

Occupational Cancer Risk Series

Solar Ultraviolet Radiation (UVR)



There may be hazards where you work that increase your risk of developing cancer. This factsheet discusses occupational hazards related to solar ultraviolet radiation (UVR) or sun exposure.

Key messages

- Solar UVR is a known human carcinogen.
- Overexposure to solar UVR increases your risk of developing skin cancer.
- Each year in Australia, about 200 melanomas and 34 000 non-melanomas are caused by being exposed to solar UVR at work.
- To eliminate or reduce exposure to solar UVR, use the recommended controls.
- Refer to Safe Work Australia's [Guide on Exposure to Solar Ultraviolet Radiation \(UVR\)](#)

Solar UVR and cancer

Solar UVR is invisible energy produced by the sun. It's made up of three wavelengths, UVA, UVB and UVC. Both UVA and UVB can reach the earth's surface and are carcinogens. This means they cause cancer. Every time we overexpose our skin to radiation from the sun, some of our skin cells are damaged and we increase our risk of developing skin cancer. A sunburn or a tan is a sign of skin being damaged by solar UVR. All skin types can be damaged, but fairer skin is at increased risk. Solar UVR has also been linked with cancer of the eye, cataracts (clouding on the lens of the eye) and pterygium (a growth on the white of the eye).

Your cancer risk from solar UVR varies depending upon these environmental factors:

- **Solar elevation** – when the sun is higher in the sky there will be higher levels of solar UVR.
- **Ozone** – ozone thickness changes daily. When the ozone layer is thicker, less UVB reaches earth.
- **Cloud cover** – solar UVR can pass through light clouds so solar UVR levels on cloudy days may be similar to those on a cloud free day.
- **Ground surface reflectivity** – highly reflective surfaces can increase surrounding levels of solar UVR. These include concrete, snow, glass, water and polished metals.
- **Altitude** – higher altitude means higher solar UVR.
- **Proximity to the equator** – the closer you are to the equator, the higher solar UVR is generally.

Over 1.2 million Australian workers are exposed to solar UVR at levels 5-10 times more than indoor workers. If you are exposed to solar UVR at work you are at greater risk of developing skin cancer.

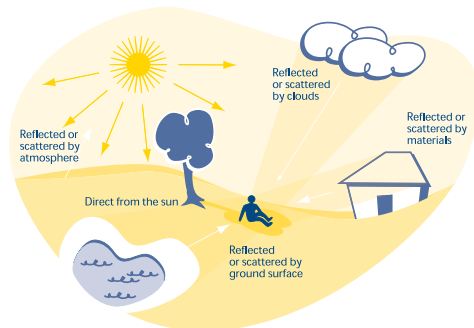
The UV index

The UV index describes the strength of solar UVR. The higher the number, the stronger the solar UVR and the faster unprotected skin will be damaged. If you work outside all the time, you should always use protective clothing including hats, sunglasses and sunscreen regardless of UV Index. If you work outside occasionally, then you should use protection when the UV is 3 and above. A UV forecast for many locations is available from www.MyUV.com.au.

What you need to know about solar UVR

Temperature is NOT related to solar UVR strength and our skin can be damaged without us knowing as we cannot feel UVR. There are two types of solar UVR; direct UVR which arrives directly from the sun, and diffuse UVR which is scattered by the atmosphere and reflective surfaces. Remember that

Figure 1. Direct and diffuse solar UVR



solar UVR can still damage the skin in the winter, so sun protection is required whenever the UV Index is 3 or higher or when you are outside for long periods near highly reflective surfaces, e.g. snow or water.

For vitamin D concerns please see [Cancer Council Australia's position statement](#).

Effective workplace controls

Where there is solar UVR, the employer must ensure a protection plan is in place. Safe Work Australia's [Guide on Exposure to Solar Ultraviolet Radiation \(UVR\)](#) and the Australian Radiation Protection and Nuclear Safety Agency's (ARPANSA) [Occupational Exposure to Ultraviolet Radiation](#), outline how you can manage employees' exposure to solar UVR.

A summary of recommended controls is outlined in Table 1 (a combination of controls should be used). If control measures are not used, outdoor workers are at increased risk of developing skin cancer.

