SKIN CARE WEST
MEDICAL + SURGICAL DERMATOLOGY

Sun protection

The five essentials

SEEK shade and plan

Sit in natural, built or portable shade whenever possible. Check the UV index with your daily weather forecast. If it's 3 or higher, plan outdoor activities early or late in the day to avoid peak sunlight hours.

SLIP on clothing

The best barrier between your skin and the sun. Cover as much skin as possible. The tighter the fabric weave, the better the sun protection. Consider investing in some UPF rated clothing for outdoor work, sport, or travel.

SLOP on sunscreen

SPF 30 (or higher) and broad-spectrum. Choose a water-resistant product if exposed to water, either through swimming or sweating. Use a generous amount and apply *before* you go outside. Reapply often when physically active.

SLAP on a hat

A broad brim is essential to protect your face, neck and ears.

SLIDE on sunglasses

Protect your eyes year-round. Make sure your sunglasses protect from both UVA and UVB. Choose something with larger lenses to better protect the skin around your eyes.

Never rely on sunscreen alone – use all 5 essential steps to get good sun protection!

SKIN CARE WEST
MEDICAL + SURGICAL DERMATOLOGY

Sun Protection Strategies

'Which Sunscreen should I use?"

Most of us think of 'sunlight' in terms of the visible light that's essential to our daytime activities. Unfortunately, sunlight also contains forms of energy that can damage our skin. The atmosphere above us blocks much of that harmful energy, but a component that is referred to as 'ultraviolet radiation' or UVR, makes it through. UVR from both natural and artificial sources (such as tanning beds) is a class 1 carcinogen just like tobacco smoke and asbestos. Exposure to UVR is the *most common modifiable risk factor associated with skin cancer and premature skin aging*.

UVB makes up only 5% of the UV radiation that reaches the earth's surface, but it carries the most energy. It's the primary cause of sunburn and skin cancer. The most common rating system used to quantify the protection offered by sunscreen against UVB is **SPF,** which stands for 'sun protection factor'. The rating indicates the fraction of potentially damaging radiation that will make it through to your skin. An SPF of 2 means ½ of the UVB will make it through. As the numbers get larger, the difference gets smaller. Once you get to an SPF of 30, which means only 1/30th of the UVB reaches your skin, the theoretical difference in going higher is very small. It's important to understand that *SPF only rates UVB protection*.

UVA makes up the other 95% of the UV radiation in sunlight and plays a significant role in sun induced skin aging, including premature wrinkles and pigment changes. Although it's less damaging to your skin, there is much more of it, and it *penetrates through glass*. The role of UVA in skin cancer is less well understood then UVB, but it may be larger than previously appreciated. Many early sunscreens provided little or no protection against UVA, and a standardized rating system to quantify the level of protection has not been established. One that is gaining acceptance is **PPD,** which stands for 'persistent pigment darkening'. Although not common in North America, it has been adopted in parts of Asia and in Europe. It's important to understand that *sunscreen with a high SPF does not necessarily have a good PPD*.

Skin type, which is determined on the basis of skin color and tanning ability, is the primary factor to consider when evaluating your risk related to UV radiation. **Melanin**, the pigment in your skin that gives it color, also plays a critical role as a natural defense against UV radiation. Individuals with the *darkest skin types can tolerate about 10-15x the sun exposure of those with the lightest skin types*. **Tanning ability** is your skin's capacity to make more melanin in response to UV exposure. *A tan does provide some protection, but at most it's equivalent to an SPF of 2 or 3*. If you tend to 'burn and then tan' the initial amount of damage that will occur to your skin may be significant, and will likely outweigh any protective benefit a tan may provide.

UV index is a rating system that quantifies how much damaging UV radiation is present in sunlight in a particular place and time. It's now commonly reported with many weather forecasts and it's the easiest way to estimate risk on any given day. Your decisions regarding sun protection should be guided by the UV index in the same way that you would use the probability of rain in deciding to wear a raincoat or pack an umbrella. The index is directly proportional to the intensity of UV that causes a sunburn on human skin, so if you tend to burn in an hour on a day with an index of three (low), you'll burn in 30 minutes when the index is 6 (moderate), and within 15 minutes if the index is 12 (very high). If you are fair

skinned, and especially if you have blond or red hair, you may need sun protection even when the UV index is low and your exposure time is brief.

