Skin Cancer: Basal and Squamous Cell

What is cancer?

The body is made up of trillions of living cells. Normal body cells grow, divide into new cells, and die in an orderly way. During the early years of a person’s life, normal cells divide faster to allow the person to grow. After the person becomes an adult, most cells divide only to replace worn-out or dying cells or to repair injuries.

Cancer begins when cells in a part of the body start to grow out of control. There are many kinds of cancer, but they all start because of out-of-control growth of abnormal cells.

Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells continue to grow and form new, abnormal cells. In most cases the cancer cells form a tumor. Cancer cells can also invade (grow into) other tissues, something that normal cells can’t do. Growing out of control and invading other tissues are what makes a cell a cancer cell.

Cells become cancer cells because of damage to DNA. DNA is in every cell and directs all its actions. In a normal cell, when DNA is damaged the cell either repairs the damage or the cell dies. In cancer cells, the damaged DNA is not repaired, but the cell doesn’t die like it should. Instead, this cell goes on making new cells that the body does not need. These new cells will all have the same damaged DNA as the first abnormal cell does.

People can inherit damaged DNA, but most often the DNA damage is caused by mistakes that happen while the normal cell is reproducing or by something in our environment. Sometimes the cause of the DNA damage is something obvious, like cigarette smoking or ultraviolet (UV) light exposure. But often no clear cause is found.

Cancer cells often travel to other parts of the body, where they begin to grow and form new tumors. This process is called metastasis. It happens when the cancer cells get into the bloodstream or lymph vessels of our body.
No matter where a cancer may spread, it is named (and treated) based on the place where it started. For example, prostate cancer that has spread to the bones is still prostate cancer, not bone cancer.

Different types of cancer can behave very differently. They grow at different rates and respond to different treatments. This is why people with cancer need treatment that is aimed at their particular kind of cancer.

Not all tumors are cancerous. Tumors that aren’t cancer are called benign. Benign tumors can cause problems – they can grow very large and press on healthy organs and tissues. But they can’t grow into (invade) other tissues. Because they can’t invade, they also can’t spread to other parts of the body (metastasize). These tumors are almost never life threatening.

**What are basal and squamous cell skin cancers?**

Here are some things you should know about the normal structure and function of the skin.

**Normal skin**

The skin is the largest organ in your body. It has many different functions, such as:

- Covering the internal organs and helping protect them from injury
- Serving as a barrier to germs such as bacteria
- Preventing the loss of too much water and other fluids
- Helping control body temperature
- Protecting the rest of the body from ultraviolet (UV) rays
- Helping the body make vitamin D

The skin has 3 layers: the epidermis, the dermis, and the subcutis (see picture).
Epidermis

This top layer of skin is very thin, averaging only about 1/100 of an inch thick. It protects the deeper layers of skin and the organs of the body from the environment.

The main types of cells in the epidermis include:

- **Squamous cells**: These are flat cells in the outer part of the epidermis that are constantly shed as new ones form.

- **Basal cells**: These cells are in the lower part of the epidermis, called the *basal cell layer*. These cells constantly divide to form new cells to replace the squamous cells that wear off the skin’s surface. As these cells move up in the epidermis, they get flatter, eventually becoming squamous cells.

- **Melanocytes**: These cells make the brown pigment called *melanin*, which gives the skin its tan or brown color. It protects the deeper layers of the skin from some of the harmful effects of the sun. For most people, when skin is exposed to the sun, melanocytes make more of the pigment, causing the skin to tan or darken.

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

This middle layer of the skin is much thicker than the epidermis. It contains hair follicles, sweat glands, blood vessels, and nerves that are held in place by a protein called collagen, which gives the skin its elasticity and strength.

Subcutis

The deepest layer of the skin (the subcutis) and the lowest part of the dermis form a network of collagen and fat cells. The subcutis helps the body conserve heat and has a shock-absorbing effect that helps protect the body’s organs from injury.

Types of skin cancer

Basal cell carcinoma

This is not only the most common type of skin cancer, but the most common type of cancer in humans. About 8 out of 10 skin cancers are basal cell carcinomas (also called basal cell cancers). When seen under a microscope, the cells in these cancers look like cells in the lowest layer of the epidermis, called the basal cell layer.

These cancers usually develop on sun-exposed areas, especially the head and neck. Basal cell carcinoma was once found almost entirely in middle-aged or older people. Now it is also being seen in younger people, probably because they are spending more time in the sun.

These cancers tend to grow slowly. It’s very rare for a basal cell cancer to spread to other parts of the body. But if a basal cell cancer is left untreated, it can grow into nearby areas and invade the bone or other tissues beneath the skin.

If not removed completely, basal cell carcinoma can recur (come back) in the same place on the skin. People who have had basal cell skin cancers are also more likely to get new ones in other places. As many as half of the people who are diagnosed with a basal cell cancer will develop a new skin cancer within 5 years.

Squamous cell carcinoma

About 2 out of 10 skin cancers are squamous cell carcinomas (also called squamous cell cancers). The cells in these cancers look like abnormal versions of the squamous cells seen in the outer layers of the skin.

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

Squamous cell cancers are more likely to grow into deeper layers of skin and spread to other parts of the body than basal cell cancers, although this is still uncommon.

**Keratoacanthomas** are dome-shaped tumors that are found on sun-exposed skin. They may start out growing quickly, but their growth usually slows down. Many keratoacanthomas shrink or even go away on their own over time without any treatment. But some continue to grow, and a few may even spread to other parts of the body. Their growth is often hard to predict, so many skin cancer experts consider them a type of squamous cell skin cancer and treat them as such.

**Melanoma**

These cancers develop from melanocytes, the pigment-making cells of the skin. Melanocytes can also form benign (non-cancerous) growths called moles. Melanomas are much less common than basal and squamous cell cancers, but they are more likely to grow and spread if left untreated. Melanoma and moles are discussed in *Melanoma Skin Cancer*.

**Less common types of skin cancer**

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

- **Merkel cell carcinoma**
- **Kaposi sarcoma**
- **Cutaneous (skin) lymphoma**
- Skin adnexal tumors (tumors that start in hair follicles or skin glands)
- Various types of **sarcomas**

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

**Pre-cancerous and pre-invasive skin conditions**

These conditions may develop into skin cancer or may be very early stages of skin cancer.
**Actinic keratosis (solar keratosis)**

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

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

In some cases, actinic keratoses may turn into squamous cell skin cancers. Most actinic keratoses do not become cancers, but it can be hard sometimes for doctors to tell them apart from true skin cancers, so doctors often recommend treating them. If they are not treated, you and your doctor should check them regularly for changes that might be signs of skin cancer.

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

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

Bowen disease appears as reddish patches. Compared with actinic keratoses, Bowen disease patches tend to be larger (sometimes over ½ inch across), redder, scaliyer, and sometimes crusted. Like actinic keratosis, Bowen disease usually does not cause any symptoms, although it might be itchy or sore.

Like most other skin cancers (and actinic keratoses), these patches most often appear in sun-exposed areas. Bowen disease can also occur in the skin of the anal and genital areas (where it is known as *erythroplasia of Queyrat*). This is often related to sexually transmitted infection with human papilloma viruses (HPVs), the viruses that can also cause genital warts.

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

**Benign skin tumors**

Most tumors of the skin are benign (not cancerous) and rarely if ever turn into cancers. There are many kinds of benign skin tumors, including:
• Most types of moles (see Melanoma Skin Cancer for more about moles)

• Seborrheic keratoses: tan, brown, or black raised spots with a waxy texture or occasionally a rough surface when they are on the legs (also known as stucco keratosis)

• Hemangiomas: benign blood vessel growths, often called strawberry spots

• Lipomas: soft tumors made up of fat cells

• Warts: rough-surfaced growths caused by some types of human papilloma virus (HPV)

What are the key statistics about basal and squamous cell skin cancers?

Cancers of the skin (most of which are basal and squamous cell skin cancers) are by far the most common of all types of cancer. According to one estimate, about 3.5 million basal and squamous cell skin cancers are diagnosed each year (occurring in about 2.2 million Americans, as some people have more than one). About 8 out of 10 of these are basal cell cancers. Squamous cell cancers occur less often.

