

## Patient information from the BMJ Group

# Skin cancer (squamous cell)

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## Skin cancer (squamous cell)

Squamous cell skin cancer usually appears as a crusted lump on your skin that tends not to heal or go away. In most people, treatment cures this cancer.

We've brought together the best research about squamous cell skin cancer and weighed up the evidence about how to treat it. You can use our information to talk to your doctor and decide which treatments are best for you.

## What is squamous cell skin cancer?

Squamous cell cancer is the second most common skin cancer in the UK. It tends to appear as a crusted lump on your skin that looks different from the skin around it. This lump might not heal. In most people, treatment cures this cancer.

## Key points for people with squamous cell skin cancer

- The main cause of squamous cell skin cancer is getting too much sun.
- You're more likely to get this cancer if you have fair skin or burn easily.
- This cancer doesn't usually spread to other parts of your body.
- But it's more likely to spread if it shows up on your ears or lips.
- Most people who have surgery to remove the cancer are cured.
- If your cancer is caught when it's smaller, it's less likely to spread or come back after surgery.
- You can protect yourself and your family by using sunscreen and staying out of the sun. To learn more, see [Staying safe in the sun](#) .

## Skin cancer (squamous cell)



Using sunscreen can protect you and your family from getting squamous cell skin cancer.

You're more likely to get squamous cell skin cancer if you get lots of sun. The effects of sun on your skin add up over your lifetime, so people who work outdoors and older people are more likely to get squamous cell skin cancer.

You may hear your doctor call this cancer **squamous cell carcinoma** or **non-melanoma skin cancer**.

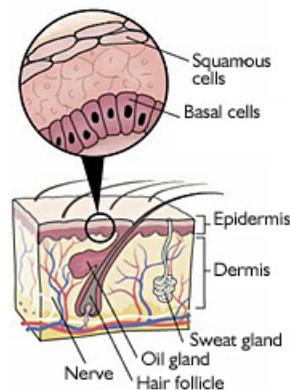
Squamous cell skin cancer isn't the most serious type of skin cancer. The most serious type is called melanoma. (To learn more, see our information on [Melanoma](#) .) But squamous cell cancer can spread.

Here we talk about squamous cell skin cancer that hasn't spread.

### Your skin

To understand how you get squamous cell skin cancer and how it's treated, it helps to know something about your skin and how it protects you from the sun.

Your skin does lots of important jobs. It protects your body from injuries and infections , and cools you down by making sweat when it's hot. It also has lots of nerves that give you your sense of touch.



Squamous cell skin cancer starts in the outer layer of your skin.

Your skin has two layers.

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- An outer layer (called the **epidermis**) protects your body from injuries and infections. This layer is where the flat squamous cells sit. The innermost cells in this layer are called basal cells.
- An inner layer (called the **dermis**) has blood vessels and **glands**, such as sweat glands. The nerves that give you your sense of touch sit in this layer.<sup>[9]</sup> The hair follicles in which your skin hair grows are also in the inner layer.

### What happens when you get skin cancer?

Cancers are diseases that start in your own cells. Usually, cells grow, multiply, and die off in a controlled way. But sometimes a cell starts to grow and multiply in an uncontrolled way. These abnormal cells group together to form a lump, called a tumour.

Not all tumours are cancer. Some tumours are benign, which means that they won't spread to other parts of your body. Most benign tumours are not harmful. But if your tumour is a cancer, the cancer cells can spread to other parts of the body.

To read more about the three main kinds of skin cancer, see [Types of skin cancer](#).

### Squamous cell skin cancer

As its name suggests, squamous cell skin cancer starts in your skin's squamous cells. These cells sit in the top layer of your skin, just under the surface.

When your skin's squamous cells get damaged (usually by sunlight), they change. This means that:<sup>[10]</sup> <sup>[11]</sup>

- Something goes wrong with the way in which they normally die and are replaced by new cells
- Instead of flaking off after about 40 days, the damaged cells stay on your skin
- They keep multiplying, making more cells
- All these cells together may form a lump
- This lump may be a tumour (a squamous cell cancer).

### How the sun damages your skin

The part of sunlight that has the biggest role in causing skin cancer is ultraviolet (UV) light. The two main types of UV light that affect your skin are called UV-A and UV-B.

Both of these can cause skin cancer. But your skin makes **melanin** to protect you from the sun. Melanin is a brown or black pigment. When you're in the sun, your skin makes more melanin to stop it becoming damaged. It's melanin that gives you a tan. But if your skin isn't very good at making melanin or can't make it fast enough, you get sunburnt.

## Skin cancer (squamous cell)

### Skin cancer: why me?

Some people are more likely than others to get squamous cell skin cancer. Doctors call things that make you more likely to get a disease **risk factors**. If you have a risk factor for a disease, it doesn't mean that you'll definitely get the disease. It just means you're more likely to get it.

The most important risk factors for squamous cell skin cancer are **your skin type** and **how much sun you get**. If you have fair skin that burns easily, you're more likely to get skin damage that can lead to this type of cancer. And the more sun you get, the more likely you are to get this cancer. So, for example, if you work outdoors, you're more likely to get sunburned and to get this cancer than someone who works in an office.

### Common risk factors

#### Having fair skin that burns, blue eyes and freckles

People who have dark skin are far less likely to get squamous cell skin cancer. To find out more, see [Your skin type](#) .

#### Getting a lot of sun

More people sunbathe today than did about 50 years ago. This partly explains why skin cancer is becoming more common. <sup>[16]</sup>

We all get sun on some parts of our body from time to time. But how risky this is depends on how old you are when it happens and how long you get the sun for. Here's what we know.

- Getting lots of sun as a child seems to be most risky, especially if you burn. <sup>[16]</sup>
- Older people are more prone to squamous cell skin cancer because their skin has had much more sun than younger people's skin. <sup>[7]</sup>
- If you work outdoors (say, on a building site), you'll get a lot more sun on your skin than someone who works in an office. <sup>[16]</sup> This means your skin is more likely to become damaged and you're more likely to get squamous cell skin cancer.
- The closer you live to the equator, the more hours of sunlight you get each day. This also means you're more likely to get skin damage and squamous cell skin cancer. <sup>[17]</sup>

#### Having skin damage caused by the sun

If the sun damages your skin, you might get small patches that look different from the skin around them. Doctors call these **actinic keratoses**. They are also called **solar keratoses**.

## Skin cancer (squamous cell)

If you've got actinic keratoses, you may have flaky patches of skin.<sup>[17]</sup> <sup>[18]</sup>

- The flaky patches may be slightly raised from the rest of your skin.
- They may be harder than the skin around them.
- They may be red, pink, or brown.
- They usually appear on areas of your skin that get the most sun, such as a balding scalp, your forehead, your face and the backs of your hands.

Some doctors think that the patches are an early form of squamous cell skin cancer.<sup>[12]</sup>  
<sup>[14]</sup> And some studies show that actinic keratoses can turn into skin cancer. But the chances of this happening are very low, less than 1 in 1,000 in a year.

The more of these patches you have, the more likely it is that one will turn into skin cancer.<sup>[19]</sup> So, some doctors think all actinic keratoses should be treated.<sup>[14]</sup> <sup>[19]</sup>

Even so, treatments for actinic keratoses may sting or hurt, especially if you've got lots of patches or they're large.<sup>[18]</sup> And actinic keratoses may get better without treatment, especially if you protect that area of your skin from the sun.<sup>[20]</sup> So, many doctors now don't recommend treating actinic keratoses, apart from keeping them out of the sun.

