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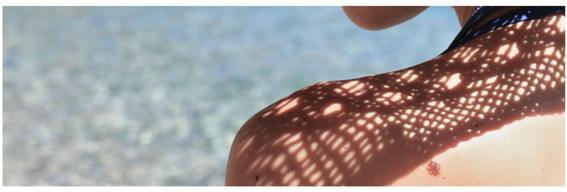
PRO

Long-term application of sunscreen could decrease risk of melanoma

PHOTOPROTECTION | BASIC

Melanoma is the least common but the most deadly skin cancer, accounting for only about 1% of all cases, but the vast majority of skin cancer death. In 2017, it is estimated that there will be 87,110 new cases of melanoma in the United States and 9,730 deaths from the disease. The United States has experienced a dramatic increase in the number of melanoma cases over the past few decades. The incidence of melanoma has increased 15 times in the last 40 years. This is a more rapid increase than for any other cancer.[1]



It **represents 104 000 new cases per year in Europe** and **22 000 deaths per year.**[2]

Advanced melanoma is the **fastest growing malignancy in men** and the **second-fastest growing in women.**[2]

Melanoma comprises **only 4% of all skin cancers** but is responsible for **80% of skin-cancer related deaths.**[2]

At a time, when most cancer incidences are falling, **the incidence of Melanoma is increasing at a rate of 3 to 7%** in many European countries.[2]

Exposure to UV radiation is the only established modifiable cause of melanoma.[3,4]

The cumulative annual exposure dose of UV varies widely among individuals in a given population, depending to outdoor activities but also by the exposure to artificial sources of UV.3 It is the cumulative annual exposure dose of solar UV and a history of multiple sunburns which predict the risk of melanoma. Sun exposure during childhood rather than adulthood appears most critical in its pathogenesis.[4]

The five world regions with the greatest incidence rates of melanoma are Australasia, North America, Western Europe, Central Europe, and Eastern Europe, with New Zealand, Australia, Norway, Sweden and the Netherlands as the five highest age-standardized incidence rates.[1]

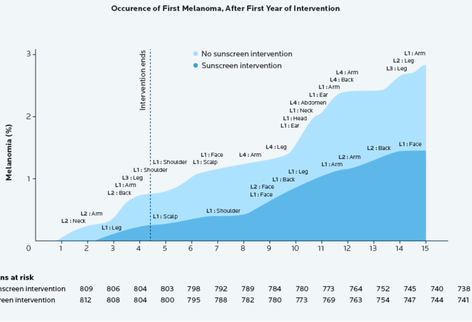
Multiple reasons explain this disproportionate burden of melanoma :

- **Predominantly fair-skinned population;**
- **Living with high ambient UVR levels;**
- **High-risk phenotype (fair skin, hair, and eye color)**
- **Family history of melanoma;**
- **Cultural emphasis on tanning.**[5]

Some sex differences in melanoma incidence and mortality are documented. Men tend to have worse sun protection behaviors and reduced skin screening, as well as tumor biologic differences.[6] According to a study conducted in 23 countries, even if 88% of skin cancers are linked to a lack of protection during sun exposure and 81% to the regular use of tanning beds, only 11 % have their moles checked by a dermatologist once a year and only 33 % self check their moles each year.[7]

Could sunscreens prevent melanoma ?

A unique randomized trial of sunscreen application with 10-year aftermath have given evidence of the long-term efficacy of sunscreen in reducing melanoma incidence. The long-term follow-up of 1621 participants, showed that, among adults age 25 to 75 years, regular application of sunscreen in a 5-year period appeared to reduce the incidence of new primary melanomas for up to 10 years after trial cessation. A protective effect was also evident for invasive melanoma, which showed a 73% decrease in those randomly assigned to daily sunscreen after approximately 15 years of follow-up.[8]



Persons at risk

No sunscreen intervention	809	806	804	803	798	792	789	784	780	773	764	752	745	740	738
Sunscreen intervention	812	808	804	800	795	788	782	780	773	769	763	754	747	744	741

Figure : Occurrence of first primary melanoma by level of invasion and anatomic site in the two sunscreen treatment groups.

There was no evidence to suggest that the observed difference could be explained by a difference in sun exposure in the intervention group relative to the control group, because outdoor behavior was similar during and after the trial. The apparent decrease in melanoma across all body sites, not only prescribed application sites, likely reflected the ongoing tendency of more participants in the daily than the discretionary sunscreen group to apply sunscreen regularly to the trunk and lower limbs. Intensity of application also tended to be higher in the intervention group.[8]

Given the importance of early-life sun exposure in the genesis of melanoma, a long-term sunscreen intervention among children and adolescents may yield even greater benefits in cancer prevention than did this intervention in adults.[8]

Regular application of sunscreen not only concerns people who live in sunny climates like Australia's with high levels of ambient sun exposure, they also have implications for white people living in temperate climates in North America and Europe who are at increased risk of melanoma because of increased UV exposure caused by the predilection for holidays in sunny places.[8]

The American Academy of Dermatology recommends taking the following steps to prevent melanoma and inform patients about sun exposure :[9]

- Seek shade when appropriate; avoid exposure under sun between 11 a.m. and 4 p.m.
- Wear protective clothing, such as a long-sleeved shirt, pants (dark colors and tightly woven clothing protect better), a wide-brimmed hat (that protect the scalp, forehead and nape of the neck) and sunglasses, when possible.
- Protect with sunscreen adapted to the skin type and sun exposure conditions and respect the use instructions. Reapply frequently, at least every two hours or after activities.
- Use extra caution near water, snow and sand as they reflect the damaging rays of the sun, which can increase chances of sunburn.
- Get vitamin D safely through a healthy diet that may include vitamin supplements todon't seek the sun.
- Avoid tanning beds. Ultraviolet light from the sun and tanning beds can cause skin cancer and wrinkling. Better to use a self-tanning product with sunscreen.
- Check anything changing on the skin every year and see a dermatologist.

What's to be done in practice ?

The landscape of melanoma, the most deadly skin cancer, has changed dramatically in the 21st century. Prevention, including increased public education and awareness, early detection, genetic testing, and substantial improvements in advanced melanoma therapies are examples of recent progress. Regular sunscreen use prevents cutaneous squamous cell carcinoma long term, but the need for more effective prevention is recognized around the world as climbing incidence and high mortality in white populations persist.[3]

Only 46% of people who almost always used sunscreen are sunburned compared with only 31% of those who rarely used sunscreen. Those findings can be explained by the poor estimated amount of sunscreen applied (from 0.55 mg/cm² to 1.0 mg/cm²) when the recommended dose is 2 mg/cm².[10]

Educational campaigns that specifically recommend daily sunscreen application to target incidental exposures might significantly contribute to the improvement of sun protection behavior, with continual advice needed to promote maintenance of the behavior. Encouraging a daily sunscreen application strategy is a highly effective and achievable method of ensuring protection during unintentional sun exposure.[10]

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