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INFORMATION:

Sunburn Basics

If you like to enjoy the sun, you probably share several characteristics with other sun lovers.

You like to look healthy.

You like the outdoors.

You have sun-damaged skin.

You may also share an increased risk of skin cancer.

In order to avoid these risks, you do not have to give up the sun. But you do need to avoid overexposing your skin to the sun. The first thing you need to realize is that sun exposure will damage your skin, if your exposure is moderate, your skin will adapt (by thickening and by forming melanin); then it will repair itself. If you tan deeply over a period of several years, these protective mechanisms can backfire. Your skin may become permanently thickened and discolored. These skin changes can cause you to develop premature wrinkling and skin lesions. For some people, the outer layer (or lens) of the eye also thickens in response to sun exposure and can form a cataract.

We all need some sun exposure - it's our primary source of vitamin D, which helps you absorb calcium for stronger, healthier bones. But it doesn't take much time in the sun for most people to get the vitamin D they need, and unprotected exposure to the sun's ultraviolet rays can cause skin damage, eye damage, immune system suppression, and potentially skin cancer. Even people in their 20s can develop skin cancer. Most children realize between 50 to 80 percent of their lifetime sun exposure before age 18, so it is important that parents teach their children how to enjoy fun in the sun safely. With the right precautions, you can greatly reduce your child's chance of developing skin cancer as they grow older.

The sun's rays, which are called ultraviolet A and ultraviolet B rays (UVA and UVB) damage your skin. This leads to early wrinkles, skin cancer and other skin problems. Exposure to the sun often over time, even if you don't burn, can lead to skin cancer. A tan is the body's desperate attempt to protect itself from the sun's harmful rays.

How Caused

Sunburn develops when the amount of UV exposure exceeds what can be protected against by the skin's melanin. The lighter your skin, the less melanin it has to absorb UV and protect itself. Not all sunlight is equal in UV concentration. The intensity of the sun's rays depends upon the time of year, as well as the altitude and latitude of your location. UV rays are strongest during the summer. Remember that the timing of this season varies by location. UV rays are most powerful near the equator, where the sun is strongest, as well as high altitudes, where the air and cloud cover are thinner, allowing more damaging UV rays to get through the atmosphere.

Both UV-A and UV-B rays are damaging to the skin. UV-A can cause darkening of the skin and pre-mature aging of the skin. However, UV-B is the more intense UV ray that causes

sunburn and is most linked to skin cancer. Researchers have confirmed that cumulative UV-B sun damage (for example, a history of blistering sunburns) contributes to the development of skin cancer. People who live in tropical areas or at high altitudes are exposed to a higher concentration of UV rays, compared to people who live in other areas. The thinning of the ozone layers appear to be allowing more harmful UV rays to reach the earth, so regardless of where we live we need to be extra careful about protecting our skin with sunscreen and clothing, especially midday (10 a.m. until 4 p.m.), when the sun's rays are strongest. Up to 80 percent of the sun's ultraviolet (UV) rays reach the earth on cool, windy, hazy, foggy or cloudy days, so practice your sun-safety techniques even when the sky looks gray.

How/When Can Happen

Too much sun at any one time can lead to a sunburn. The redness, pain and swelling from a sunburn are comparable to any other type of burn. In most cases, your discomfort (or pain) will be temporary. However, the long-term effects of multiple sunburns are cumulative. If you have six or more sunburns in your lifetime, your risk of some skin cancer is 2.4 times that of someone who had never had a sunburn. Sunburn develops when the amount of UV exposure exceeds what can be protected by the skin's melanin. The lighter your skin, the less melanin it has to absorb UV and protect itself. And all skin, no matter what color, responds to continued sun exposure by thickening and hardening, resulting in leathery skin and wrinkles later in life.

In reaction to UVB, the top layers of your skin will release chemicals that cause your blood vessels to expand and leak fluids, causing inflammation, pain and redness otherwise known as sunburn. This type of damage can occur in as little as 15 minutes and will continue to develop for 24 to 72 hours after exposure to the sun. All types of sunburn, whether serious or mild, can cause permanent and irreversible skin damage.

