

Cancer Association of South Africa (CANSA)



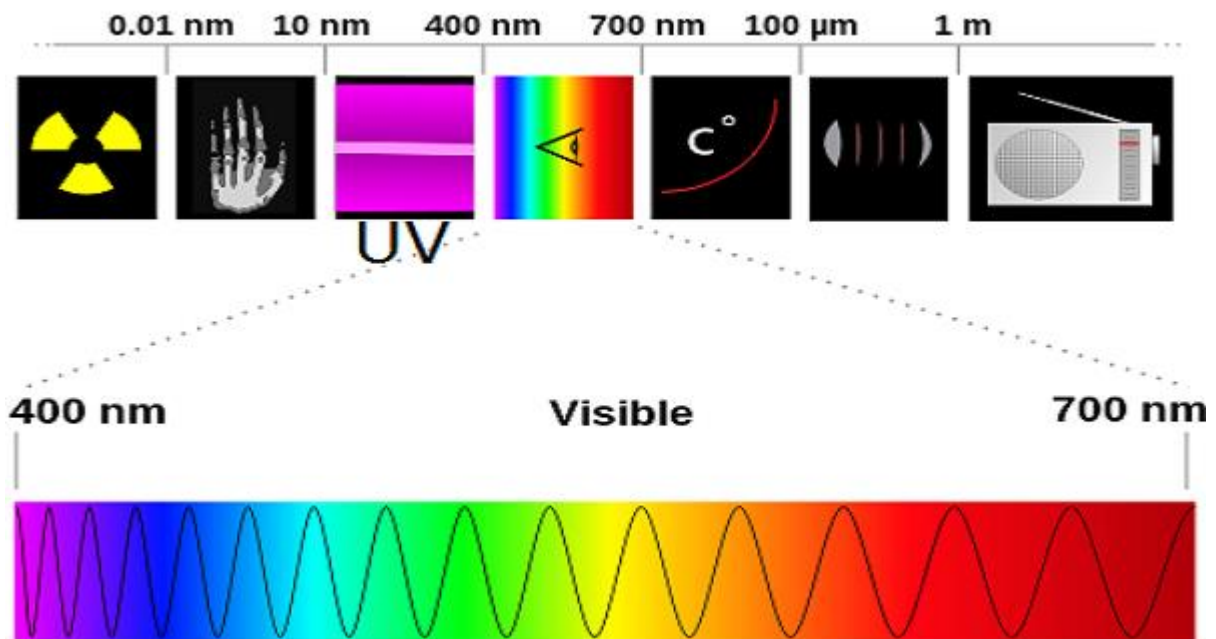
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Fact Sheet on Actinic Cheilitis

Introduction

Radiation in the part of the electromagnetic spectrum where wavelengths are just shorter than those of ordinary, visible violet light but longer than those of X-rays.

Ultraviolet (UV) radiation is defined as that portion of the electromagnetic spectrum between X-rays and visible light, between 40 and 400 nm wavelength.



Electromagnetic spectrum. From left to right: gamma rays, X-rays, UV light, visible light, infrared light, microwave, radio waves.
Energy decreases as one goes from left to right.

The sun is the world's primary natural source of UV radiation. Artificial sources include tanning booths, black lights, halogen lights, high-intensity discharge lamps, fluorescent and incandescent sources, and some types of lasers. Unique hazards apply to the different sources depending on the wavelength range of the emitted UV radiation. (Dictionary.com; Study.com).

Types of UV Radiation and Their Biological Effects

The three most common types of UV light are **UV-A**, **UV-B** and **UV-C** and are shown in the table below.

Type	Wavelength	Relative Energy	Comments
UV-A	320 - 400nm	Lowest Energy	Least damaging and reaches the earth's surface
UV-B	280 - 320nm	Middle Energy	More damaging than UV-A; however, most UV-B is absorbed by the atmosphere. It is the most damaging to us on earth
UV-C	200 - 280nm	Highest Energy	Most damaging but not a problem because it is totally absorbed by the atmosphere and does not reach the earth

One can see from the table (above) that while UV-C is the most energetic form of UV light, it does not reach the earth, so it does not cause health problems.

UV-B is considered the most destructive form of UV radiation on earth because it has enough energy to cause photochemical damage to cellular DNA. Most of the UV-B waves are absorbed by the atmosphere, but not all of the energy is.

A small amount of UV-B is needed by humans for synthesis of Vitamin D, however, harmful effects can include sunburn, cataracts, and development of skin cancer. (Study.com).

Actinic Cheilitis

Actinic cheilitis is a premalignant condition. It results from chronic exposure of the lower lip to solar ultraviolet radiation. It is more vulnerable than surrounding skin because mucosal epithelium is thinner and less pigmented than the epidermis.

Actinic cheilitis presents as diffuse or patchy dryness and variable thickening of the vermilion of the lower lip. The common form of actinic cheilitis is due to chronic sun exposure. It is also called actinic cheilosis, solar cheilitis, and sometimes, actinic cheilitis with histological atypia.



[Picture Credit: Actinic Cheilitis]

Actinic cheilitis mainly affects adults with fair skin who live in tropical or subtropical areas, especially outdoor workers. They often recall having sunburned lips in earlier years. They may also have actinic keratoses on other sun exposed sites of the scalp, ears, face and hands.

(DermNet NZ)

Actinic cheilitis is a premalignant condition affecting the lower lip and caused by excessive sun exposure. Long-term exposure to ultraviolet radiation leads to freckling, loss of elasticity, telangiectasia, and actinic cheilitis.

