



## Talking “sun safety” with patients:

*the latest on sunscreens, tanning bed risks, and tips for limiting exposure to the sun’s harmful rays*

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AS WE LOOK AHEAD TO SUMMER, MOST ONTARIANS ARE UNDOUBTEDLY EXCITED ABOUT THE PROSPECT OF LONGER DAYS, MORE SUNSHINE, AND FOR SOME, A CHANCE TO WORK ON THEIR TAN. SUMMERTIME ALSO MARKS A RETURN TO MANY SEASONAL TRADITIONS, SUCH AS OUTDOOR BARBECUES, BASEBALL GAMES, AND WALKS IN THE PARK — ALL ACCOMPANIED BY SIGNIFICANT EXPOSURE TO THE STRONGER SUMMER SUN.

Patients often have questions about sun protection, and sometimes show up for an appointment after significant sun exposure. Both circumstances provide an opportunity for physicians to educate patients about the significant risks of sun exposure vis a vis skin cancer.

Skin cancer is the most commonly diagnosed cancer worldwide, and rates continue to rise. Together, melanoma and non-melanoma skin cancers account for more diagnoses than lung, breast, and prostate cancer combined. Melanoma alone is estimated to kill 1,000 Canadians in 2012.

### Ultraviolet Radiation

Exposure to ultraviolet (UV) radiation is the single biggest risk factor for the development of skin cancer.

Electromagnetic radiation in the form of sunlight strikes the earth’s atmosphere in three main forms: infrared, visible, and ultraviolet radiation. Ultraviolet radiation is further subdivided into three types based on wavelength: UVA (320–400 nm), UVB

(290–320 nm) and UVC (100–280 nm). UVA rays make up the lion’s share (90%–99%) of all UV radiation that reaches the earth’s surface, followed by UVB rays (1%–10%). UVC rays are absorbed by the earth’s atmosphere and pose very little risk to humans.

Historically, scientists have believed that UVB rays (the rays that cause burning) are the main cause of skin cancer, however, it is now clear that UVA (the rays that cause aging) are also implicated. In genetically predisposed individuals, both types of rays can induce DNA mutations that eventually into skin cancer.

### Tanning Beds

In addition to natural UV radiation from sunlight, the risks from artificial UV tanning lights have also become increasingly evident in recent years. In 2009, the World Health Organization’s International Agency for Cancer Research promoted artificial tanning lights from the designation “probably carcinogenic” to the designation “carcinogenic;” tobacco and asbestos share this same designation.

Although tanning lights were always known to be harmful, this reclassification galvanized medical communities around the world to condemn the practice of artificial tanning and lobby lawmakers to ban it, particularly for youth under the age of 18.

In Canada, Nova Scotia was the first province to ban tanning beds for youth under the age of 18. In March 2012, the government of British Columbia followed suit, and promised to introduce similar legislation by fall of this year. Effective January 1, 2012, California was the first U.S. state to prohibit anyone under the age of 18 from using an indoor tanning bed.

For the physician interested in counselling sun safety, there are many challenges, including the fact that the practice of tanning has been shown to be addictive.

For many, a tan is perceived as a sign of beauty, wealth and, erroneously, of health. In a society where appearance matters, this association makes our job all the more challenging. Mixed messaging on vitamin D has also proven challenging.

### The Vitamin D Issue

Some physicians argue that avoiding UV light altogether mitigates the potential beneficial effects gained from vitamin D synthesis (i.e., that sun exposure is the most important source of vitamin D). There is no question that vitamin D has beneficial effects for health, however, there are still many questions surrounding the optimal amount of vitamin D required.

It is clear that acquiring vitamin D through indiscriminate exposure to UV rays is associated with skin cancer risks. As such, dermatologists generally believe that adequate vitamin D levels should be gained through diet (foods such as salmon, eggs, milk, orange juice, or supplementation), not from UV exposure.

In the future, however, recommendations for some “safe” and “acceptable” amount of sun exposure, for the purpose of vitamin D production, will likely be based on individual patient needs.