Frequent sunburns increase your risk of developing skin cancer. You are most likely to get burned when taking part in passive activities like relaxing with a book, watching a sporting event or sitting in the park. By being aware of these facts and protecting your skin every day, you can avoid sunburn and lower your risk of skin cancer.

Who's at most risk

Approximately 1 in 5 people in the United States will be diagnosed with skin cancer at some point in their lives. About 90 percent of all skin cancers can be prevented. The most significant, preventable cause of skin cancer is excessive exposure to the sun. Practicing sun-safety techniques, you can greatly reduce your risk of sunburn as well as developing skin cancer. Here are some common traits found in skin cancer patients:

Caucasians are at greater risk than other ethnic origins.

People who have had excessive exposure to UV radiation from the sun without protection.

People with fair skin are 20 times more likely to develop skin cancer.

Males are 2 to 3 times more likely than females to have basal cell and squamous cell cancers.

People with a family history of skin cancers.

The incidence of skin cancer in the United States has reached epidemic proportions. 1 in 5 Americans will develop skin cancer in their lifetime, and one American dies every hour from this devastating disease. Since sunburn has been proven to have a direct link to the development of skin cancer, and SunSignals can help you avoid sunburn, SunSignals can play an important role in helping to reduce that risk of skin cancer.

Adverse results of Sun Damage

The most obvious result of too much sun is a sunburn, which involves skin redness and sometimes tenderness, swelling, blistering, fever, and nausea. Although some skin types prevent individuals from burning, everyone is at risk for other UV-related health effects. Over time, exposure to the sun and severe sunburns can lead to skin cancer. The most common places for skin cancer to develop are on those body parts exposed to the sun such as the face, neck, ears, forearms, and hands.

Premature wrinkling is another cause of excessive sun damage; too much sun can change your skin's texture, giving it a tough, leathery appearance. The sun also can cause discolorations in skin tone including red, yellow, gray, or brown spots. Some people may develop bumps, hives, blisters, or red blotchy areas as an allergic reaction to sun exposure.

Certain drugs, perfumes, and cosmetics also can make some people sensitive to the sun. No matter what your skin type or susceptibility to burns, sun exposure can damage your immune system and make your body more vulnerable to infections and cancers. Skin diseases, such as herpes simplex (cold sores), chicken pox, lupus, and Polymorphous Light Eruption (PLE), a sun allergy, can become worse with sun exposure.

The American Academy of Ophthalmology has cautioned that excess exposure to UV radiation can cause a painful burn of the cornea. Chronic eye exposure to UV radiation may increase the incidence of 'cataract,' which is a clouding of the eye lens - a fleshy membrane covers the eye, possibly developing spots that could result in blindness. This further underscores how truly damaging over exposure to the sun can be. SunSignals will help minimize the chance of over exposure. SunSignals provide a clear indicator of when you have reached the maximum recommended UVB radiation, signaling you to take protective action. UVB rays are the primary cause of sunburn and the most linked to the development of skin cancer.

Types of Skin Cancers

1/ Basal Cell Carcinoma – Small, fleshy bumps or lumps on the head, neck and hands. Named for the lowest layer of the epidermis (top layer of skin) where the cancer originates. This is the most common skin cancer that rarely spreads but can extend below the skin.

2/ Squamous Cell Carcinoma – Lumps of tissue or red, scaly patches usually found on the rim of the ear, the face, lips, and mouth. Originates in the higher level of the epidermis. It's the second most common skin cancer, and unlike Basal Cell Carcinoma, it can spread.

Basal and Squamous skin cancers are less deadly than melanomas. Nevertheless, if left untreated, they can spread, causing disfigurement and more serious health problems. More than 960,000 Americans will develop these non-melanoma skin cancers in a single year. These

two cancers have a cure rate as high as 95 percent if detected and treated early. The key is to watch for signs and seek medical treatment

3/ Melanoma - The most serious and aggressive type of skin cancer, that causes the most deaths. Originates in the melanocytes (the cells that produce the skin coloring or pigment known as melanin). Many dermatologists believe there may be a link between childhood sunburns and melanoma later in life. Melanoma cases in this country have more than doubled in the past two decades, and the rise is expected to continue.

