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pathways for health



July/August 2010: Sunscreen Safety and The Sun for Health

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July Recipes: Blueberries...July is National Blueberry Month

<http://pathways4health.org/2010/04/09/blueberries/>

July and August are the classic vacation months when we question how to be safe in the sun. We are told to protect ourselves from the sun's damaging UV rays. But, the sun can also be an ally, particularly as we age, since moderate exposure can provide health benefits for the prevention of a variety of chronic diseases.

Most people experience 50% to 80% of their lifetime exposure to the sun before the age of 18. Also, melanoma-type skin cancers are associated with severe sunburn experienced before the age of 20.¹ But as we age, we especially require vitamin D to support health: Vitamin D partners with calcium to support healthy bones and works as an ally in the prevention of depression, osteoporosis, cancers (since vitamin D regulates cell growth), diabetes, heart disease, multiple sclerosis, and other inflammatory and chronic diseases. The most natural, non-toxic form of vitamin D comes from the sun, because the body makes vitamin D from sunshine only in amounts that are needed. "...sunlight destroys any excess vitamin D that your body makes, so you could never become vitamin D intoxicated from sun exposure."²

Obviously, balancing the risks and the benefits of exposure to the sun, particularly with the erosion of the ozone layer, is challenging. This newsletter covers sunscreen safety, as well as the role of sunshine and vitamin D in supporting health. Since interests vary, I have summarized and placed first the key ideas of this newsletter to allow you to read selectively:

¹ www.kidshealth.org

² Michael Holick, PhD, MD, Director of the Bone Health Care Clinic and the Heliotherapy, Light, and Skin Research Center at Boston University Medical Center. *Alternative Therapies*, May/June 2008. He was a pioneer in vitamin D research in the 1960s and is one of the world's leading experts on vitamin D, its role in skin and bone health, the prevention of cancer and other chronic disease. See *The UV Advantage* and *The Vitamin D Solution*.

Summary...Sunshine Safety and Measures for Health?

- *Children and teens can err on the side of less sun and more sunscreens.* With children generally, we do not need to think too much about the sun as a healer of chronic disease. These are the years to be sensible in order to avoid melanoma cancers in later life. At the same time, through gradually building up to the sun, sunshine can be very helpful in reducing childhood asthma and wheezing disorders while it enhances growth, bone formation, energy, and mood.
- *For adults, sunlight is a major agent that can help prevent a host of chronic diseases.* These are the years when the risk/reward appears to tip toward seeking moderate exposure to the sun...particularly since the seeds of melanoma skin cancer were already laid down during childhood. On the positive side, moderate doses of sunshine can help protect against internal cancers and chronic, inflammatory diseases perhaps to outweigh the risks of skin cancers, many of which can be managed by periodic visits to the dermatologist, and through prudent year-round exposure to the sun and adequate antioxidant nutrition. *So, you may want to get 15-30 minutes of sun exposure and then apply sunscreen. Since the face and head account for less than 10% of your total skin surface, applying a sunscreen to your face (especially in the summer) before going out in the sun can help prevent aging, while you absorb for a time helpful rays on exposed areas of other parts of your body before applying sunscreen.*
- *No matter your age, build up with gradual exposure to the sun.* Begin in the spring with 5-15 minutes, progressing to 30 minutes a day, exposing face and arms, when possible. Darker skinned people with more melanin in their skin can handle more sun than those who are fair.
- *Eat nutrient-dense, antioxidant-rich organic fruits and vegetables to boost your internal defenses to the sun's free radical effects.* Some experts believe that the sun's rays work as a catalyst for the body to release internal toxins through the skin and that sunburn is exacerbated by nutritional deficiencies that leave the skin vulnerable to DNA mutations from radiation.³ So avoid foods with a heavy pesticide load, choosing instead fruits and vegetables that provide a rich array of antioxidants, as well as foods and supplements that provide high-quality oils.
- *Skin cancer versus chronic disease.* While it is true that excessive exposure to the sun (you should never expose your skin to the point of burning or blistering) does increase your risk of basal and squamous cell skin cancer and can prematurely age the skin, sensible and frequent mild exposure, combined with an antioxidant-rich diet, may be the best strategy to avoid serious chronic diseases.
- *The most effective sunscreens contain zinc oxide or titanium dioxide.* These two ingredients "create a physical barrier that sits on the skin's surface and are not absorbed into the body. They reflect light away from the skin, the way a mirror would." Try to look for a sunscreen that

