Cancer Association of South Africa (CANSA)

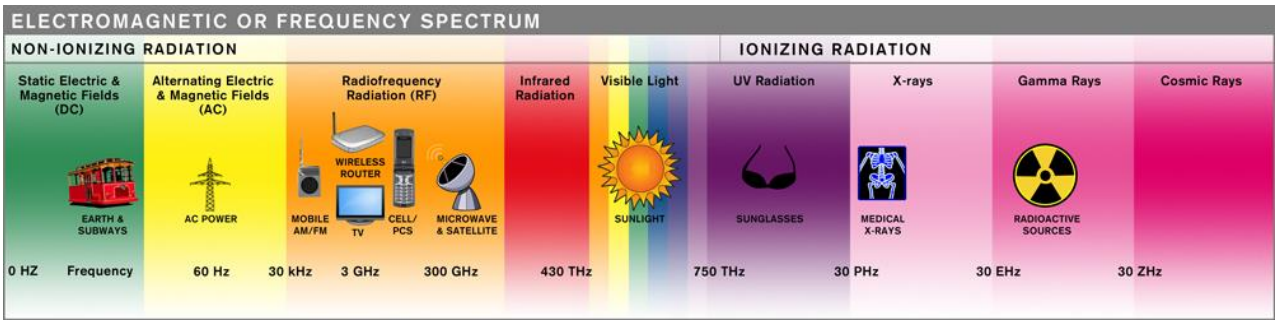
Fact Sheet
on
Actinic Cheilitis

Introduction

According to the SCC Scottish Sensory Centre, University of Edinburgh, UV radiation is described as follows: "In the electromagnetic spectrum there is an area of visible light. UV radiation has wavelengths shorter than visible light. We can't see it, although birds and insects can. The wavelength of UV light varies from 10-400 nm. Within this UV spectrum there are three different sorts of UV light. The first section, called UVA, has wavelengths of 320-400 nm. The second, UVB, has wavelengths of 290-320 nm. The third, UVC, has wavelengths of 10-290 nm."

[Picture Credit: Actinic Cheilitis Picture]

The diagram below shows ultraviolet (UV) radiation as part of the electromagnetic spectrum. The wavelength of ultraviolet radiation is between 10nm and 400nm which makes it shorter than the wavelengths of visible light (400nm to 700nm) and longer than X-rays.



[Picture Credit: EMF & RF Solutions]

Sources and Uses of Ultraviolet Radiation

Although there are manmade sources of ultraviolet (UV) radiation like arc welding, mercury vapour lamps and UV lamps, the sun is the major source of ultraviolet radiation.

Uses and benefits of ultraviolet radiation include:

- Phototherapy (also called light therapy or heliotherapy)
- Disinfection and sterilisation
- Triggers Vitamin D production in human skin
- Tanning

Harmful Effects of Ultraviolet Radiation in Humans

Overexposure to ultraviolet radiation may cause:

- Sunburn
- Skin cancer, especially squamous cell carcinoma
- Premature ageing of skin
- Suppression of the immune system
- Eye damage (macular degeneration, damage to the cornea of the eye, and cataract formation)

Actinic Cheilitis

Actinic Cheilitis is a pre-malignant condition which results of excessive exposure to the UV rays of the sun. It is especially the lower lip, more so than surrounding skin that is affected. It is mostly seen along the line that separates the lips from the skin of the face. Individuals with albinism are often affected by Actinic Cheilitis.

[Picture Credit: Actinic Cheilitis]

Other names for Actinic Cheilitis include actinic cheilosis, actinic keratosis of the lip, solar cheilosis, sailor's lip and farmer's lip. It presents mainly in adults with fair skin who spend a lot of time in the sun. It presents as a diffuse or patchy dryness on the lower lip. If neglected it may cause squamous cell carcinoma *in situ*.