The number of these cancers has been increasing for many years. This is probably from a combination of better skin cancer detection, people getting more sun exposure, and people living longer.

Death from these cancers is uncommon. It’s thought that about 2,000 people die each year from non-melanoma skin cancers, and that this rate has been dropping in recent years. Most people who die from these cancers are elderly and may not have seen a doctor until the cancer had already grown quite large. Other people more likely to die of these cancers are those whose immune system is suppressed, such as those who have had organ transplants.

The exact number of people who develop or die from basal and squamous cell skin cancers each year is not known for sure. Statistics of most other cancers are known because they are reported to and tracked by cancer registries, but basal and squamous cell skin cancers are not reported.

What are the risk factors for basal and squamous cell skin cancers?

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

But having a risk factor, or even many risk factors, does not mean that you will get the disease. And some people who get the disease may have few or no known risk factors.

The following are known risk factors for basal cell and squamous cell carcinomas. (These factors don’t necessarily apply to some other forms of skin cancer, such as Kaposi sarcoma and skin lymphoma.)

**Ultraviolet (UV) light exposure**

Exposure to ultraviolet (UV) rays is thought to be the major risk factor for most skin cancers. Sunlight is the main source of UV rays. Tanning beds are another source of UV rays.

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

To learn more about the effects of UV rays on the skin and what you can do to protect yourself and your loved ones, see *Skin Cancer Prevention and Early Detection*.

**Having light-colored skin**

Whites have a much higher risk of skin cancer than African Americans or Hispanics. This is because the skin pigment melanin has a protective effect in people with darker skin. Whites with fair (light-colored) skin that freckles or burns easily are at especially high risk. This is one of the reasons Australia, where many people descend from fair-skinned immigrants from the British Isles, has the highest rate of skin cancer in the world.

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

**Older age**

The risk of getting basal and squamous cell skin cancers rises as people get older. This is probably because of the buildup of sun exposure over time. These cancers are now being seen in younger people as well, probably because they are spending more time in the sun with their skin exposed.
Male gender

Men are about twice as likely as women to have basal cell cancers and about 3 times as likely to have squamous cell cancers of the skin. This is thought to be due mainly to getting more sun exposure.

Exposure to certain chemicals

Exposure to large amounts of arsenic increases the risk of developing skin cancer. Arsenic is an element found naturally in well water in some areas. It’s also used in making some pesticides and in some other industries.

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

Radiation exposure

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

Previous skin cancer

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

Long-term or severe skin inflammation or injury

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

Psoriasis treatment

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

Xeroderma pigmentosum (XP)

This very rare inherited condition reduces the ability of skin cells to repair DNA damage caused by sun exposure. People with this disorder often develop many skin cancers, starting in childhood.
**Basal cell nevus syndrome (also known as nevoid basal cell carcinoma syndrome or Gorlin syndrome)**

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

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

**Weakened immune system**

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

For example, people who get organ transplants are usually given medicines that weaken their immune system to help prevent their body from rejecting the new organ. This increases their risk of developing skin cancer. The rate of skin cancer in people who have had transplants can be as high as 70% within 20 years after the transplant. Skin cancers in people with weakened immune systems tend to grow faster and are more likely to be fatal.

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

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

**Human papilloma virus (HPV) infection**

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

**Smoking**

People who smoke are more likely to develop squamous cell skin cancer, especially on the lips. Smoking is not a known risk factor for basal cell cancer.
Do we know what causes basal and squamous cell skin cancers?

While many risk factors for basal and squamous cell skin cancers have been found, it’s not always clear exactly how these factors might cause cancer.

Most basal cell and squamous cell skin cancers are caused by repeated and unprotected skin exposure to ultraviolet (UV) rays from sunlight, as well as from man-made sources such as tanning beds.

UV rays can damage the DNA inside skin cells. DNA is the chemical in each of our cells that makes up our genes. Genes contain instructions for how our cells function. We usually look like our parents because they are the source of our DNA. But DNA affects more than just how we look.

Some genes help control when our cells grow, divide into new cells, and die. Certain 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 causing cells to die at the right time are called tumour suppressor genes. Cancers can be caused by DNA changes that turn on oncogenes or turn off tumour suppressor genes. Changes in several different genes are usually needed for a cell to become cancerous.

Sometimes the DNA damage inside skin cells affects certain genes that control how and when the cells grow and divide. Usually the cells can repair the damage, but in some cases this results in abnormal DNA, which may be the first step on the path to cancer.

Researchers don’t yet know all of the DNA changes that result in skin cancer, but they have found that in many skin cancers the cells have changes in tumour suppressor genes.

The gene most often altered in squamous cell cancers is called TP53. This tumour suppressor gene normally causes cells with damaged DNA to die. When TP53 is altered, these abnormal cells may live longer and perhaps go on to become cancerous.

A gene often mutated in basal cell cancers is the “patched” (PTCH) gene, which is part of the “hedgehog” signaling pathway inside cells. This pathway is vital in development before birth and is important in some adult cells. PTCH is a tumour suppressor gene that normally helps keep cell growth in check, so changes in this gene can allow cells to grow out of control. People who have basal cell nevus syndrome, which is often inherited from a parent and results in getting many basal cell cancers, have an altered PTCH gene in all the cells of their body.

These are not the only gene changes that play a role in the development of skin cancer. There are likely to be many others as well.

People with xeroderma pigmentosum (XP) have a high risk for skin cancer. XP is a rare, inherited condition resulting from a defect in an enzyme that repairs DNA damage.
Because people with XP are less able to repair DNA damage caused by sunlight, they often develop many cancers on sun-exposed areas of their skin.

The link between squamous cell skin cancer and infection with some types of the human papilloma virus (HPV) also involves DNA and genes. These viruses have genes that affect the growth-regulating proteins of infected skin cells. This can cause skin cells to grow too much and to not die when they’re supposed to.

Scientists are studying other links between DNA changes and skin cancer. A better understanding of how damaged DNA leads to skin cancer might be used to design treatments to overcome or repair that damage.

**Can basal and squamous cell skin cancers be prevented?**

Not all basal and squamous cell skin cancers can be prevented, but there are things you can do that could help reduce your risk of getting these and other skin cancers.

**Limit your exposure to ultraviolet (UV) rays**

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

**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 are going to be in the sun:

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

**Avoid tanning beds and sun lamps**

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

**Protect children from the sun**

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

**To learn more…**

For more information on how to protect yourself and your family from UV exposure, see *Skin Cancer: Prevention and Early Detection.*

**Avoid harmful chemicals**

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

**Check your skin regularly**

Checking your skin regularly may help you spot any new growths or abnormal areas and show them to your doctor before they even have a chance to turn into skin cancer. For more information, see the section “Can basal and squamous cell skin cancers be found early?”

**Can basal and squamous cell skin cancers be found early?**

Basal cell and squamous cell skin cancers can often be found early, when they are likely to be easier to treat.

**Skin self-exam**

You can play an important role in finding skin cancer early. Learn the patterns of moles, blemishes, freckles, and other marks on your skin so that you’ll notice any changes.
It’s important to check all over your skin, preferably once a month. Skin self-exams are best done in a well-lit room in front of a full-length mirror. Use a hand-held mirror for areas that are hard to see, such as the backs of your thighs.

All areas should be examined, including your palms and soles, scalp, ears, nails, and your back. (For a more thorough description of a skin self-exam, see Skin Cancer: Prevention and Early Detection and the booklet Why You Should Know About Melanoma.) Friends and family members can also help you with these exams, especially for those hard-to-see areas, such as your scalp and back.

Be sure to show your doctor any areas that concern you and ask your doctor to look at areas that may be hard for you to see.

Any spots on the skin that are new or changing in size, shape, or color should be seen by a doctor promptly. Any unusual sore, lump, blemish, marking, or change in the way an area of the skin looks or feels may be a sign of skin cancer or a warning that it might occur. The area might become red, swollen, scaly, crusty or begin oozing or bleeding. It may feel itchy, tender, or painful.