Solar Ultraviolet Radiation (UVR)

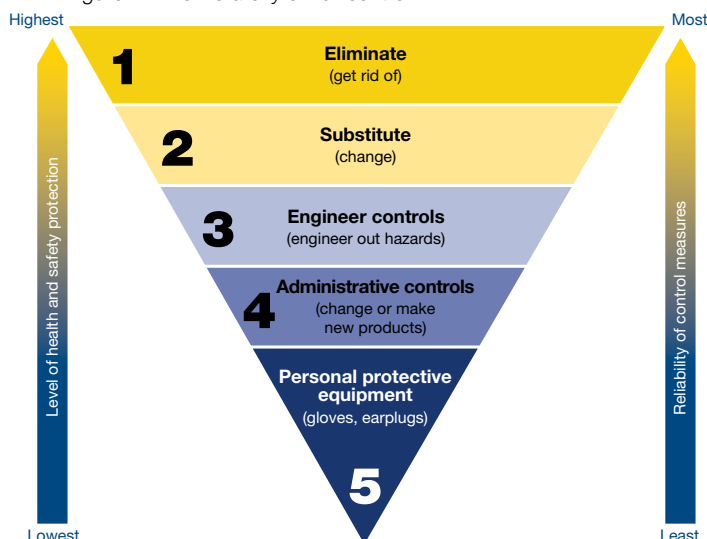
Workers must also:

- take reasonable care of their own health and safety
- not negatively affect the health and safety of other people; and
- follow any reasonable instruction and workplace health and safety policies, of which they have been notified.

For information regarding the laws or regulations in your state or territory, please use the links on the landing page under 'useful resources'.

Workplaces should **eliminate or reduce** exposure to identified hazards using the hierarchy of control (Figure 2) and implement a [risk management process](#). Workers should always be involved in detecting hazards and control measures that suit the workplace. Training workers on workplace hazards and policies is also a work health and safety requirement.

Figure 2. The hierarchy of risk control



A sun protection policy should also be developed, to explain how and why solar UVR needs to be managed. A sample policy is available in Safe Work Australia's [Guide on Exposure to Solar Ultraviolet Radiation \(UVR\)](#).

A SunSmart workplace checklist, does your workplace have:

- a periodic risk assessment using the hierarchy of risk control
- sun protection control measures
- sun protection policies
- training for employees to work safely in the sun
- SunSmart workers as role models.

For any concerns related to control measures at your workplace or for more information, contact:

- your workplace supervisor or management (if you are an employee)
- your workplace health and safety representative or union representative
- [state and territory work health and safety regulators](#)
- [Safe Work Australia](#).

Table 1. Summary of controls for solar UVR exposure

ACTIVITY	CONTROL
Shade	Where possible shade should be provided, including canopies and screens. If it is not possible to work in a shaded area, shade should be provided during breaks. Due to indirect solar UVR, shade should not be the only control.
Reflective surfaces	Where possible change or avoid reflective surfaces. Soft or rough surfaces reflect less UVR and are safer than hard or smooth surfaces. Painting surfaces a less reflective colour (dark colours) also helps to reduce reflective UVR.
Window tinting	Tinted car windows help to reduce the amount of solar UVR entering a vehicle.
Rotate work	Rotate jobs between workers if some activities can be done in shaded areas. Plan to complete outdoor jobs early in the morning or later in the afternoon when solar UVR levels are lower.
Personal Protective Equipment (PPE)	Sun protective work clothing includes long sleeved shirt with a collar and long pants. Cotton, polyester and linen is best, as they are lightweight; allow sweat to evaporate and when tightly woven can protect against 95% of UVR. Broad-brimmed hats should be provided. The brim should be at least 7.5cm (6cm for bucket hats). Legionnaire hats are also suitable. Baseball caps do not provide good sun protection. The UPF of the fabric for clothes and hats should be as high as possible (50+). Close fitting, wrap-around sunglasses with a lens category of at least two should be used. Sunscreen should have an SPF of 30 or higher. It should be broad spectrum ie. it will filter both UVA and UVB radiation) and water-resistant. It should be applied 20 minutes before going out into the sun and re-application should occur at least every two hours (one teaspoon per limb). No sunscreen offers 100% protection; it should be used in combination with other PPE. A SPF 30 lip balm should also be used.
SunSmart UV alert	Encourage workers to use the UV alert via their smartphones or display the alert in a common area.
Skin checks	All workers should be encouraged and provided with information on why and how to check their skin. A self-examination guide is available on myUV.com.au . High-risk workers should see their doctor every 12 months.

How do I detect cancer early and reduce my risk?

Contact your doctor if anything on your skin: has changed size, shape or colour; itches or bleeds; looks different to other spots around it; has not healed within three weeks; or was not there before. To find out what you can do to create a workplace that aims to reduce cancer risk, contact Cancer Council 13 11 20 or visit [www.cancer.org.au](#).

Sunscreen, hats and sunglasses bought for sun protection at work are tax deductible. For more information, visit the [Australian Taxation Office website](#).