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Actinic Keratosis

An **actinic keratosis** (also known as a **solar keratosis**) is the most common skin condition caused by sun damage. It is the result of skin being damaged by the sun over many years. Actinic keratoses are usually rough, scaly patches on sun-exposed areas such as the head and face. They are common, especially in older people, many of whom have more than one. Usually they are harmless but there is a small risk that they may eventually turn into skin cancer. So, treatment is usually advised.

What is an actinic keratosis?

An actinic keratosis is a small, thickened, scaly growth which develops on the skin. It is the most common skin condition caused by sun damage. It is caused by excessive exposure to ultraviolet (UV) rays from the sun over many years.

What does an actinic keratosis look like?



By Future FamDoc (own work), via Wikimedia Commons

Each can range from the size of a pinhead to 1-3 cm across. Their colour can be light, dark, pink, red, the same colour as your skin, or a combination of these. The top of each one may have a yellow-white, scaly crust. Redness may develop in the surrounding skin. The picture shows actinic keratoses on a forehead.

Actinic keratoses feel rough and dry. They are slightly raised from the surface of the skin. Often it is easier to feel rather than see them. They can also be hard and warty. Sometimes hard skin grows out of an actinic keratosis like a horn (called a cutaneous horn).

Several actinic keratoses may develop at about the same time, often in the same area of skin. Sometimes they can join together and form a large, flat-ish, rough area of skin.

Actinic keratoses usually develop on areas of skin which have received a lot of sun exposure. Skin on the following areas is commonly affected:

- Face.
- Neck.
- Ears.
- Bald patches on the scalp.
- The backs of the hands.

They may also appear in other areas (such as the back, chest and legs) in people who do a lot of sunbathing. There are usually no other symptoms. Rarely, you may get an itchy or prickling sensation from affected areas of skin.

Who gets actinic keratoses?

Actinic keratoses are caused by damage to the skin by UV light which is part of sunlight. The skin is normally good at repairing any minor damage. But, over the years some areas of skin are unable to cope with the repeated exposure to sun and an actinic keratosis can form. So, it is not a recent bout of sun-tanning that causes them but repeated minor sun damage to the skin over time.

People with fair skin who do not tan easily are most commonly affected, especially those with blue/green eyes and blonde/red hair. Because their skin has less protective pigment, these people are the most susceptible to sunburn and other forms of sun damage. Actinic keratoses **can** occur in people with darker skin but they are almost unheard of in black-skinned people.

As it usually takes years of sun exposure to develop an actinic keratosis, older people tend to be most commonly affected. Actinic keratoses are more common in those aged over 50 years. However, they may appear at a much earlier age in people who work outdoors (such as construction workers, farmers, etc), or who do a lot of sunbathing or use sunbeds frequently. In the UK, about 1 in 4 or 5 people over the age of 60 years have (or have had) actinic keratoses. It is much more common in places where the climate is sunnier - for example, Australia. They are more common in men, mainly because men are more likely to have outdoor occupations.

Actinic keratoses are more common in people who have a **suppressed immune system**, such as:

- People who have had organ transplants (because they take long-term anti-rejection medication).
- People who have had **chemotherapy to treat cancer**.
- People who take medicines which suppress the immune system for other conditions such as **rheumatoid arthritis** or **systemic sclerosis**.
- People with **HIV infection**.

However, even in such people, they do not occur without exposure of the skin to the sun.

What happens to actinic keratoses?

Three things can happen to each actinic keratosis. This is important when considering treatment:

- The actinic keratosis may regress. This means it clears away on its own, without treatment.
- An actinic keratosis may persist. So, it remains, doesn't change but doesn't disappear either.
- It might progress into a skin cancer (see below).

Are actinic keratoses dangerous?

In themselves, actinic keratoses are not cancerous (malignant) and do no harm. However, they can sometimes be unsightly.

In people who have between seven and eight actinic keratoses on their skin, there is about a 1 in 10 chance that one will turn into a form of skin cancer called squamous cell carcinoma (SCC) over a 10-year period. This is **not** the most serious form of skin cancer (melanoma). It is a fairly slow-growing cancer and can usually be easily cured if treated early enough. This means that actinic keratosis can be seen as a possible precursor to cancer. See separate leaflets called **Skin Cancer - an Overview** and **Skin Cancer - Non-melanoma** for more details.

Some actinic keratoses become cancerous because the UV exposure from the sun's rays causes changes (mutations) to the genes in the DNA of skin cells. This causes skin cells to divide and grow abnormally, instead of just repairing damage. The abnormal cells tend to multiply in an out of control way - this causes a lump (tumour).

How are actinic keratoses diagnosed?

Your GP may be able to diagnose an actinic keratosis by its typical appearance alone. Sometimes this is difficult and, if doubt exists, you may be referred to a skin specialist (dermatologist). A dermatologist will examine the skin more closely, perhaps with a dermatoscope. This is a magnifier with a light that helps to distinguish between harmless (benign) skin lesions and cancerous (malignant) ones. Sometimes it is necessary to take a **biopsy of the skin lesion**. This means that a small sample of skin (a biopsy) is taken and examined under the microscope in a laboratory. A biopsy means that the cells in the skin can be seen and an accurate diagnosis can be confirmed.

What is the treatment for actinic keratoses?

No treatment may be an option

Without treatment, some actinic keratoses will disappear on their own. However, they can come back (recur) or you may develop new ones. If you only develop one, your doctor may advise that you leave it alone (provided it is not causing any symptoms). It may go away; however, see a doctor if you notice any change in the appearance or if it becomes tender. You may be advised to apply a moisturising (emollient) cream to help soften the skin around the actinic keratosis. You may also be advised to apply sun cream with a high sun protection factor (SPF). High-factor sunscreens also moisturise, but importantly they will prevent further sun damage to the skin (and hopefully prevent the development of further actinic keratoses).