If you think you have an actinic keratosis, you should talk to your doctor. If you know you have an actinic keratosis, you should **check your skin regularly**. If one of your keratoses becomes thicker or is sore when you touch it, see your doctor.<sup>[17]</sup>

### Having had skin cancer before

You're much more likely to get any kind of new skin cancer if you've had skin cancer in the past five years.<sup>[14]</sup> So it's especially important to:

- Protect your skin from the sun (to find out more, see [Staying safe in the sun](#) )
- Have any new or changed patches or spots checked by your GP.

### Less common risk factors

#### Having an organ transplant

If you've had an organ transplant, you have a higher risk of getting squamous cell skin cancer. This is because you have to take medicines called **immunosuppressants** to stop your body rejecting your new organ. Taking these medicines makes it harder for your body to fight off infections and tumours.<sup>[17]</sup>

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## Handling certain chemicals and materials

Some chemicals and materials can trigger squamous cell skin cancer. If you have to handle these in your job, you may be more likely to get this cancer. But skin cancers from chemicals are becoming less common. This is because working conditions have improved and workers use safety measures to protect their skin more than they used to.

The chemicals and materials that have been linked to squamous cell skin cancer include:  
[\[21\]](#)

- Arsenic
- Soot
- Tar
- Metal ore
- Insecticides.

## Having a scar or other injury

You're more likely to get squamous cell skin cancer in parts of your skin that have been irritated in some way. For example, it may start in an old wound that you got from a skin ulcer or in a scar that you got from a vaccination or burn.

## Having x-rays or working with x-rays

X-rays are a type of radiation. They were used in the 1940s and 1950s to treat skin conditions such as acne. If you had this treatment, you're at higher risk of getting squamous cell skin cancer.

Doctors don't use this kind of treatment anymore. But if you regularly work with x-rays, you may be at a higher risk of getting this cancer. [\[16\]](#)

## Xeroderma pigmentosum

If you have xeroderma pigmentosum, you're more likely to get squamous cell skin cancer. This is because if you have this condition, your cells can't fix the damage caused by the sun. So you're more likely to get skin cancer at an early age.

Xeroderma pigmentosum is something you're born with. It's passed to you in the genes you inherit from your parents. [\[22\]](#)

## What stage is my cancer?

Doctors usually use a system called the TNM system to say how advanced your cancer is. Your cancer is given a code in the form of letters and numbers. [\[24\]](#)

## Skin cancer (squamous cell)

This system is more useful for other types of cancer than for squamous cell skin cancer. That's because most squamous cell skin cancers are small (less than 2 centimetres, or 7/8 of an inch, across) and haven't spread. But we talk about it here in case you want to know about it.

In the TNM system: <sup>[13]</sup> <sup>[25]</sup>

- **T** is for **tumour**
- **N** is for lymph **nodes**
- **M** is for **metastasis** (this is when the cancer has spread to another part of your body).

Each letter is also given a number:

- For **T**: the number tells you how big the skin cancer is
- For **N**: the number tells whether the cancer has spread to nearby lymph nodes
- For **M**: the number tells whether the cancer has spread to other parts of your body.

In general, lower numbers mean your squamous cell skin cancer is less serious.

TNM		What it means
T (tumour)	T0	You don't have any signs of a tumour
	Tis	Your tumour has some of the changes that make it cancer, but it hasn't yet turned into the kind that spreads (this is also called squamous cell carcinoma in situ)
	T1	Your tumour is 2 centimetres (7/8 of an inch) or less across
	T2	Your tumour is more than 2 centimetres (7/8 of an inch) across, but not more than 5 centimetres (2 inches) across
	T3	Your tumour is more than 5 centimetres (2 inches) across
	T4	Your tumour has spread to nearby cartilage, muscle or bone
N (nodes)	N0	Your cancer hasn't spread to lymph nodes in the area
	N1	Your cancer has spread to lymph nodes in the area
M (metastasis)	M0	Your cancer hasn't spread to other parts of your body

## Skin cancer (squamous cell)

	M1	Your cancer has spread to other parts of your body
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You can use this table to match up the TNM numbers to the stage of your squamous cell skin cancer.

Cancer stage	TNM		
	0	Tis	N0
1	T1	N0	M0
2	T2 or T3	N0	M0
3	T4	N0	M0
	Any T	N1	M0
4	Any T	Any N	M1

### What are the symptoms of squamous cell skin cancer?

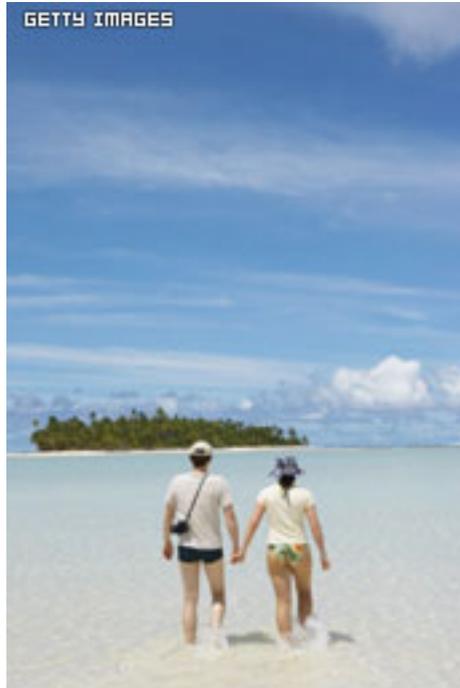
The main symptom of squamous cell skin cancer is a red, brown or pink crusted lump on your skin that looks different from the skin around it. This lump may not heal.

If you have squamous cell skin cancer, you may have some of the following symptoms. Squamous cell skin cancer may appear as a patch of skin that: [\[12\]](#) [\[14\]](#) [\[16\]](#)

- Is a different colour from the skin around it (the patch may look reddish, brown or pink)
- May flake, hurt, or bleed
- May have crusting, especially on the edges of the patch
- May have raised or sunken areas.

Squamous cell skin cancers can vary in size from just a few millimetres (slightly more than 1/16 of an inch) across, to 5 centimetres (2 inches) across. They can appear anywhere on your skin. But they usually appear on the parts of your body that get the most sun. They're most likely to be found on your: [\[17\]](#)

## Skin cancer (squamous cell)



Squamous cell skin cancer appears on the parts of your body that get the most sun.

- Head
- Neck
- Forearms
- Lower legs
- Upper body (in men)
- Bottom lip
- Tops of your ears.

If you're a woman, your legs, face and lower arms probably get the most sun. But if you're a man who works outside without wearing a shirt, your face, arms, and upper body probably get the most sun. So be sure to check the skin in these areas especially carefully.

[16]

### Different types of squamous cell skin cancer

There are many different types of squamous cell skin cancer.

