



# Protecting workers from solar UV radiation

January 2018



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# 1.0

## What is this guide about?

Workers may be exposed to harmful ultraviolet (UV) radiation from the sun, particularly while working outdoors. This exposure may increase the chance of developing serious health conditions, such as skin cancer.

Where there is a risk to health and safety from sun exposure during work, a person conducting a business or undertaking (PCBU) must ensure that this risk is managed appropriately. The risk of sun exposure cannot be fully eliminated. Therefore, it must be minimised, so far as is reasonably practicable, by establishing effective controls.

This quick guide provides information for PCBUs on how to identify and assess the health risk from solar UV radiation, and if so, how to effectively manage and monitor this risk.

Note: Workers can also be exposed to UV radiation through artificial sources, such as UV lamps and arc welding. This guide primarily looks at how UV radiation from the sun can be managed.

### Key concepts in this quick guide

#### What and who is a PCBU?

A 'PCBU' refers to a person conducting a business or undertaking. A PCBU can be an individual person such as a self-employed farmer, or a builder, or an organisation (eg a company).

#### Who is a worker?

A worker is an individual who carries out work in any capacity for a PCBU. A worker can be an employee, a contractor, or an employee of a contractor.

#### The difference between a PCBU and a worker

There is a clear difference between a PCBU and a worker when the PCBU is an organisation. However, when an individual is a PCBU (ie self-employed) the difference may be less clear. When a person is self-employed, and decides how their work is done, and creates and controls risks, they are considered a PCBU. However, if a self-employed person is working for another PCBU and that PCBU decides what they do, and how and when they do it, then they are considered to be a worker of that PCBU.

#### What does reasonably practicable mean?

Health and safety duties need to be managed so far as is reasonably practicable. Reasonably practicable means doing what is reasonable in your circumstances to ensure health and safety (eg what a reasonable person in your position would be expected to know and do). You first do what is reasonable to eliminate the risk. If the risk can't be eliminated, then you must minimise it.

## How do you decide what is reasonably practicable in your circumstances?

When thinking about what 'so far as is reasonably practicable' means, ask the following questions:

### 1. How likely is the hazard or risk?

The more likely a risk is to occur, the more you should do to eliminate or minimise the risk.

### 2. How severe is the harm that might result?

The greater the potential harm, the greater the action required. The problem with hazards such as UV radiation is that the serious harm may appear after a long period of time. This does not mean the health risks from sun exposure are any less serious, and should still be managed accordingly.

### 3. What do you know, or ought reasonably to know, about the hazard or risk and the ways of eliminating or minimising it?

You are expected to find out if there are any ways (control measures) to eliminate or minimise the risk. Identifying hazards and doing risk assessments with input from workers, other PCBUs in your workplace and health and safety representatives, and looking at health and safety records and processes of other businesses, will help inform your decisions.

### 4. What is the availability of the control measures, and how suitable are they for the specific risk?

How a risk is eliminated or minimised will depend on the situation, type of work, work environment etc. This is where you will need to ask for worker input and then apply judgement to determine the most effective actions to take.

### 5. Finally, what are the costs of the control measure and is the cost grossly disproportionate to the risk?

After assessing the answers to questions 1-4, consider the costs associated with the ways to eliminate or minimise risks including whether they are grossly disproportionate to the risk.

See our [Reasonably practicable](#) fact sheet for more information

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# 2.0

## Your duty of care

### Who is responsible?

As a PCBU, you have a primary duty to ensure your workers are not put at risk by the work they do. If you have identified UV radiation exposure as a potential health hazard for your workers, it is your responsibility to manage the risks arising from this hazard. You must take steps to eliminate and minimise the risk, so far as reasonably practicable. This may include providing protective equipment, and encouraging or providing health checks.

You should engage with your workers when identifying the risks in your workplace, and when determining appropriate control measures.

Workers and other persons in the workplace also have a duty to take reasonable care to keep themselves, and others, safe while working.

#### HEALTH AND SAFETY AT WORK ACT (HSWA) 2015

##### PCBUs must (so far as is reasonably practicable):

- ensure the health and safety of your workers
- provide and maintain a work environment without health and safety risks
- provide and maintain suitable facilities for the welfare of workers carrying out the work (and provide access to those facilities)
- provide information, training, instruction or supervision necessary to protect your workers from health and safety risks, and
- monitor the health of workers, and work conditions, to prevent injury or illness to workers from the work they do.

##### Workers must:

- take care of their own health and safety
- comply with any reasonable instructions given by the PCBU, and
- co-operate with any reasonable workplace health and safety policies or procedures that the PCBU has notified them of.

### Involving workers

You must involve your workers and their representatives in work health and safety. You have two duties:

- to engage with your workers on health and safety matters that may directly affect them, so far as is reasonably practicable
- to have practices that give your workers reasonable opportunities to participate effectively in improving health and safety on an ongoing basis (these are known as worker participation practices).

A healthy and safe workplace is more easily achieved when everyone involved in the work communicates with each other to identify hazards and risks, talks about any health and safety concerns and works together to find solutions. Seek the views of your workers and their representatives as you work out how to deal with your work risks.

For further information about worker engagement and participation, go to WorkSafe's website: [www.worksafe.govt.nz](http://www.worksafe.govt.nz)

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# 3.0

## Solar UV radiation as a hazard

### What is solar UV radiation?

Ultraviolet (UV) radiation is a type of radiation that is given off by the sun and some artificial sources. This radiation can damage the genetic material (DNA) of skin cells, causing harm to a person. UV radiation cannot be seen or felt; therefore workers may be exposed to harmful radiation without knowing.

There are three types of UV rays:

- UVA - ages skin cells, causes DNA damage and some skin cancers
- UVB - damages skin cells, causes sunburn and most skin cancers
- UVC - does not pass through our atmosphere; does not usually cause skin cancer.

### How can solar UV radiation harm workers?

Over-exposure to UV radiation is a serious health risk for workers, particularly those who regularly work outdoors. This is because they are exposed to UV radiation more frequently and for longer periods of time than people working indoors.

