melanoma-skin-cancer/about/new-research.html](http://www.cancer.org/cancer/melanoma-skin-cancer/about/new-research.html)
2. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy.html)
3. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)

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# Targeted Therapy Drugs 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.

Targeted drugs can be very helpful in treating melanomas that have certain gene changes.

## 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 that has spread beyond the skin, a [biopsy](#)<sup>1</sup> sample of it will likely 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 on melanomas that 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 can shrink or slow the growth of tumors in some people whose melanoma has spread or can't be removed completely.

Dabrafenib can also be used (along with the MEK inhibitor trametinib; see below) after [surgery](#) in people with [stage III](#)<sup>2</sup> 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](#)<sup>3</sup>. 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 can be used to treat melanoma that has spread or can't be removed completely.

Trametinib can also be used along with dabrafenib after surgery in people with stage III melanoma, where it can help lower the risk of the cancer coming back.

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.

MEK inhibitors 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.

### **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 an advanced 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?](#)<sup>4</sup>).

## More information about targeted therapy

To learn more about how targeted drugs are used to treat cancer, see [Targeted Cancer Therapy](#)<sup>5</sup>.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>6</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/how-diagnosed.html](http://www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/how-diagnosed.html)
2. [www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/melanoma-skin-cancer-stages.html](http://www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/melanoma-skin-cancer-stages.html)
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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 might be used to treat advanced melanoma after other treatments have been tried, but it's not often used as the first treatment because newer forms of [immunotherapy](#) and [targeted drugs](#) are typically more effective. Chemo is usually not as helpful for melanoma as it is for some other types of cancer, but it can shrink tumors in some people.

### 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

Some of these drugs are given alone, while others are more 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.

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 (ILP) and isolated limb infusion (ILI):** These are ways of giving chemotherapy that are sometimes used to treat melanoma that is confined to an arm or leg but that can't be removed with surgery. The idea with this approach is to keep the chemo in the limb and not allow it to reach other parts of the body, where it could cause more side effects.

This 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.

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.

- For **ILP**, the artery and vein are first surgically separated from the circulation to the rest of the body, and are then hooked up to tubes going to a special machine in the operating room.
- For **ILI**, long tubes (catheters) are inserted through the skin and into the artery and vein. This method is less complex and takes less time, and it might not require general anesthesia (where you are in a deep sleep).

In either case, a tourniquet is tied around the limb to help make sure the chemo doesn't enter the rest of the body. Chemotherapy (usually with a drug called melphalan) is infused into the blood in the limb through the artery. (This is done by the machine in ILP, and by using a syringe in ILI.) During the treatment session, the blood exits the limb through the tube in the vein, the chemo is added, and then the blood is returned back to

the limb through the tube in the artery. (During ILP, the drug can also be heated by the machine to help the chemo work better.) By the end of the treatment the drug is washed out of the limb, and the tubes are removed (and for ILP the blood vessels are stitched back together) 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
- Mouth sores
- Loss of appetite
- Nausea and vomiting
- Diarrhea or constipation
- Increased risk of infection (from having too few white blood cells)
- Easy bruising or bleeding (from having too few blood platelets)
- Fatigue (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 *peripheral neuropathy*. 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.

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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 needed for most people with melanoma on the skin, although it might be useful in certain situations:

- It might be an option to treat very early stage melanomas, if [surgery](#) can't be done 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 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](#)<sup>1</sup>. 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<sup>®</sup> focuses about 200 thin 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
- Changes in skin color
- Hair loss where the radiation enters the body
- Fatigue
- Nausea (if radiation is aimed at the abdomen)

Often these go away after treatment.

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

### **More information about radiation therapy**

To learn more about how radiation is used to treat cancer, see [Radiation Therapy](#)<sup>2</sup>.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>3</sup>.

### **Hyperlinks**

1. [www.cancer.org/treatment/treatments-and-side-effects/palliative-care.html](http://www.cancer.org/treatment/treatments-and-side-effects/palliative-care.html)
2. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/radiation.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/radiation.html)
3. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)

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# Treatment of Melanoma Skin Cancer, by Stage

The type of treatment(s) your doctor recommends will depend on the [stage](#)<sup>1</sup> and location of the melanoma. But other factors can be important as well, such as the risk of the cancer returning after treatment, if the cancer cells have certain gene changes, and your overall health.

## Treating stage 0 melanoma

Stage 0 melanoma (melanoma in situ) has not grown deeper than the top layer of the skin (the epidermis). It is 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 second, wider 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 typically treated by wide excision ([surgery](#) to remove the melanoma as well as a margin of normal skin around it). The width of the margin depends on the thickness and location of the melanoma. Most often, no other treatment is needed.

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

If the SLNB does not find cancer cells in the lymph nodes, then no further treatment is needed, although close [follow-up](#)<sup>2</sup> is still important.

If cancer cells are found on the SLNB, a lymph node dissection (removal of all lymph nodes near the cancer) might be recommended. Another option might be to watch the lymph nodes closely by getting an [ultrasound](#)<sup>3</sup> of the nodes every few months.

If the SLNB found cancer, adjuvant (additional) treatment with an [immune checkpoint inhibitor](#) or [targeted therapy drugs](#) (if the melanoma has a *BRAF* gene mutation) might be recommended to try to lower the chance the melanoma will come back. Other drugs or perhaps vaccines might also be options as part of a [clinical trial](#)<sup>4</sup>.