Other parts of the body that may be affected include:

- Other parts of the face
- The hands
- The ear lobes
- The scalp (especially if there is thinning of the hair

Muse, M.E. & Crane, J.S. 2020.

"'Sailor's Lip,' or actinic cheilitis (AC), is a precursor of squamous cell carcinoma (SCC) found on the lips. Similar to actinic keratosis, actinic cheilitis is a premalignant lesion caused by chronic sun exposure. It is most common on the lower lip along the vermillion border. Given SCC on the lips is considered a high-risk form of skin cancer with an 11% chance of metastasis compared to 1% for other body locations, it is essential to recognize and appropriately manage these potentially malignant precursory lesions."

Varela-Centelles, P., Seoane-Romero, J., García-Pola, M.J., Leira-Feijoo, Y. & Seoane-Romero, J.M. 2020.

"Actinic cheilitis (AC) is a sun-induced premalignant lesion. AC is a clinical term housing a wide pathological spectrum ranging from hyperkeratosis to invasive squamous cell carcinoma. The aim of this systematic review was to examine the therapeutic efficacy of different approaches in clinical, histological, and cosmetic

terms, and the malignization rate after treatment. A systematic search was undertaken in October 2016 and updated in April 2019 at MEDLINE (from 1966), Embase (from 1980), and Proceedings Web of Science (Conference Proceedings Citation Index-Science (CPCI-S) from 1990) databases. The search strategy was (("actinic" or "solar") AND ("cheilitis")) using both medical subject headings (MeSH) and freetext. A total of 392 potentially eligible reports were identified. After the selection procedure, 20 articles were included. It was concluded that surgical treatment is the first line of treatment for AC and has proved useful for the clinical and pathological control of the disorder. However, there was no evidence of effective treatment in preventing malignant transformations. Non-surgical procedures showed less consistent results, although drug therapy may improve the results obtained by other therapeutic approaches."

Incidence of Actinic Cheilitis in South Africa

The outdated National Cancer Registry (2017) does not provide any information regarding the incidence of Actinic Cheilitis in South Africa as it is a pre-malignant condition.

Moreira, P., Assaf, A.V., Cortellazzi, K.L., Takahama Junior, A. & Azevedo, R.S. 2020.

Objective: This cross-sectional study aimed to evaluate the prevalence and factors potentially associated with the development of actinic cheilitis (AC) in Brazilian rural workers.

Subjects and methods: A professional performed all physical examinations and evaluations using semi-structured questionnaires in 240 rural workers.

Results: Eighty-three participants were diagnosed with AC (34.6%). It was more prevalent among workers older than 45 years (3.29-10.96 95% IC; OR = 3.30; p = .0018), Caucasians (phototypes I and II) (4.78-16.12 95% IC; OR = 10.81; p < .0001), illiterate individuals (2.16-21.59 95% IC; OR = 10.43; p = .0037), those with 6 or fewer years of formal schooling (2.03-7.89 95% IC; OR = 4.63; p = .0013), those regularly using pesticides (1.58-6.64 95% IC; OR = 2.79; p = .0260) and those who used the private health service in their last appointment (1.17-3.54 95% IC; OR = 2.72; p = .0083).

Conclusion: There was a substantial prevalence of AC among rural workers with advanced age, white skin, and illiteracy, those with lower levels of education, those who regularly use pesticides, and those who utilised private health services in their last appointment. Thus, healthcare strategies that include rural workers are required for the control and prevention of AC in both public and private health services.

Prevention of Actinic Cheilitis

The best protection against developing Actinic Cheilitis includes:

- Protection of the face against sun exposure by wearing a broad rim hat
- Regular application of an effective sunscreen (SPF 30)
- Avoid being outside when the sun is at its hottest

Rodrigues, M.S., Kaefer, E.O., Sganzerla, J.T., Gassen, H.T., Dos Santos, R.B. & Miguens-Jr, S.A. 2020.