Basal cell and squamous cell skin cancers can look like a variety of marks on the skin. The key warning signs are a new growth, a spot or bump that’s getting larger over time, or a sore that doesn’t heal within a few weeks. (See the section “Signs and symptoms of basal and squamous cell skin cancer” for a more detailed description of what to look for.)

Exam by a health care professional

As part of a routine cancer-related checkup, your doctor or other health care professional should check your skin carefully. He or she should be willing to discuss any concerns you might have about this exam.

Regular skin exams are especially important for people who are at high risk of skin cancer, such as people with reduced immunity (for example, those who have had an organ transplant) or people with conditions such as basal cell nevus syndrome or xeroderma pigmentosum (XP). Talk to your doctor about how often you should have your skin examined.

Signs and symptoms of basal and squamous cell skin cancers

Skin cancers often do not cause bothersome symptoms until they have grown quite large. Then they may itch, bleed, or even hurt. But typically they can be seen or felt long before they reach this point.
Basal cell carcinomas

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

These cancers can appear as:

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

Basal cell cancers are often fragile and might bleed after shaving or after a minor injury. Sometimes people go to the doctor because they have a sore or a cut from shaving that just won’t heal, which turns out to be a basal cell cancer. A simple rule of thumb is that most shaving cuts heal within a week or so.

Squamous cell carcinomas

Squamous cell cancers tend to occur on sun-exposed areas of the body such as the face, ear, neck, lip, and back of the hands. Less often, they form in the skin of the genital area. They can also develop in scars or skin sores elsewhere.

These cancers can appear as:

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

Both basal and squamous cell skin cancers can also develop as a flat area showing only slight changes from normal skin. To see some examples of basal and squamous cell cancers, visit our Skin Cancer Image Gallery.
These and other types of skin cancers can also look different from the descriptions above. This is why it’s important to have any new or changing skin growths, sores that don’t heal, or other areas that concern you checked by your doctor.

**How are basal and squamous cell skin cancers diagnosed?**

Most skin cancers are brought to a doctor’s attention because of signs or symptoms a person is having.

If you have an abnormal area that might be skin cancer, your doctor will do exams and tests to find out if it is cancer or some other skin condition. If there is a chance the skin cancer may have spread to other areas of the body, other tests might be done as well.

**Medical history and physical exam**

Usually the first step is for your doctor to take your medical history. The doctor will ask when the mark on the skin first appeared, if it has changed in size or appearance, and if it is causing any symptoms (pain, itching, bleeding, etc.). You may also be asked about past exposures to causes of skin cancer (including sunburns and tanning practices) and if you or anyone in your family has had skin cancer.

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

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

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

Along with a standard physical exam, some dermatologists use a technique called *dermoscopy* (also known as *dermoscopy, epiluminescence microscopy* [*ELM*] or *surface microscopy*) to see spots on the skin more clearly. The doctor uses a dermatoscope, which is a special magnifying lens and light source held near the skin. Sometimes a thin layer of alcohol or oil is used with this instrument. The doctor may take a digital photo of the spot.
When used by an experienced dermatologist, this test can improve the accuracy of finding skin cancers early. It can also often help reassure you if a spot on the skin is probably benign (non-cancerous) without the need for a biopsy.

**Skin biopsy**

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

There are different types of skin biopsies. The doctor will choose one based on the suspected type of skin cancer, where it is on your body, its size, and other factors. Any biopsy will probably leave at least a small scar. Different methods can result in different scars, so if this is a concern, ask your doctor about possible scarring before the biopsy is done. No matter which type of biopsy is done, it should remove as much of the suspected area as possible so that an accurate diagnosis can be made.

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

**Shave (tangential) biopsy**

For a shave biopsy, the doctor shaves off the top layers of the skin with a small surgical blade. Usually the epidermis and the outer part of the dermis are removed, although deeper layers can be taken as well if needed. Bleeding from the biopsy site is then stopped by applying an ointment or a chemical that stops bleeding, or by using a small electrical current to cauterize the wound.

**Punch biopsy**

For a punch biopsy, the doctor uses a tool that looks like a tiny round cookie cutter to remove a deeper sample of skin. The doctor rotates the punch biopsy tool on the skin until it cuts through all the layers of the skin, including the dermis, epidermis, and the upper parts of the subcutis. The sample is removed and the edges of the biopsy site are often stitched together.

**Incisional and excisional biopsies**

To examine a tumor that may have grown into deeper layers of the skin, the doctor may use an incisional or excisional biopsy. An incisional biopsy removes only a portion of the tumor. An excisional biopsy removes the entire tumor.
For these types of biopsies, a surgical knife is used to cut through the full thickness of skin. A wedge or sliver of skin is removed for examination, and the edges of the wound are usually stitched together.

Examining the biopsy samples

All skin biopsy samples are sent to a lab, where they are looked at under a microscope by a doctor called a pathologist. Often, the samples are sent to a dermatopathologist, a doctor who has special training in looking at skin samples.

Lymph node biopsy

It’s rare for basal or squamous cell cancer to spread beyond the skin, but if it does it usually goes first to nearby lymph nodes, which are bean-sized collections of immune cells. If your doctor feels lymph nodes near the tumor that are too large and/or too firm, a lymph node biopsy may be done to determine whether cancer has spread to them.

Fine needle aspiration biopsy

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

An FNA biopsy is not used to diagnose a suspicious skin tumor, but it may be used to biopsy large lymph nodes near a skin cancer to find out if the cancer has spread to them. FNA biopsies are not as invasive as some other types of biopsies, but they may not always provide a large enough sample to find cancer cells.

Surgical (excisional) lymph node biopsy

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

How are basal and squamous cell skin cancers staged?

The stage of a cancer is a description of how widespread it is. For skin cancers, the stage is based on the cancer’s size and location, whether it has grown into nearby tissues or
bones, whether it has spread to the lymph nodes or any other organs, and certain other factors.

Basal cell skin cancer is almost always cured before it spreads to other organs, so it is seldom staged unless the cancer is very large. Squamous cell cancers have a greater (although still small) risk of spreading, so staging may sometimes be done, particularly in people who have a high risk of spread. This includes people with suppressed immune systems, such as those who have had organ transplants and people infected with HIV, the virus that causes AIDS.

The tests and exams described in the section “How are basal and squamous cell skin cancers diagnosed?” are the main ones used to help determine the stage of the cancer. In rare cases, imaging tests such as x-rays, CT scans, or MRI scans may be used as well.

**The American Joint Committee on Cancer (AJCC) TNM staging system**

A staging system is a standard way to sum up how far a cancer has spread. This helps members of the cancer care team determine a patient’s prognosis (outlook) as well as the best treatment options.

The system most often used to stage basal and squamous cell skin cancers is the American Joint Commission on Cancer (AJCC) TNM system. The TNM system is based on 3 key pieces of information:

- **T** stands for tumor (its size, location, and how far it has spread within the skin and to nearby tissues).
- **N** stands for spread to nearby lymph nodes (bean-sized collections of immune system cells, to which cancers often spread first).
- **M** is for metastasis (spread to distant organs).

**T categories**

**TX:** The main (primary) tumor cannot be assessed.

**T0:** No evidence of primary tumor.

**Tis:** Carcinoma in situ (the tumor is still confined to the epidermis, the outermost skin layer).

**T1:** The tumor is 2 centimeters (cm) across (about 4/5 inch) or smaller and has no or only 1 high-risk feature (see below).

**T2:** The tumor is larger than 2 cm across, or is any size with 2 or more high-risk features.
**T3:** The tumor has grown into facial bones, such as the jaw bones or bones around the eye.

**T4:** The tumor has grown into other bones in the body or into the base of the skull.

**High-risk features:** These features are used to distinguish between some T1 and T2 tumors.

- The tumor is thicker than 2 millimeters (mm).
- The tumor has invaded down into the lower dermis or subcutis (Clark level IV or V).
- The tumor has grown into tiny nerves in the skin (perineural invasion).
- The tumor started on an ear or on a part of the lip.
- The tumor cells look very abnormal (poorly differentiated or undifferentiated) under a microscope.