UV radiation can harm a worker in several ways:

#### SUNBURN

Sunburn is a type of radiation burn. The symptoms of sunburn show that the body is attempting to protect and repair damage to the skin. In some instances, it may take only 10 minutes of UV radiation exposure for a serious burn to occur. Symptoms of sunburn usually peak 8-12 hours after exposure. Symptoms can include:

- redness
- swelling
- pain
- blistering
- nausea
- fever
- chills.

#### SKIN CANCER

Skin cancer is the abnormal growth of skin cells. It is the most serious side effect of UV radiation exposure. If left untreated, skin cancer can spread throughout the body, which can be fatal.

Skin cancer occurs when the body is unable to repair the damage to the skin cell. The skin cells begin to grow in an abnormal way, and over time can become cancerous. The amount of UV radiation exposure needed to cause skin cancer is different for each person, but the likelihood of harm increases the more a person is exposed to the sun.

There are different types of skin cancer:

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### Basal cell carcinoma

- the most common skin cancer
- grows slowly over a longer period of time
- after months or years may spread to nearby tissue
- first appears as small, round or flattened lumps
- may be flat and red, or
- may be raised, skin coloured, red, or brown.



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### Squamous cell carcinoma

- less common but more dangerous than basal cell carcinoma
- grows quickly and may spread to nearby tissue and lymph nodes if left untreated
- appears as skin coloured rough lumps
- may bleed easily and turn into ulcers, and
- can look like a sore that doesn't heal.



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### Melanoma

- least common but most dangerous form of skin cancer
- can spread to internal organs and cause death if untreated
- starts as a new freckle or mole on the skin that changes colour, thickness or shape over time
- may develop from an existing brown spot, or develop in normal skin
- may appear on parts of the body that have not been exposed to the sun
- can vary in colour, ranging from dark brown to black, red, blue-black or a combination of colours
- usually has irregular outline or shape
- may look different to other spots (the odd one out).



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### Solar keratosis (sunspots)

- rough, dry and firm patches of skin
- not skin cancer but indicates chronic sun damage.



## EYE DAMAGE

Exposure to UV radiation can cause serious harm to the eyes which may result in permanent damage. Symptoms of eye damage from UV radiation can be painful and may impair vision; this can affect a worker's ability to work safely. Conditions include:

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### Photokeratitis and photoconjunctivitis

- pain, redness, swelling of the eye
- tears
- blurred vision
- a gritty feeling in the eye
- sensitivity to light
- headache.

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### Cataracts

- clouding of the eye
- blurred, clouded or dim vision
- sensitivity to light
- difficulty with vision at night
- seeing 'halos' around lights.

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### Pterygium and pinguecula

- tissue growth on eye surface
- redness and inflammation of the eye
- blurring/obscuring of vision
- a feeling of a foreign object in eye.

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### Eye cancer

- a lump in the eye or on the eyelid that is getting bigger
- seeing floating objects/spots/squiggly lines
- seeing flashes of light
- a dark patch in the eye
- partial or total vision loss.

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### Melanoma statistics

- Over 2000 people are reported to the New Zealand cancer registry with melanoma every year - that's around 6 every day.
- Melanoma causes nearly 80% of all skin cancer deaths.
- Over 300 New Zealanders die of melanoma every year.
- New Zealand has the highest melanoma incidence rate in the world.
- 70% of melanoma cases occur in people aged 50 years and older.
- Māori and Pacific people often have thicker, more serious melanomas, although they have a lower chance of developing melanoma.
- Death rates are higher for men.

Statistics sourced from the Ministry of Health and Health Promotion Agency  
[www.sunsmart.org.nz/skin-cancer/facts-and-figures](http://www.sunsmart.org.nz/skin-cancer/facts-and-figures)

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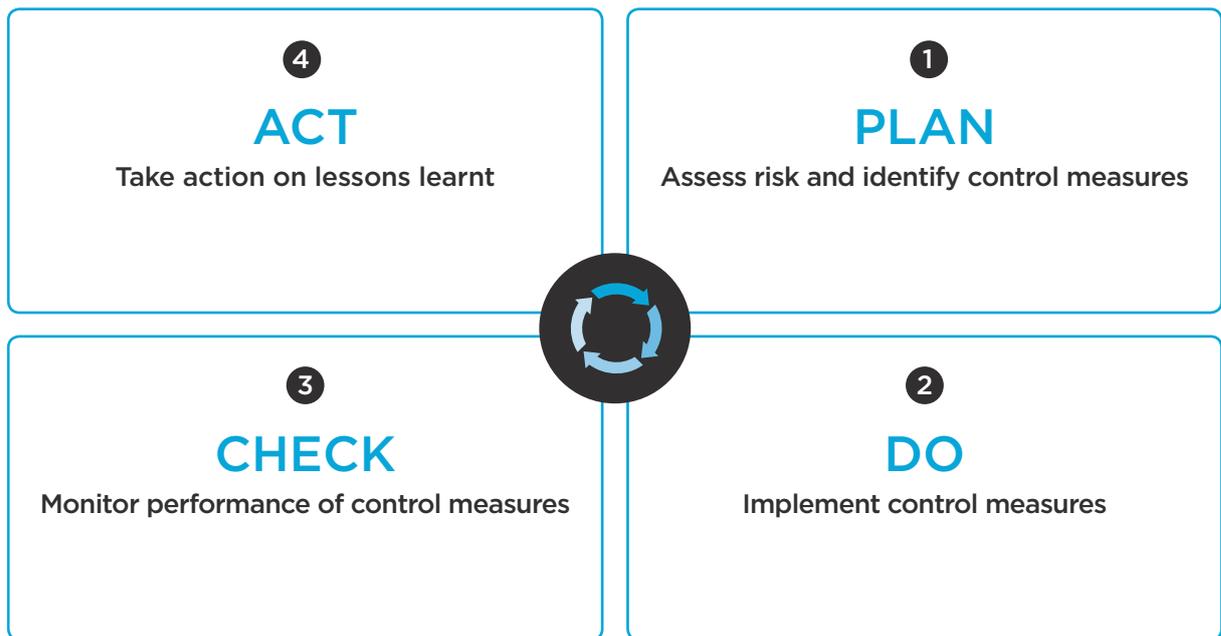
# 4.0

## How can I manage the risk?

### Plan-Do-Check-Act

You can manage the risk from UV radiation by following the Plan-Do-Check-Act approach outlined in Figure 1. Following the Plan-Do-Check-Act approach can help you to:

- **Plan:** assess if exposure to UV radiation is a hazard for your workers, and identify appropriate control measures
- **Do:** set up control measures that eliminate or minimise exposure
- **Check:** monitor how effectively your control measures are working
- **Act:** make changes to improve if necessary.



