Cancer Association of South Africa (CANSA)

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Fact Sheet on Actinic Keratosis

Introduction

Actinic keratoses (AKs) form on skin that soaks up lots of sun over the years. An actinic keratosis (AK), is a rough, dry, scaly patch or growth that forms on the skin. An AK forms when the skin is badly damaged by ultraviolet (UV) rays from the sun or indoor tanning. Most people get more than one AK. When one has more than one AK, one has actinic keratoses, or AKs.

[Picture Credit: Actinic Keratosis]

Anyone who has many AKs should be under a dermatologist's care. Most people who have many AKs continue to get new AKs for life. AKs are considered precancerous. Left untreated, AKs may turn into a type of skin cancer called squamous cell carcinoma (please refer to the Fact Sheet on Squamous Cell Carcinoma).

AKs typically appear on sun-exposed areas such as the face, bald scalp, lips, and the back of the hands, and are often elevated, rough in texture, and resemble warts. Most become red, but some will be tan, pink, and/or flesh-toned. If left untreated, up to ten percent of AKs develop into squamous cell carcinoma (SCC), the second most common form of skin cancer. In rarer instances, AKs may also turn into basal cell carcinomas, the most common form of skin cancer (please refer to the Fact Sheet on Basal Cell Carcinoma).

By seeing a dermatologist for check-ups, the AKs can be treated before they become skin cancer. If skin cancer does develop, it can be caught early when treatment often cures skin cancer.
(American Academy of Dermatology; Skin Cancer Foundation).

Incidence of Actinic Keratosis (AK) in South Africa.

The National Cancer Registry (2011) does not provide any information regarding the incidence of Actinic Keratosis (AK).

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Basal Cell Carcinoma

According to the National Cancer Registry (2011) the following number of Basal Cell Carcinoma cases was histologically diagnosed in South Africa during 2011:

Group - Males 2011	Actual No of Cases	Estimated Lifetime Risk	Percentage of All Cancers
All males	8 000	1:17	24,87%
Asian males	46	1:123	7,24%
Black males	328	1:259	3,29%
Coloured males	816	1:15	21,20%
White males	6 810	1:5	38,43%

Group - Females 2011	Actual No of Cases	Estimated Lifetime Risk	Percentage of All Cancers
All females	5 627	1:36	17,71%
Asian females	38	1:125	5,22%
Black females	274	1:557	1,99%
Coloured females	565	1:32	15,23%
White females	4 750	1:8	34,94%

The frequency of histologically diagnosed cases of Basal Cell Carcinoma in South Africa for 2011 were as follows (National Cancer Registry, 2011):

Group - Males 2011	0 – 19 Years	20 – 29 Years	30 – 39 Years	40 – 49 Years	50 – 59 Years	60 – 69 Years	70 – 79 Years	80+ Years
All males	8	67	353	949	1 657	2 194	1 873	855
Asian males	0	1	1	7	11	10	9	7
Black males	0	5	22	45	62	81	78	33
Coloured males	2	10	37	112	138	190	240	125
White males	6	51	284	785	1 426	1 874	1 599	735

Group - Females 2011	0 – 19 Years	20 – 29 Years	30 – 39 Years	40 – 49 Years	50 – 59 Years	60 – 69 Years	70 – 79 Years	80+ Years
All females	9	77	310	667	1 117	1 400	1 174	835
Asian females	0	0	1	6	8	13	9	1
Black females	0	13	30	34	65	33	46	29
Coloured females	1	7	51	60	116	146	112	72
White females	8	57	228	567	1 020	1 188	1 007	733

N.B. In the event that the totals in any of the above tables do not tally, this may be the result of uncertainties as to the age, race or sex of the individual. The totals for 'all males' and 'all females', however, always reflect the correct totals.