**N categories**

**NX:** Nearby lymph nodes cannot be assessed.

**N0:** The cancer has not spread to nearby lymph nodes.

**N1:** The cancer has spread to 1 nearby lymph node which is on the same side of the body as the main tumor and is 3 centimeters (cm) or less across.

**N2a:** The cancer has spread to 1 nearby lymph node which is on the same side of the body as the main tumor and is larger than 3 cm but not larger than 6 cm across.

**N2b:** The cancer has spread to more than 1 nearby lymph node on the same side of the body as the main tumor, none of which are larger than 6 cm across.

**N2c:** The cancer has spread to nearby lymph node(s) on the other side of the body from the main tumor, none of which are larger than 6 cm across.

**N3:** The cancer has spread to any nearby lymph node that is larger than 6 cm across.

**M categories**

**M0:** The cancer has not spread to distant organs.

**M1:** The cancer has spread to distant organs.
Stage grouping

To assign an overall stage, the T, N, and M categories are combined in a process called stage grouping. The stages are described using the number 0 and Roman numerals from I to IV. In general, patients with lower stage cancers tend to have a better outlook for a cure or long-term survival.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 0</td>
<td>Tis, N0, M0</td>
</tr>
<tr>
<td>Stage I</td>
<td>T1, N0, M0</td>
</tr>
<tr>
<td>Stage II</td>
<td>T2, N0, M0</td>
</tr>
<tr>
<td>Stage III</td>
<td>T3, N0, M0</td>
</tr>
<tr>
<td></td>
<td>T1 to T3, N1, M0</td>
</tr>
<tr>
<td>Stage IV</td>
<td>T1 to T3, N2, M0</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>Any T, any N, M1</td>
</tr>
</tbody>
</table>

How are basal and squamous cell skin cancers treated?

This information represents the views of the doctors and nurses serving on the American Cancer Society’s Cancer Information Database Editorial Board. These views are based on their interpretation of studies published in medical journals, as well as their own professional experience.

The treatment information in this document is not official policy of the 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.

General treatment information

If you have been diagnosed with basal or squamous cell skin cancer, your doctor will discuss your treatment options with you. Depending on your situation, you may have different types of doctors on your treatment team. Many basal and squamous cell cancers (as well as pre-cancers) are treated by dermatologists – doctors who specialize in
treating skin diseases. If the cancer is more advanced, you may be treated by another type of doctor, such as:

- A **surgical oncologist**: a doctor who treats cancer with surgery
- A **medical oncologist**: a doctor who treats cancer with chemotherapy or other medicines
- A **radiation oncologist**: A doctor who treats cancer with radiation therapy

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

- Surgery
- Other forms of local therapy
- Radiation therapy
- Systemic chemotherapy
- Targeted therapy

Different approaches might be used to treat basal cell carcinoma, squamous cell carcinoma, actinic keratosis, and Bowen disease. Fortunately, most of these cancers and pre-cancers can be cured with fairly minor surgery or other types of local treatments.

(Other skin cancers, such as melanoma, lymphoma of the skin, Merkel cell carcinoma, Kaposi sarcoma, and other sarcomas are treated differently and are discussed separately, in other pieces.)

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. If there is anything you don’t understand, ask to have it explained. (See the section “What should you ask your doctor about basal and squamous cell skin cancers?” for some questions to ask.)

**Surgery for basal and squamous cell skin cancers**

Many different kinds of surgery can be used for basal cell and squamous cell skin cancers. The options for surgery depend on the type of skin cancer, how large the cancer is, where it is on the body, and other factors. In most cases the surgery can be done in a doctor’s office or hospital clinic using a local anesthetic (numbing medicine). For skin cancers with a high risk of spreading, surgery sometimes will be followed by other treatments, such as radiation or chemotherapy.
Excision

This is similar to an excisional biopsy (described in the section “How are basal and squamous cell skin cancers diagnosed?”), but in this case the diagnosis is already known. For this procedure, the skin is first numbed with a local anesthetic. The tumor is then cut out with a surgical knife, along with some surrounding normal skin. The remaining skin is carefully stitched back together, which will leave a scar.

Curettage and electrodesiccation

In this treatment, the doctor removes the cancer by scraping it with a long, thin instrument with a sharp looped edge on one end (called a curette). The area is then treated with an electric needle (electrode) to destroy any remaining cancer cells. This process is often repeated once or twice during the same office visit. Curettage and electrodesiccation is a good treatment for superficial (confined to the top layer of skin) basal cell and squamous cell cancers. It will leave a scar.

Mohs surgery (microscopically controlled surgery)

Mohs surgery is sometimes used when there is a high risk the skin cancer will come back after treatment, when the extent of the skin cancer is not known, or when the goal is to save as much healthy skin as possible, such as with cancers near the eye or other critical areas such as the central face, ears or fingers. It is done by a specially trained surgeon.

Mohs can often offer better outcomes than some other forms of surgery and other treatments. But it’s also usually more complex and time-consuming than other methods. In recent years, skin cancer experts have developed guidelines for when it’s best to use this technique based on the type and size of skin cancer, where it is on the body, and other important features.

Using the Mohs technique, the surgeon removes a very thin layer of the skin (including the tumor) and then checks the outer edges of the removed sample under a microscope. If cancer cells are seen, the next layer is removed and examined. This is repeated until the skin samples are free of cancer cells. This process is slow, often taking several hours, but it means that more normal skin near the tumor can be saved. This can help the area look better after surgery.

Lymph node surgery

If lymph nodes near a squamous or basal cell skin cancer are growing larger, doctors will be concerned that the cancer might have spread to these lymph nodes. One or more nodes may be biopsied (see the section “How are basal and squamous cell skin cancers diagnosed?”), or many nodes might be removed in a more extensive operation called a lymph node dissection. The nodes are then looked at under a microscope for signs of
cancer. This type of operation is more involved than surgery on the skin, and usually requires general anesthesia (where you are asleep).

Lymphedema, a condition in which excess fluid collects in the legs or arms, is a possible long-term side effect of a lymph node dissection. Lymph nodes in the groin or under the arm are part of the lymph system, which normally helps fluid from the legs and arms drain back toward the heart. If the lymph nodes are removed, fluid can build up, causing these limbs to swell. If severe enough, it can cause skin problems and an increased risk of infections in the limb. Elastic stockings and compression sleeves can be used to help people with this condition. For more information, read Understanding Lymphedema (For Cancers Other Than Breast Cancer) on our website.

**Skin grafting and reconstructive surgery**

After removing large basal or squamous cell skin cancers, it may not be possible to stretch the nearby skin enough to stitch the edges of the wound together. In these cases, healthy skin may be taken from another part of the body and grafted over the wound to help it heal and to restore the appearance of the affected area. Other reconstructive surgical procedures can also be helpful in some cases.

**Local treatments other than surgery for basal and squamous cell skin cancers**

Several techniques other than surgery can be used to treat basal and squamous cell skin cancers that have not spread to lymph nodes or other parts of the body. Some of these treatments are described as types of surgery since they destroy a targeted area of body tissue. But these techniques don’t use scalpels or cut into the skin.

**Cryosurgery (cryotherapy)**

Cryosurgery is used most often for pre-cancerous conditions such as actinic keratosis and for small basal cell and squamous cell carcinomas.

For this treatment, the doctor applies liquid nitrogen to the tumor to freeze and kill the cells. This is often repeated a couple of times in the same office visit. After the dead area of skin thaws, it will swell, blister and crust over.

The wound may have fluid draining from it for a while and take a month or two to heal. It will leave a scar, and the treated area may have less color after treatment.

**Photodynamic therapy (PDT)**

PDT can be used to treat actinic keratoses. But its exact role in treating basal and squamous cell skin cancers, if any, still needs to be determined.
This treatment uses a special liquid drug that is applied to the skin. The drug collects in the tumor cells over several hours or days, where it is converted to a different chemical that makes the cells very sensitive to certain types of light. A special light source is then focused on the tumor(s), which kills the cells.

PDT can cause redness and swelling on the skin where it is used. Another possible side effect of PDT is that it can make a person’s skin very sensitive to sunlight for some time, so precautions may be needed to avoid severe burns.

To learn more about this technique, see Photodynamic Therapy.