- One type of squamous cell skin cancer is **Bowen's disease**. This type of skin cancer doesn't spread below the top layer of your skin. [16] This cancer may look like **eczema**

## Skin cancer (squamous cell)

or [psoriasis](#) . Where you get Bowen's disease seems to depend on your sex. If you're a woman, you're more likely to get it on your legs. If you're a man, you're more likely to get it on your ears or your scalp. <sup>[26]</sup>

- There is another type of squamous cell skin cancer that looks like a [wart](#) . This is called a **verrucous carcinoma**. This cancer is rare. But if it isn't treated, it can destroy the parts of your skin and your bone that are near it. This cancer usually doesn't spread to other parts of your body. <sup>[26]</sup> It tends to appear in your mouth, on the soles of your feet or in your genitals and in your [anus](#) . But it can show up anywhere on your skin.
- If you're a man, you can get a type of squamous cell skin cancer under the foreskin of your penis if you haven't been circumcised. Doctors call this **erythroplasia of Queyrat**. It is very rare. It appears as patches on your skin, which may bleed and crust or is flaky and itchy. You may get one patch or many patches. If this cancer isn't treated it can turn into cancer of the penis. You're more likely to get this type of cancer if you've had infections on your penis, such as [genital warts](#) . <sup>[26]</sup>

If you're worried about any unusual spots or patches on your skin, see your doctor.

### How do doctors diagnose squamous cell skin cancer?

If you're worried about a spot, lump, flaky patch, or blemish on your skin, you should see your doctor.

It can be hard to diagnose squamous cell skin cancer just by looking at it. Sometimes it's difficult to tell the difference between this type of skin cancer and another type of damage caused by the sun (called an [actinic keratosis](#) ).

If your GP thinks you may have squamous cell skin cancer, they should refer you to a doctor with specialist training in diagnosing skin cancer. <sup>[30]</sup> This will probably be a dermatologist.

You may need a simple operation to remove some cells from your skin. The cells will be checked under a microscope for signs of cancer. This operation is called a **biopsy**.

You should get an appointment within two weeks if: <sup>[31]</sup>

- You have a scaly or crusty blemish bigger than 1 centimetre (about half an inch) that won't heal
- You are taking drugs to suppress your [immune system](#) and have symptoms that suggest you could have squamous cell skin cancer
- You've had an organ transplant and have a new or growing skin blemish.

## Skin cancer (squamous cell)

You'll also get an early hospital appointment if your GP has already done a biopsy and diagnosed squamous cell skin cancer.

### What happens during a biopsy?

During a biopsy, your doctor removes part or all of the spot on your skin. Before the biopsy your doctor will probably give you an injection to numb the area around the spot so you won't feel any pain.

During the biopsy your doctor may:

- Remove part of your spot and send it to a laboratory to check for cancer
- Remove all of your spot and send it to a laboratory to check for cancer.

Your doctor will probably want to remove all of your spot. This is because there may be just a few cancer cells in one part of your spot. So if your doctor takes out just a part of it, these cells could be missed.

But if your spot is very big or is on your face, your doctor probably won't remove all of it until they know for certain that it's cancer. This is so you don't get a big scar if you don't need to. <sup>[32]</sup>

You will have to go back to your doctor to find out the results of your biopsy. This may be your GP or the dermatologist at the hospital where you had the biopsy.

Your doctor will tell you one of three things. <sup>[33]</sup>

- Your skin sample didn't contain any cancer cells.
- Your skin sample had some cancer cells in it, but they were all removed during your biopsy. You won't need to have any more surgery. (When the laboratory technician checks a skin sample, they look at how much healthy tissue there is around it. Healthy tissue contains no cancer cells. If there is enough healthy tissue removed, it means that all the cancer cells have been removed. If there were any cancer cells left behind they could spread to other parts of the body.)
- Your skin sample had some cancer cells in it, and some others may have spread. You will need to have surgery to remove all the cancer. You will also have some more tests to see whether your cancer has spread.

Your doctor may talk about the stage of your squamous cell skin cancer. All cancers are classified according to how serious they are. This helps doctors decide what treatment is needed. To learn more, see [What stage is my cancer?](#)

## Skin cancer (squamous cell)

### Checking the rest of your body

Your doctor may do tests to see whether your cancer has spread to other parts of your body, especially if the spot on your skin is large. (If your cancer has spread, your doctor may say that it has **metastasised**.)

Your doctor might: <sup>[32]</sup>

- Feel your abdomen
- Listen to your lungs
- Take an **x-ray** of your chest
- Do a blood test
- Check the levels of chemicals in your blood (levels of some chemicals in your blood go up if your cancer has spread).

But most people don't need these tests.

### How common is squamous cell skin cancer?

**Squamous cell skin cancer is becoming more common.**

About 60,000 people in England and Wales are diagnosed with skin cancer each year. <sup>[27]</sup> But, because many skin cancers are not registered, the number of people who actually get skin cancer each year could be about 125,000. <sup>[27]</sup>

About 1 in 5 skin cancers are squamous cell skin cancer. <sup>[28]</sup> This means that between 12,000 people and 25,000 people are diagnosed with this type of skin cancer every year in England and Wales. The older you are, the more likely you are to get it. <sup>[27]</sup>

Squamous cell skin cancer is becoming more common. Doctors think this is because people are spending more time in the sun than they used to, perhaps because they have more holidays. <sup>[16]</sup>

### What treatments work for squamous cell skin cancer?

Squamous cell skin cancer often starts as a crusted lump on your skin. You can get it anywhere, but most people get it on parts of their body that have been in the sun a lot.

Squamous cell skin cancer isn't the most serious type of skin cancer (that's [melanoma](#)), but it can spread if it isn't treated.

## Skin cancer (squamous cell)

### Key points about preventing and treating squamous cell skin cancer

- You can protect yourself and your family from squamous cell skin cancer by getting less sun. To find out more, see [Staying safe in the sun](#) .
- Daily use of a sunscreen with a sun protection factor (SPF) of at least 15 reduces your chance of getting sun damaged skin and of getting squamous cell skin cancer.
- If you have squamous cell skin cancer, you'll need surgery to remove it.
- For most people, surgery is the only treatment they'll need.
- Your doctor may recommend having radiotherapy after surgery to make sure any cancer cells that were left behind are killed.

Which treatments work best? We've looked at the best research and given a rating for each treatment according to how well it works. We've divided this information into two parts.

- [Treatments to prevent squamous cell skin cancer](#)
- [Treatments for squamous cell skin cancer](#)

For help in deciding which treatment is best for you, see How to use research to support your treatment decisions.

### Treatment Group 1

#### Treatments to prevent squamous cell skin cancer

##### Treatments that are likely to work

- [Sunscreens](#) : These are lotions, creams, gels or sprays that protect your skin from sunlight. [More...](#)

### Treatment Group 2

#### Treatments for squamous cell skin cancer

##### Usual treatment

- [Surgery for squamous cell skin cancer](#) : Most people with this type of skin cancer have surgery. This has been the standard treatment for such a long time that not much new research has been done on it. So we haven't been able to weigh up the evidence for surgery in the way we have for other treatments. [More...](#)

## Skin cancer (squamous cell)

### Treatments that need further study

- [Mohs micrographic surgery](#) : This type of surgery removes as little of your healthy skin as possible while trying to get rid of all the cancer cells. [More...](#)
- [Radiotherapy after surgery](#) : In this treatment, radiation is used to kill any cancer cells that the surgery may have left behind. [More...](#)

### What will happen to me?

No one can say for certain what will happen to you if you have squamous cell skin cancer. What happens depends on many things. <sup>[26]</sup>

What we do know is that **most people are cured completely after surgery**. But, in about 1 in 100 or 2 in 100 people, the cancer spreads to other parts of their body. <sup>[16]</sup>  
<sup>[29]</sup> If this happens, the cancer is harder to cure.