³ *The Gigantic Sunscreen Hoax.*

contains antioxidant vitamins like vitamins C and alpha-lipoic acid, which can be helpful in parrying any stray free-radical damage to the skin.⁴

- *To derive the most health benefits, frequent, short exposure to sunshine is best. There are no set rules about how much sun is optimal, since this will vary with your age (vitamin D deficiency increases as we age), skin color (longer exposure for darker skin)⁵, with where you are located on the globe (less is needed at the equator and more toward the poles), and your state of health (sunshine can be helpful for depression, inflammation, high blood sugar, fragility fractures, chronic pain, PMS, psoriasis, and diabetes and obesity, to name just a few.*
- *Light rays absorbed through the eyes stimulate the pineal gland (called the “third eye” because of its link to hormone function). You might consider wearing glasses that allow UV light to pass through, and sunglasses tinted a neutral grey in order to decrease uniformly the amount of light across the broad spectrum.⁶*
- *Scientific studies suggest that sunshine exposure both through the iris of the eye and on unprotected skin is important for general health. For anyone with a chronic disease, sunshine can be used medicinally, often with very positive results.*

Overview

It is vacation time again when the prior months of short-winter and rainy-spring days have depleted us of vitamin D, so we naturally crave the sun. Weekends and vacations tempt us to stretch out to feel the sun’s energy penetrate our being. Every cell of our body is equipped with vitamin D receptors, and perhaps this explains why we broadly sense its deeply restorative power.

Traditional cultures worshipped the sun. Without building temples, we do too, in our own informal ways. But what distinguished traditional cultures was their respect for the sun’s power: Each spring, they adapted gradually to the sun, building up protective melanin in their skin⁷ to be able to tolerate its power well before the strongest days of summer. They planned outdoor work to avoid the sun at its most intense hours. Work started early in the day, with a break for a long noon meal and rest, before resuming again in mid-afternoon. And, they ate whole foods rich in antioxidant protections. To expose our “virgin” skin to the vacation sun lying flat on a reflective sandy beach or on a float in a pool while consuming the Standard American Diet is a modern phenomenon.

⁴ Ralph W. Moss, PhD, “New Evidence that Vitamin D Fights Cancer.”

⁵ An *Archives of Internal Medicine* study found the deficiencies of vitamin D varied by race...70% of Caucasians, 90% of Hispanics, and 97% of African Americans...but no matter the race, most Americans are lacking in vitamin D.

⁶ www.healingcancer.naturally.com

⁷ Nature also designed humanity to accommodate to the sun’s rays. People living at the equator had more melanin and therefore darker skin to provide greater protection than lighter-skinned peoples living in northern latitudes. The same phenomenon applies to eye color, with people living at the equator having a naturally deep-brown/black iris, compared to light-blue tones of Scandinavians. www.second-opinion.co.uk/full_spectrum_sunlight

Today, while our need for vitamin D is as great as ever (we are more deficient in vitamin D than any other vitamin—some 80 percent of Americans, 90 percent of Hispanics, and 97 percent of African Americans are vitamin D deficient) we must worry about our exposure to the sun. It is not only the erosion of the ozone layer, but also our modern indoor lifestyle that make us ill-suited for the quick shift to long vacation days in the sun, especially at a beach or pool. The best strategy is to begin in the spring to work into the sun, if possible, by exposing your skin to the sun for 15-30 minutes a day, before or after the hours of 10 a.m. to 2 p.m. This will help build your resilience and also your vitamin D levels.

The Sun and Sunscreen Facts:

Sunlight's three rays, UVA, UVB, and UVC:

UVA radiation is a major concern because it easily travels through the ozone layer, with few sunscreens offering UVA protection. UVA rays cause wrinkles and aging; damage the immune system; and foster skin cancers.

UVB rays appear less lethal than UVA rays since the ozone layer absorbs the majority and sunscreens provide protection. Excessive UVB radiation that does get through causes sunburn, damage to the immune system, and can lead to cataracts and skin cancer. But we do need some UVB exposure (which sunscreens parry) since it is UVB rays hitting unprotected skin that enables the body to create vitamin D.

UVC rays, the shortest wave length, can damage tissue, but they are largely screened out by the ozone layer. We do need trace amounts for good health. UVC rays perform a positive role in science and industry through their ability to kill bacteria.