Cautionary Note: Unprotected sun exposure is even more dangerous for kids with moles on their skin (or whose parents have a tendency to develop moles), very fair skin and hair, or a family history of skin cancer, including melanoma. You should be especially diligent about sun protection if your child has one or more of these high risk characteristics.

SunCare

Sunscreen Alone May Not Be Adequate Enough

“Sunburn is a common injury for many people during the summer months and one that is highly preventable,” stated dermatologist Richard F. Wagner, MD, coauthor of “Mechanisms of Sunscreen Failure” published in the May 2001 issue of the Journal of American Academy of Dermatology. “We found that even beachgoers who used sunscreen were still getting sunburned because they weren’t applying enough of it or reapplying it as often as they should.”

About the only thing guaranteed with sunscreen, doctors say, is this sobering fact: It is not enough! If you must expose bare skin to the sun’s rays, apply sunscreen – no matter what your skin shade, experts say: If you’re going to the beach, you need to cover every inch not protected by your swimsuit, face, ears, neck, trunk, legs, and feet. And you need to reapply frequently as sunscreens wear off, rub off, and wash off.

Studies show that sunscreen lowers the risk of squamous cell cancer and may lower the risk of basal cell cancer and melanoma. It works by blocking ultraviolet rays. How well it works, however is largely up to you. You should apply it about 20 minutes before going outside. It takes a while for the ingredients to start working. Use one ounce per application, enough to fill a shot glass.

Dr. Katrina Chiller recommends that people use sunscreen with an SPF, or sun protection factor of 15, whether they think they are going in the sun or not. “People need to be aware of the strength of the sun,” says Chiller.

According to the preferred laboratory testing amounts, you should be using a 120ml bottle of sunscreen during a single eight-hour day at the beach. Most of us don’t use nearly that much. So instead of applying enough to actually reach an SPF 15 rating, we use less and diminish the SPF value.

What’s more, when you perspire or wipe your skin with a towel, you lessen some of the sunscreen’s effectiveness. Consumers are applying as little as a quarter of the sun-prep they need to apply, way below what is needed to achieve the SPF’s that the product offers in the laboratory.

“There’s no such thing as safe exposure,” said David Simpson, an American Cancer spokesman, “You can reduce the risk. But the risk is still there.”

Skin Cancer

General Stats and Facts

Sunburn is the skin’s reaction to ultraviolet radiation (UV). Step outside without any form of protection and UV will immediately start to penetrate into the layers of your skin. Related to this, there is increased awareness that UVB radiation from the sun is the primary cause of skin damage and skin cancer.

According to World Health Organization, between 2 to 3 million non-melanoma skin cancers and more than 130,000 malignant melanomas occur globally each year, and these numbers are rising. In the U.S., more than 1,300,000 cases of common skin cancers occur annually, and it is estimated that approximately 55,000 new cases of melanoma are being diagnosed per year. About 8,000 people in the U.S. are expected to die from skin cancer this year. Skin cancer’s impact is also notable also because its victims tend to be younger than those of most other cancers. “Average age of skin-cancer diagnosis is 49, and victims in their teens, 20s and 30s are not uncommon,” says researcher Dr. John Thompson of the University of Washington and the Fred Hutchinson Cancer Research Center.

Ultra Violet radiation is made up of three components: UV-A, UV-B, and UV-C. The harmful effects of UV-A and UV-B have been known for some time (no UV-C from the sun reaches the earth’s surface because it is blocked by the Ozone Layer).

UV-A contributes to skin damage and may increase the risk of skin cancer but UV-A takes much longer to affect the skin than UV-B. To that point, Dr. Edward C. De Fabo of the George Washington University Medical Center, Washington DC, and colleagues, exposed mice to light of various wavelengths. including UVA and UVB solar simulation via filtered and unfiltered sun lamps. Melanoma was triggered most strongly by the UVB lamp. "Considerable controversy exists as to which wavelengths in the sunlight spectrum initiate melanoma, "De Fabo told Reuters Health. "This points out clearly that UVB is the culprit whereas UVA was ineffective."

How it Happens?