Doctors usually use a system called the TNM system to say how advanced your cancer is. To find out more, see [What stage is my skin cancer?](#)

We also know that certain squamous cell skin cancers are more serious than others. <sup>[16]</sup>

- As with all cancers, the earlier your skin cancer is diagnosed and treated, the better your chance of a cure.
- If your cancer is larger, it will be harder to treat. A tumour that is more than about 2 centimetres (7/8 of an inch) across is three times more likely to spread to other parts of your body.
- If your tumour is thicker (that is, it goes deeper into your skin), it's more likely to spread. In one study, no tumours spread if they were 2 millimetres (just over 1/16 of an inch) or less in thickness. Around 4 in 100 tumours spread if they were between 2 millimetres and 6 millimetres (between about 1/16 of an inch and 1/4 of an inch) in thickness. And 16 in 100 tumours spread if they were more than 6 millimetres (around 1/4 inch) thick.
- If your cancer is on your lip or ear, it's more likely to spread than if it's on another part of your body.
- If your cancer appears on injured or scarred skin, it's more likely to spread than if it appears on healthy skin.

Studies in the US show that if you're black, squamous cell skin cancer may be more serious. In black people it is often diagnosed later, making it harder to treat. <sup>[17]</sup> We don't know whether this is also the case in the UK.

### Questions to ask your doctor

If you're worried about a crusted lump or a flaky spot or patch on your skin, or if you've been told you have squamous cell skin cancer, you may want to talk to your doctor to find out more.

Here are some questions you might want to ask.

- Do I have cancer or is the spot or patch on my skin harmless?
- How can you tell what it is?
- Will I need surgery to check whether it's cancer, and will I need to have all of it removed?
- Will I need any other tests?
- If so, what kinds of tests will I need?
- What stage is my cancer?
- Which treatment is best for me?
- Will the treatment leave a scar or have other side effects?
- What do you think is likely to happen to me?
- Are people in my family at higher risk of getting this type of cancer?
- Will my cancer come back?
- What can I do to protect myself from this cancer?

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## Treatments:

### Sunscreens for preventing squamous cell skin cancer

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on sunscreens for preventing squamous cell skin cancer?](#)

This information is about preventing squamous cell skin cancer. It tells you about sunscreens, a treatment used for preventing this cancer. It is based on the best and most up-to-date research.

## Skin cancer (squamous cell)

### Do they work?

Yes. If you always use sunscreen when you go out in the sun, you can cut your chances of getting squamous cell skin cancer. You are also less likely to get another type of skin damage called [actinic keratosis](#).

### What are they?

Sunscreens are lotions, creams, gels or sprays that you put on your skin. They protect your skin from ultraviolet (UV) light, the part of sunlight that has the biggest role in causing skin cancer.

Two main types of UV light affect the skin: UV-A and UV-B. Both of these can damage your skin and cause cancer. <sup>[32]</sup>

You can buy all kinds of sunscreens. Sunscreens have lots of different ingredients, including moisturisers and perfumes. <sup>[2]</sup> A sunscreen usually starts with what is called a base or carrier cream. The **active ingredients** are added to this cream. <sup>[35]</sup> To find out how well your brand protects you, see [What's in your sunscreen?](#)

Sunscreens also have a number that tells you how much protection they provide. This number is called the **SPF**, which stands for sun protection factor. You should always use a sunscreen with an SPF of at least 15. To learn more, see [What's SPF?](#)

Using sunscreen helps, but it isn't the only thing you should do when you're out in the sun. You should also wear sunglasses and cover your skin as much as possible with hats, long-sleeved tops, and long trousers, skirts, or dresses. To learn more, see [Staying safe in the sun](#).

### How can they help?

Using a sunscreen whenever you spend time in the sun can help you in two ways.

- **Your skin is less likely to get damaged by the sun.** Two studies found that people who used sunscreens every day had fewer areas of damaged skin (called actinic keratoses) than those who didn't use sunscreens. <sup>[35]</sup> <sup>[36]</sup>
- **You are less likely to get skin cancer.** One study showed that people who used sunscreens every day were less likely to develop squamous cell skin cancer after four years. <sup>[37]</sup> When the people were checked again eight years later, they were still less likely to have skin cancer. <sup>[38]</sup>

### How do they work?

The UV part of sunlight is the part that doctors think damages your skin and leads to skin cancer. Sunscreens protect your skin from UV light in two main ways. <sup>[1]</sup>

## Skin cancer (squamous cell)

- They soak up certain types of UV light before they can damage your skin (often the sunscreen ingredients will soak up UV-A or UV-B, but not both).
- They reflect UV light away from your skin.

### Can they be harmful?

In studies, up to 1 in 7 people said that sunscreens irritated their skin. <sup>[39]</sup> <sup>[40]</sup>

- Some said their sunscreen gave them a rash or made their skin feel greasy.
- Others said that if they started sweating, the sunscreen made their eyes sting.
- The problems went away when they switched to another sunscreen, even if it had the same SPF.

One study found that people who used sunscreens that had a high SPF stayed in the sun longer than those who used a sunscreen with a lower SPF. <sup>[41]</sup> Sunbathing for longer times may increase your odds of getting skin cancer, even if you're using sunscreen. <sup>[41]</sup>

### How good is the research on sunscreens for preventing squamous cell skin cancer?

There's good evidence that sunscreens help protect against squamous cell skin cancer. We found three good-quality studies that show that sunscreens probably help prevent this type of cancer. <sup>[35]</sup> <sup>[38]</sup> <sup>[39]</sup>

A fourth study found that people who used a sunscreen with a high sun protection factor (SPF) spent longer in the sun than those who used a sunscreen with less protection. <sup>[41]</sup> You should try not to spend too long in the sun even if you are wearing sunscreen.

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## Surgery for squamous cell skin cancer

In this section

[Does it work?](#)

[Your operation](#)

[How can it help?](#)

[How does it work](#)

[Can it be harmful](#)

This information is for people who have squamous cell skin cancer. It tells you about surgery, a treatment used for this cancer.

### Does it work?

Yes. If you have squamous cell skin cancer, you'll need surgery to remove it. This has been the standard treatment for many years. It helps stop the cancer spreading and increases your chance of being cured.

## Skin cancer (squamous cell)

### Your operation

During the operation, your doctor will cut away your skin cancer and some of the tissue around it to try to remove all of the cancer cells. You won't usually have to stay in hospital to have your skin cancer removed. The operation might be done at your local hospital, or by a specialist at your local clinic. <sup>[42]</sup>

- Before your operation, you'll get an injection to numb the area near your skin cancer so you won't feel anything (a local **anaesthetic** ).
- Your doctor will cut out the tumour together with some of your healthy-looking skin around it. This is called **taking a margin**. Your doctor takes away some of your tissue from around the cancer to make sure all the cancer cells are gone. <sup>[43]</sup>

One of the biggest questions doctors face is: how much healthy tissue should be removed? Unfortunately, there hasn't been much research to answer this question. Doctors usually take out between 4 millimetres and 10 millimetres (between 1/6 of an inch and 1/2 of an inch) of healthy tissue from around the cancer.

Some doctors may advise you to have a special type of surgery called **Mohs surgery** (also called Mohs micrographic surgery). This operation takes longer but removes less tissue.

- During the operation, your doctor carefully takes out thin layers of tissue one by one, until the tumour is gone. Each layer is checked under a microscope to make sure there aren't any cancer cells left.
- The idea is that your doctor will remove as little healthy tissue as possible but will still get all of the cancer.