Diagnosed more frequently in males and in individuals over 50 years of age, squamous cell carcinoma is often found in the late stages and has the potential to spread throughout the body. The typical patient diagnosed with actinic cheilitis is someone who is Caucasian with a history of tobacco use. Studies have found a correlation of tobacco and outdoor occupations in a study group of 65 patients diagnosed with actinic cheilitis. Most of the patients worked as construction workers, fishermen, and farmers with an average age of 50-plus years and a 12:1 male to female ratio. Reported lesions were on the right side of the lip in 46.1 percent of the cases because of the preference to hold their cigarette on the right side as opposed to the mid-line or the left side. Interestingly, the patients in this study reported the lesions to be present for 2.6 years before diagnosis.

Additionally, 72.3 had moderate dysplasia to invasive squamous cell carcinoma at the time of biopsy, with the remaining patients diagnosed as having mild epithelial dysplasia (27.7 percent). Damage from the sun is known to cause basal cell carcinoma, squamous cell carcinoma, acantholytic dermatosis, melanoma, and actinic keratosis or solar keratosis. (Burkhart).

Differential Diagnosis of Actinic Cheilitis

The following conditions should be considered before making a diagnosis of actinic cheilitis:

- Leukoplakia
- Lichen Planus
- Lupus erythematosus
- Early Oral Squamous Cell Carcinoma
- Cheilitis due to radiation.

Clinical Features of Actinic Cheilitis

In the early stage, mild erythema (reddening) and oedema (swelling) followed by dryness and fine scaling of the lower lip vermilion border (the junction between the lip and skin) are the presenting signs.

As the lesion progresses, the epithelium (skin) becomes thin and smooth, with small whitish-grey areas intermingled with red regions and scaly formations. Erosions (ulcers) and tiny nodules may develop.

The vermilion appears atrophic (thinned) and pale with a glossy surface and loss of demarcation at the vermilion border. With progression, fissuring and ulceration can occur along with crusting or scaling. Epithelial atrophy and elastosis are seen histologically and these changes are irreversible. Areas of persistent ulceration should be biopsied due to a 6 – 10% rate of malignant transformation.

The lesion is pre-malignant and usually occurs in fair-skinned men over 50 years of age, 4 – 8th decade of life and who have had outdoor jobs / activities. (Exodontia.info).

Treatment of Actinic Cheilitis

Actinic cheilitis treatment options cover the spectrum of topical therapies to surgical and light-based procedures — but, similar to other medical conditions, they each have their own pros and cons. As for topical therapies, none are actually FDA approved for this condition and research on utilisation specifically for actinic cheilitis is scarce.

One concern regarding topical therapies to the lip is potentially heightened absorption through the mucosa, at least theoretically leading to high serum levels and systemic sequelae. These may include gastrointestinal symptoms (abdominal pain, diarrhoea, etc.) in some patients with dihydropyrimidine dehydrogenase deficiency when using topical 5-fluorouracil products or flu-like symptoms with topical imiquimod.

A newer medication, ingenol mebutate, has some early adopter physicians recommending it for actinic cheilitis as well, but as with other sites there can be a very robust inflammatory response with this medication and some patients may have very significant scabbing and crusting.

Aside from topical therapies, other treatment options include diffuse cryotherapy to the lower lip, trichloroacetic acid peel, photodynamic therapy - especially with activation by a pulsed-dye laser, laser vermilionectomy and surgical vermilionectomy with mucosal advancement. Laser vermilionectomy procedures are sometimes commonly employed for the treatment of actinic cheilitis. Patients typically fall into 3 main groups:

- those with clinical evidence of greyish-hyperkeratotic multifocal patches with no areas of breakdown of the mucosa
- those who have had a biopsy on an area of mucosal breakdown and crusting that reveals only actinic cheilitis (with full visualization of the base of the lesion) and no evidence of squamous cell carcinoma
- those who have recently had a squamous cell carcinoma on the lower lip removed with surgical techniques and greyish-hyperkeratotic changes are visible in other areas on that lower lip.

While all abovementioned treatment modalities could be utilised, all have pros and cons that need to be considered, though no comparative studies exist to help a physician decide on a specific choice. Cryotherapy may not provide consistent depth of penetration and also leads to blister formation and scabbing.

Photodynamic therapy usually does not have as robust a reaction as cryotherapy, but often requires several treatments. Topical therapy, such as imiquimod, can be very effective, but, in addition to the abovementioned flu-like symptoms, may also lead to aphthous ulcers.

Surgical vermilionectomy requires uniform distal excision of the entire lower lip, and leads to a lot of discomfort, swelling and potential asymmetry and pulling of the lower lip intra-orally from the tethering to the gingival sulcus.

Laser Vermilionectomy - this can be a very effective therapy that offers controlled depth of penetration to selected microns, though, similar to these other destructive therapies, leads to a significant healing response often lasting 5-7 days.

Ablative laser vermilionectomy procedures can be performed with either an ablative erbium or CO₂ laser. While CO₂ laser is often used in literature, it is associated with extensive

thermal damage zone, typically not necessary for the treatment of superficial conditions, such as actinic cheilitis. On the other hand, a 2940-nm erbium laser permits easy recognition of the treatment endpoint of pinpoint bleeding and allows for a precise depth of epithelial ablation. The most common settings used are 3-5 passes with depth of ablation of 40-50 microns (corresponding to fluences of 10-12.5 J/cm²), paying close attention to the endpoint of diffuse pinpoint bleeding. More hyperkeratotic areas may require additional passes to reach this endpoint than others.

(The Dermatologist).

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