**Topical chemotherapy**

Chemotherapy uses drugs that kill cancer cells. Topical chemotherapy means that an anti-cancer medicine is put directly on the skin (usually in a cream or ointment) rather than being given by mouth or injected into a vein.

**5-fluorouracil:** The drug most often used in topical treatment of actinic keratoses, as well as some basal and squamous cell skin cancers, is 5-fluorouracil, or 5-FU (Efudex®, Carac®, Fluoroplex®, others). It is typically applied to the skin once or twice a day for several weeks.

When applied directly on the skin, 5-FU kills tumor cells near the skin’s surface, but it can’t reach cancer cells deeper in the skin or those that have spread to other organs. For this reason, treatment with 5-FU generally is used only for pre-cancerous conditions such as actinic keratosis and for some very superficial skin cancers.

Because it is only applied to the skin, the drug doesn’t spread throughout the body, so it doesn’t cause the same side effects that can occur with systemic chemotherapy (treatment that affects the whole body). But it can make the treated skin red and very sensitive for a few weeks. Other topical medicines can be used to help relieve this. The skin’s sensitivity to sunlight is also increased by 5-FU, so treated areas must be protected from the sun to prevent sunburn for a few weeks after use of this cream.

A very small portion of people have a condition called **DPD deficiency**, which makes it hard for their bodies to break down and get rid of 5-FU. This can result in serious or even life threatening side effects. If you are applying 5-FU and have any reactions other than on your skin, call your doctor or nurse right away.

**Diclofenac:** A gel containing the drug diclofenac (Solaraze®) is sometimes used to treat actinic keratoses. This drug is a non-steroidal anti-inflammatory (NSAID). This group of drugs includes pain relievers such as aspirin and ibuprofen. The gel is usually applied twice daily for 2 or 3 months. It may cause less severe skin reactions than 5-FU, but it can also take longer to work.

**Ingenol mebutate:** A newer gel used to treat actinic keratosis, ingenol mebutate (Picato®), might work more quickly than other topical gels. It is applied to the skin daily
for 2 or 3 days. The gel can cause bothersome skin reactions, but these usually begin to go away within a week of starting treatment.

**Immune response modifiers**

Certain drugs can boost the body’s immune system response against the cancer, causing it to shrink and go away.

**Imiquimod** (Zyclara®) is a cream that can be applied to actinic keratoses and some very early basal cell cancers. It is not a chemotherapy drug. Instead, it causes the immune system to react to the skin lesion and destroy it. It is typically applied at least a few times a week for several weeks, although schedules can vary. Like other topical gels, it can cause severe skin reactions in some people. It can also cause flu-like symptoms.

**Interferon** is a man-made version of an immune system protein. It can be injected directly into the tumor to boost the immune response against it. It may be used occasionally when surgery is not possible, but it may not be as effective as other treatments.

**Laser surgery**

This relatively new approach uses a beam of laser light to vaporize cancer cells. It’s sometimes used for actinic keratosis, squamous cell carcinoma in situ (Bowen disease), and for very superficial basal cell carcinomas (those only on the surface of the skin). It is not yet known if this type of treatment is as effective as standard methods of treatment, and it is not widely used.

**Chemical peeling**

For this technique, the doctor applies a small amount of trichloracetic acid (TCA) or a similar chemical to the skin tumor, killing the tumor cells over the course of several days. This approach is sometimes used to treat actinic keratosis.

**Radiation therapy for basal and squamous cell skin cancers**

Radiation therapy uses high-energy rays (such as x-rays) or particles (such as photons, electrons, or protons) to kill cancer cells. The radiation is focused from outside the body onto the tumor.

When radiation therapy is used to treat skin cancers, it is often done with a type of radiation called **electron beam radiation**. It uses a beam of electrons that only penetrate as far as the skin. This helps limit the side effects to other organs and body tissues.

If a tumor is very large or is on an area of the skin that makes surgery difficult, radiation may be used as the main treatment instead of surgery. Radiation therapy can also be
useful for some patients who, because of poor general health, can’t have surgery. Radiation therapy can often cure small basal or squamous cell skin cancers and can delay the growth of more advanced cancers.

Radiation is also useful when combined with other treatments. For example, radiation can be used after surgery as an adjuvant (additional) treatment to kill any small areas of remaining cancer cells that may not have been visible during surgery. This lowers the risk of cancer coming back after surgery. Radiation may also be used to help treat skin cancer that has spread to lymph nodes or other organs.

Getting radiation treatment is much like getting an x-ray, but the radiation is stronger and aimed more precisely at the cancer. The procedure itself is painless. Each treatment lasts only a few minutes, although the setup time – getting you into place for treatment – takes longer.

**Possible side effects of radiation**

Side effects of radiation can include skin irritation, redness, drying, and hair loss in the area being treated. With longer treatment, these side effects may get worse. After many years, new skin cancers sometimes develop in areas previously treated by radiation. For this reason, radiation usually is not used to treat skin cancer in young people. Radiation is also not recommended for people with certain inherited conditions (such as basal cell nevus syndrome or xeroderma pigmentosum), who may be at higher risk for new cancers, or for people with connective tissue diseases (such as lupus or scleroderma), which radiation might make worse.

To learn more about radiation therapy, see the Radiation Therapy section of our website or *Understanding Radiation Therapy: A Guide for Patients and Families*.

**Systemic chemotherapy for basal and squamous cell skin cancers**

Systemic chemotherapy (chemo) uses anti-cancer drugs that are injected into a vein or given by mouth. These drugs travel through the bloodstream to all parts of the body. Unlike topical chemotherapy, systemic chemotherapy can attack cancer cells that have spread to lymph nodes and other organs.

For squamous cell carcinoma that has spread, chemo drugs such as cisplatin, doxorubicin, 5-fluorouracil (5-FU), topotecan, and etoposide might be used. These drugs are given into a vein (intravenously), usually once every few weeks. They can often slow the spread of these cancers and relieve some symptoms. In some cases, they may shrink tumors enough so that other treatments such as surgery or radiation therapy can be used.
Basal cell carcinoma very rarely reaches an advanced stage, and chemotherapy is not typically used to treat these cancers. Advanced basal cell cancers are more likely to be treated with targeted therapy.

**Possible side effects of chemotherapy**

Chemo drugs attack cells that are dividing quickly, which is why they work against cancer cells. But other cells in the body, such as those in the bone marrow (where new blood cells are made), the lining of the mouth and intestines, and the hair follicles, also divide quickly. These cells are also likely to be affected by chemo, which can lead to side effects.

The side effects of chemo depend on the type and dose of drugs given and the length of time they are used. These side effects may 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. Some drugs can have specific effects that are not listed above, so be sure to talk with your cancer care team about what you might expect in terms of side effects.

There are often ways to lessen these side effects. For example, drugs can be given to help prevent or reduce nausea and vomiting. Tell your medical team about any side effects or changes you notice while getting chemo so that they can be treated promptly.

To learn more about chemotherapy, see the Chemotherapy section of our website, or read *A Guide to Chemotherapy*.

**Targeted therapy for basal and squamous cell skin cancers**

Doctors have found some of the gene changes inside skin cancer cells that make them different from normal skin cells, and they have begun to develop drugs that attack these changes. These targeted drugs work differently from standard chemotherapy drugs. They
may work sometimes when chemotherapy drugs don’t. They may also have less severe side effects. Doctors are still learning the best way to use these drugs to treat skin cancers.

**Hedgehog pathway inhibitors**

Examples of targeted drugs include **vismodegib (Erivedge®)** and **sonidegib (Odomzo®)**, which can be used to treat some advanced or recurrent basal cell skin cancers. It is very rare for basal cell cancers to reach an advanced stage, but when they do, these cancers can be hard to treat. Most basal cell cancers have mutations (changes) in genes that are part of a cell signaling pathway called *hedgehog*. The hedgehog pathway is crucial for the development of the embryo and fetus and is important in some adult cells, but it can be overactive in basal cell cancers. These drugs target a protein in this pathway.

These drugs are taken as capsules, once a day. In people with basal cell cancers that have spread or come back after surgery and other local treatments, they have been shown to help shrink tumors in some patients, although it’s not yet clear if they help people live longer.