To learn more, see [Mohs micrographic surgery](#) .

### Closing your wound

After the operation, your doctor will close your wound with stitches, if needed. This step is usually very simple, and you'll be left with just a small scar after your stitches are gone.

If your cancer is large:

- You may need to have it removed by a more specialised doctor, such as a plastic surgeon
- Your wound may be closed in a different way; your surgeon may need to pull a flap of nearby skin over your wound.

Occasionally, surgeons have to use a **skin graft**. When you have a skin graft, skin is taken from another part of your body and stitched over your wound. You'll probably have

## Skin cancer (squamous cell)

a bigger scar if you have a skin graft. And you'll also have a scar in the place where the graft came from.

Your wound will probably heal in about two weeks.

### Taking out your stitches

Stitches are left in for different lengths of time in different parts of your body.

- If you have stitches on your face, especially around your eyes, they may be taken out after five to seven days.
- If they are on your upper back (where the skin is tight) or lower leg (where wounds take longer to heal), the stitches may be left in place for two or more weeks.

### How can it help?

Surgery aims to get rid of your cancer and improve your chance of being cured. There isn't much recent research that compares people who've had this operation with people who haven't. That's because doctors have known for a long time that this operation helps.

Some research has looked at how much healthy skin should be removed with the cancer. One study found that taking away 4 millimetres of healthy tissue was enough to treat 95 percent of cancers less than 2 centimetres wide. It also found that taking out 6 millimetres of healthy tissue was enough to treat more than 95 percent of cancers wider than 2 centimetres.<sup>[44]</sup> But there were problems with this study, so more research is needed.

### How does it work

Without surgery, your skin cancer would continue to grow, and cancer cells could break off and spread to other parts of your body. Having the cancer removed helps prevent this from happening.

### Can it be harmful

This surgery isn't likely to cause side effects, although you could get an allergic reaction to the anaesthetic, an infection in the cut, or bleeding. You might also have some pain after surgery, but this can be helped with paracetamol or another painkiller recommended by your doctor.

### Scars after surgery

The type of scar you have depends on where the surgery was, and how easy it was for your doctor to close your wound.

- If the skin across your wound is tight, you'll probably have a more noticeable scar. Also, some parts of your body are more likely to get scars than others. For example, you're more likely to have a thicker, wider scar if you have surgery on your chest.

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- If you get a thick scar, you can try massaging it gently but firmly against the bone or other firm tissue beneath it four or five times a day. You should do this for about three to four minutes each time. This may help to make your scar less thick.
- Your scar may itch slightly, especially in the first few months. But this should go away after a while.
- Your scar will probably be red for three to six months.
- Your scar should fade to the colour of the skin around it, or will become slightly paler, by about a year after surgery.

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## Mohs micrographic surgery

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on Mohs micrographic surgery?](#)

This information is for people who have squamous cell skin cancer. It tells you about Mohs micrographic surgery, a treatment used for this cancer.

### Does it work?

We're not certain whether this type of surgery is any better than the usual surgery for squamous cell skin cancer. But experts think that it might be the best option for some tumours. We'll need to see the results from more research before we'll know for certain.

To find out more, see [Surgery for squamous cell skin cancer](#) .

### What is it?

Mohs micrographic surgery (called Mohs surgery for short) is an operation for skin cancer.

It takes longer than the usual type of surgery for skin cancer and it removes less tissue.

- Mohs surgery is usually used on tumours that grow quickly or that have come back after surgery. It may also be used on large tumours that appear on delicate areas of your skin, such as your face.
- During the operation, your doctor carefully takes out thin layers of skin one by one, until the whole tumour and all of the cancer cells are gone. Each layer is checked under a microscope to make sure there aren't any cancer cells left behind. <sup>[18]</sup> <sup>[45]</sup>
- If you have Mohs surgery, your doctor will give you an injection to numb the area around the cancer. After the surgery, you'll probably go home the same day.

## Skin cancer (squamous cell)

- The advantage of Mohs surgery is that very little of your tissue that doesn't have cancer is taken out. Usually all of the cancer is taken out. The downside is that Mohs surgery takes longer.

### How can it help?

There's haven't been any good-quality studies (called [randomised controlled trials](#) ) that compared having Mohs surgery with having the usual surgery for squamous cell skin cancer. So we can't say for certain whether it's better or not. We need to see the results from more research before we'll be able to say for certain.

### How does it work?

During Mohs surgery, your doctor carefully removes thin layers of your skin one by one until the tumour and all the cancer cells are gone. Your doctor checks each layer under a microscope to make certain that all of the cancer is removed. This is a much more detailed way of making sure that all of the cancer cells are removed. <sup>[45]</sup>

### Can it be harmful?

All surgery has risks. The main problems that can happen are bleeding, infection, and scarring. <sup>[45]</sup>

Also, as with all types of surgery used to treat squamous cell skin cancer, some of your healthy tissue may be damaged. Sometimes nerves are damaged, especially on delicate areas such as your eyelids and lips, so these areas may not work properly or feel the way they used to.

Even so, Mohs surgery will probably cause less damage than other types of surgery. <sup>[46]</sup>

### How good is the research on Mohs micrographic surgery?

There's been little research on Mohs micrographic surgery.

There's haven't been any good-quality studies (called [randomised controlled trials](#) ) that compared having this operation with having other treatments for squamous cell skin cancer.

The only research we found was a summary that looked at lots of different treatments for squamous cell skin cancer since 1940. <sup>[47]</sup> We need more research on this technique before we can say whether it's better or worse than the usual operation.

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## Radiotherapy after surgery

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

# Skin cancer (squamous cell)

[Can it be harmful?](#)

[How good is the research on radiotherapy after surgery?](#)

This information is for people who have squamous cell skin cancer. It tells you about radiotherapy after surgery, a treatment used for squamous cell skin cancer.

## Does it work?

We're not certain. There hasn't been enough research on having radiotherapy after surgery. But it might help some people.

## What is it?

Radiotherapy is a treatment that uses high-energy **x-rays** to kill cancer cells.

Radiotherapy is usually used for tumours that are hard to treat with surgery alone.<sup>[18]</sup> For example, your cancer may grow into nearby tissue along your nerves. If this happens, your doctor may not be able to remove all of the cancer with surgery without damaging a lot of your healthy tissue.

First you'll have [surgery](#) to remove as much of the cancer as possible. Then you'll have radiotherapy to kill any cancer cells that may be left in your skin.

You'll probably have radiotherapy a few times every week. You'll have the treatment over a few weeks.

Each session usually takes about 30 minutes. You won't feel anything during this treatment, but you may get some side effects.

## How can it help?

We're not sure how having radiotherapy after surgery can help. There hasn't been much research that has looked at having this treatment for squamous cell skin cancer.

Some studies have suggested that having radiotherapy can reduce the chance of the cancer coming back for people whose cancer can't be totally removed by surgery.<sup>[48]</sup>

<sup>[49]</sup> But we can't be certain of this.

## How does it work?

Radiotherapy reaches deep into your skin to kill cells that are growing and multiplying rapidly. Because cancer cells grow and multiply much faster than most of your body's healthy cells, the radiation is more likely to kill cancer cells than healthy cells. Radiation is used to kill any cancer cells that were left behind after surgery.

But some healthy cells also multiply rapidly. And these may also be killed.

## Can it be harmful?

Having radiotherapy for squamous cell skin cancer doesn't hurt. But you may have some side effects. There are two types of side effects of radiotherapy.