Skin cancer usually develops slowly, invading and destroying nearby tissues. It may take months or years for basal cell or squamous cell carcinomas to develop. Because of this slow growth, skin cancer can often be detected and treated early in its development, increasing the chance of a cure. Basal cell carcinoma can invade normal tissue and damage deeper tissues, such as muscles and bones, and affect the appearance of the skin.

Squamous cell carcinoma usually grows slowly and often develops in injured or diseased skin. Basal cell and squamous cell carcinomas are highly curable if they are detected and treated early. However, recurrent skin cancer, particularly recurrent squamous cell carcinoma, is more

likely to spread to other parts of the body.

Melanoma develops when normal pigment production skin cells undergo malignant transformation. Usually only one melanoma develops at a time. Although many melanomas begin in an existing mole or other lesion, 70 to 80 percent may start in previously unmarked skin. If not treated, most melanomas eventually spread to other parts of the body. Melanomas rarely disappear without treatment once they have spread.

Who's At Most Risk?

Increasingly, studies indicate that too much sun in childhood and the early teens, especially severe sunburn, greatly raises the risk of getting skin cancer later in life. As adults, we can't undo the sunburns we had as kids, but health experts warn parents to make sure their children avoid too much sun. Protecting children from too much sun is getting heightened emphasis because of studies showing repeated sunburns in childhood are a major risk factor for developing skin cancer.

Here's advice from experts:

Never rely on sunscreen alone for protection; sunscreens can't guarantee it will block all harmful rays.

Dress babies and young children in lightweight clothing that covers the arms and legs.

Apply sunscreen to exposed skin at least 30 minutes before going outside, even on cloudy days.

Use sunscreen with a sun-protection factor (SPF) of at least 15.

Experts say ideally kids should stay out of the sun between 10 a.m. and 4 p.m. If they do go out during those hours, make sure they take breaks in the shade.

These recommendations apply to adults as well.

Although anyone can get skin cancer, people with certain characteristics are particularly at risk.

The risk factors for skin cancer are:

Fair to light skin complexion

Family history of skin cancer

Personal history of skin cancer

Chronic exposure to the sun

History of sunburns early in life

Atypical moles

A large number of moles

Freckles (an indicator of sun sensitivity and sun damage)

Sun Protection Facts to Help You Prevent Skin Cancer

1. About 80 percent of skin cancers could be prevented by protecting ourselves from the sun's rays.
2. Everyone is at risk for skin cancer, regardless of skin color, and everyone needs protection from the sun.
3. Plan your sun strategy before you go out. You'll need a hat, protective clothing, sunscreen and SunSignals UV Sensors!
4. Plan your activities to avoid the hours of 10 a.m. to 4 p.m., when the sun's rays are strongest.
5. Sunlight can reflect off water, sand, concrete and snow, and can reach below the water's surface.
6. Cloudy skies may make the air temperature cooler, but UV rays are still coming through the clouds.
7. Cover up! Wear clothing to protect your skin as much as possible. Choose long-sleeve shirts and long pants, and wear a hat that shades your face, neck and ears.
8. Some medications such as antibiotics can increase your skin's sensitivity to the sun. Ask your doctor or pharmacist about drugs you are taking and extra precautions.
9. Children need extra protection from the sun. Encourage children to play in the shade, wear protective clothing and apply sunscreen regularly.
10. Always use a broad-spectrum sunscreen with a Sun Protection Factor (SPF) of 15 or greater. Look for the number on the label.
11. For best results, apply sunscreen about 30 minutes before going outside to allow it time to bond with your skin.
12. Reapply sunscreen often and after swimming, playing, perspiring or drying skin with a towel.
13. Don't use sunlamps or tanning booths. A tan from these artificial methods won't protect you in the sun when you go on a vacation. They damage the skin, and don't help or protect you.
14. It's never too late to protect your skin. Even if you've tanned or burned before, you can begin protecting your skin today by following these recommendations.

Sun Science

Skin Cancer a 'time bomb,' scientists warn.

"Despite a 24 percent rise in the last five years in cases of melanoma, the deadliest type of skin cancer, most young Britons are ignoring warnings about sunbathing. Seventy percent of young people are still seeking a tan when they go on holiday, Dr. Charlotte Proby, a dermatologist at the Cancer Research UK, told a news conference.