## 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 width of the margin depends on the thickness and location of the melanoma.

Because the melanoma may have spread to nearby lymph nodes, many doctors recommend a [sentinel lymph node biopsy](#) (SLNB) as well. This is an option that you and your doctor should discuss.

If an SLNB is done and does not find cancer cells in the lymph nodes, then no further treatment is needed, although close [follow-up](#)<sup>5</sup> is still important.

If the SLNB finds that 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. Another option might be to watch the lymph nodes closely by getting an [ultrasound](#)<sup>6</sup> of the nodes every few months.

If the SLNB found cancer, adjuvant (additional) treatment with an [immune checkpoint inhibitor](#) or [targeted therapy drugs](#) (if the melanoma has a *BRAF* gene mutation) might be recommended to try to lower the chance the melanoma will come back. Other drugs or perhaps vaccines might also be options as part of a [clinical trial](#)<sup>7</sup>.

## 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, (additional) adjuvant treatment with an [immune checkpoint inhibitor](#) or with [targeted therapy drugs](#) (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](#)<sup>8</sup> 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 melanoma tumors 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](#), 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 or isolated limb infusion (infusing just the limb with [chemotherapy](#)). Other possible treatments might include [targeted therapy](#) (for melanomas with a *BRAF* or *C-*

*KIT* gene change), [immunotherapy](#), or chemotherapy.

Some people with stage III melanoma might not be cured with current treatments, so they may want to think about taking part in a [clinical trial](#)<sup>9</sup> of newer treatments.

## Treating stage IV melanoma

Stage IV melanomas have already spread (metastasized) 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) or nivolumab (Opdivo) are typically the first drugs tried, especially in people whose cancer cells do not have *BRAF* gene changes. These drugs can shrink tumors for long periods of time in some people. Ipilimumab (Yervoy), a different type of checkpoint inhibitor, is not typically used by itself as the first treatment, although it might be combined with nivolumab or pembrolizumab. This slightly increase the chances that the tumor(s) will shrink, although it's also more likely to result in serious side effects, which needs to be considered carefully. People who get any of these drugs need to be watched closely for serious side effects..

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 a good option. Immune checkpoint inhibitors such as pembrolizumab or nivolumab are another option for these people. Doctors aren't sure if targeted therapy or immunotherapy is better as the first treatment. This is now being studied. But there might be situations where it makes sense to use one instead of the other. For example, the targeted drugs are more likely to shrink tumors quickly, so they might be preferred in cases where this is important. In either case, if one type of treatment isn't working, the other can be tried.

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 these drugs often stop working eventually.

**Immunotherapy** using interleukin-2 (IL-2) can help a small number of people with stage IV melanoma live longer, and it might be tried if immune checkpoint inhibitors aren't working. Higher doses of IL-2 seem to be more effective, but they can also have more severe side effects, so it 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.

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

Because stage IV melanoma is often hard to cure with current treatments, patients may want to think about taking part in a [clinical trial](#)<sup>10</sup>. Many studies are now looking at new targeted drugs, immunotherapies, chemotherapy drugs, and combinations of different types of treatments. (See [What's New in Melanoma Skin Cancer Research?](#)<sup>11</sup>)

## 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.

### Local recurrence

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](#)<sup>12</sup> (SLNB). Depending on the results of the SLNB, other treatments might be recommended as well.

### In-transit recurrence

If melanoma recurs in nearby lymph vessels in or just under the skin (known as *in-transit recurrence*), it should be removed, if possible. Other options include injections of the [T-VEC vaccine \(Imlygic\)](#), [Bacille Calmette-Guerin \(BCG\) vaccine](#), 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 or isolated limb infusion (infusing just the limb with [chemotherapy](#)). Other possible treatments might include [targeted therapy](#) (for melanomas with a *BRAF* or *C-KIT* gene change), [immunotherapy](#), or chemotherapy.

### Recurrence in nearby lymph nodes

If nearby lymph nodes weren't all 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 adjuvant (additional) treatments such as [radiation therapy](#) and/or [immunotherapy](#) or [targeted therapy](#) (for cancers with *BRAF* gene changes). If surgery is not an option, radiation therapy or systemic treatment (immunotherapy, targeted therapy, or chemo) can be used.

### Recurrence in other parts of the body

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/infusion [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](#)<sup>13</sup>.

*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

1. [www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-](http://www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-)

- [staging/melanoma-skin-cancer-stages.html](#)
2. [www.cancer.org/cancer/melanoma-skin-cancer/after-treatment/follow-up.html](http://www.cancer.org/cancer/melanoma-skin-cancer/after-treatment/follow-up.html)
  3. [www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/how-diagnosed.html](http://www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/how-diagnosed.html)
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  8. [www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html](http://www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html)
  9. [www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html](http://www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html)
  10. [www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html](http://www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html)
  11. [www.cancer.org/cancer/melanoma-skin-cancer/about/new-research.html](http://www.cancer.org/cancer/melanoma-skin-cancer/about/new-research.html)
  12. [www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/how-diagnosed.html](http://www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/how-diagnosed.html)
  13. [www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html](http://www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html)

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