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- Those that happen soon after your treatment (called acute or short-term side effects)
- Those that happen a long time after your treatment is over (called long-term side effects).

Side effects that can happen soon after you have radiotherapy include: <sup>[50]</sup>

- Dry skin
- Red skin
- A skin rash
- Broken skin
- Blisters.

Side effects that you may get later are: <sup>[50]</sup>

- Your skin may change colour
- Your skin may get thinner
- You may get sores
- Your skin may become flaky.

Also, the part of your skin that was treated may not be able to sweat.

### **How good is the research on radiotherapy after surgery?**

There hasn't been much research to say whether having radiotherapy after surgery is better than having surgery on its own. We didn't find any good-quality studies (called randomised controlled trials), which are the fairest test of whether or not a treatment works.

We did find some less good-quality studies. These studies suggested that having radiotherapy after surgery can reduce the chances of cancer coming back in some people.

<sup>[48]</sup> <sup>[49]</sup> <sup>[51]</sup> <sup>[52]</sup> But we need more research to know for certain.

### Further informations:

#### Staying safe in the sun

It is important to use sunscreen to protect your skin when you're out in the sun. But it's not the most important thing. There are lots of other things you should also do to protect yourself and your family when you're outdoors. <sup>[1]</sup> <sup>[2]</sup> <sup>[3]</sup>

- Stay out of the sun when it's at its hottest. This could be as long as between 10 a.m. and 4 p.m. if you are staying in a hot country.
- Wear a hat.
- Wear long-sleeved tops and trousers or a long skirt or dress.
- Wear sunglasses. These will help protect your eyes and the skin around them.
- Choose a sunscreen that protects against both ultraviolet A and ultraviolet B light.
- Make sure you never burn. Use a sunscreen that has a sun protection factor (or SPF) of at least 15. To learn more, see [What is SPF?](#)
- Spread the sunscreen evenly on all the skin that will be in the sun.
- Use enough sunscreen. To get the right amount, use the 'two-finger rule'. Squeeze out sunscreen along the length of your first two fingers. Use this much sunscreen on each of these parts of your body: your head, neck and face; each arm; upper back; lower back; chest; stomach; each upper leg (back and front); and each lower leg (back and front). <sup>[4]</sup>
- Put on sunscreen 15 minutes before you go out in the sun.
- Reapply your sunscreen regularly. Try to reapply at least every two hours, and more often if you've been swimming or sweating a lot. <sup>[5]</sup>
- Reapply sunscreen more often when you're out in the snow or in water. The sun's rays reflect off the surface of snow and water, which means you get more sun.
- Don't stay in the sun longer just because you're using sunscreen. You can still get burnt. If you use sunscreen to stay in the sun longer, you can actually increase your chances of getting a type of skin cancer called melanoma. <sup>[6]</sup>

## Skin cancer (squamous cell)

- Don't use sunbeds. The sun is not the only source of ultraviolet (UV) light (the part of sunlight that plays the biggest part in causing skin cancer). Sunlamps in sunbeds give off mostly ultraviolet A light. This may play a part in causing skin cancer. <sup>[7]</sup> <sup>[2]</sup>
- See your doctor if you notice any new blemishes or changes in a mole.

### Take extra care with children's skin

Children and teenagers are more likely to spend a long time in the sun, so it's important to take special care of their skin. If the sun damages your skin when you're a child, you're more likely to get skin cancer (especially melanoma) when you get older. <sup>[8]</sup> (To find out more, see [Melanoma](#) .)

Babies under 6 months old should stay out of the sun because their skin is thin and sensitive, and sunscreens may give them a rash.

### What is SPF?

SPF stands for **sun protection factor**. It is given as a number.

- The SPF number tells you how much protection from sunburn a sunscreen will give you.
- The higher the SPF number, the longer you can stay out in the sun before you get sunburnt.
- Everyone should always use a sunscreen with an SPF of 15 or more.

### Types of skin cancer

There are three main types of skin cancer. The main features of all three are described in the table below. <sup>[12]</sup> <sup>[13]</sup> <sup>[14]</sup> <sup>[7]</sup> <sup>[15]</sup>

	<b>Melanoma (skin cancer)</b>	<b>Squamous cell skin cancer</b>	<b>Basal cell skin cancer</b>
How common is it?	Least common type	Second most common type	Most common type
How serious is it?	Most serious	Somewhat serious	Least serious
How do you get it?	Linked to bad sunburn	Linked to spending time in the sun over many years	Linked to being in the sun
Will it spread?	Most likely to spread	Can spread, but it's not likely to	Almost never spreads

## Skin cancer (squamous cell)

How does it start?	Usually starts in a mole; the mole may bleed, change shape or colour, itch, spread or turn into a scab	Usually shows up as lumps, or red or brown flaky patches, on your face, arms, legs, body, ears or lips; can start on top of an old scar	Usually shows up as small lumps on your head, neck and hands
How long does it take?	Can develop quickly	Takes many years to develop, but grows faster than basal cell skin cancer	Takes many years to develop
Who is at risk?	Younger people are most likely to get it	Older people are most likely to get it	Older people are most likely to get it

### Your skin type

Doctors say people have different skin types. They can tell which skin type you have by using the table below. <sup>[23]</sup>

Here's what we know about how your skin type affects your chance of getting squamous cell skin cancer: <sup>[2]</sup>

- People who have skin type I, II or III are most likely to get this cancer
- People who have black skin are far less likely to get it.

Skin type	People who:	Examples
I	Always burn easily, never tan, have skin that is extremely sensitive to the sun	Red-headed people; people who have freckles; people of Irish, Welsh or Scottish descent
II	Always burn easily, tan a little, have skin that is very sensitive to the sun	Fair-skinned, light-haired or blue-eyed people
III	Sometimes burn, tan slowly to a light brown, have skin that is sensitive to the sun	Most white people have this type of skin
IV	Burn a little, always tan to a moderate brown colour, are a little sensitive to the sun	People of Mediterranean descent
V	Rarely burn, tan well, are not sensitive to the sun	People of Middle Eastern descent, some people of Mediterranean descent, some black people
VI	Never burn, have very dark skin, are not sensitive to the sun	Most black people

### What's in your sunscreen?

Sunscreens protect you against a kind of sunlight called **ultraviolet (UV) light**. Doctors think this is the part of sunlight that has the biggest role in causing skin cancer.

## Skin cancer (squamous cell)

There are two main types of UV light that affect the skin: UV-A and UV-B. Both of these can damage your skin and cause cancer. <sup>[32]</sup>

Some ingredients in sunscreens protect you against one type of UV light but not the other. Some ingredients protect against both. And some are specialised, giving protection against specific types of UV-A light (known as UV-A I and UV-A II).

Check the list below to find out whether your sunscreen protects you against UV-A I, UV-A II and UV-B light. <sup>[34]</sup> All of these types of light can cause skin cancer. <sup>[1]</sup>

Ingredient	Type(s) of UV light that it protects you against
Aminobenzoic acid (also called PABA)	UV-B
Avobenzene (often called Parsol 1789)	UV-A I
Cinoxate	UV-B
Dioxybenzone	UV-A II, UV-B
Homosalate	UV-B
Octocrylene	UV-B
Octisalate	UV-B
Oxybenzone	UV-A II, UV-B
Padimate O	UV-B
Sulisobenzene	UV-A II, UV-B
Titanium dioxide	All UV light
Trolamine salicylate	UV-B
Zinc oxide	All UV light

### Glossary:

#### infection

You get an infection when bacteria, a fungus, or a virus get into a part of your body where it shouldn't be. For example, an infection in your nose and airways causes the common cold. An infection in your skin can cause rashes such as athlete's foot. The organisms that cause infections are so tiny that you can't see them without a microscope.

