

## A short note on role of sunscreen in skin cancer prevention.

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### Introduction

Skin cancer is a global health concern that continues to affect millions of people each year. Exposure to ultraviolet (UV) radiation from the sun is a major risk factor for the development of skin cancer. As the incidence of skin cancer rises, it becomes increasingly important to understand and implement effective preventive measures. One such measure, which plays a pivotal role in skin cancer prevention, is the use of sunscreen. In this article, we will explore the significance of sunscreen in protecting the skin from harmful UV rays and reducing the risk of skin cancer.

Before delving into the role of sunscreen, it's crucial to comprehend the nature of UV radiation. The sun emits different types of UV rays, namely UVA, UVB, and UVC. UVC is mostly absorbed by the Earth's atmosphere and doesn't pose a significant threat. However, both UVA and UVB rays can penetrate the atmosphere and affect the skin [1].

UVA rays are responsible for premature aging and are linked to the formation of wrinkles and age spots. On the other hand, UVB rays are the primary cause of sunburn and play a major role in the development of skin cancer. Prolonged and unprotected exposure to these UV rays can lead to irreversible damage to the skin cells, making the use of sunscreen a crucial preventive measure [2].

Sunscreen acts as a protective barrier against UV radiation by absorbing, reflecting, or scattering the harmful rays. The two main types of active ingredients in sunscreens are organic (chemical) and inorganic (physical) filters. Organic filters, such as avobenzone and octocrylene, absorb UV radiation and transform it into harmless heat, while inorganic filters, such as zinc oxide and titanium dioxide, create a physical barrier that reflects and scatters UV rays [3].

Broad-spectrum sunscreens are designed to protect against both UVA and UVB rays, offering comprehensive defense against the entire spectrum of harmful radiation. SPF (Sun Protection Factor) is a numerical measure used to indicate the level of protection a sunscreen provides against UVB rays. The higher the SPF, the greater the protection.

The link between UV exposure and skin cancer is well-established. Skin cancer is primarily divided into three types: basal cell carcinoma, squamous cell carcinoma, and melanoma. While basal and squamous cell carcinomas are more common and have a relatively low metastatic potential,

melanoma is a more aggressive form of skin cancer with a higher risk of spreading to other parts of the body [4].

UV radiation is a known carcinogen, and chronic exposure can lead to the accumulation of DNA damage in skin cells, increasing the risk of mutations and the development of cancer. Sunscreen plays a crucial role in preventing these harmful effects by providing a shield against the damaging effects of UV radiation [5].

### Importance of sunscreen in skin cancer prevention

**Preventing UV-induced DNA damage:** Sunscreen acts as a frontline defense, preventing UV rays from penetrating the skin and causing DNA damage. By minimizing DNA damage, sunscreen reduces the risk of mutations that could lead to the development of cancerous cells.

**Reducing the incidence of melanoma:** Melanoma, the most deadly form of skin cancer, is strongly associated with intense and intermittent sun exposure. Sunscreen, especially when used consistently, has been shown to decrease the incidence of melanoma. This is particularly crucial given the rising rates of melanoma in many parts of the world [6].

**Protection against premature aging:** In addition to its role in preventing skin cancer, sunscreen is effective in preventing premature aging caused by UVA rays. Wrinkles, fine lines, and age spots are often the result of prolonged exposure to UVA radiation, which can be mitigated by the regular use of sunscreen.

**Combating sunburns:** Sunburn is not only painful but also a clear sign of skin damage. Sunscreen helps prevent sunburn by blocking and absorbing UVB rays, providing immediate relief and long-term protection against the harmful effects of overexposure [7].

**Encouraging sun-safe behaviour:** The use of sunscreen promotes sun-safe behavior by encouraging individuals to be mindful of sun exposure. By incorporating sunscreen into their daily skincare routine, people are more likely to take additional precautions, such as seeking shade, wearing protective clothing, and avoiding peak sun hours.

**Protecting vulnerable populations:** Certain populations, such as individuals with fair skin, a history of sunburns, or a family history of skin cancer, are more susceptible to the harmful effects of UV radiation. Sunscreen becomes an essential tool in protecting these vulnerable individuals and

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reducing their overall risk of developing skin cancer [8].

While sunscreen is an invaluable tool in skin cancer prevention, its effectiveness relies on proper usage and adherence to recommended guidelines. Challenges such as inadequate application, inconsistent reapplication, and the misunderstanding of SPF values can compromise the efficacy of sunscreen. Additionally, some individuals may experience skin irritation or allergies to certain sunscreen ingredients, emphasizing the need for diverse sunscreen options to accommodate various skin types [9].

Moreover, the environmental impact of certain sunscreen ingredients has raised concerns. For example, oxybenzone and octinoxate, common chemical filters, have been linked to coral reef damage. As a response, there has been a push for the development and use of reef-safe sunscreens, which are formulated without these harmful chemicals. Educating the public about proper sunscreen application, choosing suitable products, and being aware of environmental considerations is essential in maximizing the benefits of sunscreen while minimizing potential drawbacks [10].

## Conclusion

The role of sunscreen in skin cancer prevention cannot be overstated. As a simple yet powerful tool, sunscreen provides a protective shield against the harmful effects of UV radiation, reducing the risk of skin cancer and premature aging. Its significance goes beyond personal skincare; it contributes to the overall public health goal of reducing the incidence of skin cancer, especially in regions where sun exposure is high. To harness the full potential of sunscreen, it is imperative to promote awareness, educate the public on proper usage, and address environmental concerns associated with certain sunscreen ingredients. By integrating sunscreen into daily skincare routines and adopting sun-safe behaviors, individuals can take a proactive approach to safeguarding their skin and reducing the burden of skin cancer on a global scale. As we continue to navigate the challenges posed by skin cancer, sunscreen emerges as a beacon of prevention, empowering individuals to enjoy the benefits of sunlight while minimizing the risks associated with prolonged UV exposure.

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