Squamous Cell Carcinoma

According to the National Cancer Registry (2011) the following number of squamous cell carcinoma (SCC) cases was histologically diagnosed in South Africa during 2011:

Group - Males 2011	Actual No of Cases	Estimated Lifetime Risk	Percentage of All Cancers
All males	3 386	1:40	10,55%
Asian males	21	1:195	3,35%
Black males	311	1:292	3,12%
Coloured males	360	1:34	9,36%
White males	2 694	1:12	15,24%

Group - Females 2011	Actual No of Cases	Estimated Lifetime Risk	Percentage of All Cancers
All females	2 129	1:101	6,74%
Asian females	17	1:420	2,34%
Black females	265	1:578	1,93%
Coloured females	224	1:83	6,06%
White females	1 623	1:27	12,01%

The frequency of histologically diagnosed cases of squamous cell carcinoma (SCC) in South Africa for 2011 was as follows (National Cancer Registry, 2011):

Group - Males 2011	0 – 19 Years	20 – 29 Years	30 – 39 Years	40 – 49 Years	50 – 59 Years	60 – 69 Years	70 – 79 Years	80+ Years
All males	4	18	76	184	544	952	1 006	582
Asian males	0	0	1	0	3	6	6	3
Black males	3	13	26	38	71	68	55	31
Coloured males	0	0	7	22	57	99	110	65
White males	1	5	42	124	413	779	836	483

Group - Females 2011	0 – 19 Years	20 – 29 Years	30 – 39 Years	40 – 49 Years	50 – 59 Years	60 – 69 Years	70 – 79 Years	80+ Years
All females	3	27	61	122	289	470	587	550
Asian females	0	0	2	0	1	5	8	0
Black females	1	24	34	40	48	36	43	35
Coloured females	0	0	4	13	35	49	70	52
White females	2	3	21	69	205	380	466	463

N.B. In the event that the totals in any of the above tables do not tally, this may be the result of uncertainties as to the age, race or sex of the individual. The totals for 'all males' and 'all females', however, always reflect the correct totals.

Causes of Actinic Keratosis (AK)

Chronic sun exposure is the cause of almost all actinic keratoses. Sun damage to the skin is cumulative, so even a brief period in the sun adds to the lifetime total. Cloudy days are not safe either, because 70-80 percent of solar ultraviolet (UV) rays can pass through clouds. These harmful rays can also bounce off sand, snow and other reflective surfaces, giving one extra exposure.

The ultraviolet radiation given off by the lamps in a tanning salon can be even more dangerous than the sun. CANSA, therefore, warns against the use of tanning beds/sunbeds.

[Picture Credit: Tanning Bed]

Occasionally, actinic keratoses may be caused by extensive exposure to X-rays or a number of industrial chemicals, e.g. arsenic, coal tar, soot, pitch, creosote, shale oils, and petroleum products, such as mineral oil or motor oil.

Because the total amount of time spent in the sun adds up year by year, older people are most likely to develop actinic keratoses. However, nowadays, some individuals in their 20s are affected. Still, actinic keratoses become much more common in

people over the age of 50. Some experts believe almost everyone over 80 has actinic keratoses.

Also, individuals whose immune defences are weakened by cancer chemotherapy, Aids, organ transplantation or excessive UV exposure are less able to fight off the effects of the radiation and thus more likely to develop actinic keratoses.

People who have fair skin, blonde or red hair, and blue, green, or gray eyes are at the greatest risk, but darker-skinned people can develop keratoses if they expose themselves to the sun without protection. People with certain rare conditions that make the skin very sensitive to the sun's UV rays, such as albinism and xeroderma pigmentosum (XP), are at very high risk.

[Picture Credit: Albinism]

Though only about 10 percent of AKs turn into cancers, there is no way to know ahead of time which ones are precursors of squamous cell carcinoma. That is why it is fortunate that there are so many effective treatments for eliminating actinic keratoses.