Side effects can include muscle spasms, joint pain, hair loss, fatigue, problems with taste, poor appetite and weight loss, nausea and vomiting, itchy skin, diarrhea, and constipation. These drugs can also cause women to stop having their periods.

Because the hedgehog pathway affects fetal development, these drugs should not be taken by women who are pregnant or could become pregnant. It is not known if they could harm the fetus if it is taken by a male partner. Anyone taking these drugs should use reliable birth control during and for some time after treatment.

**Clinical trials for basal and squamous cell skin cancers**

You may have had to make a lot of decisions since you’ve been told you have skin cancer. One of the most important decisions you will make is choosing which treatment is best for you. You may have heard about clinical trials being done for your type of cancer. Or maybe someone on your health care team has mentioned a clinical trial to you.

Clinical trials are carefully controlled research studies that are done with patients who volunteer for them. They are done to learn more about promising new treatments or procedures.

Clinical trials are one way to get state-of-the-art cancer treatment. Sometimes they may be the only way to get some newer treatments. They are also the best way for doctors to learn better methods to treat cancer. Still, they are 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. You can also call our clinical trials matching service for a list of those that meet your medical needs. You can
reach this service at 1-800-303-5691 or on our website at www.cancer.org/clinicaltrials. You can also get a list of current clinical trials by calling the National Cancer Institute (NCI) at 1-800-4-CANCER (1-800-422-6237) or by visiting the NCI clinical trials website at www.cancer.gov/clinicaltrials.

You must meet certain requirements to take part in any clinical trial. If you do qualify you get to decide whether or not to enter (enroll in) it.

To learn more about clinical trials, see *Clinical Trials: What You Need to Know*.

**Complementary and alternative therapies for basal and squamous cell skin cancers**

You might hear about ways to treat skin cancer or relieve symptoms that your doctor hasn’t mentioned. Everyone from friends and family to social media groups and websites might offer ideas for what might help you. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

**What exactly are complementary and alternative therapies?**

Not everyone uses these terms the same way, and they are used to refer to many different methods, so it can be confusing. We use *complementary* to refer to treatments that are used *along with* your regular medical care. *Alternative* treatments are used *instead of* a doctor’s medical treatment.

**Complementary methods:** Most complementary treatment methods are not offered as cures for cancer. Mainly, they are used to help a person feel better. Some methods that are used along with regular treatment are meditation to reduce stress, acupuncture to help relieve pain, or peppermint tea to relieve nausea. Some complementary methods are known to help, while others have not been tested. Some have been proven not to be helpful, and a few have even been found to be harmful.

**Alternative treatments:** Alternative treatments may be offered as cancer cures. These treatments have not been proven safe and effective in clinical trials. Some of these methods may pose danger, or have life-threatening side effects. But the biggest danger in most cases is that you may lose the chance to be helped by standard medical treatment. Delaying or interrupting your medical treatments might give the cancer more time to grow and make it less likely that treatment will help.

**Finding out more**

It’s easy to see why people with cancer think about alternative methods. You want to do all you can to fight the cancer, and the idea of a treatment with few or no side effects sounds great. Sometimes medical treatments like chemotherapy can be hard to take, or
they may no longer be working. But the truth is that most alternative methods have not been tested and proven to work in treating cancer.

As you consider your options, here are 3 important steps you can take:

• Look for “red flags” that might suggest fraud. Does the method promise to cure all or most cancers? Are you told not to have regular medical treatments? Is the treatment a “secret” that requires you to visit certain providers or travel to another country?

• Talk to your doctor or nurse about any method you are thinking about using.

• Contact us at 1-800-227-2345 or read *Complementary and Alternative Methods and Cancer* on our website to learn more about complementary and alternative methods.

**The choice is yours**

Decisions about how to treat or manage your cancer are always yours to make. If you want to use a non-standard treatment, learn all you can about the method and talk to your doctor about it. With good information and the support of your health care team, you may be able to safely use the methods that can help you while avoiding those that could be harmful.

**Treating basal cell carcinoma**

Basal cell skin cancer very rarely spreads to other parts of the body, although it can grow into nearby tissues if not treated. Several methods can be used to remove or destroy these cancers. The options depend on factors such as the tumor size and location, and a person’s age, general health, and preferences.

All of the treatment methods listed here can be effective. The chance of the cancer coming back (recurring) ranges from less than 5% for Mohs surgery to up to 15% or higher for some of the others, but this depends on the size of the tumor. Small tumors are less likely to recur than larger ones. Even if the tumor does recur, it can often still be treated effectively.

**Surgery**

Different types of surgery can be used to treat basal cell cancers.

**Curettage and electrodesiccation:** This is a common treatment for small basal cell carcinomas. It might need to be repeated to help make sure all of the cancer has been removed.

**Excision:** Excision (cutting the tumor out) is often used to remove basal cell carcinomas, along with a margin of normal skin.
**Mohs surgery:** Mohs surgery has the best cure rate for basal cell carcinoma. It’s especially useful in treating large tumors, tumors where the edges are not well-defined, tumors in certain locations (such as on or near the nose, eyes, ears, forehead, scalp, fingers, and genital area), and those that have come back after other treatments. However, it’s also usually more complex and time-consuming than other methods.

**Radiation therapy**

Radiation therapy is often a good option for treating patients who might not be able to tolerate surgery and for treating tumors on the eyelids, nose, or ears – areas that can be hard to treat surgically – especially in older patients where cure may not be as important as control over the long term. It’s also sometimes used after surgery if it’s not clear that all of the cancer has been removed.

**Immune response modifiers, photodynamic therapy, or topical chemotherapy**

These treatments are sometimes considered as options for treating very superficial tumors (tumors that have not extended too deeply into the skin). Close follow-up is needed because these treatments do not destroy any cancer cells that are deep under the surface.

**Cryosurgery**

Cryosurgery can be used for some small basal cell carcinomas but is not usually recommended for larger tumors or those on certain parts of the nose, ears, eyelids, scalp, or legs.

Cryosurgery can also be used to treat large tumors in one treatment session to relieve symptoms from the cancer. The site of treatment often takes a month or two to heal.

**Targeted therapy for advanced basal cell cancers**

In rare cases where basal cell cancers spread to other parts of the body or can’t be cured with surgery or radiation therapy, a targeted drug such as vismodegib (Erivedge) or sonidegib (Odomzo) can often shrink or slow their growth. These drugs are taken daily as a capsule.

**Treating squamous cell carcinoma of the skin**

Most squamous cell skin cancers are found and treated at an early stage, when they can be removed or destroyed with local treatment methods. Small squamous cell cancers can usually be cured with these treatments. Larger squamous cell cancers are harder to treat, and the chance of fast-growing cancers coming back can be as high as 50%.
In rare cases, squamous cell cancers can spread to lymph nodes or distant sites. If this happens, further treatment with radiation therapy and/or chemotherapy may be needed.

**Surgery**

Different types of surgery can be used to treat squamous cell skin cancers.

**Excision:** Cutting out the tumor, along with a small margin of normal skin, is often used to treat squamous cell carcinomas.

**Curettage and electrodesiccation:** This approach is sometimes useful in treating small, thin squamous cell carcinomas (less than 1 cm across), but it is not recommended for larger tumors.

**Mohs surgery:** Mohs surgery has the highest cure rate. It’s especially useful for squamous cell carcinomas larger than 2 cm (about 4/5 inch) across or with poorly defined edges, for tumors that have come back after other treatments, for cancers that are spreading along nerves under the skin, and for cancers on certain areas of the face or genital area. This approach is typically more complex and time-consuming than other types of surgery.

**Radiation therapy**

Radiation therapy is often a good option for patients with large cancers, especially in areas where surgery would be hard to do (such as the eyelids, ears, or nose), or for patients who may not be able to tolerate surgery. It’s not used as much as the first treatment in younger patients because of the possible risk of long-term problems.

Radiation is sometimes used after surgery (simple excision or lymph node dissection) if all of the cancer was not removed (if the surgical margins were positive), if nerves are involved, or if there is a chance that some cancer may still be left.