**FIGURE 1:** Plan-Do-Check-Act

# 5.0

## Assess the risk

When assessing the risk, consider the factors that may contribute to a worker's overall level of exposure to UV radiation. Consider the frequency and length of potential exposure alongside environmental factors which influence overall UV radiation risk.

The total amount of UV radiation that a worker may be exposed to when working outside depends on the factors described in Table 1.

<b>The time of day and time of year</b>	- sun height - earth-sun separation
<b>The weather conditions</b>	- cloud amount and type - pollution levels
<b>The geographical location of the work</b>	- ozone amount - altitude - latitude
<b>The surfaces at the work site</b>	- reflective surfaces
<b>The chemicals a worker is exposed to</b>	- photosensitising substances.

**TABLE 1:**  
Specific environmental factors that affect solar UV radiation risk

Involve your workers in the assessment process – they can help you to identify the situations or tasks that may expose them to UV radiation. You should also identify any factors which may increase a worker's sensitivity to UV radiation. This will help you to determine which workers are likely to be affected, and to choose appropriate control measures.

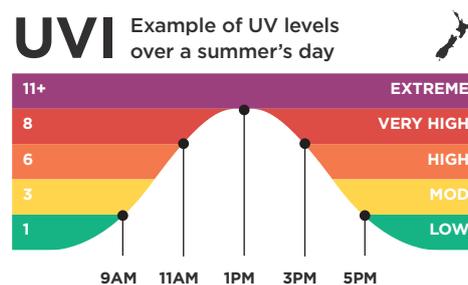
### Time of day and time of year

The height of the sun can affect the levels of UV radiation. When the sun is higher in the sky, UV radiation levels are generally higher. This is because the radiation passes through less of the atmosphere when at a higher angle. The height of the sun varies at different times of the year, as well as at different times of the day.

- The sun is highest around midday (high UV radiation).
- The sun is lower early morning and late evening (low UV radiation).
- During summer, the sun is higher in the sky than in winter.
- The earth is closest to the sun in the southern hemisphere during summer.

The UV Index (UVI) (Figure 2) provides a measurement of how strong the UV radiation is at a particular place on a particular day. The higher the number, the stronger the UV radiation intensity is. When the UVI is 3 or above it can be damaging to skin and eyes.

CATEGORIES	UV INDEX RANGE
Low	1-2
Moderate	3-5
High	6-7
Very High	8-10
Extreme	11 and above



**FIGURE 2:** UV levels over a summer's day

Knowing the daily UV levels in your area can help you and your workers decide which level of protection should be used. You should consider setting up a system where workers are aware of the day's UV levels.

For example, encouraging workers to check the alert on their phone or desktop at the start of each work day can help them to manage the risk.

There are different ways you can check the UV level in your area including:

- Sun Protection Alert
- National Institute of Water and Atmospheric Research (NIWA) forecast UV
- Phone apps such as *uv2Day* app or *UVLens* app (can be downloaded to your smartphone or mobile device)

Smartphone apps like *uv2Day* are a useful tool to determine the UV levels for the day. These apps show how the UV levels are expected to change over the day. They also give an estimate of how many minutes of sun exposure at any time can cause skin damage.

Providing workers with these tools can help them to:

- plan their day in advance to minimise UV exposure, and
- assess their personal risk of UV exposure at any time.

UV radiation levels can vary significantly across seasons, and throughout the day. Without a tool (such as *uv2Day*) that shows the levels of UV radiation, workers cannot tell what the UVI will be at any time or place.



**FIGURE 3:**  
Sun protection alert

## Weather conditions

UV radiation can vary depending on the weather conditions. UV levels are generally higher on a cloudless day. However, UV radiation is able to pass through cloud cover and can reach harmful levels even on a cloudy day. For short periods of time, UV levels can even be higher on a cloudy day than on a clear day.

- **Light cloud cover** may have similar UV radiation intensity to a cloud free day (high UV radiation).
- **Scattered cloud cover** may cause varied levels of UV radiation intensity (high UV radiation).
- **Heavy cloud cover** reduces the UV radiation intensity significantly (lower UV radiation).

## Geographical location

The intensity of UV radiation can vary at different geographical locations, depending on the latitude, altitude and ozone layer at the location.

- **Latitude:** UV radiation levels are higher in areas closer to the equator. This is because there is less overhead ozone, and the radiation from the sun has a shorter distance to travel through the atmosphere.
- **Altitude:** UV radiation levels are higher at higher altitudes. This is because there is less atmosphere available to absorb or scatter the UV radiation.
- **Ozone:** The ozone is an atmospheric gas that provides protection by absorbing UVB radiation. UV radiation levels are higher when the overhead ozone amount is lower.

## Photosensitising substances

Some substances can cause a person's skin or eyes to be abnormally sensitive to UV radiation. These substances are called photosensitisers.

A worker may come into contact with a photosensitiser by swallowing it (eg taking medication), breathing it in (eg inhaling chemicals), or through skin contact (eg touching plants).

Many medications are linked to photosensitivity. Workers should talk with a health professional about the medications they are using and how this may affect photosensitivity.