Background: Actinic Cheilitis (AC) is a pathological condition of the labial mucosa considered potentially malignant. The aim of this study was to investigate the effect of treatment of AC with daily use of a vitamin-based barrier cream.

Material and methods: For this clinical study, 36 participants with lower-lip AC were recruited from three oral medicine services. At baseline, participants were evaluated by clinical examination and clinical severity of AC was classified as grade I to IV. All participants were dispensed a tube of a barrier cream containing vitamins A, D, E and ZnO to apply once nightly for 90 consecutive days. Monthly follow-up was performed to

reclassify AC clinial severity. The primary outcome of interest was clinical remission of AC at 90-day follow-up compared to baseline.
Results: Progressive remission of AC lesions was observed as early as the first month and throughout the assessment period (p = 0.000). The 3-month period was insufficient for remission of lesions, especially among male participants (p = 0.002) and with a longer sun exposure in years (p = 0.007).
Conclusions: Daily use of the vitamin-based barrier cream had a promissing positive impact on the severity of actinic cheilitis. However, a 90-day course of treatment was not sufficient to achieve lesions remission. The findings of this study suggest a promising new avenue for the treatment of lower-lip AC.
Key words: Actinic cheilitis, vitamins, retinoids, vitamin D, therapeutics.

Assessment and Treatment of Actinic Cheilitis
When skin changes are noticed on the lower lip or other areas of the body, one should visit a dermatologist for assessment and treatment. This may involve:

- Clinical assessment
- Biopsy
- Electrosurgery
- Cryotherapy
- Application of medication to the affected area.

Lai, M., Pampena, R., Cornacchia, L., Pellacani, G., Peris, K. & Longo, C. 2020.
Background: No large studies have defined the best treatment of actinic cheilitis.
Methods: We conducted a systematic review to define the best therapies for actinic cheilitis in clinical response and recurrences.
Results: We first identified 444 papers, and 49 were finally considered, including 789 patients and 843 treated areas. The following therapies were recorded in order of frequency: laser therapy, photodynamic therapy (PDT), 3% diclofenac in 2.5% hyaluronic acid, PDT + 5% imiquimod, aminolevulinic acid-laser or methyl-aminolevulinic acid-laser, 5% imiquimod, fluorouracil, partial surgery, 0.015% ingenol mebutate, 50% trichloroacetic acid, and laser + PDT. Concerning the primary outcome, complete clinical response was achieved in 76.5% of patients, and 10.2% had clinical recurrences. Partial surgery and laser therapy showed the highest complete response rates (14 of 14 [100%] and 244 of 260 [93.8%], respectively) with low recurrences. Only a limited number of patients were treated with other therapies, with the exception of PDT, with 68.9% complete responses and 12.6% of recurrences. Interestingly, when combined with 5% imiquimod, the efficacy of PDT was significantly enhanced.
Limitations: Heterogeneity across studies.
Conclusion: Laser therapy appears the best option among nonsurgical approaches for actinic cheilitis, and PDT showed higher efficacy when sequentially combined with 5% imiquimod. Larger studies are needed to confirm these data.

Trager, M.H., Farmer, K., Ulrich, C., Basset-Seguin, N., Herms, F., Geskin, L.J., Bouaziz, J.D., Lebbé, C., de Masson, A., Bagot, M. & Dobos, G. 2020.
"Actinic cheilitis is a pre-malignant condition that can progress to squamous cell carcinoma with a higher propensity for metastasis than cutaneous squamous cell carcinoma. Optimal treatment for actinic cheilitis has not been established and evidence-based estimates of clinical cure in the dermatology literature are limited. Here, we review and synthesize outcome data published for patients with actinic cheilitis after treatment with various modalities. A systematic review was conducted in Medline, Embase, and the Cochrane library for English, French, and German-language studies and references of included articles from inception to January 20th , 2020. Studies were included if they reported on at least 6 patients with biopsy