When an AK is suspected to be an early cancer, the physician may take tissue for biopsy. This is done by shaving off the top of the lesion with a scalpel or scraping it off with a curette. Local anaesthesia may be required. Bleeding is usually stopped with a styptic agent.
(Skin Cancer Foundation; Johns Hopkins Medicine; Cancer Research UK).

Who is at Risk for Actinic Keratosis?

Those individuals who develop actinic keratosis tend to be fair-skinned people who have spent a lot of time outdoors at work or at play over the course of many years or who have exposed their skin to indoor tanning radiation. Their skin often becomes wrinkled, mottled, and discoloured from sun exposure. Others at risk for developing actinic keratosis include those who have their immune systems suppressed, such as organ-transplant patients, as well as patients with psoriasis treated with PUVA therapy (topical long-wave ultraviolet light plus oral chemicals called psoralens).
(MedicineNet).

Signs and Symptoms of Actinic Keratosis (AK)

The signs and symptoms of an actinic keratosis include:

- Rough, dry or scaly patch of skin, usually less than 2.5 centimetres in diameter
- Flat to slightly raised patch or bump on the top layer of skin
- In some cases, a hard, wart-like surface
- Colour as varied as pink, red or brown, or flesh-coloured
- Itching or burning in the affected area

Actinic keratoses (AKs) are found primarily on areas exposed to the sun, including the face, lips, ears, back of the hands, forearms, scalp and neck.
(Mayo Clinic).

Diagnosis of Actinic Keratosis (AK)
A General Practitioner (GP) may be able to diagnose actinic keratosis by examining the patches on a person's skin. In some cases, the diagnosis may need to be confirmed by removing a small sample of skin and examining it under a microscope.

Actinic keratosis can often be managed by a GP, but one may need to see a skin specialist (dermatologist) for further assessment if the:

- GP is not certain about the diagnosis
- GP thinks one or more of the patches may be cancerous or at a high risk of becoming cancerous
- patches are particularly severe or widespread
- patient is taking immunosuppressant drugs - for example, following an organ transplant
- patches have not responded to treatment

(NHS Choices).

Tips for Managing Actinic Keratosis (AK)
An actinic keratosis (AK) forms on skin that has been badly damaged by ultraviolet (UV) rays. The sun and indoor tanning expose individuals to these harmful rays. If a person has been diagnosed with AKs, dermatologists recommend protecting the skin from the sun. By protecting the skin from the sun, one can help prevent new AKs from forming. This also will help make the treatment more effective.

Dermatologists offer the following tips to their patients who have AKs:

- Avoid the midday sun. Do this by scheduling outdoor activities for earlier in the morning (before 10:00) and later in the afternoon (after 15:00).

- Put on sunscreen every day — even on cloudy days and in the winter. Apply sunscreen to all skin that clothing will not cover.
  3 things that a sunscreen must offer:
  - SPF (sun protection factor) of 30 or higher
  - UVA/UVB protection (label may say 'broad-spectrum')
  - Water resistance

- Protect the lips. Apply a lip balm that contains sunscreen (if available). The lip balm also should offer an SPF of 30 or greater and UVA/UVB protection.

- Protect the skin with clothing, preferably with a good UPF value. Whenever possible wear:
  - A wide-brimmed hat
  - Long sleeves
  - Long pants

To see how well the clothes will protect - hold each garment in front of bright light. If one can see light through the cloth, harmful light from the sun can penetrate the cloth. Select another garment. One could also wear that garment but apply sunscreen first to the skin that the garment will cover.

Do not use tanning beds or other indoor tanning devices. Tanning beds and sun lamps emit UV rays that can be stronger than the rays from the sun. This can cause new AKs.

Check the skin as often as the dermatologist recommends. If one notices a growth on the skin that has any of the following traits, contact a dermatologist right away:

- Starts to itch or bleed.
- Becomes noticeably thicker.
- Remains after treatment.
- Changes in size, shape, or colour.