#### gland

A gland is any group of cells in the body that makes and releases something for use by another part of the body. For example, the thyroid gland makes a hormone called thyroxine. This acts on receptors within cells. By acting on the receptors it gives the cells a message to speed up their metabolism and work harder.

#### immunosuppressants

Immunosuppressants are medicines that reduce your body's natural immune response. You're given these medicines if you've had an organ transplant, so your immune system doesn't react to your new organ and attack it. But immunosuppressants can also put you at risk of some types of cancer, such as squamous cell skin cancer.

#### ulcer

An ulcer is an open sore. Ulcers can happen in many parts of your body, such as in your stomach, and the skin of your legs, mouth, or genitals.

#### vaccination

A vaccination is an injection a doctor can give you to protect you from getting an infectious illness (an illness that spreads between people).

#### X-ray

# Skin cancer (squamous cell)

X-rays are pictures taken of the inside of your body. They are made by passing small amounts of radiation through your body and then onto film.

## genes

Your genes are the parts of your cells that contain instructions for how your body works. Genes are found on chromosomes, structures that sit in the nucleus at the middle of each of your cells. You have 23 pairs of chromosomes in your normal cells, each of which has thousands of genes. You get one set of chromosomes, and all of the genes that are on them, from each of your parents.

## lymph nodes

Lymph nodes (also called lymph glands) are small, bean-shaped lumps that you can't usually see or feel easily. You have them in various parts of your body, such as your neck, armpits, and groin. Lymph nodes filter lymph and remove unwanted things from your body, such as bacteria and cancer cells.

## eczema

Eczema is a very itchy rash. It may be dark and bumpy and release fluid. Scratching makes it worse. You can get eczema anywhere on your body, but it is most common on the wrists, the insides of the elbows and the backs of the knees. If you have asthma or allergies you are more likely to get eczema than someone who doesn't have these conditions.

## psoriasis

Psoriasis is a skin condition. If you have it, patches of your skin are covered by a dry, red rash that has grey or silvery flakes. You usually get psoriasis on your elbows, knees, scalp, nails, groin and lower back. If you have psoriasis, there will be times when you have symptoms and times when you don't.

## warts

Warts are small lumps that can grow on your skin. Warts are often caused by an infection with a kind of virus called a papillomavirus.

## anus

The anus, which is at the end of the rectum, is where stools leave your body when you go to the toilet. Part of the anus is a muscle that helps you hold in the stool until you are on the toilet.

## immune system

Your immune system is made up of the parts of your body that fight infection. When bacteria or viruses get into your body, it's your immune system that kills them. Antibodies and white blood cells are part of your immune system. They travel in your blood and attack bacteria, viruses and other things that could damage your body.

## metastasis

This happens when cancer cells spread to parts of the body that are far away from the original tumour. The cancer can travel through the bloodstream, lymphatic system or other fluids. New tumours may form in another area of the body as a result.

## active ingredient

An active ingredient is the substance in a medicine or supplement that causes changes to take place in your body.

## anaesthetic

An anaesthetic is a chemical that blocks the ability to feel sensations like pain or heat. A local anaesthetic blocks the feeling in a specific area of the body. For example, your dentist uses a local anaesthetic like lignocaine in your gums so that you don't feel the pain of having a cavity filled. A general anaesthetic makes you completely unconscious and is usually used only in a carefully controlled environment like an operating room.

## allergic reaction

You have an allergic reaction when your immune system overreacts to a substance that is normally harmless. You can be allergic to particles in the air you are breathing, like pollen (which causes hay fever) or to chemicals on your skin, like detergents (which can cause a rash). People can also have an allergic reaction to drugs, like penicillin.

## randomised controlled trials

Randomised controlled trials are medical studies designed to test whether a treatment works. Patients are split into groups. One group is given the treatment being tested (for example, an antidepressant drug) while another group (called the comparison or control group) is given an alternative treatment. This could be a different type of drug or a dummy treatment (a placebo). Researchers then compare the effects of the different treatments.

## Sources for the information on this leaflet:

1. Moloney FJ, Collins S, Murphy GM. Sunscreens: safety, efficacy and appropriate use. *American Journal of Clinical Dermatology*. 2002; 3: 185-191.
2. Glanz K, Saraiya M, Wechsler H, et al. Guidelines for school programs to prevent skin cancer. *Morbidity and Mortality Weekly Report*. 2002; 51: 1-18.
3. Cancer Research UK. SunSmart. Available at <http://www.sunsmart.org.uk> (accessed on 14 January 2014).

## Skin cancer (squamous cell)

4. Taylor S, Diffey B. Simple dosage guide for suncreams will help users. *BMJ*. 2002; 324: 1526.
5. Cancer Research UK. SunSmart. Available at <http://www.sunsmart.org.uk> (accessed on 14 January 2014).
6. Autier P, Dore JF, Negrier S, et al. Sunscreen use and duration of sun exposure: a double-blind, randomized trial. *Journal of the National Cancer Institute*. 1999; 91: 1304-1309.
7. Cancer Research UK. SunSmart. Available at <http://www.sunsmart.org.uk> (accessed on 14 January 2014).
8. Cancer Research UK. SunSmart. Available at <http://www.sunsmart.org.uk> (accessed on 14 January 2014).
9. Martini FH, Ober WC, Garrison CW, et al. *Fundamentals of anatomy and physiology*. 5th edition. Prentice Hall, New Jersey, NJ; 2001.
10. Martini FH. The integumentary system. In: Martini FH, Ober WC, Garrison CW, et al. *Fundamentals of anatomy and physiology*. 5th edition. Prentice Hall, New Jersey, U.S.A.; 2001.
11. MacPherson G, ed. *Black's medical dictionary*. 39th edition. Madison Books, Lanham, U.S.A.; 1999.
12. Marghoob AA. Basal and squamous cell carcinomas: what every primary care physician should know. *Postgraduate Medicine*. 1997; 102: 139-142, 146, 152-154.
13. Lapka DV. Skin cancer. *RN*. 2000; 63: 32-40.
14. Jerant AF, Johnson JT, Sheridan CD, et al. Early detection and treatment of skin cancer. *American Family Physician*. 2000; 62: 357-368.
15. FamilyDoctor.org. Skin cancer. May 2014. Available at <http://familydoctor.org/familydoctor/en/diseases-conditions/skin-cancer.html> (accessed on 20 October 2014).
16. Alam M, Ratner D. Cutaneous squamous-cell carcinoma. *New England Journal of Medicine*. 2001; 344: 975-83.
17. Marks R. Squamous cell carcinoma. *Lancet*. 1996; 347: 735-738.
18. Brash DE, Bale AE. Cancer of the skin. In: DeVita VT Jr, Hellman S, Rosenberg SA (editors). *Cancer: principles and practice of oncology*. 6th edition. Lippincott Williams and Wilkins, Philadelphia, U.S.A.; 2001.
19. Marks R, Rennie G, Selwood TS. Malignant transformation of solar keratoses to squamous cell carcinoma. *Lancet*. 1988; 1: 795-797.
20. Marks R, Foley P, Goodman G, et al. Spontaneous remission of solar keratoses: the case for conservative management. *British Journal of Dermatology*. 1986; 115: 649-655.
21. Hacker SM, Flowers FP. Squamous cell carcinoma of the skin: will heightened awareness of risk factors slow its increase? *Postgraduate Medicine*. 1993; 93: 115-121.
22. Bruce AJ, Brodland DG. Overview of skin cancer detection and prevention for the primary care physician. *Mayo Clinic Proceedings*. 2000; 75: 491-500.
23. American Academy of Dermatology. Sunscreen FAQs. Available at <http://www.aad.org/media-resources/stats-and-facts/prevention-and-care/sunscreens> (accessed on 14 January 2014).
24. International Union Against Cancer. Carcinoma of the skin. In: Sobin LH, Wittekind CH (editors). *TNM classification of malignant tumours*. 6th edition. Wiley, New York, U.S.A.; 2002.
25. The Australian Cancer Network. Clinical practice guide - basal cell carcinoma, squamous cell carcinoma (and related lesions) - a guide to clinical management in Australia. November 2008. Available at <http://www.cancer.org.au/health-professionals/clinical-guidelines/skin-cancer.html> (accessed on 14 January 2014).
26. Lohmann CM, Solomon AR. Clinicopathologic variants of cutaneous squamous cell carcinoma. *Advances in Anatomic Pathology*. 2001; 8: 27-36.

