



EXCESSIVE SUN EXPOSURE – A DANGER FACTOR FOR THE SKIN

When the weather warms up, we all like to get more sunshine. While better weather can make us feel brighter, we must also be aware of the dangers as well as the benefits of sun exposure. Sun exposure can be managed in a way that is beneficial and safe, and prevents health problems such as skin cancers and excessive ageing of the skin.

Until the 1920s, people ensured that they avoided the sun because a tan meant that you worked outside! However, legend has it that the great French designer Coco Chanel first popularised the idea of the suntan after she accidentally sunburned while on a boat in the 1920s. From this era onwards, people started looking for a suntan, because it showed that they could afford to travel.

Excessive sun exposure and skin ageing

As the body ages, there will be ageing signs in the skin. However, when there is excessive sun exposure these signs are accelerated. Photo ageing is due to damage caused by short wavelength ultraviolet radiation (UVB) injury to the epidermis. Longer wavelength ultraviolet radiation (UVA) damages the middle layers or dermis and any infrared A radiation damages the deeper dermis and subcutaneous tissue.

When the skin is excessively exposed to the sun without protection, these ageing changes become apparent sooner. They tend to occur on sun-exposed areas such as the face, neck, upper chest, backs of hands and arms.

People who are fair skinned have more problems with sun-related skin ageing than those who are darker skinned.

Specific skin problems due to excessive sun exposure

Solar elastosis is a photoageing change in the skin which really just refers to the thinning and stretching of the support tissues in the dermis, as well as the predictable changes in appearance described below.

Fine lines and wrinkles can occur on the skin, especially around the mouth. As the epidermis becomes thinner due to reduction in oestrogen in women, these fine lines become more predominant.

The skin gets thinner, so veins and blood vessels can be seen more easily.

Pigmentation change can occur all over the more exposed areas. In fair-skinned people, this can result in numerous freckles. In anyone there can be change of brown and red discoloration of the neck and upper chest, which is caused **poikiloderma**. Brown blotches called **solar lentigos** can sometimes be seen mainly on the face and arms.

Guttate hypomelanosis is a change due to ageing where there are patches of white as the skin becomes tanned. This is because the white areas have lost their pigment with age. (These are not really caused by excessive sun exposure, but are included for completeness.)

Excessive blood vessel production can be caused by ageing and/or sun exposure. The most common are **telangiectasias** which are shown as red veins and flushes of red, mostly on the cheeks and nose.

Other ageing skin lesions include **solar comedones** which are really milia-like lesions that sprout up anywhere on excessively sun exposed skin. **Colloid milia** can also occur.

Progressing a little bit further, **solar keratoses**, or otherwise known as actinic keratoses, are the result of sun damage that causes the epithelium to overgrow and become heaped up. These lesions are precancerous and tend to occur on bald heads, tips of ears, faces, arms and any sun exposed areas. They can be multiple, flat, thickened, scaly, warty, skin-coloured or even a bit reddened. Sometimes a keratoses can develop into a horn-like growth.

Treatments for sun-damaged skin

Treatment of brown or red pigmented lesions can be performed with intense pulsed light (IPL). Intense pulsed light will also treat some of the veins. Vascular laser can get the rest of the veins.

Milia can be treated with extraction, liquid nitrogen treatment and, to some degree, microdermabrasion.

If solar keratoses is treated early (often simply with liquid nitrogen application by the family doctor or nurse), skin cancer can be avoided. If they are not treated, skin cancer may develop in up to 25% of cases.

Skin cancers

Skin cancer is the ultimate sun damage that the skin experiences. There are three main types.

1. Basal cell carcinoma
2. Squamous cell carcinoma
3. Melanoma.

Basal cell carcinoma tend to occur around the face, but can also occur on other parts of the body. It has a particular signature appearance with a pearly rounded edge that contains small blood vessels.

Squamous cell carcinoma often grows out of actinic or solar keratoses and can occur anywhere. Of particular worry is when squamous cell carcinoma occurs on the lip, earlobe or even on the scalp. This is because these can spread throughout the body.

Malignant melanoma is the most worrying of the skin cancers and is the one that looks dark. It is very rare to have an amelanotic malignant melanoma (devoid of pigment).

People most at risk of skin cancer

The three groups of people who are most at risk of malignant melanoma are:

- Those with the palest skins.
- Those with a family history of malignant melanoma.
- Those who have dysplastic naevus syndrome. This is a condition where the person has more than around 20 moles of different sizes, shapes and colours. In this condition, most of these moles occur on the trunk, upper arms and upper legs.

A survey in New Zealand has shown the following statistics on malignant melanoma:

- Fewer than 1% occurred in people under 20
- 13% occurred in people 20-40 years old
- 36% occurred in those aged 40-59
- 51% occurred in those aged over 60.

It appears that older people are getting malignant melanoma more because they are the generation that did not know about excessive sun risk in their youth.

Apart from the three conditions mentioned, your risk of melanoma is affected by total sun exposure over life, especially during childhood.

