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Merkel Cell 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 Merkel cell carcinoma.

- [Merkel Cell Carcinoma Risk Factors](#)
- [What Causes Merkel Cell Carcinoma?](#)

Prevention

There's no sure way to prevent Merkel cell carcinoma. But there are things you can do that might help lower your risk. Learn more.

- [Can Merkel Cell Carcinoma Be Prevented?](#)

Merkel Cell Carcinoma Risk Factors

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

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

These are some known risk factors for MCC:

Merkel cell polyomavirus (MCV) infection

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

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

Ultraviolet (UV) light exposure

[Exposure to ultraviolet \(UV\) rays¹](#) is thought to be a major risk factor for most skin cancers, including MCC. UV rays damage the DNA inside skin cells. This can lead to skin cancer when this ongoing damage affects the DNA of genes that control skin cell growth.

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

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

From psoriasis treatments: Some patients with psoriasis (a long-lasting inflammatory skin disease) are given medicines called psoralens along with UV light treatments, this is known as PUVA treatments. This can increase the risk of MCC.

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 Detection²](#).

Having light-colored skin

The risk of MCC is much higher for whites than for African Americans or Hispanics. Nearly all (more than 9 out of 10) MCCs are diagnosed in white people. This is probably because darker skin has a protective effect against the damaging effects of UV rays.

Being older

The risk of MCC goes up as people get older. In fact, this cancer is very rare in people under the age of 50. About 8 out of 10 people with MCC are over age 70. The increased risk may be related to skin damage caused by sun exposure over time and the fact that people's immune systems tend to become weaker as they get older.

Being male

Men are 2-times more likely than women to develop MCC. This might be because they tend to get more sun exposure.

Having a weakened immune system

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

For example, **people who get organ transplants** usually are given drugs that weaken (suppress) the immune system to help keep them from rejecting the new organ. This increases their risk of developing MCC. People with autoimmune diseases (like lupus) sometimes take medicines that suppress the immune system, which might increase their risk for other diseases.

People with HIV³, the virus that causes AIDS, often have weakened immune systems and are also at increased risk for MCC.

People with some types of blood cancers, such as [chronic lymphocytic leukemia \(CLL\)⁴](#) or certain [lymphomas⁵](#), also tend to have weakened immune systems. This can be from the cancer itself, or from its treatment. People with these cancers are more likely to get MCC.

MCCs in people with weakened immune systems tend to grow faster and are more

likely to be life-threatening.

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/cancer-causes/infectious-agents/hiv-infection-aids.html
4. www.cancer.org/cancer/chronic-lymphocytic-leukemia.html
5. www.cancer.org/cancer/lymphoma.html

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See all references for Merkel Cell Skin Cancer (www.cancer.org/cancer/merkel-cell-skin-cancer/references.html)

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What Causes Merkel Cell Carcinoma?

Although we know some of the things that can increase a person's risk of Merkel cell carcinoma (MCC), it's not clear exactly how these things might cause MCC.

Cancer is caused by changes in the DNA inside of cells. DNA in our cells makes up our genes, which control how our cells work. 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 help 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 by slowing down cell division or making cells 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 many different genes are usually needed for a cell to become a cancer cell.

Researchers don't yet know all of the DNA changes that can result in MCC, but they have found that many of these cancers have changes in tumor suppressor genes.

MCC does not seem to run in families, so the DNA changes that lead to MCC are not likely passed on (inherited) from a person's parents. Instead, these changes probably happen during the person's life. Sometimes these changes might just be random events that happen inside cells, without having an outside cause. But sometimes the cause might be something specific, like long-term sun exposure or infection with the Merkel cell polyomavirus (MCV).

[Ultraviolet \(UV\) radiation¹](#) can damage the DNA inside skin cells. Sometimes this damage affects certain genes that control how and when cells grow and divide, which may be the first step on the path to cancer.

How MCV infection plays a role in the development of MCC isn't clear. But researchers have found that the virus can get inside cells and cause them to make a protein that turns off tumor suppressor genes, which might lead to MCC.

MCV infection might help explain why people with weakened immune systems have a higher risk of MCC. It might be that the virus is normally kept in check (but not killed) by the immune system. A weakened immune system could then allow the virus to grow and flourish, which in turn might raise the risk of MCC.

Scientists are looking for the specific DNA changes inside MCC cells to help explain what causes it. A better understanding of how damaged DNA leads to MCC might also be used to design better treatments for it.

Hyperlinks

1. www.cancer.org/cancer/cancer-causes/radiation-exposure/uv-radiation.html

References

See all references for Merkel Cell Skin Cancer (www.cancer.org/cancer/merkel-cell-skin-cancer/references.html)

Coggshall K, Tello TL, North JP, Yu SS. Merkel cell carcinoma: An update and review: Pathogenesis, diagnosis, and staging. *J Am Acad Dermatol*. 2018;78(3):433-442.

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Can Merkel Cell Carcinoma Be Prevented?

Your risk of getting Merkel cell carcinoma (MCC) is low, and some risk factors for MCC, such as your age, gender, and skin color can't be controlled. Still, there are things you can do that might help lower your risk. These might also lower your risk of getting [more common types of skin cancer](#)¹, as well as some other types of cancer.

Limit your exposure to ultraviolet (UV) rays

The most important way to lower your risk of skin cancers (including MCC) is to limit your [exposure to UV rays](#)². 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”

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

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

Don't use tanning beds or sunlamps

Many people believe the UV rays of tanning beds are harmless. This is not true. Tanning lamps give off UV rays, which can cause long-term skin damage and can contribute to skin cancer. Most skin doctors and health organizations recommend not using tanning beds and sun lamps.

Protect children from the sun

Children need special care, 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.

Learn more about protecting yourself in the sun

For more on how to protect yourself and your family, see [Be Safe in the Sun](#)³.

Keep your immune system strong

Having a weakened immune system greatly increases the risk of getting MCC, as well as other types of skin cancer. In some cases, such as organ transplant, you can't control the things that must be done that weaken (suppress) your immune system. But something you can control is being infected with HIV.⁴

Infection with HIV, the virus that causes AIDS, weakens the immune system. Avoiding known risk factors for HIV infection, such as intravenous (IV) drug use and having unprotected sex with many partners, can also lower your risk of immune system problems. This, in turn, might help keep you from getting MCC and many other types of cancer. To learn more, see [HIV Infection, AIDS, and Cancer](#)⁵.

Hyperlinks

1. www.cancer.org/cancer/skin-cancer.html
2. www.cancer.org/cancer/cancer-causes/radiation-exposure/uv-radiation.html
3. www.cancer.org/healthy/be-safe-in-sun.html
4. www.cancer.org/cancer/cancer-causes/infectious-agents/hiv-infection-aids.html
5. www.cancer.org/cancer/cancer-causes/infectious-agents/hiv-infection-aids.html

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See all references for Merkel Cell Skin Cancer (www.cancer.org/cancer/merkel-cell-skin-cancer/references.html)

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Written by

The American Cancer Society medical and editorial content team
(www.cancer.org/cancer/acs-medical-content-and-news-staff.html)

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