Keep all appointments with a dermatologist. Left untreated, AKs can turn into a type of skin cancer called squamous cell carcinoma (please refer to the Fact Sheet on Squamous Cell Carcinoma). With early detection and treatment, skin cancer has a high cure rate.

Because AKs develop on skin that has been badly damaged by UV rays, one also has a higher risk for developing other types of skin cancer, including melanoma (please refer to the Fact Sheet on Melanoma). Keeping one's appointments helps to detect skin cancer early when a cure is likely.

Realise that new AKs may form. AKs form on badly damaged skin. Some people will continue to develop new AKs for life, even when they protect their skin from the sun. This does not mean that sun protection and treatment are not working.
(American Academy of Dermatology).

Treatment of Actinic Keratosis (AK)

- Early treatment of actinic keratosis is recommended to stop the possible progression to a type of skin cancer (squamous cell carcinoma).

- Treatment may include:

- Almost all AKs can be eliminated if treated early, before they become skin cancers. Various treatment options are available, which depend on the growth's characteristics and the patient's age and health. Some of these strategies increase sun sensitivity, so check with your doctor, and be especially diligent about using sun protection during the treatment period. Common treatments include the following.

- This is the most commonly used treatment method when a limited number of lesions exist. Treatment can be performed in the physician's office, and no cutting or anaesthesia is required. Liquid nitrogen, applied with a spray device or cotton-tipped applicator, freezes the growths. The lesions subsequently shrink and/or blister, become crusted and fall off. Temporary redness and swelling may occur after treatment, and in some patients, pigment may be lost, leaving white spots.

- When AKs are numerous and widespread, topical creams, gels and solutions are especially useful by themselves or in combination with another form of treatment. They treat both visible and invisible lesions with a minimal risk of scarring.

- *One of the most commonly used topical medications for AK is* ***5-fluorouracil (5-FU)*** cream or solution, an FDA-approved topical chemotherapy rubbed gently onto the lesion areas once or twice daily for two to four weeks. It can be used on all affected areas. Temporary side effects include redness, swelling, and crusting but for many the therapeutic benefits outweigh any temporary discomfort. 5-FU is available in a variety of formulations, in concentrations ranging from 0.5 percent to 5 percent.

The treated areas usually heal within two weeks, there is rarely scarring, and the cosmetic result is good. ***Imiquimod*** **cream**, also FDA-approved, works in a different way: It stimulates the immune system to produce interferon, a chemical that destroys cancerous and precancerous cells. Available in concentrations of 5%, 3.75% and 2.5 %, it is rubbed gently on the lesion, most often two or three times a week for several weeks or months. The cream is generally well-tolerated, but some individuals develop redness and ulcerations.

- *A gel combining* ***hyaluronic acid****, a chemical found naturally in the body, with the*non-steroidal anti-inflammatory drug **diclofenac** may also be effective for people whose skin is oversensitive to other topical treatments. The gel is applied twice a day for two to three months, though courses of treatment under three months have proven less effective. Recent research found that a formula of 3 percent diclofenac twice daily successfully eliminated AKs in organ transplant patients (who are highly susceptible to AKs and skin cancers) and also was effective at preventing invasive squamous cell carcinomas.

- In 2012, the FDA approved an effective new topical medicine called **Picato®** (**ingenol mebutate**). Available in concentrations of 0.015 and 0.05 percent depending on the AK site, this gel is the first topical therapy to treat AKs effectively with just two or three days application time – three consecutive days for the 0.015% concentration (used on the face and scalp) and two consecutive days for the more concentrated 0.05% gel (used on the trunk and extremities). Skin redness, flaking/scaling, crusting, and swelling are the most common side effects. Picato can cause painful reactions in the first days of treatment, but these usually begin to abate within a week of starting treatment.

- PDT is FDA-approved for the treatment of both AK and Bowen's Disease, a superficial form of SCC that appears as a persistent red-brown scaly patch. PDT is especially useful for widespread lesions on the face and scalp. A light-sensitizing agent, topical 5–aminolevulinic acid (5-ALA) or methyl aminolevulinate (MAL), is applied to the lesions in the physician's office. Subsequently, those medicated areas are activated by strong blue or red light, which selectively destroys AKs while causing minimal damage to surrounding normal tissue. Some redness, pain and swelling can result. After the procedure, patients must strictly avoid sunlight for at least 48 hours, as UV exposure will increase activation of the medication, and may cause severe sunburns.

- Doctors may combine therapies for a period of time to treat AKs. Typically, treatment regimens combine cryosurgery with PDT or a topical agent like imiquimod, diclofenac, of 5-FU. The topical medications and PDT may also be used serially every three months, six months, or year, as determined by the physician at routine skin examinations. This approach may both improve the cure rate and reduce side effects. One to two weeks of 5-FU followed by cryosurgery can reduce the healing time for 5-FU and decrease the likelihood of white spots following cryosurgery.

- When an AK is suspected to be an early cancer, the physician may take tissue for biopsy by shaving off a portion of the AK with a scalpel or scraping the lesion with a curette (an instrument with a sharp ring-shaped tip). The curette may also be used to scrape off the base of the lesion. Bleeding is stopped with an electrocautery needle or by applying trichloroacetic acid (TCA). Local anaesthesia is necessary.

- This method, best known for reversing the signs of photoaging, is also used to remove some superficial actinic keratoses on the face, especially when other techniques have not succeeded. *Trichloroacetic acid (TCA)* and/or similar chemicals are applied directly to the skin, causing the top skin layers to slough off. New skin generally regrows within a few weeks. This technique may require local anaesthesia and can cause temporary discoloration and irritation.

- The skin's outer layer and variable amounts of deeper skin are removed using a carbon dioxide or erbium YAG laser. Lasers are effective for removing actinic cheilitis from the lips and AKs from the face and scalp. They give the physician good control over the depth of tissue removed. Lasers are also used as a secondary therapy when topical medications or other techniques are unsuccessful. However, local anaesthesia may be required. The risks of scarring and pigment loss are slightly greater than with other techniques.

(Skin Cancer Foundation; WebMD; DermNet NZ).

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Sources and References

Actinic Keratosis
http://www.aocd.org/?page=ActinicKeratosis

Albinism
http://www.thezimbabwean.co/news/zimbabwe-news/66410/living-with-albinism.html

American Academy of Dermatology
https://www.aad.org/dermatology-a-to-z/diseases-and-treatments/a---d/actinic-keratosis
https://www.aad.org/dermatology-a-to-z/diseases-and-treatments/a---d/actinic-keratosis/tips

Cancer Research UK
http://www.cancerresearchuk.org/about-cancer/type/skin-cancer/about/skin-cancer-risks-and-causes

DermNet NZ
http://www.dermnetnz.org/lesions/solar-keratoses.html

Johns Hopkins Medicine
http://www.hopkinsmedicine.org/healthlibrary/conditions/skin_cancer/actinic_keratosis_a_precancerous_condition_85,P01335/

Mayo Clinic
http://www.mayoclinic.org/diseases-conditions/actinic-keratosis/basics/symptoms/con-20030382

MedicineNet
http://www.medicinenet.com/actinic_keratosis/page2.htm#who_is_at_risk_for_an_actinic_keratosis

NHS Choices
http://www.nhs.uk/conditions/solar-keratosis/Pages/Introduction.aspx

Skin Cancer Foundation
http://www.skincancer.org/skin-cancer-information/Actinic-Keratosis
http://www.skincancer.org/skin-cancer-information/actinic-keratosis/actinic-keratosis-treatment-options

Tanning Bed
http://www.rantlifestyle.com/2014/06/03/20-signs-youre-a-huge-tool/

WebMD
http://www.webmd.com/skin-problems-and-treatments/tc/actinic-keratosis-topic-overview?page=2