Sun Avoidance and Clothing

Avoidance is the most effective sun protection strategy. A common recommendation is to limit outdoor activities between daytime hours of peak sun intensity, usually from about 10 am until 4 pm. For many of us, that's simply not possible, especially if you work outdoors. A more practical approach is to *match* your sun protection efforts to the expected intensity of the UV radiation you will be exposed to, and to limit sun exposure during peak hours *as much as possible*. If you can plan your outdoor activities for parts of the day when the sun intensity is lower, great, but if not then recognize the increased risk, dress accordingly, and apply sunscreen to areas you will not be able to protect with clothing. Find shade as much as possible.

Appropriate **clothing** is by far the fastest and simplest way to protect most of your skin. **UPF,** which stands for 'ultraviolet protection factor', is a fairly new rating system used to quantify the level of protection offered by clothing. UPF is similar to SPF in terms of how you can apply it. It's used mostly for sports or recreation-oriented garments, but *all* clothing offers some protection against *both* UVA and UVB. Light and sheer summer fabrics may go as low as a UPF of 6, but many fabrics are much higher, and most clothing will provide at least moderate protection. With fabrics such as cotton, a denser weave and darker color is usually more protective. For instance, a white cotton t-shirt has a UPF of about 7, but it may be as high as 10 if it's dyed a dark color. You can get a rough idea of a garment's level of protection by how much light passes through the fabric when it's held up to the sun. Some newer textiles combine both excellent breathability and comfort in hot weather, with very high UPF ratings. There are also evolving options such as the laundry detergent additive 'Tinosorb', which can increase the level of protection provided by regular clothing.

Two clothing accessories are *critically important* and deserve special mention. These are **broad brimmed hats**, and **sunglasses**. Your head and neck will likely be exposed to more UV radiation than any other part of your body, and eventually the accumulated damage may be substantial. Photoaging of your face will inevitably have cosmetic implications, and if you develop a cancer there may also be functional issues to consider, such as involvement of an eyelid or a facial nerve. The most important structures to protect are your eyes, ears, nose and lips. Sunglasses with an appropriate frame and lenses with complete UVA/UVB protection will protect your eyes and the delicate skin around them. A broad brimmed hat will shade much of your upper face, cover any exposed scalp, and protect structures such as the tops of your ears, which are a very common site of sun damage.

Understanding and Choosing Sunscreen

The compounds in sunscreens have traditionally been divided into two categories. **Physical** sunscreen compounds (also referred to as 'mineral' sunscreens) are those that block UVR and reflect it back off your body. **Chemical** sunscreen compounds absorb UVR and convert it to a negligible amount of heat. Recently the sunscreen industry has started using the term '**organic'** instead of 'chemical' for these compounds. It sounds safer but has no association with how that term is used in the food industry. It's a just a reference to their molecular structure.

Zinc oxide and **titanium dioxide** are the only physical sunscreen compounds currently available. Both of them protect against UVA and UVB, but to varying degrees, so they should usually be combined together

or with other agents for complete UV protection. Their major advantage is that they are chemically stable, which equates to a long shelf life and a consistent level of protection over time. They tend to cause fewer irritant and allergic reactions in individuals with sensitive skin. They are also effective immediately after application. Their major disadvantage is that they are more visible on the skin surface, which may make them cosmetically unacceptable in some applications. New formulations contain smaller particles or a tint to overcome this issue.

A large number of chemical sunscreen compounds are currently in use, most of which protect against UVB, and a few that protect against UVA or both. Compounds in this category have historically been associated with higher rates of skin reactions, although the frequency is very low with modern products. These compounds can lose their effectiveness over time, especially if they are stored in hot environments such as a vehicle. There is some evidence that a common compound from this category (oxybenzone) may disrupt the ecological balance in coral reefs.

There are some important terms that you may want to look for on sunscreen labels. Broad Spectrum indicates that the product will protect against both UVA and UVB and has an SPF rating of 15 or higher. The level of UVA protection in most of these products is not currently rated. Water Resistant or Waterproof indicates that the product has improved adherence, and it will usually come with directions to re-apply at intervals of either 40 or 80 minutes.

