



If You Can See Sunlight, Seek the Shade

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While shade is a potentially valuable means of protection from the damaging effects of the sun's ultraviolet (UV) rays, not all shade is equally protective. People can spend long hours in the shade while still receiving quite a lot of sun exposure and risking skin damage. This is because UVB rays, often considered the most harmful part of sunlight, can reach the skin indirectly. Indirect or diffuse UV light is radiation that has been scattered by the clouds and other elements in the atmosphere, and/or bounced back from UV-reflective surfaces like dry sand or concrete. In fact, a large percentage of the UV light we receive while sitting under a tree or an umbrella is indirect. We can rely only on deep shade (where we cannot see the sky and no UV penetrates) to offer truly complete protection.

HEADS FIRST!

Skin cancers are disproportionately concentrated on the head compared with other parts of the body. Faces (the nose in

particular¹) are especially at risk, and for men, the ears are a focal point for melanoma,² the deadliest form of skin cancer. Although the head is easy to protect, too often it is left bare because hats are seen as

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unfashionable or an unnecessary burden. [See "Hats: The Stylish Route to Sun Protection", p.22]. Even when hats are worn, many provide only minimal shade — especially for the nose, ears, and neck.

Hats with broad brims all around and those with brims angled downwards provide the greatest UV protection³; brims must be at least three inches wide to provide reasonable sun protection around the nose and cheeks (**Figure 1a**). Research has

shown that broad-brimmed hats provide protection equivalent to an SPF (sun protection factor) of approximately 5 for the nose, ears and neck, while baseball-style caps (**Figure 1b**) offer about the same protection for the nose but little for other parts of the face, including the cheeks and chin.³⁻⁵ Legionnaire-style hats, which resemble baseball caps but have long ear and neck flaps, provide satisfactory protection (SPF 5 or more) for the neck⁴ as well as the face.

UMBRELLAS

Unless they are very large, umbrellas provide relatively little UV protection. Their SPFs can range from 3–10⁶ and their UPFs up to 50+ (UPF, the ultraviolet protection factor, measures protection from UV radiation in fabrics. A shirt with a UPF of 30 indicates that just 1/30th of the sun's UV radiation can reach the skin), but no matter how high the fabric's SPF or UPF, the amount of UV present beneath an umbrella can be up to 84 percent of that in sun⁷ depending on the levels of indirect UV; the amount of indirect UV is proportionate

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to the amount of open sky visible from the shade.¹⁰ Therefore, a single umbrella on a sandy beach by the sea provides limited sun protection because so much UV is reflected *under* the umbrella from the surfaces of the sand, water and sky.⁸

TREES

Shady trees are always inviting on a hot, sunny day, and those with large spreads of dense foliage best protect us from the sun.^{13,14} (**Figure 2a**), while those with sparse foliage are not as protective (**Figure 2b**). If you can, choose a tree near other trees, or buildings, to further block out the sky.

Factors that increase the amount of scattered or indirect UVB, such as reflective surfaces, will decrease the protection trees can provide. The same tree actually gives less protection earlier and later in the day, when the proportion of diffuse UV is high, than it does in the middle of the day when the sun is more directly overhead. Similarly, someone sitting under a tree on a sunny day with little indirect UV is better protected than someone sitting under the same tree on a cloudy day, when there is more indirect sunlight.¹⁵ However, any tree cover is better than none.

OTHER SHADE STRUCTURES

Shade structures such as roofed areas, shade-sails (UV-protective fabrics that can be installed over outdoor areas) and pergolas (free standing, open-roofed arbors) vary widely in the amount of protection provided. Since levels of indirect UV can still be high beneath these shade structures, many have real SPF of only around 3–6.⁹ In a recent study of 29 shade structures in New Zealand primary schools, only six had SPF of 15 or greater, the minimum acceptable amount recommended for outdoor activities.¹⁰ This was alarming, given the importance of protecting children against UV and the strong evidence that excessive sun exposure during childhood significantly increases the risk of developing skin cancer later in life.

Factors that determine how well a structure provides shade include the size of the structure, its orientation (which direction it faces), and where it is in relation to other structures, such as buildings, trees and other vegetation. The amount of UV protection provided by a structure is also contingent upon the angle of the sun and the degree of cloud cover. Because the amount of diffuse UV that hits the skin depends on the amount of open sky visible from the shade,¹⁰ larger shaded areas provide more protection than small ones. Shade structures with side-on walls or other side protection, and those surrounded by other structures provide the greatest shelter from the sun's rays.^{11,12} (The surrounding trees in **Figure 3a** provide extra protection compared to the protection provided in **Figure 3b**.)

BEYOND SHADE

Shade alone can rarely provide full UV protection, especially for prolonged periods. However, it is one important element in a comprehensive sun protection program that includes covering exposed skin with clothing (particularly clothes made of bright- or dark-colored, tightly woven fabrics), wearing hats and sunglasses, and regularly using sunscreen with an SPF of 15 or higher. All these steps taken *together* will help ensure that we are adequately protected from the sun's rays when we are outdoors. ■

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References available on p.111.



Figure 1a



Figure 1b



Figure 2a



Figure 2b



Figure 3a



Figure 3b