Young skin is particularly vulnerable to ultraviolet radiation from the sun which causes skin cancer but teenagers and adults are not taking precautions, according to a new survey. Unless young people change their habits and learn to protect themselves properly in the sun we could be heading for a skin cancer time bomb, Proby said.

The poll of 1,800 people commissioned by Cancer Research UK revealed young women are most likely to sunbathe on holidays and more prone to use low protection sun screens. Less than 10 percent of people questioned listed checking for changes in moles and not taking action against the disease."

"Skin cancer is already the third most common form of cancer in 15-24 years olds after Hodgkin's disease and testicular cancer and is the fastest increasing of all cancers. Malignant melanoma is the most serious type of skin cancer. It accounts for roughly 10 percent of reported cases of illness and can spread rapidly throughout the body, forming secondary tumours. Almost 7,000 people in Britain were diagnosed with the disease in 2000 and about 1,7000 died. It now kills more people in Britain each year than in Australia, which has a warmer, sunnier climate.

But Proby said more people are fleeing Britain's unpredictable weather and taking holidays in Spain, Greece, Portugal and other sunny countries."

Photosensitizers

"Certain medications and products can also cause your skin to be extra sensitive to sunlight, as can some disease. So, if you get a rash or an unusually severe burn after being out in the sun only a short time, don't automatically assume that you have an allergy. Chemicals that produce an intense reaction after a brief exposure to the sun are called photosensitizers. You don't have to be sun sensitive to have a reaction to a photosensitizing drug or product, although not everyone will have a reaction. Oddly, you may have the reaction once and not again."

"Some common photosensitizing drugs include acne medicines, antihistamines, blood pressure medications, nonsteroidal inflammatory drugs, antifungal agents, diuretics, oral diabetes medications, tranquilizers, and tricyclic antidepressants. Photosensitivity can also result from exposure to soaps, deodorants, perfumes, dandruff shampoos that contain coal tar, and even some sunscreens. Photo reactive agents are also found in artificial sweeteners, petroleum products, hair dyes and common household items like shoe polish and mothballs."

"In addition, photosensitivity can be the result of an underlying medical condition, such as systemic lupus erythematosus, an autoimmune disease that mainly affects the skin and joints but can involve other organs as well. Porphyria, a disorder that results from too many porphyrin molecules (derived from chemicals that make hemoglobin) in the blood and urine, can cause it, too. People who have AIDS also may be highly sensitive to light."

The SunWise School Program – Stay Healthy in the Sun

Why Worry About Too Much Sun

Sunburn

Premature Wrinkling

Skin Cancer

Sun Sensitivity

Immune System Suppression and disease

Eye Damage

Ultraviolet B, Not A, Radiation Triggers Melanoma

“Dr. Edward C. De Fabo of The George Washington University Medical Center, Washington DC, and colleagues, exposed mice to light of various wavelengths. This included UVA, UVB, solar simulation, an unfiltered sunlamp, and a sunlamp filtered to remove more than 96 percent of the UVB spectrum. Melanoma was triggered most strongly by the UVB lamp, followed by the solar simulator and the sunlamp, which both had comparable melanoma-inducing properties, De Fabo’s group reports in the September 15th issue of Cancer Research.

In contrast, mice exposed to UVA light or to the filtered sunlamp had responses no different from those of a comparison group of animals that were not exposed to any of the light sources. Considerable controversy exists as to which wavelengths in the sunlight initiate melanoma, De Fabo told Reuters Health.

This paper points out clearly that UVB is the culprit whereas UVA was ineffective. The findings are essential for accurately determining the melanoma risk of exposure to sunlight or sun tanning lamps. Furthermore, by contrasting the molecular effects of UVB and UVA radiation, genes linked to melanoma initiation should be more readily identifiable.”

An Annoying Skin Condition

“ Being in the sun is not necessarily a total joy for everyone. It is estimated that between six and ten million people suffer from a sun allergy know as Polymorphic Light Eruption (PLE). With PLE, the skin becomes abnormally sensitive to sunlight. Often confused with prickly heat, PLE manifests as small red, burning or itchy eruptions on the skin. These itchy areas most commonly appear in areas of the skin that are normally covered by clothing in the winter. Common affected areas are the arms, the V of the chest or the trunk of the body.