- Workers should check their medication for photosensitivity side effects, and talk to a doctor or pharmacist if they are not sure.
- You (a PCBU) should identify the photosensitising substances that your workers may come into contact with in their work.

MEDICATIONS	EXAMPLES
<b>Antibiotics</b>	<ul style="list-style-type: none"><li>- Tetracyclines</li><li>- Fluoroquinolones (eg ciprofloxacin)</li><li>- Sulfonamides</li></ul>
<b>Nonsteroidal anti-inflammatory drugs</b> (eg Nurofen® & Voltaren®)	<ul style="list-style-type: none"><li>- Ibuprofen</li><li>- Naproxen</li><li>- Ketoprofen</li><li>- Celecoxib</li></ul>
<b>Diuretics</b> (water pills)	<ul style="list-style-type: none"><li>- Frusemide</li><li>- Bumetanide</li><li>- Hydrochlorothiazide</li></ul>
<b>Retinoids</b> (skin creams)	<ul style="list-style-type: none"><li>- Isotretinoin</li><li>- Acitretin</li></ul>
<b>Hypoglycaemics</b> (diabetic medication)	<ul style="list-style-type: none"><li>- Sulfonylureas (eg glipizide, glyburide)</li></ul>
<b>Antipsychotics</b>	<ul style="list-style-type: none"><li>- Phenothiazines (eg chlorpromazine, fluphenazine)</li><li>- Thioxanthenes (eg chlorprothixene)</li></ul>
<b>PDT Pro-photosensitisers</b> (cancer treatment)	<ul style="list-style-type: none"><li>- 5-aminolevulinic acid</li><li>- Methyl-5-aminolevulinic acid</li><li>- Photofrin</li></ul>

<b>MEDICATIONS</b>	<b>EXAMPLES</b>
<b>Targeted therapies (cancer treatment, including chemotherapy)</b>	<ul style="list-style-type: none"> <li>- Vemurafenib (50%)</li> <li>- Dabrafenib</li> <li>- Imatinib</li> <li>- Vandetanib</li> <li>- Fluorouracil</li> </ul>
<b>Other drugs (heart medication, blood pressure medication, antifungal medication)</b>	<ul style="list-style-type: none"> <li>- Amiodarone</li> <li>- Hydroxychloroquine</li> <li>- Diltiazem</li> <li>- Enalapril</li> <li>- Quinine</li> <li>- Dapsone</li> <li>- Quinidine</li> <li>- Voriconazole</li> </ul>

**TABLE 2:**  
Examples of common medications that cause photosensitivity (Credit: DermNet New Zealand)

Table 3 describes common chemical and plant photosensitisers that workers may be exposed to, particularly in construction, manufacturing and agriculture work.

<b>COMMON CHEMICAL AND PLANT PHOTOSENSITISERS</b>	<b>EXAMPLES</b>
<b>Coal tar and related products</b>	<ul style="list-style-type: none"> <li>- anthracene</li> <li>- phenanthrene</li> <li>- creosote</li> <li>- pitch</li> </ul>
<b>Dyes</b>	<ul style="list-style-type: none"> <li>- acridine</li> <li>- fluorescein</li> <li>- erythrocin</li> <li>- rhodamine</li> <li>- bromofluorescein</li> <li>- methylene blue</li> <li>- rose bengal</li> <li>- eosine</li> </ul>
<b>Chlorinated hydrocarbons</b>	<ul style="list-style-type: none"> <li>- chlorobenzols</li> <li>- triphenyls</li> <li>- diphenyls</li> </ul>
<b>Plants</b>	<ul style="list-style-type: none"> <li>- bergamot</li> <li>- fennel</li> <li>- St John's Wort</li> <li>- chrysanthemum</li> <li>- bind weed</li> <li>- fig</li> <li>- dill</li> <li>- lime</li> <li>- buttercup</li> <li>- lemon</li> </ul>

**TABLE 3:**  
Common substances that cause photosensitivity through skin contact (Credit: SafeWork Australia)

## Reflective surfaces

When UV radiation is present, reflective surfaces can expose workers to that UV radiation, even while working in shade. Changing the colour or texture of a surface can reduce the amount of UV radiation that is reflected off it.

Surfaces that reflect more UV radiation usually are:

- lighter coloured surfaces (eg snow and white paint)
- hard or smooth surface (eg concrete).

Surfaces that reflect less UV radiation usually are:

- darker coloured (eg new asphalt)
- soft or rough surface (eg grasslands).

Table 4 describes the types of common surfaces and the level of UV radiation they reflect.

MATERIAL		LEVEL OF REFLECTED SOLAR UV RADIATION (%)
Asphalt	- New black roadway	5
	- Old grey roadway	10
Concrete	- Footpath	10-15
	- Road gravel	5
Asphalt	- Tar-sealed road	6
Grass	- Grasslands	1-2
	- Lawn	2-5
Fibreglass	- Fibreglass boat deck	10
Paint	- White house paint	20
Sand	- Wet beach sand	7
	- Dry beach sand	15 - 20
Soil	- Clay/humus	5
Water	- Open water	3
	- Open ocean	8
	- Sea surf/white foam	25 - 30
	- Snow old/new	50 - 80
Wood	- Wood boat deck	5 - 10
Metal	- Shiny corrugated iron	18

**TABLE 4:**  
Materials and the level of reflected UV radiation  
(Credit: SafeWork Australia, Dr Richard McKenzie (NIWA))

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# 6.0

## Choose effective control measures

If you have identified solar UV radiation as a hazard for your workers, you must ensure that the risk arising from the hazard is eliminated or minimised, so far as reasonably practicable. You must:

- implement control measures to eliminate the risk, so far as reasonably practicable
- implement control measures to effectively minimise the likelihood of the risk happening, so far as reasonably practicable.

We recommend you use the hierarchy of controls (table 5) to help you choose the most effective control measures.

If a risk can't be eliminated, it must be minimised. In some instances, you can do this by making simple changes, such as changing the time of day or location when and where a task is done. This is the preferred option, but where this is not practical, lower hierarchy controls, such as personal protective equipment should be provided.