Early signs of malignant melanoma

Malignant melanoma grow from the melanocytes in the skin which give skin its pigment. The melanocytes are there to produce melanin which protects the skin by absorbing ultraviolet radiation. In effect, a tan results from damage to the skin and melanocytes by UV radiation. When melanocytes overgrow uncontrollably, malignant melanoma occurs.

It is very important to catch malignant melanoma as early as possible, as this increases survival. The signs to look for are any changes in the:

- Area of a pre-existing mole
- Border or outline of an existing mole
- Colour or colour distribution of an existing mole.

I always say to people that they should have any new mole checked or any change in an existing mole checked by a doctor.

Using sunblocks

Sunblocks and skin care are important in helping us to manage our sun exposure safely and beneficially.

Sun screens work by either absorbing the UV or reflecting it. Titanium and zinc work by reflecting the radiation that lands on the surface of the skin. Chemical absorbers include oxybenzone. Neither

titanium dioxide nor oxybenzone can quite get the whole of the sun spectrum. However, zinc can. This is why I prefer zinc-based sunblocks.

Some products have added a molecule to oxybenzone, creating a chemical blocker that covers the whole of the sun spectrum.

It is important to apply sunblock at least 20 minutes before going out into the sun, because it takes this long for it to work. When sunbathing, it is important to reapply sunblock frequently, especially after swimming. The SPF rating is not useful if the sunblock can be rubbed off or washed off with swimming.

When considering going out into the sun, it is best to avoid the high UV times between 11am and 4pm. After that, the next most effective protection is covering up and effective protection using a sunscreen.

Skin care that protects and reverses sun damage

Retinoids are molecules derived from Vitamin A-like retinol, retinylpalmitate and tretinoin. They are a multi-beneficial group of skin treatments that reduce wrinkles by communicating with the DNA of skin cells and ordering the skin cells to behave normally. They also have other benefits, including protecting the skin from UV and assisting in wound healing. Retinoids are frequently used to treat acne and rosacea, as well as in cosmetic treatments.

Antioxidant vitamins protect and to some degree can restore sun-damaged skin. To different degrees, the following ingredients of skin care have been found to do this.

- Vitamin C and E
- Co-enzyme Q10
- Alpha lipoic acid
- Idebenone.

Natural substances that are antioxidant include green tea and pycnogenol.

The positives about sun exposure

Having expressed concern about over exposure to the sun and the damage and serious risks that can occur, it is important to have balance about sun exposure. This is because we have now gone too far in some situations. We now know that there is a worldwide epidemic of Vitamin D deficiency. It is estimated that 50% of the population is Vitamin D deficient. Have we taken the message of staying out of the sun, covering up and applying sunscreen too far?

There are numerous benefits of Vitamin D that many of us are now not able to access because we work indoors and become Vitamin D deficient to start with, and then we actively avoid the sun.

By far the biggest source of Vitamin D is the sun. There is a precursor molecule in the skin which, when exposed to the sun, makes an early form of Vitamin D which then goes to the liver and is converted to 25-hydroxy Vitamin D. This then goes to the kidney, which then makes the final molecule – dihydroxy Vitamin D.

Vitamin D is not only important for bone health, but it affects every cell in the body. Health effects include helping you lose weight by improving insulin and glucose management in the body, reduction of heart disease and diabetes prevention, reduction of cancer, improvement of the immune system, multiple sclerosis, falls in older people, and many more health benefits.

Normalising Vitamin D levels can improve many conditions, including:

- Breast cancer by 70%
- Endometrial cancer by 50%
- Ovarian cancer by 20%
- Colon cancer by 55%
- All cancers combined by up to 75%
- All fractures combined by 50%
- Multiple sclerosis by 55%.

Vitamin D deficiency

There are signs that our population is Vitamin D deficient. Studies in New Zealand have shown us that, in one Wellington clinic, up to 83% of pregnant women were Vitamin D deficient. We are also now starting to see cases of rickets in children in New Zealand. This is the condition where the bones of children don't develop normally because of lack of Vitamin D.

I have observed one other interesting trend. I have noticed that the melanoma incidence of Australia and New Zealand has been increasing since we started introducing sun protection, at the same time we have developed a tendency to Vitamin D deficiency. As Vitamin D can prevent cancer, it is easy to wonder whether this association of high melanoma with excessive sunblock use and sun avoidance could be due to this. However, no research has been done to try and show this association.

Striking the right balance with sun exposure

So, where do we go from here? Well, it is all about moderation. I believe it is okay to enjoy some sunshine on your body, but make sure that you put sunblock on the most exposed places such as the face, neck, décolletage and backs of hands and arms. *Never allow yourself or your children to get burnt.*

If you are worried about lack of Vitamin D from the sun, you can get it in your diet by taking cod liver oil and having plenty of oily fish like salmon, herring and sardines. If your Vitamin D level is low, there is good news because you can take it as a tablet! Your family doctor can test you.

It is always best to enjoy the sun safely. Behaving in moderation so that you get enough Vitamin D, but don't age and damage your skin requires commonsense and good management. You can always take a Vitamin D tablet and you can always get a fake tan.