If treatment is advised, there are several options. The method that your doctor advises depends on factors such as:

- The number of actinic keratoses that you have.
- Where they are.
- How big or thick they are.
- How big an area of skin is affected.
- Your health and your preferences.

Freezing an actinic keratosis with liquid nitrogen

Liquid nitrogen is a common treatment in people who have small numbers of actinic keratoses. It is also called cryotherapy or cryosurgery. Liquid nitrogen is so cold that it destroys tissue. An actinic keratosis can be easily sprayed with liquid nitrogen. It is destroyed and then falls off a few days later. A small scab is left and is gradually replaced by fresh healthy skin. Liquid nitrogen often causes the surrounding skin to blister for a few days. Sometimes this form of treatment can leave a white spot on the skin after treatment.

A cream or gel

Topical treatments (meaning you apply them to the skin) are useful if you have a lot of small actinic keratoses where you would otherwise need repeated freezing to get rid of them all. Creams, gels (water-based) and ointments (greasier) are available.

- One type of gel contains an anti-inflammatory medicine called **diclofenac**. Usually at least three months of treatment is needed. Side-effects may include itching and a rash.
- Another cream which is sometimes used contains a medicine called **fluorouracil**. This kills the abnormal cells and fresh normal skin grows back. This cream is usually applied for 3-4 weeks but it can cause significant (but temporary) inflammation, soreness and blistering of surrounding skin. Fluorouracil cream is often used if someone has several actinic keratoses.
- **Imiquimod cream** is an alternative. There are two strengths of imiquimod. One type (Aldara®) is applied three times per week for a month initially. After a four-week break, the response of the skin treated is reassessed. Sometimes it is necessary to repeat one further four-week course. The other type (Zyclara®) is applied once daily for two weeks, followed by a two-week break, and then once daily for a further two weeks. Imiquimod may also cause inflammation, irritation or redness of the skin where it is applied.
- **Salicylic acid** ointment is another cream that is sometimes used. It may be used alone or in a combination cream with fluorouracil, called Actikerall®.
- **Ingenol mebutate** gel is a newer option which has a shorter course of treatment. Again there are two strengths. One strength is used for the face and scalp for three days. The other is used for the body and feet and hands for two days.

Photodynamic therapy

Photodynamic therapy is an alternative to topical treatments. It is used in conjunction with a cream called methyl-5-aminolevulinic acid (Metvix®). This cream is sensitive to light (photosensitive). A special light is then focused on the area to be treated. The combination of the cream and the light helps to kill the abnormal cells. This form of treatment may be useful if there are a large number of actinic keratoses, or if the keratoses are around the eyes or where healing of the skin may be more difficult (such as the lower part of the leg). It may also be used if other treatments have not been successful.

Other treatments

An actinic keratosis may be cut or scraped off. This is usually done after numbing the skin with some local anaesthetic. Other treatments which are sometimes used can include laser surgery, chemical peels and dermabrasion (where skin surface is removed by abrasion).

Other risks if you have an actinic keratosis

If you have one or more actinic keratoses it is a marker that you have had a lot of sun exposure. The **more serious type of skin cancer, melanoma**, most commonly occurs in people who have had a lot of sun exposure. So, although an actinic keratosis does not progress into a melanoma, if you have an actinic keratosis, your risk of developing a melanoma on some other part of your skin is increased. So, tell a doctor soon if you notice any changes on any part of your skin, such as new moles, small dark patches developing, or a change in an existing mole. (For example, if it is getting bigger, has an irregular outline, or is bleeding or crusting.)

Can actinic keratoses be prevented?

If you spend a lot of time in the sun you have an increased risk of developing actinic keratoses and skin cancer. You will also prematurely age your skin and cause wrinkles.

To reduce the risk of developing skin cancers, actinic keratoses and other conditions associated with sun-damaged skin, we should all:

- Stay out of strong sunlight. In particular, avoid sun between 11 am and 3 pm.
- When out in the sun:
 - Seek natural shade in the form of trees or other shelter.
 - Wear clothes as a sunscreen, including T-shirts, long-sleeved shirts, and hats.
 - Use a broad-spectrum sunscreen with an SPF of 30 or higher to protect against UVB and UVA.
 - Reapply sunscreen regularly, particularly if you are swimming, or sweating a lot, or after towelling yourself dry.
 - Use plenty of sunscreen. At the very least, six full teaspoons are needed to cover the body of an average adult.

It helps to examine your skin regularly. See your GP about any skin rashes, growths, lumps or bumps that do not heal within six weeks.

Further reading & references

- [British Association of Dermatologists guidelines for the care of patients with actinic keratosis 2017](#); British Association of Dermatologists (2017)
- [Del Rosso JQ, Kircik L, Goldenberg G, et al; Comprehensive management of actinic keratoses: practical integration of available therapies with a review of a newer treatment approach. J Clin Aesthet Dermatol. 2014 Sep;7\(9 Suppl S2-S12\):S2-S12.](#)
- [Werner RN, Stockfleth E, Connolly SM, et al; Evidence- and consensus-based \(S3\) Guidelines for the Treatment of Actinic Keratosis - International League of Dermatological Societies in cooperation with the European Dermatology Forum - Short version. J Eur Acad Dermatol Venerol. 2015 Nov;29\(11\):2069-79. doi: 10.1111/jdv.13180. Epub 2015 Sep 14.](#)
- [Actinic keratosis](#); DermNet NZ
- [Photodynamic therapy for non-melanoma skin tumours \(including premalignant and primary non-metastatic skin lesions\)](#); NICE Interventional Procedure Guidance, February 2006

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