Sun Exposure and Skin Cancer

Many people love the warm sun. The sun's rays make us feel good, and in the short term, make us look good. But our love affair isn't a two way street: Exposure to sun causes most of the wrinkles and age spots on our faces. Consider this: One woman at age 40 who has protected her skin from the sun actually has the skin of a 30-year-old!

How does the sun change my skin?

Exposure to the sun causes:
- Pre-cancerous (actinic keratosis) and cancerous (basal cell carcinoma, squamous cell carcinoma and melanoma) skin lesions - caused by loss of the skin's immune function
- Benign tumors
- Fine and coarse wrinkles
- Freckles
- Discolored areas of the skin, called mottled pigmentation;
- Sallowness -- a yellow discoloration of the skin;
- Telangiectasias -- the dilation of small blood vessels under the skin;
- Elastosis -- the destruction of the elastic tissue causing lines and wrinkles.

What causes skin cancer?

Skin cancer is the most prevalent form of all cancers in the U.S. and the number of cases continues to rise. It is the uncontrolled growth of abnormal skin cells. This rapid growth results in tumors, which are either benign (noncancerous) or malignant (cancerous).

There are three main types of skin cancer: basal cell carcinoma, squamous cell carcinoma and melanoma. Basal cell and squamous cell cancers are less serious types and make up 95% of all skin cancers. Also referred to as non-melanoma skin cancers, they are highly curable when treated early. Melanoma, made up of abnormal skin pigment cells called melanocytes, is the most serious form of skin cancer and causes 75% of all skin cancer deaths. Left untreated, it can spread to other organs and is difficult to control.

Ultraviolet (UV) radiation from the sun is the number one cause of skin cancer, but UV light from tanning beds is just as harmful. Exposure to sunlight during the winter months puts you at the same risk as exposure during the summertime.

Cumulative sun exposure causes mainly basal cell and squamous cell skin cancer, while episodes of severe sunburns, usually before age 18, can cause melanoma later in life. Other less common causes are repeated X-ray exposure, scars from burns or disease and occupational exposure to certain chemicals.

Although relatively rare in youths under 12, young children do attempt suicide -- and may do so impulsively when they are upset or angry. Girls are more likely to attempt suicide, but boys are more likely to actually kill themselves when they make an attempt. Children with a family history of violence, alcohol abuse, or physical or sexual abuse are at greater risk for suicide, as are those with depressive symptoms.

Who is at risk for skin cancer?

Although anyone can get skin cancer, the risk is greatest for people who have fair or freckled skin that burns easily, light eyes and blond or red hair. Darker skinned individuals are also susceptible to all types of skin cancer, although their risk is substantially lower.

Aside from complexion, other risk factors include having a family history or personal history of skin cancer, having an outdoor job and living in a sunny climate. A history of severe sunburns and an abundance of large and irregularly-shaped moles are risk factors unique to melanoma.
What are the symptoms of skin cancer?

The most common warning sign of skin cancer is a change on the skin, typically a new mole or skin lesion or a change in an existing mole.

- Basal cell carcinoma may appear as a small, smooth, pearly or waxy bump on the face, ears, and neck; or as a flat, pink/red or brown-colored lesion on the trunk or arms and legs.
- Squamous cell carcinoma can appear as a firm, red nodule, or as a rough, scaly flat lesion that may itch, bleed and become crusty. Both basal cell and squamous cell cancers mainly occur on areas of the skin frequently exposed to the sun, but can occur anywhere.
- Melanoma usually appears as a pigmented patch or bump. It may resemble a normal mole, but usually has a more irregular appearance.

When looking for melanoma, think of the ABCD rule that tells you the signs to watch for:
- Asymmetry - the shape of one half doesn't match the other
- Border - edges are ragged or blurred
- Color - uneven shades of brown, black, tan, red, white or blue
- Diameter - a significant change in size (greater than 6mm)

How is skin cancer diagnosed?

Skin cancer is diagnosed only by performing a biopsy. This involves taking a sample of the tissue, which is then placed under a microscope and examined by a dermatopathologist, or doctor who specializes in examining skin cells. Sometimes a biopsy can remove all of the cancer tissue and no further treatment is needed.

How is skin cancer treated?

Treatment is individualized and is determined by the type of skin cancer, its size and location and the patient’s preference.