You must give your workers opportunities to engage with you before you make decisions about the ways you will eliminate or minimise the risks.

### Hierarchy of Controls

ACTION	EXAMPLE OF CONTROL MEASURE	
<b>Elimination</b>		
<b>Minimisation</b>	Isolating/ preventing contact or exposure to risk	- Move outdoor work indoors.
	Imposing engineering control measures	- Install shade/ covers - Change reflective surfaces.
	Imposing administrative control measures	- Change work methods/procedures - Change work schedules around peak UV hours. - Educate workers on sun safety. - Establish a sun protection policy.
	Using personal protective equipment (PPE)	- Provide protection (eg sunscreen, protective clothing and eyewear). - Provide training on PPE use and ensure that it fits properly.

**TABLE 5:**  
Hierarchy of controls

Combine controls that minimise the risk. This is an effective way to reduce the amount of UV radiation exposure to workers.

## How can I eliminate exposure?

Eliminating the hazard is the most effective control measure and should always be the first option considered when reducing risk. Exposure to solar UV radiation is difficult to eliminate completely; a practical alternative is to minimise exposure by using multiple control measures.

## How can I minimise exposure?

Where it is not reasonably practicable to eliminate the risk, minimise the risk by putting in place control measures to reduce the overall level of exposure. A combination of higher and lower hierarchy controls that minimise the risk can be effective.

## Job organisation

If the job does not need to be done outdoors, reduce exposure to UV radiation by moving the job indoors. This isolates the risk of UV radiation, and can limit the level of exposure to a worker.

## Scheduling

Scheduling indoor tasks around the times of day when UV radiation levels are the most intense can help minimise the level of exposure to workers. Solar UV radiation levels are strongest during the middle of the day, so work routines should be planned around this. UVI levels are usually the lowest in the morning during daylight saving periods. In the New Zealand summer, the highest UVI levels occur between midday and 2:00 pm, depending on location.

Use the UVI to determine the level of UV radiation at any given time.

- Schedule outdoor tasks for the morning or late afternoon when UV radiation levels are well below harmful levels (UV Index 1-2).
- Schedule tasks that can be completed indoors or under cover between 10 am and 4 pm when UV radiation levels are high (UV Index 3-11+).
- Organise the work roster so workers rotate between indoor and outdoor tasks and aren't continually completing work that exposes them to solar UV radiation for prolonged periods of time or for multiple days in a row.

## Shade

Using the shade provided by natural or permanent structures is an effective and easy way to protect against the UV radiation. Where practicable, move jobs to make use of natural shade provided by trees and buildings; or set up portable structures like tents, canopies or screens where natural shade is not available. If it is not possible to work in a shaded area, make sure workers can access a shaded area in between work tasks or during breaks.

When using shade, make sure you assess the quality of the shade and how effective the coverage will be for your workers. Shade is best used in combination with other control measures.

## Glass

Glass provides some protection from solar UV radiation. Most types of glass used in New Zealand provide a level of protection similar to that of SPF10 sunscreen. The level of protection can vary between different types of glass, especially those with Ultraviolet Protection Factor (UPF) added.

When travelling in a vehicle, a worker may be exposed to solar UV radiation passing through the glass windows. Applying clear or tinted film to windows can significantly reduce the level of solar UV radiation a worker may be exposed to. The risk is higher if the windows are open.

The windows in office buildings have a high Ultra Protection Factor (UPF) which absorbs nearly all of the solar UV radiation that reaches it. This provides a strong level of protection for workers indoors.

## Training and Education

Provide education and training for workers. This can help establish effective sun safety practices in your workplace. When everyone is aware of the risks of UV radiation, it increases the importance of sun protection as a health and safety issue and makes it more likely that procedures will be followed. Training and education for workers should cover:

- the harmful health effects of sun exposure, including UV radiation
- the control measures in your workplace and how to effectively use them
- how to report back on the effectiveness of control measures and make suggestions
- sun safety myths
- how to check for skin cancer, and
- what to do if you find a change to your skin.

### Sun Safety Myths

Addressing sun safety myths is an important part in tackling any misleading information that both PCBUs and workers may have about sun safety.

**Myth 1: When you can't see or feel the sun, you are safe and can't get burnt.**

False - we can't see or feel UV radiation. Sunlight or warmth from the sun is not the same as UV radiation. The radiation from the sun does not provide light that we can see, or heat that we can feel, so your skin can burn even if it feels cool.

**Myth 2: Wearing PPE is an inconvenience and difficult to enforce with workers.**

False - wearing PPE or protective clothing can be an inconvenience if it is not the right fit for the job, however, choosing the right PPE and protective clothing for the job minimises inconvenience and discomfort.

**Myth 3: Sunscreen provides enough protection on its own.**

False - sunscreen is limited in the amount of protection it can provide. In order to be effective, sunscreen must be applied correctly over all exposed areas and must be reapplied regularly as it wears off (especially coming into contact with water).

**Myth 4: I haven't used sun protection before and it's too late now to start.**

False - sun damage adds up, meaning the more we are exposed, the greater the risk. It is never too late to start protecting skin and eyes against UV radiation.

**Myth 5: I have developed a gradual sun tan without burning so I am better protected from the sun.**

False - a sun tan is an indicator that the skin is trying to protect itself from UV radiation exposure. It does this by creating more pigment which provides a very small SPF. While the sun tan is present, it provides a very small amount of protection from future sunburn. However, the cell damage caused by this process can be enough to cause skin cancer.

Overall, the risk of being harmed in this process outweighs the small and short-lived benefit of the sun tan.

## Personal Protective Equipment

PPE is essential for a sun safety programme. As well as higher hierarchy controls, PPE should be considered when setting up control measures.

PPE must be chosen carefully to make sure it is effective and safe for the work conditions it is being used in. The design and use of PPE should meet the needs of workers, considering the level of protection needed and how comfortable and practical it is to use.