Radiation can also be used to treat cancers that have come back after surgery and have become too large or deep to be removed surgically.

**Cryosurgery**

Cryosurgery is used for some early squamous cell carcinomas, especially in people who can’t have surgery, but is not recommended for larger invasive tumors or those on certain parts of the nose, ears, eyelids, scalp, or legs.

**Treating advanced squamous cell cancers**

**Lymph node dissection:** Removing regional (nearby) lymph nodes is recommended for some squamous cell carcinomas that are very large or deeply invasive and in cases where
the lymph nodes feel enlarged and/or hard. After the lymph nodes are removed, they are looked at under a microscope to see if they contain cancer cells. In some cases, radiation therapy might be recommended after surgery.

**Systemic chemotherapy:** Systemic chemotherapy is an option for patients with squamous cell cancer that has spread to lymph nodes or distant organs. Sometimes it’s combined with surgery or radiation therapy.

### Treating actinic keratosis and Bowen disease

#### Actinic keratosis

Actinic keratosis is often treated because it can turn into squamous cell cancer. But because this risk is low, treatments are generally aimed at avoiding scars or other disfiguring marks as much as possible.

Actinic keratosis is commonly treated with either cryosurgery or topical creams or gels such as fluorouracil (5-FU), imiquimod, diclofenac, or ingenol mebutate. These treatments destroy the affected area of the epidermis, the outermost layer of the skin, which usually cures actinic keratosis.

Other localized treatments (shave excision, curettage and electrodesiccation, photodynamic therapy, laser surgery, chemical peeling) are also sometimes used.

#### Bowen disease

Bowen disease (squamous cell carcinoma in situ) is usually treated by excision. Curettage and electrosiccation, radiation therapy, topical fluorouracil (5-FU), and cryosurgery are other options. Laser surgery or topical therapy may be considered in special situations.

### What should you ask your doctor about basal and squamous cell skin cancers?

It’s important to have honest, open discussions with your doctor. You should feel free to ask any question, no matter how small it might seem. Here are some questions you might want to ask:

- What type of skin cancer do I have?
- Can you explain the different types of skin cancer?
- Has my cancer grown deeply into the skin? Has it spread to lymph nodes or other organs?
• Do I need any other tests before we can decide on treatment?
• Do I need to see any other doctors?
• How much experience do you have treating this type of cancer?
• What are my treatment options? What do you recommend? Why?
• Will I be okay if the cancer is just removed with no other treatment?
• What will treatment be like? Where will it be done?
• What are the risks or side effects from treatment?
• Will I have a scar after treatment?
• What are the chances of my cancer coming back with the treatment options we have discussed? What would we do if that happens?
• How quickly do we need to decide on treatment?
• What should I do to be ready for treatment?
• What are my chances of developing another skin cancer?
• Should I take special precautions to avoid sun exposure? What are the most important steps I can take to protect myself from the sun?
• What type of follow-up will I need after treatment?
• Are any of my family members at risk for skin cancer? What should I tell them to do?

Along with these sample questions, be sure to write down some of your own. For instance, you might want more information about recovery times so you can plan your work or activity schedule. Or you may want to ask about second opinions or about clinical trials for which you may qualify.

Keep in mind that doctors aren’t the only ones who can provide you with information. Other health care professionals, such as nurses and social workers, may have the answers to some of your questions. You can find more information about speaking with your health care team in *Talking With Your Doctor*.

**What will happen after treatment for basal and squamous cell skin cancers?**

For most people with basal or squamous cell skin cancers, treatment will remove or destroy the cancer. Completing treatment can be both stressful and exciting. You may be
relieved to finish treatment, but find it hard not to worry about cancer growing or coming back. (When cancer comes back after treatment, it is called recurrent cancer or a recurrence.) This is a very common concern in people who have had cancer.

It may take a while before your fears lessen. But it may help to know that many cancer survivors have learned to accept this uncertainty and are living full lives. Living With Uncertainty: The Fear of Cancer Recurrence, talks more about this.

For a small number of people with more advanced skin cancers, the cancer may never go away completely. They may get regular treatment with radiation therapy, chemotherapy, or other treatments to try to help keep the cancer in check. Learning to live with cancer that does not go away can be difficult and very stressful. It has its own type of uncertainty. When Cancer Doesn’t Go Away talks more about this.

**Follow-up care**

If you have completed treatment, your doctors will still want to watch you closely.

If skin cancer does recur, it is most likely to happen in the first 5 years after treatment. People who have had skin cancer are also at high risk for developing another one in a different location, so close follow-up is important.

Your doctor will probably recommend that you examine your skin at least once a month. This includes looking for any changes where the cancer was treated, as well as looking for any new areas of concern in other places. You can also ask someone close to you to watch for new suspicious areas in places that are hard to see.

It’s also very important to protect yourself from getting too much sun, which can increase your risk of new skin cancers.

Your schedule for follow-up visits will depend on the type of skin cancer you had and on other factors. Different doctors may recommend different schedules.

- For basal cell cancers, visits are often recommended about every 6 to 12 months.
- For squamous cell cancers, visits are usually more frequent, often every 3 to 6 months for the first few years, followed by longer times between visits.

During your follow-up visits, your doctor will ask about symptoms and examine you for signs of recurrence or new skin cancers. For higher risk cancers, such as squamous cell cancers that had reached the lymph nodes, the doctor may also order imaging tests such as CT scans. If skin cancer does recur, treatment options depend on the size and location of the cancer, what treatments you’ve had before, and your overall health.

Follow-up is also needed to check for possible side effects of certain treatments. This is a good time for you to ask your health care team any questions and to discuss any concerns you might have. Almost any cancer treatment can have side effects. Some might last for a
few weeks or months, but others can be permanent. Tell your cancer care team about any symptoms or side effects that bother you so they can help you manage them.

Seeing a new doctor

At some point after your treatment, you may be seeing a new doctor who doesn’t know about your medical history. It’s important to be able to give your new doctor the details of your diagnosis and treatment. Gathering these details during and soon after treatment may be easier than trying to get them at some point in the future. Make sure you have this information handy (and always keep copies for yourself):

- A copy of your pathology report(s) from any biopsies or surgeries
- If you had surgery, a copy of your operative report(s)
- If you stayed in the hospital, a copy of the discharge summary that the doctor wrote when you were sent home
- If you had radiation therapy, a summary of the type and dose of radiation and when and where it was given
- If you had chemotherapy or targeted therapy, a list of your drugs, drug doses, and when you took them
- The names and contact information of the doctors who treated your cancer

It’s also very important to keep your health insurance. Tests and doctor visits cost a lot, and even though no one wants to think of their cancer coming back, this could happen.

Lifestyle changes after treatment for basal or squamous cell skin cancer

You can’t change the fact that you have had skin cancer. What you can change is how you live the rest of your life – making choices to help you stay healthy and feel as well as you can. This can be a time to look at your life in new ways. Maybe you are thinking about how to improve your health over the long term. Some people even start during cancer treatment.

Make healthier choices

For many people, a diagnosis of cancer helps them focus on their health in ways they may not have thought much about in the past. Are there things you could do that might make you healthier? Maybe you could spend less time in the sun, try to eat better, or get more exercise. Maybe you could cut down on alcohol, or give up tobacco. Even things like keeping your stress level under control might help. Now is a good time to think about
making changes that can have positive effects for the rest of your life. You will feel better and you will also be healthier.

You can start by working on the things that worry you most. Get help with those that are harder for you. For instance, if you are thinking about quitting smoking and need help, call the American Cancer Society at 1-800-227-2345.

**Can I lower my risk of cancer coming back or getting new skin cancers?**

Most people want to know if there are specific lifestyle changes they can make to reduce their risk of cancer coming back.

People who have had skin cancer are at higher risk for developing another skin cancer. Because of this, it’s important to limit your exposure to UV rays (from the sun or tanning beds – see the section “Can basal and squamous cell skin cancers be prevented?”) and to continue to examine your skin every month for signs of possible new skin cancers. Seeing your doctor regularly for skin exams is also important. Skin cancers that are found early are typically much easier to treat than those found at a later stage.