### Promoting Three Kinds of Sun Protection

A large part of changing patient behaviour lies in education. The cornerstones of sun safety messaging revolve around three main strategies: sun and tanning bed avoidance, sun protective clothing, and sunscreens.

First, it behooves us to educate patients to avoid the sun in general, particularly between the peak hours of 10 a.m. and 4 p.m. Seeking shade, staying under trees, or utilizing sun umbrellas are common-sense sun avoidance practices. Informing parents that children’s skin is more sensitive, and that childhood sun exposure is much more important than adult sun exposure in contributing to the development of skin cancer, should drive home this message. Educating our youth about the risks of artificial tanning is the latest extension of the UV-avoidance message.

Our second message involves the importance of wearing sun-protective

clothing. Light coloured wide-brimmed (3-inch) hats, tightly woven full-length trousers, long-sleeve shirts, and UV-protective sunglasses must be encouraged. While this message readily resonates with our older patient populations, it is admittedly a much tougher sell for our younger fashion-conscious cohort. Convincing a 19-year-old to submit to an unexciting, non-trendy wardrobe of sun-protective clothing will predictably fail. The art of medicine lies in knowing what will work for your particular patient, and converting that knowledge into action.

The third sun safety message, and the one with most traction, particularly for youth, is the regular and liberal use of sunscreens. Sunscreens represent a group of topical products that protect the skin from the harmful rays of the sun. Sunscreens act by absorbing, reflecting or scattering UV radiation from the sun.

The two main categories of sunscreen are chemical sunscreens, which

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penetrate the superficial layers of the skin, and physical sunscreens, which physically coat the surface of the skin. Chemical sunscreens contain organic compounds that absorb UV radiation and convert it to heat, while physical sunscreens contain inorganic inert substances that physically block UV radiation by reflecting or scattering it. Each sunscreen agent has unique properties that characterize it as a UVA, UVB, or combined UVA-UVB absorber. In the past, the term sunblock was used interchangeably with sunscreen, but is no longer considered acceptable under Canadian sunscreen labelling regulations.

#### SPF in Sunscreens

The sun protection factor (SPF) was developed as a laboratory measure of the effectiveness of a sunscreen. The SPF represents the length of time that sunscreen-protected skin can be exposed to UVB rays before developing minimal erythema, compared

to the length of time it takes for non-protected skin. This assumes that the intensity of the exposure is uniform over the time of exposure, which it rarely is in practice. SPF gives us a gross indication of how much longer we could expect to be exposed to the sun before burning compared to no sunscreen.

Our own skin has intrinsic SPF due to melanin — white skin has an SPF of 3, and black skin an SPF of 13. Generally, the higher the SPF numbers the better the protection; however, this protection is not linear. An SPF of 60 does not offer double the protection of an SPF of 30. In fact, an SPF of 15 offers 93% protection while an SPF of 30 offers 96.7% protection, and an SPF of 60 offers 97.7%. Physicians should understand that additional protection beyond SPF 60 is marginal and may even give patients a false sense of security, encouraging them to stay out in the sun longer.

In the United States, companies have taken advantage of the consumer's appetite for the highest number sunscreen, with products boasting 80, 90, and 100 SPF.

Last year, the U.S. Food and Drug Administration introduced new sunscreen labelling regulations that are to take effect on June 18, 2012, to simplify the sometimes exaggerated nomenclature used in marketing these products to the public.

Among other changes, the terms sunblock or waterproof will no longer be used, 50 will be the upper limit of advertisable SPF, and clearer definitions of skin cancer risk and "broad-spectrum" will be introduced. In Canada, sunscreen labelling is regulated by Health Canada. We encourage Health Canada to review and update its current regulations on sunscreen labelling.

It is imperative to point out that SPF only measures protection against UVB and does not measure UVA protection. Because we know that UVA rays are also harmful, an SPF value is not an entirely accurate measure for overall skin protection. A sunscreen may have a high SPF, but offer very little UVA protection. Measures for UVA protection are currently lacking in Canada.

Children under six months should refrain from direct sun exposure as their skin is thin and can burn, over-heat, and dehydrate readily; sunburns in babies can be medical emergencies. Sunscreens should be avoided in this group as skin absorption, metabolic elimination, and the risks and benefits of their use are still unclear. Beyond six months, the regular use of sunscreen is recommended for infants, toddlers and children.

Coloured skin is not immune to skin cancer, and given Ontario's multicultural patient population, the sunscreen discussion is germane. Again, individualizing recommendations should be based on skin type and medical history.

The vehicle in which the UV sunscreen is included plays a vital role in ensuring efficacy and preventing toxicity. Sunscreens come in creams, gels, lotions, ointments, sprays, lip balms, and sticks. There are also water-proof formulations. The formulation really tends to be a personal choice based on personal need. A cream may be good for the face and body, whereas a gel may be good for hairy areas. Caution should be employed for all products, particularly sprays, for use on the face and around eyes as they can be irritating. Available formulations of sunscreens are numerous, however, there is no conclusive evidence that one formulation vehicle works better than another.

Patients often ask "What number sunscreen and what brand should I buy?" In general, SPF 30 is regarded as a good, all-purpose sunscreen for active people who spend extended time outdoors.

More important than the SPF and formulation, however, is applying the correct amount of sunscreen. Most of us only apply 25% of the required amount of sunscreen. A full ounce, or 30 ml — the equivalent of a shot-glass — is required to cover an exposed adult body. Sunscreen needs to be applied 20 minutes before the exposure to improve skin absorption, and reapplied every two hours, preferably on non-sweaty skin.

Each sunscreen product contains a dizzying array of chemicals that can

lead to significant consumer confusion. In general, sunscreens that are broad-spectrum with coverage for both UVA and UVB ray are most desirable. In Canada, sunscreens that contain zinc oxide or titanium dioxides (physical blockers) are categorized as natural health products and offer good broad-spectrum coverage. Other chemical sunscreens are classified as drugs.

Today, most commercial products combine ingredients. Dometrizole trisiloxane (Mexoryl XL™), as well as the combination product of diethylhexyl 2,6-naphthalatate, avobenzene and oxybenzone, commonly known under the commercial name of Helioplex™, are two separate compounds that are readily identifiable on sunscreen product labels and provide excellent broad-spectrum coverage.

In addition to the active ingredient, products also contain a myriad of non-active ingredients, such as retinyl palmitate.

Controversy surrounding the risks of sunscreen ingredients is not new. For years, para-amino benzoic acid (PABA) was a staple constituent in sunscreens, acting as a chemical UVB absorber.

In recent years, sunscreens containing PABA have largely fallen out of favour, not for any carcinogenic risk but due to their allergic potential. Many products now market themselves as being PABA-free.

In 2011, the Environmental Working Group (EWG) released its annual list of sunscreen rankings, sounding alarms regarding the safety of many commonly used sunscreens.

The report outlined concerns surrounding oxybenzone with respect to systemic absorption and hormone disruptions, as well as potential carcinogenicity from the non-active sunscreen ingredient retinyl palmitate.

Despite the media buzz, Health Canada and the American Academy of Dermatology have refuted the EWG's

safety claims, stating that available published evidence failed to substantiate their assertions.

In Canada, sunscreen manufacturers are required to have authorization from Health Canada demonstrating that their products are safe and effective prior to sale. Nevertheless, ongoing safety evaluations of existing Canadian sunscreen ingredients should be an integral part of any Health Canada policy moving forward.

Given the alarming rates and rise of skin cancer in Canada, sunscreen use will remain a mainstay of our sun-safety messaging.

New products with optimized broad-spectrum protection, improved Canadian labelling standards, and enhanced public education campaigns will proactively promote sun-safe practices and keep our patients free of skin cancer. ■

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