

SAFETY MEMO

May 3rd, 2021 – UV Exposure



Did you know?

Introduction

Exposure to ultraviolet (UV) radiation is a hazard faced by all. There are several sources of UV radiation. The most common and well known is the sun, but other sources can include: bactericidal lamps, black light lamps, plasma torches, counterfeit currency detectors, UV nail curing lamps, and dental polymerizing equipment. UV exposure can lead to skin cancer, as well as several other health conditions.

What is UV Exposure?

In scientific terms, UV radiation is electromagnetic radiation just like visible light, radar signals, and radio broadcast signals, however UV rays can ionize (remove an electron from) an atom or molecule. When skin is exposed to UV radiation, this ionizing action creates 'free radicals' (ionised oxygen molecules) inside our bodies which then go on to damage the DNA inside our cells. Most of the time, our cell's self destruct mechanism kicks in and the cell dies (sun burn and skin peeling) however if the self destruct instruction within the cell's DNA is damaged, the cell could go on to replicate and become cancer. Although the risk of this occurring in any given instance is small, over time and given enough opportunity, the likelihood increases.

Danger of UV Exposure from the Sun

The ozone layer filters out a large portion of the UV radiation from the sun. The degree of UV exposure is not constant, but varies with the seasons and time of day. UV exposure peaks with the summer solstice (June 20, 2020).

In summer afternoons when the sun is directly overhead, the UV takes the most direct path through the ozone layer and is at the highest risk to people. In the mornings and evenings (and throughout winter in Canada), the angle of the sun causes the UV rays to have a higher angle of incidence and travel through much more of the ozone layer. This increased travel length causes more UV ray filtering, reducing the risk of skin damage.

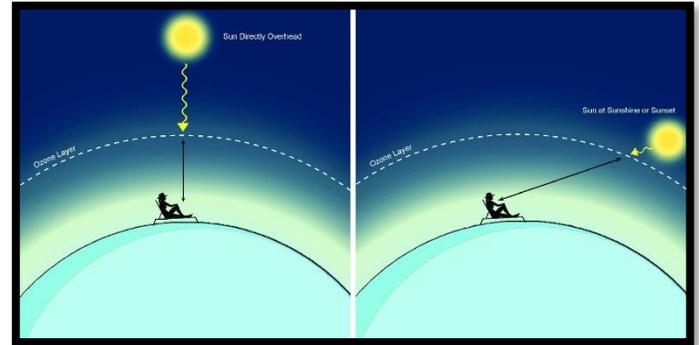


Figure 1: UV Ray Travel Distance Mid-day vs. Evening

Weather Effects

Air temperature does not effect UV radiation. However sweat accumulation can cause wash away sunscreen leaving skin exposed.

Surfaces can reflect UV radiation and add to the overall UV level. Sand and sea foam reflect between 15%-25% of UV radiation, and fresh snow can almost double UV exposure.

UV levels are highest under cloudless skies, and cloud cover generally reduces a person's exposure. However, light or thin clouds have little effect and may enhance UV levels due to scattering.

UV Index

Many weather reports include a UV Index which ranges from 0 (very low) to 14 (extreme), but values higher than 10 are very rare in Canada.

Recommendations

- Implement simple protective measures when work tasks create exposure to UV rays from the sun. This can include; wearing clothing that covers the skin or using sunscreen and a hat. Limit direct exposure to the sun and seek shade when possible.