## Skin cancer (squamous cell)

27. National Institute for Health and Care Excellence. Improving outcomes for people with skin tumours including melanoma: the manual. February 2006. Available at [http://www.nice.org.uk/nicemedia/pdf/CSG\\_Skin\\_Manual.pdf](http://www.nice.org.uk/nicemedia/pdf/CSG_Skin_Manual.pdf) (accessed on 14 January 2014).
28. Cancer Research UK. Types of skin cancer. February 2013. Available at <http://cancerhelp.cancerresearchuk.org/type/skin-cancer/about/types-of-skin-cancer> (accessed on 14 January 2014).
29. Bovill ES, Cullen KW, Barrett W, et al. Clinical and histological findings in re-excision of incompletely excised cutaneous squamous cell carcinoma. *Journal of Plastic, Reconstructive & Aesthetic Surgery*. 2009; 62: 457-461.
30. National Institute for Health and Care Excellence. Improving outcomes for people with skin tumours including melanoma: the manual. February 2006. Available at [http://www.nice.org.uk/nicemedia/pdf/CSG\\_Skin\\_Manual.pdf](http://www.nice.org.uk/nicemedia/pdf/CSG_Skin_Manual.pdf) (accessed on 14 January 2014).
31. National Institute for Health and Care Excellence. Referral guidelines for suspected cancer. June 2005. Clinical guideline 27. Available at <http://www.nice.org.uk/cg27> (accessed on 20 October 2014).
32. Slominski A, Wortsman J, Carlson AJ, et al. Malignant melanoma. *Archives of Pathology and Laboratory Medicine*. 2001; 125: 1295-1306.
33. Cancer Research UK. Tests for skin cancer. September 2014. Available at <http://www.cancerhelp.org.uk/type/skin-cancer/diagnosis/tests-for-skin-cancer> (accessed on 20 October 2014).
34. Levy SB. Sunscreens and photoprotection. Available at <http://emedicine.medscape.com/article/1119992-overview> (accessed on 20 October 2014).
35. Thompson SC, Jolley D, Marks R. Reduction of solar keratoses by regular sunscreen use. *New England Journal of Medicine*. 1993; 329: 1147-1151.
36. Darlington S, Williams G, Neale R, et al. A randomized controlled trial to assess sunscreen application and beta carotene supplementation in the prevention of solar keratoses. *Archives of Dermatology*. 2003; 139: 451-455.
37. Green A, Williams G, Neale R, et al. Daily sunscreen application and betacarotene supplementation in prevention of basal-cell and squamous-cell carcinomas of the skin: a randomised controlled trial. *Lancet*. 1999; 354: 723-729.
38. Van Der Pols JC, Williams GM, Pandeya N, et al. Prolonged prevention of squamous cell carcinoma of the skin with regular sunscreen use. *Cancer Epidemiology, Biomarkers & Prevention*. 2006; 15: 2546-2548.
39. Green A, Williams G, Neale R, et al. Daily sunscreen application and betacarotene supplementation in prevention of basal-cell and squamous-cell carcinomas of the skin: a randomised controlled trial. *Lancet*. 1999; 354: 723-729.
40. Foley P, Nixon R, Marks R, et al. The frequency of reactions to sunscreens: results of a longitudinal population-based study on the regular use of sunscreens in Australia. *British Journal of Dermatology*. 1993; 128: 512-518.
41. Autier P, Dore JF, Negrier S, et al. Sunscreen use and duration of sun exposure: a double-blind, randomized trial. *Journal of the National Cancer Institute*. 1999; 91: 1304-1309.
42. National Institute for Health and Care Excellence. Improving outcomes for people with skin tumours including melanoma: the manual. February 2006. Available at [http://www.nice.org.uk/nicemedia/pdf/CSG\\_Skin\\_Manual.pdf](http://www.nice.org.uk/nicemedia/pdf/CSG_Skin_Manual.pdf) (accessed on 14 January 2014).
43. Costello D, Powers A, Lynn J, et al. Surgical management of primary melanoma. *Current Oncology Reports*. 2000; 2: 307-313.
44. Brodland DG, Zitelli JA. Surgical margins for excision of primary cutaneous squamous cell carcinoma. *Journal of the American Academy of Dermatology*. 1992; 27: 241-248.
45. Anthony ML. Surgical treatment of nonmelanoma skin cancer. *AORN Journal*. 2000; 71: 552-554.
46. Green A, McBride P. Squamous cell carcinoma of the skin: non-metastatic. May 2010. *Clinical Evidence*. (Based on October 2009 search.) Available at <http://clinicalevidence.bmj.com/ceweb/conditions/skd/1709/1709.jsp> (accessed on 14 January 2014).

## Skin cancer (squamous cell)

47. Rowe DE, Carroll RJ, Day CL Jr. Prognostic factors for local recurrence, metastasis, and survival rates in squamous cell carcinoma of the skin, ear, and lip: implications for treatment modality selection. *Journal of the American Academy of Dermatology*. 1992; 26: 976-990.
48. Shimm DS, Wilder RB. Radiation therapy for squamous cell carcinoma of the skin. *American Journal of Clinical Oncology*. 1991; 14: 383-386.
49. McCord MW, Mendenhall WM, Parsons JT, et al. Skin cancer of the head and neck with clinical perineural invasion. *International Journal of Radiation Oncology, Biology, Physics*. 2000; 47: 89-93.
50. The Australian Cancer Network. Clinical practice guide - basal cell carcinoma, squamous cell carcinoma (and related lesions) - a guide to clinical management in Australia. November 2008. Available at <http://www.cancer.org.au/health-professionals/clinical-guidelines/skin-cancer.html> (accessed on 14 January 2014).
51. Glass RL, Spratt JS Jr, Perezmesa C. The fate of inadequately excised epidermoid carcinoma of the skin. *Surgery, Gynecology and Obstetrics*. 1966; 22: 245-248.
52. Glass RL, Perez-Mesa CM. Management of inadequately excised epidermoid carcinoma. *Archives of Surgery*. 1974; 108: 50-51.

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