proven actinic cheilitis. After quality appraisal, results of studies with the strongest methodology criteria were synthesized. 18 studies of 411 patients (published 1985 to 2016) were included. The majority of the studies were case series. Carbon dioxide laser ablation and vermilionectomy were associated with the most favorable outcomes with fewest recurrences. Chemical peel and photodynamic therapy were associated with higher recurrence. Adverse effects generally resolved in the weeks following treatment and cosmetic outcomes were favorable overall. In conclusion, there is a lack of high-quality comparative studies evaluating different treatment options for actinic cheilitis. The included publications used various outcome measures, however the majority reported on the recently defined core outcome sets. These results suggest that both carbon dioxide laser ablation and vermilionectomy are effective treatments for actinic cheilitis. Prospective head-to-head studies are needed to compare these treatment modalities and to assess patient preferences."

Andreadis, D., Pavlou, A., Vakirlis, E., Anagnostou, E., Vrani, F., Poulopoulos, A., Kolokotronis, A., Ioannidis, D. & Sotiriou, E. 2020.
"Early identification and adequate treatment of actinic cheilitis (AC), which affects the lower lip vermillion and is considered a precursor of squamous cell carcinoma, is mandatory. Photodynamic therapy (PDT) has been successfully used in AC. PDT with the use of daylight (DLPDT) is equally effective and more convenient than the conventional PDT. Data on short and long-term efficacy of DLPDT in AC are limited. Our primary purpose was to assess efficacy of DLPDT in AC as well as safety and tolerance. Twenty-two individuals with histologically confirmed AC received 2 MAL (5-aminolevulinic acid)-DLPDT sessions 1 week apart. Patients were evaluated clinically 3, 6, and 12 months after treatment. Non-complete responders were biopsied and excluded from the study if histological alterations were indicative of AC. Adverse events were recorded from baseline to the end of the 12-month follow-up period. Twenty patients completed the study. Overall, complete clinical response 12 months after treatment was 80% (16/20), while an association between treatment response and grade of dysplasia was observed ($p = 0.016$). With respect to response by grade, complete clinical response achieved in grade I AC was 100% (12/12) and 50% (4/8) in grade II AC. Main adverse events included mild erythema, oedema, and scaling, with no pain associated with DLPDT. According to our results, DLPDT seems to be of significant benefit for the treatment of grade I AC. Combination with the other treatment modalities could improve the efficacy in grade II AC. Further studies are needed for the assessment of late recurrences."

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Sources and References Consulted and/or Utilised

Actinic Cheilitis
https://www.patienthelp.org/diseases-conditions/actinic-cheilitis.html

Actinic Cheilitis Picture
https://www.healthline.com/health/actinic-cheilitis#pictures

Andreadis, D., Pavlou, A., Vakirlis, E., Anagnostou, E., Vrani, F., Poulopoulos, A., Kolokotronis, A., Ioannidis, D. & Sotiriou, E. 2020. Daylight photodynamic therapy for the management of actinic cheilitis. Arch Dermatol Res. 2020 Dec;312(10):731-737.

Canadian Centre for Occupational Health and Safety
https://www.ccohs.ca/oshanswers/phys_agents/ultravioletradiation.html

DermNet NZ
http://www.dermnetnz.org/site-age-specific/solar-cheilitis.html

Emadi, S.E., Suleh, A., Babamahmoodi, F., Ahangarkani, F., Betty Chelimo, V., Mutai, B., Raeeskarami, S.R. Ghanadan, A. & Emadi, S.N. 2017. Common malignant cutaneous conditions among albinos in Kenya. *Med J Islam Repub Iran*. 2017 Jan 11:31:3. doi 10.18869/mjiri.31.3. eCollection 2017.

EMF & RF Solutions
http://www.emfrf.com/electromagnetic-spectrum-or-frequency-spectrum/

Lai, M., Pampena, R., Cornacchia, L., Pellacani, G., Peris, K. & Longo, C. 2020. Treatments of actinic cheilitis: a systematic review of the literature. *J Am Acad Dermatol*. 2020 Sep;83(3):876-887.