Adopting healthy behaviors such as not smoking, eating well, being active, and staying at a healthy weight may also help, but no one knows for sure. However, we do know that these types of changes can have positive effects on your health, including lowering your risk for many other types of cancer, as well as other diseases.

**What’s new in research and treatment of basal and squamous cell skin cancers?**

Research into the causes, prevention, and treatment of basal and squamous cell skin cancer is under way in many medical centers throughout the world.

**Basic skin cancer research**

Scientists have made a great deal of progress in recent years in learning how ultraviolet (UV) light damages the DNA inside normal skin cells, and how this might cause them to become cancerous. Researchers are working to apply this new information to strategies for preventing and treating skin cancers.

**Public education**

Most skin cancers can be prevented. The best way to reduce the number of skin cancers and the pain and loss of life from this disease is to educate the public about skin cancer risk factors, prevention, and detection. It’s important for health care professionals and skin cancer survivors to remind others about the dangers of too much UV exposure (both
from the sun and from man-made sources such as tanning beds) and about how easily they can protect their skin from UV radiation.

Skin cancer can often be detected early, when it is most likely to be cured. Monthly skin self-exams and awareness of the warning signs of skin cancer may be helpful in finding most skin cancer when they are at an early, curable stage.

The American Academy of Dermatology (AAD) sponsors annual free skin cancer screenings throughout the country. Many local American Cancer Society offices work closely with AAD to provide volunteers for registration, coordination, and education efforts related to these free screenings. Look for information in your area about these screenings or call the American Academy of Dermatology for more information. Their phone number and website are listed in “Additional resources for basal and squamous cell skin cancers”.

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

Preventing genital skin cancers

Squamous cell cancers that start in the genital region account for almost half of the deaths from this type of skin cancer. Many of these cancers are related to infection with certain types of human papilloma virus (HPV), which can be spread through sexual contact. Limiting the number of sexual partners a person has and using safer sex practices such as wearing condoms may therefore help lower the risk of some of these cancers.

In recent years, vaccines have been developed to help protect against infection from some types of HPV. The main intent of the vaccines has been to reduce the risk of cervical cancer, but they may also lower the risk of other cancers related to HPV, including some squamous cell skin cancers.

Chemoprevention

Chemoprevention is the use of drugs to reduce cancer risk. This is likely to be more useful for people at high risk of skin cancers, such as those with certain congenital conditions (basal cell nevus syndrome, xeroderma pigmentosum, etc.), a history of skin cancer, or those who have received organ transplants, rather than for people at average risk of skin cancer.

Some of the most widely studied drugs so far are the retinoids, which are drugs related to vitamin A. They have shown some promise in reducing the risk of squamous cell cancers, but they can have side effects, including possibly causing birth defects. For this reason
they are not widely used at this time, except in some people at very high risk. Further studies of retinoids are under way.

Other drugs are being looked at to reduce the risk of basal cell skin cancers in people at high risk. Targeted drugs called hedgehog pathway inhibitors, which affect the activity of genes such as *PTCH* and *SMO*, may help some people with basal cell nevus syndrome. The drug vismodegib (Erivedge), taken daily as a capsule, has been shown to lower the number of new basal cell cancers and shrink existing tumors in people with this syndrome. The drug does have some side effects, including taste loss and muscle cramps, which can make it hard for some people to take every day. Further research on this and similar drugs is under way.

**Treatment**

**Local treatments**

Current local treatments such as surgery and radiation therapy work well for most basal and squamous cell skin cancers. Still, even some small cancers can be hard to treat if they’re in certain areas. Newer forms of non-surgical treatment such as new topical drugs, photodynamic therapy, and laser surgery may help reduce scarring and other possible side effects of treatment. The best way to use these treatments is now being studied.

**Treating advanced disease**

Most basal and squamous cell skin cancers are found and treated at an early stage, when they are likely to be cured, but some can spread to other parts of the body. These cancers can often be hard to treat with current therapies such as radiation and chemotherapy.

Several studies are testing newer targeted drugs for advanced squamous cell cancers. Cells from these cancers often have too much of a protein called *EGFR* on their surfaces, which may help them grow. Drugs that target this protein, such as erlotinib (Tarceva), gefitinib (Iressa), and cetuximab (Erbitux) are now being tested in clinical trials. A drug that targets different cell proteins, known as dasatinib (Sprycel), is also being studied for advanced skin cancers.

It’s very rare for basal cell cancers to reach an advanced stage, but when they do, these cancers can be hard to treat. Vismodegib and sonidegib, drugs that target the hedgehog signaling pathway in cells, may help some people (see “Targeted therapy for basal and squamous cell skin cancers”). Other drugs that target this pathway are now being studied as well.
Additional resources for basal and squamous cell skin cancers

More information from your American Cancer Society

The following related information may also be helpful to you. These materials can be read on our website or ordered from our toll-free number, 1-800-227-2345.

**Skin cancer causes, prevention, and detection**

A Parent’s Guide to Skin Protection (also in Spanish)
Skin Cancer: Prevention and Early Detection
Skin Cancer Image Gallery
Sun Basics: Skin Protection Made Simple (information for children aged 8 to 14)
Ultraviolet (UV) Radiation

**Living with cancer**

After Diagnosis: A Guide for Patients and Families (also in Spanish)
Talking With Friends and Relatives About Your Cancer (also in Spanish)
Coping With Cancer in Everyday Life (also in Spanish)
Caring for the Patient With Cancer at Home: A Guide for Patients and Families (also in Spanish)
Distress in People With Cancer
Anxiety, Fear, and Depression
Living With Uncertainty: The Fear of Cancer Recurrence
When Your Cancer Comes Back: Cancer Recurrence

**Understanding cancer treatments**

Understanding Cancer Surgery: A Guide for Patients and Families (also in Spanish)
A Guide to Chemotherapy (also in Spanish)
Understanding Radiation Therapy: A Guide for Patients and Families (also in Spanish)
Photodynamic Therapy

Clinical Trials: What You Need to Know

Cancer treatment side effects

Nausea and Vomiting
Anemia in People With Cancer
Fatigue in People With Cancer
Understanding Lymphedema (for Cancers Other Than Breast Cancer)

Work, insurance, and finances

In Treatment: Financial Guidance for Cancer Survivors and Their Families (also in Spanish)
Health Insurance and Financial Assistance for the Cancer Patient (also in Spanish)
Working During Cancer Treatment
Returning to Work After Cancer Treatment

Your American Cancer Society also has books that you might find helpful. Call us at 1-800-227-2345 or visit our bookstore online at cancer.org/bookstore to find out about costs or to place an order.

National organizations and websites*

Along with the American Cancer Society, other sources of information and support include:

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

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

Environmental Protection Agency (EPA)
Website: www.epa.gov/sunwise/

Has free sun safety information
National Cancer Institute
Toll-free number: 1-800-422-6237 (1-800-4-CANCER)
TYY: 1-800-332-8615
Website: www.cancer.gov

Offers accurate, up-to-date information about cancer to patients, their families, and the general public

National Comprehensive Cancer Network (NCCN)
Website: www.nccn.org

Experts from many of the nation’s leading cancer centers develop guidelines for doctors to use when treating patients, including guidelines on basal and squamous cell skin cancers

Skin Cancer Foundation
Toll-free number: 1-800-754-6490 (1-800-SKIN-490)
Website: www.skincancer.org

Has pictures and descriptions of skin cancers, information and educational materials, and newsletters

American Society of Dermatologic Surgery (ASDS)
Website: www.asds.net

Has a Skin Cancer Self-Exam Kit and Journal, which can be printed from the website, “Skin Cancer Takes Friends” – a state-by-state guide to free skin cancer screenings (usually conducted May thru July), and a Dermatologic Surgeon Locator you can search by zip code

*Inclusion on this list does not imply endorsement by the American Cancer Society.

No matter who you are, we can help. Contact us anytime, day or night, for information and support. Call us at 1-800-227-2345 or visit www.cancer.org.

References: Basal and squamous cell skin cancer detailed guide


*Last Medical Review: 4/2/2015*
*Last Revised: 7/24/2015*

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