Standard treatments for non-melanoma skin cancer (basal cell or squamous cell carcinomas) include:

- Mohs surgery (for high-risk non-melanoma skin cancers) - excision of cancer and some extra tissue
- Electrodesiccation and curettage - physically scraping away the skin cancer cells followed by electrosurgery
- Cryosurgery or freezing
- Laser therapy
- Drugs (chemotherapy)

Standard treatments for melanoma skin cancer include:

- Wide surgical excision
- Sentinel lymph node mapping (for deeper lesions) to determine if the melanoma has spread to local lymph nodes
- Drugs (chemotherapy, biological response modifiers)
- Radiation therapy
- New methods in clinical trials are sometimes used to treat skin cancer.
How can I help prevent skin cancer?

Nothing can completely undo sun damage, although the skin can sometimes repair itself. So, it's never too late to begin protecting yourself from the sun. Your skin does change with age -- for example, you sweat less and your skin can take longer to heal, but you can delay these changes by staying out of the sun. Follow these tips to help prevent skin cancer:

- Apply sunscreen with a sun protection factor (SPF) of 15 or greater 30 minutes before sun exposure and then every few hours thereafter.
- Select cosmetic products and contact lenses that offer UV protection.
- Wear sunglasses with total UV protection.
- Avoid direct sun exposure as much as possible during peak UV radiation hours between 10:00 a.m. and 3:00 p.m.
- Perform skin self-exams regularly to become familiar with existing growths and to notice any changes or new growths.
- Eighty percent of a person's lifetime sun exposure is acquired before age 18. As a parent, be a good role model and foster skin cancer prevention habits in your child.

New Report Finds Flaws in Sunscreen Protection, Safety

July 3, 2009 — Sunscreens are improving, but three of five brand-name products either don't protect the skin from sun damage sufficiently, contain hazardous chemicals, or both, according to a report by the watchdog organization Environmental Working Group (EWG).

"I'd give the industry a C minus," says Jane Houlihan, EWG's senior vice president for research. "They have moved from a D to a C-minus in my book."

Overall, however, she says the industry is "not doing enough to protect consumers from UVA radiation."

The report is called the EWG 2009 Sunscreen Guide. An industry spokesman says the report is flawed.

Dermatologists who reviewed the report for WebMD offered praise and criticism. "Some points are definitely correct," says Henry Lim, MD, chairman of the department of dermatology at Henry Ford Health Systems, Detroit. But, he adds, "This report has somewhat of an alarmist tone."

Sandra Read, MD, a Washington, D.C., dermatologist and member of the board of directors of the American Academy of Dermatology, says she finds the report discouraging but says she hopes it will raise awareness of the need for sunscreen.

The 2009 Study on Sunscreen Effectiveness

This year's report is the third annual from EWG, which investigated 1,572 sunscreens, lip balms, and daily moisturizers with sun protection factor (SPF) of at least 15, typically the minimum recommended.

This year's study, as those in the past, was triggered, according to EWG, because the FDA has not set comprehensive safety standards for sunscreens. The agency has set guidelines for UVB protection but those for UVA are pending. UVA rays are associated with skin sagging and wrinkles, but more recently have also been associated with skin cancer; UVB rays can lead to skin cancer and sunburn.

The FDA is lagging behind other countries, the report charges, because it has approved only 17 sunscreen chemicals for U.S. use, compared to at least 29 in other countries.

To do the 2009 study, EWG scientists got a list of ingredients from retailers and then used numerous databases to evaluate safety and effectiveness.
10-Best Lists
Scientists from EWG developed a "best" list for sunscreens, lip balms, and moisturizers. On the 10 best sunscreens list (many sold online):

- Soleo Organics Sunscreen Organic chemical-free sunscreen, SPF 30+
- Badger Sunscreen, SPF 30
- UV Natural Sunscreen, SPF 30+
- Mexitan Sunscreen Lotion, SPF 50
- Lavera Sunscreen Neutral, SPF 40
- California Baby Sunscreen Lotion No Fragrance, SPF 30+
- Trukid Sunny Days Facestick Mineral Sunscreen UVA/UVB Broad Spectrum, SPF 30+
- Kabana Skin Care Green Screen Organic Sunscreen, SPF 22, Skin Tone Tinted
- Obagi Nu-Derm Physical UV Block, SPF 32
- Elta MD UV Physical, SPF 41

On the top 10 lip balm list:

