



Sunscreens

Sun Protection and Common Sense

Skin cancer is reaching epidemic proportions in this country with more than 1.3 million new cases diagnosed each year. Sun exposure is responsible for the majority of skin cancers, especially melanoma – the deadliest form of skin cancer. Yet, since **approximately 80 percent of a person's lifetime sun damage occurs before age 18**, it is critical to protect our children from the harmful rays of the sun. In fact, new research confirms the importance of shielding our children from sun exposure.

Remember – sun exposure and damage to the skin is cumulative – it adds up over a lifetime!

TERMINOLOGY - The sun gives off ultraviolet (UV) radiation that we divide into categories based on the wavelength.

- **UVC radiation** is absorbed by the atmosphere and does not cause skin damage.
- **UVB radiation** affects the outer layer of skin, the epidermis, and is the primary agent responsible for sunburns. UVB does not penetrate glass, and the intensity of UVB radiation depends on the time of day and the season.
- **UVA radiation** penetrates deeper into the skin and works more efficiently. The intensity of UVA radiation is more constant than UVB without the variations during the day and throughout the year. UVA is also not filtered by glass.
- **SPF** measures the amount of UVB absorption, but there is no method of reporting the UVA absorption. The only way to determine if a sunscreen protects against UVA and UVB radiation is to look at the ingredients. A good broad-spectrum sunscreen should have an SPF of at least 15.

ACTIVE INGREDIENTS

UVB ABSORBERS

- **PABA** - or para-aminobenzoic acid, came on the market in the United States in the early 1970's and was the first true sunscreen to be generally available. It provides effective protection in the range of 260-313 nm (nanometers). It is not used much in sunscreen formulations now because it frequently causes allergic reactions, and it also stains clothing. They are however water "resistant".
- **PABA Esters** - The PABA esters are padimate O, padimate A, and glyceryl aminobenzoate. These compounds are chemically similar to PABA and provide effective protection in the range of 260-315 nm. The use of these formulations has declined with the popularity of the "PABA-free" claim. They still cause allergic reactions, but do not stain clothing. They are also water "resistant".
- **Cinnamates** - Octyl methoxycinnamate and cinoxate are cinnamates, derivatives of cinnamon that provide protection in the range of 280-310 nm. They are chemically related to balsam of Peru, tolu balsam, coca leaves, cinnamic aldehyde, and cinnamic oil. People with sensitivities to these chemicals may get an allergic reaction to sunscreen containing cinnamates. The cinnamates are much less potent than padimate O and require the addition of other UVB absorbers to achieve higher SPF's. They do not stain clothing, but they are not water resistant and need frequent reapplication!

UVA ABSORBERS

- **Benzophenones** - oxybenzone and dioxybenzone are the second most commonly used components of sunscreens. They provide effective protection in the 320-340 nm portion of the UVA range (not the complete UVA spectrum). Oxybenzone is actually a more efficient UVB absorber and boosts the SPF when added to other UVB absorbers. It does not stain clothing and does not cause skin irritation, but it is not water resistant.
- **Avobenzone** - (Parsol 1789) is the only chemical that absorbs the whole UVA spectrum at 310-400 nm. It does not provide any UVB absorption. There has been controversy about whether avobenzone actually breaks down in the presence of sunlight, but it appears that these claims have not been backed up with further studies. It does not stain clothing and does not cause skin irritation, there is some question of how stable the chemical is in sunlight.

PROPER USE

Applying sunscreen every day rather than only on sunny ones makes a big difference when it comes to fighting the first signs of skin cancer. A recent study from the April issue of the Archives of Dermatology shows that daily use of sunscreen is much more effective than sporadic use in preventing pre-cancerous skin growths called solar or actinic keratoses.

Now, for a bit of rain on your parade: A 1998 Journal of the National Cancer Institute study concluded that in white European children, sunscreen use appears to be associated with development of nevi (pigmented or dark colored moles), probably because it allows longer sun exposure and hence prolonged exposure to unfiltered UV radiation! Wearing sun blocking clothing or staying out of the sun altogether is the only effective way to prevent proliferation of nevi.

Since a high nevus count in adults is a strong predictor of melanoma, sunscreen use may actually be involved in melanoma occurrence because it may encourage recreational sun exposure. Further, Sunscreens do not protect against melanoma - probably because of their ability to delay or avoid sunburn episodes, allowing prolonged exposure to unfiltered ultraviolet radiation.

SPF CONFUSION

Conventional wisdom has it that all you need to do is multiply the amount of time it will take to sunburn by the sunburn protection factor (SPF) in order to calculate the time a sunscreen will protect you from a sun burn. Unfortunately, relying on this simple formula will cause you to become painfully aware of the fact that what you don't know about sunscreen use can hurt you!

The Food and Drug Administration requires that sunscreen products be tested at a concentration of 2 mg (of active ingredient) per square centimeter of skin. For an adult full-body application of sunscreen, this translates into 1.25 ounces of product or approximately one full handful.

The problem is that numerous studies have found that people routinely use only 25 percent of the recommended amount, and a new study shows that the amount of sunscreen used is only about 20 percent of the recommended application dose. Since the strength of the sunscreen product (the SPF value) must be reduced by this same amount, it means that an SPF 8 has the real-world photoprotective power of an SPF 1.6 (20% of 8)!

Since most people only apply 20 to 25 percent of the recommended amount, we recommend that you build this information into your

calculations. An SPF 8 would, therefore, be an SPF 1.6 to SPF 2; an SPF 15 would be an SPF 2.4 to SPF 3; and, an SPF 30 would be an SPF 4.8 to SPF 6. Using these adjusted SPF values will compensate for the real-world application dose.

This "false expectation of photoprotection" explains why many studies show that the probability of sunburning actually increases for those who use sunscreens as compared to those who do not use them.

COMBINATION PRODUCTS

Products containing sunscreen as well as a DEET insect repellent pose a potentially serious problem for children and their parents – I'll simplify it for you - DO NOT use them! While you want to keep re-applying sunscreen every 60-90 minutes, especially when sweating and after swimming, you don't want to re-apply a DEET containing insect repellent very often as you can quickly get to a dangerous or toxic dose with frequent re-application, especially in kids. Buy two separate products and do it correctly!

FINAL POINTERS TO BECOME A SAVVY SUNSCREEN USER

- Remember - sun exposure and damage to the skin is cumulative - it adds up over a lifetime! Most people get 80% of their lifetime sun exposure by age 18!!!!
- Remember - the only way to prevent skin cancer is to stay out of the sun - cover up as much skin as is possible if you will be outdoors and exposed to the sun's rays!!
- **When purchasing sunscreen for adults, select a brand with an SPF of at least 15, preferably greater.**
- Buy a new bottle of sunscreen every year - don't use one older than a year - you can't save a few pennies on this prevention measure!!!
- Apply enough sunscreen to achieve a useful SPF - the adult full-body application of sunscreen is 1.25 ounces of product or approximately one full handful. Shake the bottle before using.
- Sunscreen is most effective if first applied 20-30 minutes before sun exposure and any sweating. I even recommend applying a dose in the evening before bedtime to allow it to soak in, and then re-applying a coat before going outside the next day.
- Use sunscreen whenever you expect to be in the sun for thirty minutes or more. Even waterproof sunscreens should be re-applied every 60-90 minutes in the sun especially if you are swimming or perspiring heavily.
- Do NOT expose children less than 3 months to the rays of the sun for any length of time if at all possible. If this is not avoidable, cover as much skin as possible with clothing. Then, always use sunscreen on any

exposed skin surface areas! The danger from sunburns at an early age outweighs any risk of sensitivity to sunscreens.

- In general, infants' skin is much thinner and more sensitive to the sun than adults' skin, even in individuals with darker complexions. The amount of sunscreen needed depends on how light the child's complexion is. I would recommend using sunscreen with an SPF of at least 30 for most children, and probably higher for fair-skinned children.
- Avoid the sun's most intense rays by staying out of the sun during the middle of the day (10:00 a.m. to 4:00 p.m.) -- and don't be lulled into complacency by overcast days, since most of the sun's harmful rays will get through the clouds.
- Be especially careful if you are around water, sand, snow, or any surface that will reflect and therefore intensify the sun's rays. Remember also that the sun's rays are more intense the higher you get in elevation.