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Tanning....Beautiful (?) and Bad (!)
By: James L. Holly, MD

Skin is one of the most amazing organs in the human body. It is hard for us to think about skin as an organ. We tend to think of organs as heart, liver, kidneys, but skin is an organ, too. Skin is made up of very specific cells and tissues, and their collective purpose is to act as the boundary between "you" and "the world". Because the skin interfaces with the outside world, it is loaded with sensors, and also has a very tough layered design so that it can handle abrasion and sunlight.

Skin is made up of two main layers: the epidermis and the dermis. The epidermis is the outside barrier, while the dermis is the inside layer of the skin which contains all the nerve endings, sweat glands, hair follicles and so on. The dermis contains sweat glands, hair follicles (each with its own tiny little muscle so that your "hair can stand on end"!), nerve endings and so on. These different nerve endings let you sense the world. They also help you protect yourself from burns, punctures, etc. by warning you when something is damaging your skin.

The epidermis contains cells called melanocytes which produce melanin, a pigment that is the source of tanning. Not only do melanocytes produce a tan, they are also responsible for the form of cancer called melanoma. Melanoma is caused by UV radiation damage to melanocytes. Repeated exposure to UV can cause cancerous mutations.

When you get a tan, what is actually happening is that the melanocytes are producing melanin pigment in reaction to ultraviolet light in sunlight. The pigment absorbs the UV radiation in sunlight, so it protects the cells from UV damage. Melanin production takes a fair amount of time which is why most people cannot get a tan in one day. You have to expose yourself to UV for a short period of time to activate the melanocytes. They produce melanin over the course of hours. By repeating this process over 5 to 7 days pigment builds up in your cells to a level that is protective.

The previous paragraph applies to Caucasians. In a variety of other races melanin production is continuous, so the skin is always pigmented to some degree. In these races

the incidence of skin cancer is much lower because cells are constantly protected from UV radiation by melanin.

If you are Caucasian and you don't have a tan, then the cells in your skin are not protected from the sun's ultraviolet radiation. You are therefore an easy target for sunburn if you spend too much time in the sun. As anyone who has a sunburn knows, sunburn leaves your skin red and extremely painful. In severe cases the skin forms blisters.

Dangers of Ultraviolet Radiation

The following material is adapted from American Academy of Dermatology Statement. Ultraviolet (UV) radiation from the sun, tanning beds, and sun lamps are not harmless. There are two types of ultraviolet radiation: Ultraviolet A (UVA) and Ultraviolet B (UVB). UVB has long been associated with sunburn while UVA has been recognized as a deeper penetrating radiation that causes more damage.

Although it's been known for some time that too much UV radiation can be harmful, new information may now make these warnings even more important. Some scientists have suggested recently that there may be an association between UVA radiation and melanoma, the most serious type of skin cancer.

What are the dangers of tanning?

UV radiation from the sun, tanning beds, or sun lamps may cause skin cancer. While skin cancer has been associated with sunburn, moderate tanning may also produce the same effect. UV radiation can also have a damaging effect on the immune system and cause premature aging of the skin, giving it a wrinkled, leathery appearance.

But isn't getting some sun good for your health?

People sometimes associate a suntan with good health and vitality. In fact, just a small amount of sunlight is needed for the body to manufacture vitamin D. It doesn't take much sunlight to make all the vitamin D you can use - certainly far less than it takes to get a suntan!

Are people actually being harmed by sunlight?

Yes. The number of skin cancer cases has been rising over the years, and experts say that this is due to increasing exposure to UV radiation from the sun, tanning beds, and sun lamps. More than 1.3 million new skin cancer cases are likely to be diagnosed in the U.S. this year.

But aren't the types of skin cancer caused by the sun, tanning beds, and sun lamps easily curable?

Not necessarily. Melanoma, now with a suspected link to UVA exposure, is often fatal if not detected early. The number of cases of melanoma is rising in the U.S., with an estimated 47,700 new cases and 7,700 deaths anticipated this year.

Why doesn't the skin of young people show these harmful effects?

Skin aging and cancer are delayed effects that don't usually show up until many years after the exposure. Unfortunately, since the damage is not immediately visible, young people are often unaware of the dangers of tanning. 80% of sun damage occurs before age 18. Physicians and scientists are especially concerned that cases of skin cancer will continue to increase as people who are tanning now in their teens and twenties reach middle age.

But why is it that some people can tan for many years and still not show damage?

People who choose to tan are greatly increasing their risk of developing skin cancer. This is especially true if tanning occurs over a period of years, because damage to the skin accumulates. Moreover, premature aging of the skin with wrinkles will occur in everyone who is repeatedly exposed to the sun over a long time, although the damage may be less apparent and take longer to show up in people with darker skin.

Who is at greatest risk in the sun?

People with skin types I, II, and III are at greatest risk. Which skin type are you?

Skin Sunburn and Tanning History According to Skin Type

I. Pale white skin
Always burns; never tans

II. White
Burns easily; tans minimally

III. White (Average)
Burns moderately; tans gradually to light brown

IV. