

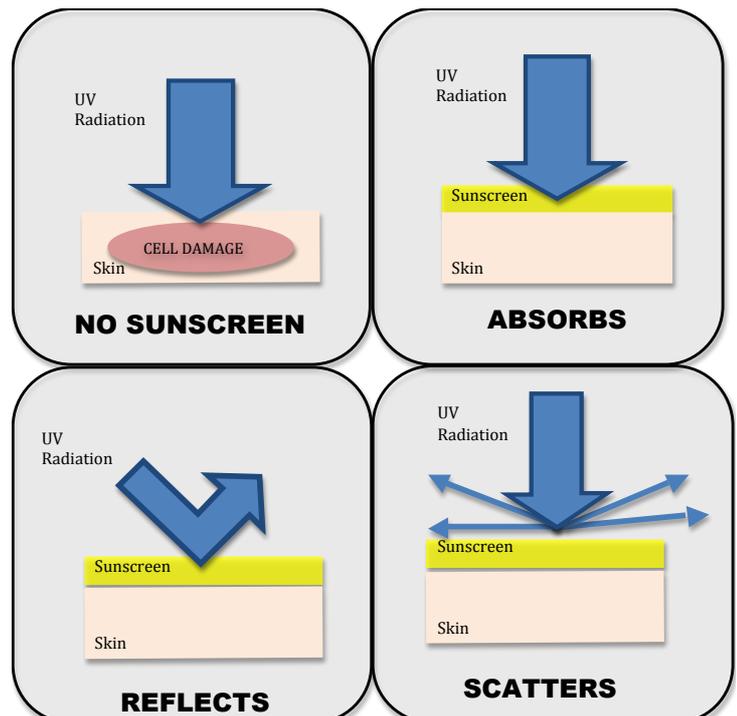
Lets Talk About...

SUNSCREEN

As skin cancer doctors we are always talking to patients about sunscreen. Why do we do this? What are the benefits? Are there any risks? Here are some answers to commonly asked questions about sunscreen.

How does sunscreen work?

Ultraviolet(UV) light from the sun is made up of UVA, UVB and UVC radiation. The UVC is filtered by the ozone layer and does not reach the surface of the Earth. UVA and UVB reaches the Earth and when it hits our skin it can penetrate and cause cell damage. UVB rays penetrate the skin less deeply than UVA due to its shorter wavelength. UVB radiation is primarily responsible for burning of the skin but UVA radiation causes burning, cell damage and skin cancer. Sunscreens temporarily prevent the UV radiation from penetrating into the skin and causing damage. They do this by either absorbing, reflecting or scattering the radiation. When a sunscreen is labelled with its SPF (Sun protection factor) number this only tells us how good it is at protecting our skin from UVB radiation (causes burning) and not about how well it protects against UVA (burning, cell damage and skin cancer) Recent Therapeutic Goods Agency (TGA) regulations have meant that sunscreens which advertise as "broad spectrum" must block to a wavelength of at least 370nm, which means that it protects against both UVA and UVB radiation. [1]



What kinds of sunscreen are available?

There are 2 main types of active ingredients in sunscreen which are either Organic or Inorganic UV filters. Organic filters mainly prevent skin damage by absorbing the UV radiation. Inorganic filters tend to be mineral compounds which can absorb, reflect or scatter the radiation. There are 33 UV filters currently approved for use in Australia including Organic compounds such as Octyl methoxycinnamate, P-aminobenzoic acid and Benzophenone. Inorganic filters are Zinc oxide and Titanium dioxide. Many sunscreens available today contain a combination of both types of UV filter. [1], [2]

What are the Benefits of Sunscreen?

1. Prevent Sunburn

Unfortunately many of us know how painful sunburn can be. Sunscreen is an important tool to help protect your skin from burning. The sun protection factor (SPF) number is an indication of how much protection a sunscreen offers when applied correctly. If skin with no sunscreen on would burn in 1 minute then a sunscreen which is rated as SPF 50 means that it would take 50 minutes for the same skin to burn. It is important to note that this relies on liberal application and it has been shown that we do not usually apply anywhere near enough sunscreen to meet these requirements! This means it is not recommended to use the SPF as a guide as to how long to stay out in the sun.

2. Reduce skin cancers

Sunscreen has been shown to reduce the incidence of Melanoma, Squamous Cell Carcinoma and Actinic Keratoses (or "Sunspots" - which can be a precursor to skin cancers). [4], [5] This was shown in the very large study in Nambour. See the section "is it effective?" for more information about this.

3. Reduce suppression of cellular immunity which can result from UV damage to the skin.

Essentially what this means is that damage to the skin from sun exposure will hinder the body's

natural ability to heal and protect itself from harmful organisms.

4. Reduce Premature Ageing.

Sunscreen use is considered to be the most effective way of preventing ageing by helping to maintain skin texture, reduce development of pimples and prevent development of visible small blood vessels as well as reducing pigmented areas such as freckling.