Melanin in our skin helps to protect us against the sun. Sunlight stimulates the body to make melanin, its effort to protect skin cells from ultraviolet radiation. The darker your skin, the more protection you have from the sun. With increasing exposure to the sun, melanin builds up for many people, so the risk of sunburn often decreases as the summer season progresses: Sun exposure that would burn us on Memorial Day or in June may be easy to handle in August, at least from the standpoint of sunburn. People with a lighter natural skin color have less melanin and need to take more care. The same is true of adults and children who have a lot of moles and/or a family history of skin cancers.

Babies and the Sun. Sunscreen should *not* be applied to babies under 6 months of age. Babies need to be kept out of the sun. Their skin is very thin, they are not able to fend off toxins in sunscreens, and melanin has not built up in their skin to offer sun protection.

SPF (sun protection factor), a measure only of UVB protection. What is SPF? If you would normally begin to burn after 10 minutes in the sun, then an SPF of 30 would theoretically allow you to be in the sun 300 minutes (10x30) before burning. This calculation is an estimate and is influenced by whether you perspire, or engage in water sports, and by the strength of the sunlight. There is little need to pay for higher than SPF 30, since higher levels add little additional protection. (An SPF of 8 is enough to

block out 93% of UVB radiation, while an SPF of 15 blocks 99%, so either would be sufficient to blunt the potential vitamin D benefits.)⁸

There is no such thing as a “sun block.” The FDA plans to ban this label. Also, tanning lotions and suntan products do not generally provide protection from UV rays.

The Sun and Sunscreen Safety

Activities that take you to the sun for prolonged periods of time are best handled by covering up with a hat and clothing, or seeking shade. If you are engaged in sports that do not allow for cover, you will want a good sunscreen that effectively blocks out damaging UVA and UVB rays AND does not breakdown in the sun. Sunburn and skin damage are not the same issue...

Sunburn is caused by UVB rays, but skin is especially damaged by UVA rays that SPF ratings do not speak to. Sunlight is made up of three types of radiation, so *just because we use a sunscreen to prevent a tan or burn does not mean our skin is safe from the sun.* (See discussion above.)

Unlike UVB, UVA rays leave no overt footprint. But, UVA rays damage the skin and the immune system by intense exposure. Few sunscreens protect against UVA. The best protection is offered by zinc oxide and titanium dioxide. (Avobenzone and Merxoryl SX, two UVA-screening ingredients approved by the FDA, break down in the sun.)

A sunscreen’s “sun protection factor” (SPF) can be misleading: It *does* indicate its protection against UVB tanning/burning rays, but little about its screening of UVA radiation. Sunscreens that do protect against both are normally denoted as “UVA/UVB” or “broad spectrum” sunscreens, but the SPF number applies only to UVB radiation. There is no numerical rating system of UVA protection.

The United States is behind Europe in analyzing and authorizing sunscreen ingredients.⁹ With few effective agents, every year new ingredients appear, some of which break down in the sun and pose the risk of free radical damage, both to the skin and to the environment. For every active sunscreen ingredient, there are 100 non-sunscreen “fillers.” (Especially, **BEWARE OF PARABEN.** It is a carcinogenic agent that is put in many skin creams and lotions for creamy smoothness.) Some added ingredients react with each other. Some are absorbed through the skin and enter the blood stream and can cause toxic effects, create allergic reactions, or disrupt hormone function.¹⁰ *Testing is left to the manufacturer:*

⁸ Holick, 70.

⁹ The FDA has approved just 17 sunscreen ingredients, compared to 29 that are authorized in Europe. We also permit just 4 UVA-screening chemicals. The only two viable and effective UVA ingredients are zinc oxide and titanium dioxide, two stable components that do not penetrate healthy skin.

¹⁰ The EWG comments: “...consumers who use sunscreens without zinc and titanium are likely exposed to more UV radiation and greater numbers of hazardous ingredients than consumers relying on zinc and titanium-based products. Sunscreens without these two ingredients contain four times as many high-hazard ingredients known or

the government does not require companies to test their sunscreens for safety before they are allowed to be marketed on store shelves.

Without government sunscreen regulations, we are fortunate that in 2004, the non-profit Environmental Working Group (EWG) stepped in to begin to test sunscreen ingredients and to offer advice and help. In its 2010 update, only 39, or 8 percent of the 500 products tested were approved for use. EWG bases its ratings on three criteria:

1. *Effectiveness* at blocking both UVA and UVB radiation;
2. *Stability* of the active ingredients when exposed to the heat and light of the sun; and
3. *Safety* of the active and inactive ingredients with respect to the health risks of children and adults, alike.