Levi, A., Hodak, E., Enk, C.D., Snast, I., Slodownik, D. & Lapidoth, M. 2019. Daylight photodynamic therapy for the treatment of actinic cheilitis. Photodermatol Phtoimmunol Photomed. 2019 Jan;35(1):11-16. doi: 10.1111/phpp.12415. Epub 2018 Aug 15.

Medical News Today
https://www.medicalnewstoday.com/articles/319133.php

Mello, F.W., Melo, G., Modolo, F. & Rivero, E.R. 2019. Actinic cheilitis and lip squamous cell carcinoma: literature review and new data from Brazil. *J Clin Exp Dent*. 2019 Jan 1;11(1):e62-e69. doi: 10.4317/jced.55133. eCollection 2019 Jan.

Moreira, P., Assaf, A.V., Cortellazzi, K.L., Takahama Junior, A. & Azevedo, R.S. 2020. Social and behavioural associated factors of actinic cheilitis in rural workers. *Oral Dis*. 2020 Aug 13.

Muse, M.E. & Crane, J.S. 2020. Actinic Cheilitis. ***In***: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan. 2020 Aug 8.

Muthukrishnan, A. & Bijai Kumar, L. 2017. Actinic Cheilosis: early intervention prevents malignant transformation. *BMJ Case Rep*. 2017 Mar 20:2017. pii: bcr2016218654. doi: 10.1136/bcr-2016-218654.

Radakovic, S. & Tanew A. 2017. 5-aminolaevulinic acid patch-photodynamic therapy in the treatment of actinic cheilitis. *Photodermatol Photoimmunol Photomed*. 2017. Nov: 33(6):306-310. doi: 10.1111/phpp. 12332. Epub 2017 Aug 29.

Rodríguez-Blanco, I., Flórez, Á., Paredes-Suárez, C., Rodríguez-Lojo, R., González-Vilas, D., Ramírez-Santos, A., Paradela, S., Suárez Conde, I. & Pereiro-Ferreirós, M. 2018. Actinic Cheilitis Prevalence and Risk Factors: A Cross-sectional, Multicentre Study in a Population Aged 45 Years and Over in North-west Spain. Acta Derm Venereol. 2018 Nov 5;98(10):970-974. doi: 10.2340/00015555-3014.

Rodrigues, M.S., Kaefer, E.O., Sganzerla, J.T., Gassen, H.T., Dos Santos, R.B. & Miguens-Jr, S.A. 2020. Evaluation of effect of a vitamin-based barrier cream on the clinical severity of actinic cheilitis: A preliminary study. *J Clin Exp Dent*. 2020 Oct 1;12(10):e944-e950.

Science Learning Hub
https://www.sciencelearn.org.nz/resources/1304-positive-and-negative-effects-of-uv

Scottish Sensory Centre
http://www.ssc.education.ed.ac.uk/BSL/physics/ultravioletradd.html

Study.com
http://study.com/academy/lesson/what-is-uv-radiation-definition-types-effects.html

The Dermatologist
http://www.the-dermatologist.com/content/actinic-cheilitis-treatment-ablative-laser-vermilionectomy

Trager, M.H., Farmer, K., Ulrich, C., Basset-Seguin, N., Herms, F., Geskin, L.J., Bouaziz, J.D., Lebbé, C., de Masson, A., Bagot, M. & Dobos, G. 2020. Actinic cheilitis: a systematic review of treatment options. *J Eur Acad Dermatol Venereol.* 2020 Nov 30.

Varela-Centelles, P., Seoane-Romero, J., García-Pola, M.J., Leira-Feijoo, Y. & Seoane-Romero, J.M. 2020. Therapeutic approaches for actinic cheilitis: therapeutic efficacy and malignant transformation after treatment. *Int J Oral Maxillofac Surg*. 2020 Oct;49(10):1343-1350.