5. Reduce exacerbations of Photodermoses.

Photodermoses are skin eruptions which are brought on by UV light. These include Polymorphous light eruption (PMLE) which causes a very itchy rash and Actinic Prurigo and Xeroderma Pigmentosum. Other conditions can also be worsened due to UV light such as Lupus and Rosacea. [1], [3]



Is Sunscreen dangerous? What about nano-particles?



There has been some concern about whether the use of nano particles in sunscreen is harmful or not. Nano particles were used to try to make the inorganic UV filter sunscreens more acceptable to consumers. Titanium dioxide and Zinc oxide are effective and widely used sunscreens but originally the particles were larger making sunscreens thicker and opaque leaving a white chalky appearance on the skin. To make them invisible and lighter nanoparticles were used.[1] A number of studies reported that nano particles may be absorbed through the skin and into the body which generated some concern. However, these studies have failed to show any evidence that these nano particles cause damage to mammalian cells and therefore there is no evidence that they cause harm. [1]

As with all things there are sometimes side effects of sunscreen such as the possibility of allergic reactions to the ingredients, dermatitis, stinging of the eyes and effects on perspiration. [6] However the limitations of sunscreen are really to do with how we use them and IF we use them. People can be put off by the texture, colour, fragrance and the cost of sunscreens and if people do not like them, then they will NOT use them. The organic filters are mostly oil soluble and so they can feel greasy. Water resistant sunscreens (which are essential if coming into contact with water or if likely to be perspiring profusely) can feel quite sticky. The feel and usability of sunscreens does seem to be improving as time goes on and hopefully this will increase the number of people who use sunscreen every day.

The incorrect use of sunscreen is the major reason that it is not more effective at reducing skin cancers. This happens when people don't use it at all, don't reapply it as recommended. Because of the sense of security that people get from wearing sunscreen there can be a tendency to spend more time in the sun than they would have done or think that because they have sunscreen on it is OK to sunbathe. We should not rely on sunscreen as our sole defence against the damaging UV radiation and should continue to practice sun-safe behaviours such as seeking shade and covering up.

Is Sunscreen Effective?

The reason that we advocate the use of sunscreen is to reduce the risk of skin cancer which can be deadly or cause significant harm.

The main evidence we have for the use of sunscreen comes from a large trial in Nambour in which more than 1600 people were split into 2 groups. One used sunscreen(SPF15) everyday on their head and arms and the other group used it only when they felt they needed to.

After 10 years the overall occurrence of Melanoma was 50% less in the group who applied sunscreen every day. The number of melanomas that were invasive were reduced by 73% in this group. [4]

The trial also showed a reduction in Squamous Cell Carcinomas(SCC). After 8 years the rates of total numbers of SCC were reduced by 38% in the sunscreen every day group.

The trial did not show a clear reduction in Basal Cell Carcinomas (BCC), although there was a tendency towards reduced numbers of BCCs and a reduced rate of people having multiple BCCs in the sunscreen every day group. [5]



What about the effect of Sunscreen Vitamin D levels?

We all require Vitamin D for healthy muscles and bones. Does sunscreen affect our ability to keep our Vitamin D levels normal?

While there is some evidence that consistently avoiding the sun can effect a persons vitamin D levels,[8] the Nambour study demonstrates that Vitamin D levels are not affected by either the use of SPF 16 sunscreen or by wearing long sleeves, a hat or by using an umbrella.[4],[5], [12]

When it is tested in the lab UVB (which helps us make most of our Vitamin D) is completely blocked by thick layers of sunscreen. In reality though most people only apply about half the amount that is recommended. This amount will not affect our Vitamin D levels but WILL reduce our risk of skin cancers! [9], [10], [11]

Vitamin D can also be acquired in the diet although it is difficult to maintain your levels with diet alone. Australians get most of their Vitamin D from sun exposure. Supplementation is available if it is required by people who are at higher risk of Vitamin D deficiency but supplementation should only begin with the advice of your GP. [8]

How do I stay Safe in the Sun?

Queensland has the highest rates of skin cancer in the world so it is extra important for us to practice sun-safe behaviours and to teach these to our children.

Sunscreen is just one defence against the damage of UV radiation. How do we keep our selves safe?

1. Minimise our exposure to the sun - especially when the sun is highest between 10am and 2 pm. The tilt of the Earth as it orbits around the sun means that Australia is already closer to the sun than other parts of the Earth. Therefore shorter amounts of time are required for your cells to be damaged! Stay out of the sun and seek shade whenever possible.

2. Wear sun protective clothing such as long sleeves and trousers, hats with a wide brim to cover the sides of your face and your ears.

3. Sunglasses that meet Australian/New Zealand standards should be worn to protect your eyes.

4. Apply Sunscreen with a high SPF (30+ or higher) liberally at least 15 minutes before going outside. Use a sunscreen which is water resistant if you are planning to be in contact with water or if you are expecting to perspire.

5. Reapply sunscreen at least every 2 hours and immediately after swimming or heavy perspiration.

6. Keep up your sun protection when travelling in a car for extended periods as UV penetrates through the windows and consider window tinting which can block some of the radiation if you spend a lot of time in the car.



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