Of the 500 major sunscreens tested by the non-profit Environmental Working Group (EWG), only 39, or eight percent of the total, tested well. The following list includes the makers of some of the top brands of approved sunscreens:

All Terrain	Jason	Thinkbaby
Badger	Kaban	Thinksport
Beyond Coastal	Little Forest	Trukid
California Baby	Loving Naturals	UV Natural
Caribbean Solutions	Purple Prairie	Vanicream
Desert Essence	Soleo	

[Note that *Banana Boat*, *Neutrogena*, and *Hawaiian Tropic* are not on the approved list.]

Look for a sunscreen that provides protection at a 30+ SPF level (higher brings little additional advantage) and with the stability to stand up to the sun's rays...*the ones that contain zinc or titanium dioxide*. **Avoid oxybenzone (a synthetic estrogen) and retinyle palmitate**. Retinyle palmitate (vitamin A) appears in some 40 percent of all sunscreens on the market this year and is believed to foster skin cancer when applied to skin that is then exposed to the sun. To find the rating of your current sunscreen see <http://www.ewg.org/2010sunscreen>.

Sunshine, Vitamin D, and Health

What is vitamin D? Vitamin D in its active form is actually a hormone. Our body makes vitamin D in a multi-step process that involves the liver and kidney, but it all starts with unprotected skin absorbing the

strongly suspected to cause cancer or birth defects, disrupt human reproduction, or damage the growing brain of a child.

sun's UVB rays. Interestingly, vitamin D is the only vitamin that we can make all on our own,¹¹ and virtually all the cells and tissues of the body [as well as the kidneys] have the capability to activate vitamin D.¹²

Vitamin D is important, particularly in infancy and childhood but also throughout life, for healthy bone formation, for mood, for a vibrant nervous system, for thyroid function and fertility, for normal blood clotting, for healthy skin and teeth, and even for the prevention of some forms of internal cancers. Vitamin D also enhances vitamin A and vitamin C, as well as a host of minerals, especially calcium, phosphorus, and choline. Since vitamin D is fat-soluble, it is stored and retained by the body over a prolonged period, even up to a year. Vitamin D synthesis declines 80% between the winter and summer, but most people can gain enough sun exposure from spring, summer, and fall to store vitamin D in body fat for release during the winter months.¹³ So while we may enjoy warmth and the feeling of sunshine on our skin, it is not critical to experience the sun every day in order to be healthy. The amount of sunshine on unprotected skin that is in keeping with good health depends on a person's age and skin color, the time of year, the geographic latitude, as well as the person's state of health (since the sun can be used medicinally for chronic illness).

Since vitamin D appears in only a few foods (cod liver oil, egg yolks, liver, and oily fish like salmon and sardines¹⁴), for all practical purposes, and unlike vitamins A, C, and E, it is hard to find adequate amounts of vitamin D through food.¹⁵ Also, vitamin D is a fat soluble vitamin, which means, when taken orally, it could accumulate to potentially toxic levels.¹⁶ Thankfully, this does not happen with sunshine, since our body is able to self-regulate to stop making vitamin D when it is no longer needed. So, the very best source is from sunshine, and it is the *only* source that assures that vitamin D cannot build to toxic levels.

Vitamin D and Cancer.

Vitamin D helps the body utilize calcium to grow bone and support the normal functioning of the heart and nervous system. Vitamin D also partners with calcium in its role to support cell differentiation when

¹¹ Jeremy Laurance, www.healingcancernaturally.com.

¹² Holick, 73

¹³ Holick, 67.

¹⁴ Farm-raised salmon, fed a diet of pellets, has only 10%-25% of the vitamin D levels of wild salmon....Holick.

¹⁵ There is essentially no vitamin D from any dietary source. It's principally found in oily fish or in sun-dried mushrooms and in fortified foods, like milk and orange juice. But there are only 100 international units (IU) in a glass of milk or vitamin D-fortified orange juice. We now recognize that for every hundred IU you ingest, you raise your blood level of 25-hydroxyvitamin D [a precursor of the active hormone form] by 1 nonogram per milliliter (ng/mL)." ...Horlick.