PPE can create a secondary hazard if it is not appropriate for the job. For example, workers may overheat if the material is too heavy, PPE equipment/clothing may get caught in machinery if it is too loose, and wide brimmed hats or dark glasses may limit vision.

PPE for UV radiation includes:

- protective clothing
- protective hats
- protective eyewear/sunglasses
- sunscreen and lip protection.



### BROAD SPECTRUM SUNSCREEN

Use broad-spectrum (protects from UVA and UVB radiation) and water resistant sunscreen.

Use alongside other controls (eg shade and clothing).

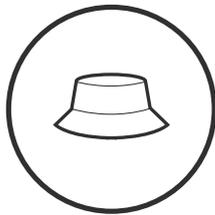
Use sun protection factor (SPF) of at least 50+ (this should comply with AS/NZS 2604:2012 Sunscreen Standard)

Be generous - apply about one teaspoon of sunscreen to each arm, leg, stomach, chest, face and back.

Apply 20 minutes before going outdoors.

Reapply every two hours.

Use sunscreen or lip balm with SPF (the higher the better) to protect lips.



### PROTECTIVE HATS

Choose close weave fabrics that have a high UV protective fabric (UPF) rating (as a rule of thumb, if you can see through the material, UV radiation from the sun can get through).

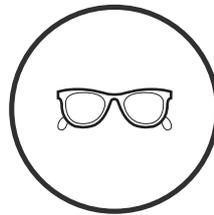
Choose broad-brimmed sun protective hats (minimum brim 7.5 cm) that cover the head, neck, face and ears.

Bucket hats should sit low on the head, have a deep crown and a brim of 6 cm.

Legionnaire hats should have a flap that covers the neck and connects with the peak to cover the side of the face.

Baseball caps do not protect the cheeks, chin, ears or neck.

Use hard hats with a wide brim or attachable flap added.



### PROTECTIVE EYEWEAR

Pick sunglasses with UV protection - fashion glasses are not sunglasses (this should comply with AS/NZS 1067.1:2016, AS/NZS 1336:2014 and AS/NZS 1337.1:2010).

Pick sunglasses suitable for the job - if your workers are driving, consider appropriate darkness/colour for the lenses.

Select specialist safety glasses if workers require additional protection from glare or flying objects, or if working with UV lamps or welding materials.

Make sure sunglasses are close fitting and wrap around the face.



### PROTECTIVE CLOTHING

Choose fabrics that are suitable for the job. The weave and colour of a fabric can affect how much protection is given.

Use lightweight and breathable fabrics in darker colours.

Where possible, use fabrics that have a UPF rating.

Choose a design that covers as much skin as practicable while balancing worker comfort and safety - advances in fabric technology have provided lightweight and easy to wear fabrics that provide UV protection.

**FIGURE 4:** Key points for choosing and using PPE

Workers should be taught how to apply and use PPE effectively and safely, and what to do if they think the PPE provided is not suitable for the job.

## PPE and heat illness

Heat stress is an additional hazard that must be considered, particularly when workers are protecting against UV radiation. The risk of heat illness is often increased when workers are only using lower hierarchy controls such as PPE to protect against UV radiation.

If a worker is wearing protective clothing that is a poor design or not fit for the conditions, it can increase the likelihood of heat illness occurring.

Heat stress is a significant hazard for outdoor workers on hot days. Heat illness can occur when workers are exposed to hot working conditions long enough to raise their core body temperature.

Heat illness includes a range of medical conditions including:

- heat rash
- heat cramp
- heat exhaustion
- heat stroke (sun stroke).

## Selecting control measures

UV radiation and heat are different hazards and create different risks for workers. It is important to select appropriate control measures to protect against UV radiation, while also managing the risk of heat illness occurring.

When selecting controls, you should balance a worker's need for protection from UV radiation, as well as comfort in the environmental conditions.

In some cases, control measures can be set up to manage the risks from UV radiation and heat illness at the same time. These include:

- schedule heavy outdoor tasks for cooler times of the day, also when UV radiation levels are lower.
- rotate workers' jobs between exposed outdoor work and indoor or shaded work.
- provide cooler, indoor or shaded areas for workers to take regular breaks
- provide shade for outdoor work.
- provide lightweight and breathable protective clothing.

# 7.0

## Monitor control measures

As part of the Plan-Do-Check-Act process, you must check the systems you have in place are working effectively. You should:

- monitor the performance of control measures.
- monitor the health of workers and exposure of workers to health risks.
- implement appropriate means for workers to report new hazards and risks and changes to existing ones.

### Checking worker health

Set up a system in your workplace where the skin and eye health of workers is monitored. This is a practical way to monitor how your control measures are working. A system that checks workers for the risks from sun exposure can include:

- encouraging workers to regularly check their own skin
- encouraging workers to get an abnormal mole, freckle or spot checked by their doctor
- encouraging or providing skin checks by a doctor/nurse trained in skin cancer detection, and
- reporting incidents of sun exposure and sunburn to a health and safety representative or management.

### Key points for monitoring worker health

<b>Educate workers</b>	<ul style="list-style-type: none"> <li>- Educate workers on the signs of skin cancer and how to detect these early.</li> <li>- Educate workers on how to correctly complete a self-assessment of their skin.</li> <li>- Educate workers on using controls effectively to prevent harm, such as use of PPE, and use of smartphone UVI apps.</li> </ul>
<b>Encourage worker reporting</b>	<ul style="list-style-type: none"> <li>- Encourage workers to report incidents of sunburn during work hours.</li> <li>- Provide a system where workers can notify you of incidents (and work conditions where UV radiation risks are high).</li> <li>- Encourage workers to report skin changes to their GP.</li> </ul>
<b>Make changes</b>	<ul style="list-style-type: none"> <li>- Use the information you have collected from workers and health professionals to make changes if necessary.</li> <li>- Re-evaluate your control measures.</li> </ul>
<b>Keep a record</b>	<ul style="list-style-type: none"> <li>- Keep a record of sunburn caused from sun exposure during work hours. This will help you to keep track of when, and how often, your workers have been exposed to potentially harmful UV radiation.</li> <li>- Organise a system where you can keep a record of information relating to worker health.</li> </ul>