Suspected to be immune system response, PLE occurs when light hits the skin causing slight changes in the skin cells. The body’s fight against these changes is what causes the skin irritation. This reaction may manifest several hours to days after exposure, and usually lasts for several days. PLE can be provoked by both short wavelength ultraviolet B (UVB) rays and also longer wavelength ultraviolet A (UVA) rays.

Effective sun protection is important to help prevent PLE eruptions.”

Sunscreen Alone Not Enough to Shield Kids From Sun

“Parents should encourage their children to avoid skin-damaging ultraviolet (UV) rays of

sunlight, but should avoid relying solely on sunscreen to do so, a pediatrician reported here Wednesday at the American Academy of Pediatrics' annual meeting. The consensus is still to recommend sunscreen, but it's only one part of a total message., said Dr. Sophie J. Balk, a community pediatrician in the Bronx and a member of AAP's committee on environment health.

As much as 80% of lifetime exposure to sunlight comes during childhood, when children are most likely to play outdoors. Research has shown that sunburns occurring during childhood significantly raise the risk of later skin cancers, including the most dangerous type, melanoma. It's not that adult exposure isn't important, Balk said, but childhood exposure may be especially important.

In fact, studies show that the risk of skin cancer in the region that a child is raised determines their later risk of skin cancer, regardless of where they end up settling. The rate of melanoma in the United States has risen dramatically in the past decades, with the current risk of developing the disease at some point in a person's life now estimated to be 1 in 71. Some people use the word epidemic, Balk said. It may have to do with our sun culture that equates tanning with beauty. However, although wearing sunscreen properly seems to prevent sunburns and the risk of non-melanoma, she said.

One reason may be that wearing sunscreen increases the time spent in the sun under damaging UV-B rays, Balk said. Perhaps sunscreen use lulls people into having a false sense of security, she suggested. That's worrisome to me. She added, Sunscreen may not prevent exposure to all UV light. There is a role in cancer prevention, but there is a question about melanoma protection."

"Balk recommended that parents should use other sun-avoidance methods in addition to sunscreen, such as having their children wear wide-brimmed hats, UV-blocking sunglasses and clothing. Then plan activities around the daily report of the sun's intensity on the UV index and avoid the sunniest times of the day, which is midday. Balk said that while seeking shade can be useful, parents should keep in mind that UV light can bounce off sand, snow, concrete and water to still reach a child.

The United States could also learn some lessons from Australia, whose fair-skinned population living in a tropical area has had the world's highest incidence of skin cancer. In the past two decades, their country has instituted aggressive policies, such as building shaded playgrounds and insisting children wear hats before allowing them to go to recess.

SUNCARE: Saving Skin

"Consumers are at last buying into higher SPFs, but until they start using them properly, skin melanoma looks likely to remain one of the most common cancers in the under 35s, says Ailsa Colquhoun. Each year there are over 3,400 new cases in women and 2,500 new cases in men. In the UK's under-35s, skin melanoma is the third most common cancer in women and in men, the fifth most common. Australia currently has one of the highest rates of skin cancer in the world and one in two Australians will develop skin cancer at some point in their lives."

"In an article published in the BMJ, Professor Brian Diffey, from the regional medical physics department at Newcastle General Hospital, states that studies show that, in some cases,

consumers are applying as little as a quarter of the sun prep they need to apply if they are to achieve the SPFs the product offers when tested under laboratory conditions. And that's only in the easy to reach areas.

The likely explanation for people getting sunburned, despite using high factor sunscreens, is that inadequate amounts of sunscreen were applied or areas of the body were missed, or both, coupled with over exposure to the sun in the belief that they were protected."

"Consumers are applying as little as a quarter of the sunprep they need to apply if they are to achieve the SPFs the product offers in the laboratory."

"Apply thickly: you should be able to see it as a light film and spread it very easily. If it disappears as soon as you start rubbing it on, you have not used enough. Use golf-ball sized dollops for young children. If your family only uses one bottle in a two-week holiday then this is not enough."

"Reapply at least every two hours: sun creams can be rubbed, washed or sweated off, even if they are waterproof."