

Non-Ablative Fractional Laser (NAFL)

Treatment May Help to Reduce Skin Cancer Risk.

Recent advances in non-ablative fractional laser (NAFL) therapies, particularly those utilizing 1927nm and 1550nm wavelengths, have garnered attention not only for their cosmetic benefits but also for their potential role in skin cancer prevention. These laser modalities stimulate collagen remodeling, promote cellular turnover, and enhance the skin's intrinsic repair mechanisms. Such biological effects may strengthen the skin's defenses against ultraviolet (UV) damage—a primary etiological factor in the development of keratinocyte carcinomas, including basal cell carcinoma (BCC) and squamous cell carcinoma (SCC). A growing body of scientific evidence suggests that NAFL treatments could contribute to lowering the incidence of new skin cancers, especially in high-risk populations with extensive actinic damage or prior skin cancer history.



Benson et al. (2023) conducted a retrospective study involving 43 patients with a history of facial keratinocyte carcinoma (KC). Their findings indicated that patients treated with NAFL experienced a 50% reduction in the rate of subsequent facial KC (20.9% vs. 40.4%). Moreover, the development of new KC was delayed in these patients. The proposed mechanism involves microscopic thermal injuries induced by the laser, which stimulate collagen production and cellular repair, possibly mediated through regulation of insulin-like growth factor 1 (IGF-1), thereby enhancing skin resilience to UV-induced carcinogenesis.

Frommeyer et al. (2021) explored the relationship between UV damage, impaired IGF-1 signaling, and skin cancer risk. Their review highlighted that NAFL therapies promote skin rejuvenation, restore IGF-1 signaling pathways, and improve DNA repair capacity within keratinocytes. These effects collectively contribute to a reduction in carcinogenic potential by bolstering the skin's natural defense mechanisms against UV-related genetic mutations.

Omland et al. (2021) examined the effects of laser immunotherapy on skin integrity and premalignant lesions. Their study demonstrated that NAFL treatments improved the structural integrity of photodamaged skin and significantly reduced actinic keratoses, which are key precursors to SCC. The treatment stimulates collagen remodeling and enhances cellular turnover, especially in elderly or heavily sun-damaged skin, where natural repair mechanisms are compromised. The mechanism involves increased fibroblast activity and an improved immune response, which together contribute to decreased carcinogenic potential.

Wenande et al. (2025) provided insights into how fractional laser therapies improve skin barrier function and promote regeneration of healthy skin. Their review emphasizes that controlled micro-injuries caused by non-ablative lasers activate repair pathways, thereby reducing actinic damage and the burden of precancerous lesions. These effects may limit the initiation and progression of skin cancers by preventing the accumulation of UV-induced mutations.

Wong et al. (2023) investigated the impact of NAFL treatments on actinic keratoses and immune surveillance. Their findings indicate that such therapies not only reduce the number and severity of actinic keratoses but also support immune mechanisms that detect and eliminate early malignant cells. This dual action is particularly beneficial for high-risk groups, including the elderly and individuals with extensive sun damage, by decreasing the likelihood of malignant transformation.

CONCLUSION:

Collectively, these studies provide compelling evidence that NAFL treatments may play a role in skin cancer prevention. By stimulating collagen production, promoting cellular turnover, restoring immune function, and reducing premalignant lesions, these therapies may help fortify the skin's defenses against UV-induced carcinogenesis. While promising, it is important to note that the specific Cynosure Lutronic products—such as Ultra 1927nm and Mosaic 3D 1550nm—were not directly evaluated in these studies. Nonetheless, the biological mechanisms and clinical outcomes reported support the potential of NAFL treatments as a dual-purpose approach for both cosmetic improvement and long-term skin health preservation.



REFERENCES

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The specific Cynosure Lutronic products, such as Ultra 1927nm and Mosaic 3D 1550nm, were not directly studied in these referenced articles. Further research is needed to confirm their efficacy in skin cancer prevention.

Intended for distribution in US and Canada.

The Ultra laser is indicated for the following: US: Intended for use in dermatological procedures requiring the coagulation of soft tissue, treatment of actinic keratosis, treatment of benign pigmented lesions, lentigos (age spots), solar lentigos (sun spots), ephelides, (freckles). Canada: Actinic keratosis (FST I-III), macular seborrheic keratoses (FST I-III), melasma (FST II-IV), skin rejuvenation (FST I-IV), and post-inflammatory hyperpigmentation (FST IV).

The Mosaic 3D laser is indicated for the following: US: Intended for use in dermatological procedures requiring the coagulation of soft tissue, as well as for skin resurfacing procedures. Canada: Intended for use in dermatological procedures requiring the coagulation of soft tissue, as well as for skin resurfacing procedures. Indications for use include wrinkles, skin rejuvenation, acne, and various scars.

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