We don't advocate for any specific brand or type of sunscreen. There are many excellent products available for a range of prices. Pick the ones that you are willing to use regularly and that don't cause any irritation to your skin. Make sure to choose a product labeled 'broad spectrum' to ensure protection against both UVA and UVB. In most cases we recommend an SPF of at least 30.

Although the theoretical benefit of a product with an SPF beyond 30 is limited, in real world use most of us apply between ¼ and ½ of the amount of sunscreen required to achieve the SPF on the product label. The SPF goes down proportionally for most products, which means that if you are using ½ the required amount of an SPF 30 sunscreen the actual SPF will be 15. That is the reason we recommend the use of products with an SPF of 30 or higher on the face, since that's where achieving the appropriate level of protection is most important.

If you are using a product that relies completely on chemical sunscreen compounds, be mindful of how you store it and the expiry date. The effectiveness of these compounds will decrease over time, especially if stored in a hot environment. Shelf life for most chemical sunscreens is 2 to 3 years.

Managing Sun Protection

Decisions regarding sun protection start with checking the UV index and planning your activities accordingly. If the index is moderate or high, choose clothing that will cover as much of your skin as possible. If you plan to be active, consider UPF clothing, since it can provide UV protection while also helping you stay cool and comfortable. Apply sunscreen to areas that will not be sufficiently protected by clothing. If you are using a physical sunscreen, it will be effective as soon as you put it on. With a chemical sunscreen, put it on at least 15 minutes before you go out. Make sure to use enough to achieve the SPF on the label. The best strategy is to apply two layers. The first should be thick enough to *easily* see that the whole area you are trying to protect is covered. The second is a thinner 'top-up' for areas that will be most exposed like your cheeks and nose.

The simplest application sequence is to start with your head and neck. Spread the sunscreen to ensure full face coverage but avoid getting it in your eyes. If you'll be wearing a hat, skip placing sunscreen on your forehead. Next make sure to put some sunscreen on your ears and the back of your neck, and then under your chin and on the front of your neck. Apply to exposed areas on your extremities and torso last. Finally, put on your hat and sunglasses and you're ready to go.

Recreation

Use several different formulations of sunscreen to make application faster and easier, such as a lotion on your head and neck and a spray for your torso and extremities. Make sure to reapply every few hours, especially if you are sweating or swimming. Don't forget to protect your lips with an SPF lip balm or equivalent.

Lifestyle

Consider sun protection as the final and most important step in your daily skin care routine. Alternatively, SPF options in moisturizers and cosmetic products you already use may help ensure daily protection. Avoid scented products and consider the use of an all-physical sunscreen if you have sensitive skin or a skin condition such as rosacea or acne. If you are using a product with a tint, put it on and let it 'set' for a few minutes so that you don't get any on your clothing.

Athletes

Invest in technical clothing that will keep you cool while providing a high UPF. Use products that contain physical sunscreen compounds and no tint, so that you can easily see areas that have not been appropriately protected when applying. Choose a product with appropriate adherence for your sport and make sure to re-apply frequently. Increase intensity of sun protection if you are involved in snow or water sports. Consider ultra-high SPF sunscreens in the 50-100 range for activities at high altitudes.

Outdoor workers

Outdoor workers have some of the highest levels of UV exposure. Pay attention to UV index before you head out to work. Focus on clothing that will allow you to stay cool and get your work done, while also protecting your skin. Keep sunscreen handy and re-apply to exposed skin several times throughout the workday.

Vitamin D

It's important to mention that UVB plays a role in the production of vitamin D in your skin. The duration of exposure required to produce sufficient levels depends on your skin type and the UV index. Typical application of sunscreen to exposed skin does not have a significant impact on the ability to generate vitamin D. In addition to sun exposure vitamin D can be obtained from dietary sources such as fortified milk and orange juice, and also in fatty fish and egg yolks. It may be difficult to achieve appropriate levels from your diet, especially during winter months or if you are using intensive sun protection. Health Canada currently recommends that everyone over the age of 50 should take a daily 400 IU vitamin D supplement. Older individuals, especially those at risk for falls, may want to consider supplementing with higher levels such as 800-1000 IU daily.