**TABLE 6:**  
Monitoring  
worker health

## Self-assessment for workers

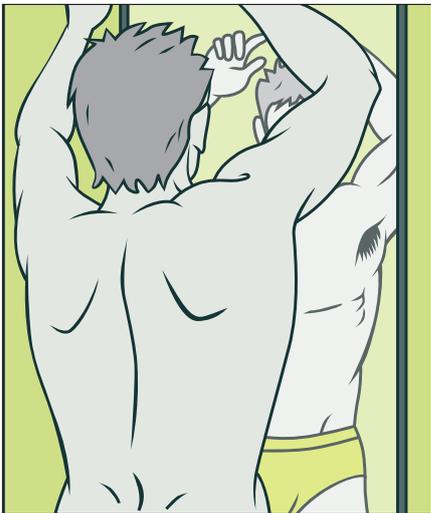
Self-assessment is the most effective way for workers to detect changes before they cause harm.

Teach workers how to check their skin correctly and what they should be looking for. Skin cancer can often appear in unlikely or hard to see places. The *ABCs of Melanoma Detection* tool is a quick and easy way for workers to recognise potentially harmful changes to their skin.

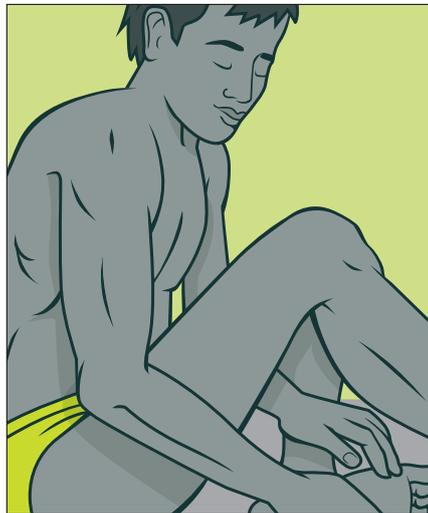
Encourage workers to complete a regular self-assessment.

## How to do a self-assessment

Examine your skin carefully. Look for new growths or existing moles or spots that have changed in size, shape, colour or texture. Pay attention to sores or spots that do not seem to heal and spots that look different to other nearby spots. Report any suspicious or different looking moles, spots or sores to your doctor.



1. Stand undressed in front of a mirror. Raise your arms and check your front and back, and left and right sides.



2. Make sure you check: fingers, hands, forearms, elbows, backs of upper arms, backs of legs, feet and toes.



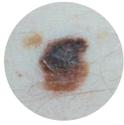
3. Use a hand-held mirror or ask an appropriate person to check hard to see places. This includes back and buttocks.



4. Use a hand-held mirror or ask an appropriate person (such as a hairdresser or barber) to check your head and neck. This includes: eyelids, ears and scalp.

## ABCs of Melanoma Detection

Moles and freckles can be checked against the A-B-C-D-E of Melanoma detection:



### **ASYMMETRY**

The shape and colour pattern of one half does not match the other.



### **BORDER IRREGULARITY**

The edges are ragged, uneven, blurred or irregular in outline.



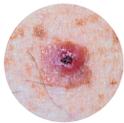
### **COLOUR VARIATION**

There are multiple colours in the one spot which may include brown, black, tan, red or grey.



### **DIFFERENT**

Appears different from other spots.



### **EVOLVING**

The mole or freckle is getting larger or changing.

**FIGURE 5:**  
Doing a self-assessment

Workers should be encouraged to seek medical advice if they notice a change to their skin (or eyes) and suspect that something is not right.

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# 8.0

## Take action to improve

Where monitoring indicates your control measures aren't working as effectively as they should be, take action to improve them. This includes:

- Take action on exposure and health monitoring results.
- Routinely review the effectiveness of control measures at scheduled periods.
- Review incidents where sun exposure has resulted in harm to workers.
- Talk to your workers to identify the situations or behaviours that may affect your controls.
- Use the results of your reviews and investigations into incidents to improve control measures.
- Seek expert advice from a health and safety professional.
- Access further information from WorkSafe at: [worksafe.govt.nz](https://www.worksafe.govt.nz) or call 0800 030 040.

