

## UV Radiation & You

The sun gives off many different types of radiation. As well as visible light or sunlight, there is invisible radiation. One type of invisible radiation is infra-red radiation, which can be felt on the skin as radiant heat. The other variety is ultraviolet (UV) radiation. UV radiation does not warm—we can neither see nor feel it—but it causes both sunburn and skin cancer. It also causes the skin to age prematurely and to become leathery, roughened and blotchy. Exposure to UV radiation over long periods can also damage the eyes. It can cause cataracts which, if untreated, leads to blindness.

### The A B C of UV Radiation

UV radiation is made up of three components: UVA, UVB and UVC. The harmful effects of UVB and UVC have been known for some time (no UVC from the sun reaches the earth's surface, it is all absorbed by the ozone layer). UVA was thought to be relatively harmless, however current evidence now shows that UVA not only contributes to skin damage but also increases the risk of skin cancer. Remember UV radiation is present in the sun's rays throughout the year in varying amounts depending on the season and is not related to temperature.

### Factors that affect UV radiation include the following:

- **Sun elevation:** The higher the sun in the sky, the more intense the UV radiation. The UV radiation levels are highest around solar noon and in summer.
- **Time of the year:** In Canberra, UV radiation levels can be as much as 10 times higher in summer than in winter. In Australia for example, sunburn can occur in as little as 15 minutes on a fine January day. UV levels reach **3 and above** in Canberra for part of **or** most of each day between August and May and sun protection will therefore be recommended during this period.
  - **Time of the day:** The danger period for UV radiation is known as the "Peak UV Period". Canberrans are reminded to take particular care between 10am and 2pm when outdoors, this includes minimising outdoor activities and events as much as possible between 11am to 3pm during the daylight daylight saving period. At least 60% of the day's UV radiation reaches the earth between these times; these are the hours when you'll burn fastest.
  - **Latitude:** The closer to equatorial regions, the higher the UV radiation levels will be.
  - **Cloud cover:** Solar UV radiation can penetrate through light cloud cover, and on lightly overcast days the UV radiation intensity can be similar to that of a cloud-free day. Heavy cloud will reduce the intensity of UV radiation. Random clouds have a variable effect on UV radiation levels, which rise and fall as clouds pass in front of the sun.
  - **Temperature:** Temperature does not affect UV radiation levels. Temperature is due to the sun's infra-red rays heating up the Earth and is not related to the amount of UV radiation present. Maximum daily temperatures are usually in the late afternoon; UV radiation, however, peaks when the sun is overhead - about midday (1pm during daylight saving time). Typically, more people get sunburnt when the temperature is between 18-27 degrees than when it is in the 30's, this is usually because they don't think about sun protection during the cooler temperatures.
- **Altitude:** The risks are much greater high up on a mountain slope than at sea level, because the thinner atmosphere at high altitude filters out much less of the UV radiation. At an altitude of around 2,000 metres (ie. Mt Perisher) the amount of UV radiation can be as much as 30% higher than at sea level.
- **Ozone:** Ozone absorbs some of the UV radiation (all of UVC, most of UVB and some of UV A) that would otherwise reach the Earth's surface. It's important to note that the decrease in ozone levels and the seasonal 'hole' in the ozone layer haven't yet been linked to high rates of skin cancer.
- **Ground reflection:** Grass and soil reflect less than 10% of UV radiation that shines on them; fresh snow reflects as much as 90%; dry beach sand about 15% and sea foam about 25%.

## **Scattered UV radiation**

Some UV radiation comes directly from the sun; but much of it is scattered about the sky and reaches you indirectly. In general you receive as much scattered UV radiation from the sky as you receive directly from the sun. If you are under shade and can see blue sky, you are still exposed to UV radiation.

You'll get more UV radiation if you're out in the open, where there are few buildings or other objects to block out parts of the sky—on the beach or boating, for example. In these locations, you're exposed to scattered UV radiation from the whole sky, as well as to the UV radiation reflected from sand or water. Because of the scattered and reflected UV radiation, a beach umbrella (for example) can only offer partial protection from solar UVR.

## **UV radiation from other sources**

Solariums advertise 'safe tanning' encouraging you to tan indoors and avoid sunburn and skin cancer. However, recent research suggests that UV radiation from solariums is a contributing cause of skin cancer including melanoma. Cancer Council ACT strongly recommends that people do not add to their UV radiation exposure by using solariums. In 2009 The International Agency for Research on Cancer (IARC) moved UV emitting tanning beds to its highest cancer risk category (1) and labeled them as 'carcinogenic to humans' after ruling they are more dangerous than previously suggested

If your occupation involves you being exposed to UV radiation either from the sun or from artificial sources, you might talk to your Occupational Health and Safety Officer or equivalent about what safety measures are in place.

Possible sources of artificial UV radiation include: electric and plasma arc welding and cutting tools; gas or vapour pressure discharge lamps used in lighting, curing paint, inks and other materials; bacterial and fungicidal cabinets and lamps; molten metal presses (only those that operate around 2220 °C or more).

## **Does UV radiation come through glass?**

Ordinary car window glass filters out about 97% of the UVB radiation and only about 37% of UVA radiation. It is approximately equivalent to a good sunscreen, which means that if you're sitting in the sun during a long trip you could still get burnt from the amount of radiation coming through the glass. Laminated windscreens block all of the UVB radiation and about 80% of the UVA radiation.

## **UV radiation and medicines**

A number of drugs, medicines and ointments can make you much more susceptible to sunburn and skin damage from UV radiation. These include some antibiotics, drugs for high blood pressure (antihypertensives), psoralens, some antidepressants, some drugs used to suppress the immune system (for example, in a kidney transplant), and nonsteroidal anti-inflammatory drugs. There are many others. Ask your doctor about any medicines prescribed for you if you're likely to be in a high UV radiation environment. If you're taking medicine which makes you more susceptible to UV radiation, take extra care to protect yourself.

## **Is sun protection recommended during winter in the ACT region?**

Our bodies require small amounts of exposure to ultraviolet radiation in sunlight to maintain adequate levels of vitamin D. During the months of June and July in Canberra, the levels of ultraviolet radiation are very low (under 3)— even in the middle of the day. For this reason, Cancer Council ACT does not generally recommend the use of hats or sunscreen during this period.

People who may need to continue sun protection in the winter months include those people with highly sun-sensitive skin; or have a history of skin cancer, and outdoor workers or those travelling into Alpine regions or North.