¹⁶This is a widely-recognized view. However, Holick believes the risks are exaggerated, "Vitamin D intoxication is one of the most rare medical conditions worldwide." 72. Holick recommends "at least 400 IU for adults over the age of 50, and 600 IU for people aged 70 and older. But now many experts agree that both children and adults need a minimum of 100 IU of vitamin D a day to maintain a blood level of 25-dydroxyvitamin D that we consider to be healthful, which is above 30 ng/mL."

the body makes new ones.¹⁷ This explains vitamin D's important role in the prevention and remission of internal cancers, particularly colon, breast, prostate, and ovary.¹⁸

In 1979, the DeLuca Group reported that "essentially every tissue in your body appeared to recognize the active form of vitamin D." (Holick, 66.) This led to an understanding that "because every tissue and cell in your body has a vitamin D receptor, we think that vitamin D acts as a sentinel for your health in that it will control cell growth. If the cell growth becomes malignant, it will either return the cell to normal or induce apoptosis, cell death." (Holick, 69.)

As early as the 1940s, it was reported that it was easy to find and treat non-melanoma skin cancers and that this might be a reasonable risk/benefit strategy to seek some sun exposed in view of the danger of undetected internal cancers developing due to lack of exposure to sunshine.¹⁹ Research suggests that *most people who develop skin cancer are not as inclined to develop deadly internal cancers. And, even most melanomas occur in areas that receive virtually no sun exposure.*²⁰ In addition, *most cancer patients are deficient in vitamin D and a vitamin D deficiency increases the risk by "30%-50% of developing some of the most deadly cancers."*²¹

Hormones and Full-Spectrum Light Through the Eye?

Full spectrum light through the iris of our eye stimulates the pineal and pituitary glands for proper hormone and brain function. John Nash Ott was an early pioneer who explored more than 40 years ago the benefits of full-spectrum light. He concluded that, "*There are neuro-chemical channels from the retina to the pineal and pituitary glands, the master glands of the whole endocrine system that control the production and release of hormones. This regulates your body chemistry and its growth, all organs of your body, including your brain, and how they function.*"²²

Ott derived his conclusions from observing changes in reproduction in plants and animals when they were deprived of full-spectrum light. He also discovered that his arthritis disappeared when he broke his glasses so his eyes were exposed to direct sunlight. (UVB rays do not pass through glass.) In 1959, Dr. Jane C. Wright, working at the Bellevue Memorial Medical Center in New York City, picked up on Ott's work. In her cancer research work, she instructed 15 women with cancer to be out in the sun as much as possible, *without wearing sunglasses*. At the end of the summer, 14 women experienced no growth of their tumors, some of which improved. The one woman, who did not get better, misunderstood the instructions and wore her regular glasses in the place of sunglasses.

Whether the exposure of the eye to full spectrum light is a positive for health may be a function of a person's diet and general nutrition. *It is possible that nutrient-dense, antioxidant-rich whole foods equip*

¹⁷ Suzanne VanDeGrift, "Calcium and Vitamin D: Partners in Health."

¹⁸ Laurance, www.healingcancernaturally.com.

¹⁹ Holick, 68.

²⁰ Holick, 74.

²¹ Holick, 73.

²² www.second-opinions.co.uk/full_spectrum_sunlight



the body to deal with the oxidative stress and free-radical effects of the sun's rays, enabling the positive benefits of full-spectrum light to outweigh the negatives for people with a superior diet. There is much still to be explored in this field to better understand the potential health benefits of sunlight.

For some stimulating reading on this under-researched topic, see John Nash Ott's, *Health and Light* (1973) and *Light, Radiation and You: How to Stay Healthy* (1990). For more information on vitamin D and cancer and chronic disease, see *The UA Advantage and The Vitamin D Solution* by Dr. Michael Holick, as well as his interview article in the May/June 2008 issue of *Alternative Therapies*. Holick, a pioneer in vitamin D research, discovered the mechanisms for its synthesis in the body. Continuing on the forefront of vitamin D/health research today, he is a voice worth listening to.

July Recipes: Blueberries, a Truly National Fruit

Blueberries are a fitting way to greet the July 4th Holiday since blueberries are a true national treasure, a fruit native only to North America.

Blueberries are loaded with iron and provide a variety of antioxidants and anti-inflammatory compounds, including vitamins A and C and a host of health-supporting phytochemicals. Nutrient dense, they are thought to play a role in the prevention of a variety of chronic disease, from cancer to Alzheimer's. Blueberries' role in brain health is associated with its anthocyanin, which gives blueberries their deep color and appears to protect the signaling neurons in the brain from oxidative stress, aiding neurological function and memory. See <http://pathways4health.org/2010/04/09/blueberries/>