# Appendices

## Appendix 1: Glossary

<b>Other persons at workplaces such as visitors</b>	<p>Examples of other persons at workplaces include workplace visitors, casual volunteers at workplaces and customers.</p> <p>Other persons have duties to take reasonable care for their own health and safety and to take reasonable care that they don't harm others at a workplace.</p> <p>They must comply, so far as is reasonably practicable, with any reasonable instruction about sun safety given by the PCBU so the PCBU can comply with the law.</p>
<b>Persons conducting a business or undertaking (PCBUs)</b>	<p>A PCBU is a 'person conducting a business or undertaking'. A PCBU may be an individual person or an organisation. This does not include workers or officers of PCBUs (to the extent they are solely workers or officers), volunteer associations (that do not have employees), or home occupiers that employ or engage a tradesperson to carry out residential work.</p> <p>A PCBU must ensure, so far as is reasonably practicable, the health and safety of workers, and that other persons are not put at risk by its work.</p> <p>PCBUs must first try to eliminate the likelihood of sun exposure, so far as is reasonably practicable. If they can't do this, they must minimise the risk putting in place control measures.</p> <p>PCBUs must provide information, training, instruction or supervision needed to protect all people from health and safety risks from the work being carried out.</p>
<b>Photosensitising substances/ photosensitiser</b>	<p>A substance (including medications) that may cause an individual to absorb more UV radiation, or make an individual more sensitive to UV radiation.</p>
<b>PPE</b>	<p>Personal protective equipment - equipment designed to protect workers from harm.</p>
<b>SPF</b>	<p>Sun protection factor - a measure of how long sunscreen protects the skin from ultraviolet radiation from the sun. For a worker wearing SPF(10) sunscreen, it will take 10 times as long for skin damage to occur.</p>
<b>UPF</b>	<p>Ultraviolet protection factor - a measure of the level of protection provided by a material, including clothing, fabrics and glass. Similar to SPF, UPF measures how much UV radiation penetrates the material and reaches the skin.</p>
<b>UV Index</b>	<p>UV Index or Ultraviolet Index (UVI) measures the intensity or strength of UV radiation in a particular location at any time. Protection is recommended when UVI levels are 3 or above.</p>
<b>UV radiation</b>	<p>Ultraviolet (UV), ultraviolet radiation (UVR), ultraviolet light (UV light) and ultraviolet rays (UV rays) all refer to the radiation given off from the sun at wavelengths less than 400nm.</p>
<b>Workers</b>	<p>A worker is an individual who carries out work in any capacity for a PCBU. A worker may be an employee, a contractor or sub-contractor, an employee of a contractor or sub-contractor, an employee of a labour hire company, an outworker (including a homeworker), an apprentice or a trainee, a person gaining work experience or on a work trial, or a volunteer worker. It also includes an individual PCBU that carries out work for the business or undertaking.</p> <p>Workers can be at any level (eg managers are workers too).</p> <p>Workers have duties to take reasonable care to keep themselves and others healthy and safe when carrying out work.</p> <p>Workers must co-operate with reasonable policies and procedures about sun safety the PCBU has in place that have been notified to them.</p> <p>Workers must comply, so far as is reasonably practicable, with any reasonable instruction about sun safety given by the PCBU so the PCBU can comply with the law.</p>

## Appendix 2: Sun protection policy

A sun protection policy is a written document that records how your workplace will manage the risk to workers of exposure to UV radiation. Create your own sun protection policy or use the template below:

### A sample workplace sun protection policy

\_\_\_\_\_ recognises that skin cancer is a major health risk for New Zealanders, including outdoor workers, who are often exposed to excessive levels of solar ultraviolet radiation.

Because UV radiation produced by the sun can cause skin cancer and damage to skin and eyes the company has established a sun protection policy that is implemented during peak UV radiation periods. Sun protection is recommended when the UV Index is 3 or above. The peak UV radiation periods are from September to April, especially between the hours of 10 am and 4 pm. Levels of UV radiation differ across New Zealand.

### Policy provisions and requirements

The organisation is required to:

- identify any practices that are barriers to achieving sun safety in the workplace
- involve employees and managers in the development and implementation of any new sun safety policy
- ensure there is a supervisor or manager responsible for the implementation of the policy at all levels of the organisation
- ensure UVI information (eg from smartphone apps like *uv2Day*) are available to outdoor workers.

Outdoor workers will be provided with and must wear:

- clothing that covers as much of the body as possible (long-sleeved shirts with collars, long trousers or knee-length shorts)
- clothing of a close weave to restrict sunlight penetration, which is lightweight and permeable to assist with the evaporation of sweat and where possible, has an Ultraviolet Protection Factor (UPF) of 50+.

Hats will:

- shade the head, face, neck and ears
- have a broad brim (minimum brim 7.5 cm), or minimum brim of 6 cm for bucket hats, and be of a close weave material
- use a brim attachment in the case of hard hats
- have a flap of fabric attached to the back of the hat or hard hat to protect the back of the neck.

Sunglasses will:

- fit closely and wrap around the face
- conform to standards AS/NZS 1067:2003 and AS/NZS 1337:1992 (safety glasses standard).

Sunscreen will:

- be broad-spectrum, water resistant and SPF 50+
- be stored below 30 degrees
- conform to standard AS/NZS 2604:2012.

Work periods will:

- be rotated so the same people are not exposed to the sun all the time
- involve varied work times so employees are not exposed to the sun for long periods during the highest risk times (from 10 am to 4 pm between the start of September and the end of April).

Shade will be:

- used as much as possible to reduce daily UVR exposure either by moving jobs indoors or to shady areas outdoors
- provided, where possible, in the form of fixed or portable shade structures.

Information and resources will be provided to ensure employees:

- have access to up-to-date information about skin cancer
- have access to UVI information (eg *uv2Day* app)
- understand the importance of being familiar with how their skin usually looks
- know how to examine their skin
- know what to look for
- know what to do if a suspicious spot, mole or freckle is noticed.

This information is available via leaflets and posters from the Cancer Society of New Zealand: [www.cancernz.org.nz](http://www.cancernz.org.nz) or contact your local Cancer Society office.

Workers will be expected to:

- co-operate with all measures introduced by management to minimise the risks associated with exposure to solar UV radiation
- comply with instructions and advice in regards to the use of sun protection control measures
- participate in any sun protection education programmes
- act as positive role models
- take all practicable steps to ensure their own safety when working in the sun.

Monitor and review:

This policy will be reviewed on a regular basis or at least every two years.

**Name**

**Position**

**Signature**

**Date Date of next policy review**

Adapted from the Cancer Society of New Zealand

### **Appendix 3: Where to find more information**

- Sun Protection Alert and skin cancer information from the Health Promotion Agency: [www.sunsmart.org.nz](http://www.sunsmart.org.nz)
- Skin cancer information from the Cancer Society of New Zealand (including SunSmart workplaces): [www.cancernz.org.nz](http://www.cancernz.org.nz)
- UV Index [www.niwa.co.nz/UV-forecasts](http://www.niwa.co.nz/UV-forecasts)
- UV and ozone information from NIWA: [www.niwa.co.nz/our-services/online-services/uv-ozone](http://www.niwa.co.nz/our-services/online-services/uv-ozone)
- Download the free *uv2Day* app [www.niwa.co.nz/node/111461](http://www.niwa.co.nz/node/111461)
- General information relating to the skin from DermNet New Zealand: [www.dermnetnz.org](http://www.dermnetnz.org)
- Melanoma information and resources: [www.melanoma.org.nz](http://www.melanoma.org.nz)



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