- Fallene cotz LipCotz, Ultra High Sun Protection, SPF 45
- Jane Iredale LipDrink, SPF 15
- Badger Lip Balm, SPF 15
- Caribbean Blue-natural basics Lip Shield, SPF 15
- Shady Day Shady Kiss Lip Balm, SPF 30
- Bare Escentuals Lip Guard, SPF 15
- Lavanila Laboratories The Healthy Lip Butter, SPF 15, Pure Vanilla, SPF 15
- Jack Black Intense Therapy Lip Balm Lemon & Chamomile, SPF 25
- Rx Suncare Lip Balm Sunblock, SPF 45
- Crabtree & Evelyn Naturals Protective Lip Balm, SPF 8, Cocoa butter & Cardamom

And the top 10 SPF moisturizers, according to EWG:

- Keys Soap Solar Rx Cosmetic Moisturizing sunscreen, SPF 30
- Marie Veronique Organics Crème de Jour Tinted, SPF 30, no nanoparticles
- Devita International Daily Solar Protective Moisturizer 30
- SanRe Organic Skinfood Supple Sunshine, Organic Rosemary and Lavender Day Creme (Dry to Normal), SPF 30
- Lotus Moon Sage Sun Protective Crème, SPF 25
- Institut Dermed Sun Protective Cream Oil Free, Untinted, SPF 28
- N.V. Perricone M.D., Targeted Care Solar Protection Face with DMAE, SPF 26
- Sue Devitt Promarine Tinted Moisturizer, SPF 30, Capri
- Sun Science Organic Daily Wear, SPF 30
- Karen's Botanical Lovely Lavender Cream, SPF 15

Failures and Improvements
Among the failings of the sunscreen products and industry, according to EWG:

- Only 5% of products overall met their criteria for safety and sunscreen effectiveness -- and that includes blocking UVA and UVW, maintaining stability, and having no or few ingredients with health hazards.
- Product claims are overstated, promising such things as "all day" protection.
- Many spray and powder products contain tiny "nano-scale" ingredients that could be absorbed more easily in the lungs and cause problems.
EWG scientists did find that 70% of sunscreens available this year contain strong UVA filters, compared to just 29% last year. Among the top brands that were reformulated to boost UVA protection are Solbar, Zia Natural Skincare, Nivea, L'Oreal, and Hawaiian Tropic.

The ingredient oxybenzone, which the EWG contends disrupts hormone systems, was in 19% fewer sunscreens this year, according to the report.

Among the 339 sunscreens not recommended are:
- Coppertone NutraShield, Sunscreen Lotion SPF 30
- Neutrogena Ultra Sheer Dry-Touch Sunblock, SPF 30
- Huggies Little Swimmers Sunscreen, Moisturizing Blue Melon Splash
- Jason Natural Cosmetics Sunbrellas: Complete Block Spray, SPF 26
- CVS Sport Sunblock Lotion, SPF 30

**Industry Response**

The recent EWG report is "unscientific and unsubstantiated," says John Bailey, chief scientist for the Personal Care Products Council, an industry group, in a statement.

In part, the statement also reads: "Consumers can be confident in the safety of the sunscreens they buy for themselves and their families because all sunscreens sold in the U.S. are regulated as over-the-counter (OTC) drugs by the U.S. Food and Drug Administration (FDA), which requires them to go through rigorous scientific assessment and approval process that includes safety and performance testing before marketing."

In a telephone interview, Bailey tells WebMD: "I think there are so many flaws in this report that it's difficult to really know where to start." One flaw, he says, is that "they should have consulted real experts in the area," Instead, he says, they developed their own way of scoring and didn't consider ingredient stability in a realistic way.

**Other Opinions**

"The most important thing they highlight is that the FDA is really lagging behind in getting a UVA rating," says Eric Schweiger, MD, a Manhattan dermatologist and clinical instructor of dermatology at Mount Sinai School of Medicine, New York, who reviewed the report for WebMD.

The report also contends that higher SPF products may tempt people to stay out longer, but Schweiger says he tells patients to use as high as possible "because people tend to not apply it right."

Lim says the report’s authors caution that oxybenzone can be absorbed into the skin. "It's true, but there is no evidence that it is of any clinical significance."

Lim also points out that sunscreens are improving, according to the report. "Not all products have good UVA protection," he says, "but more do."

"Ingredients are not the full story of good sun protection," says Read. Using sunscreen correctly, using the right sunscreen for your exposure and skin type, and reapplying every two hours is crucial, she says.

Lim advises patients to look for ingredients known to help protect against UVA, such as avobenzone (Parsol 1789), titanium dioxide, zinc oxide, or Mexoryl.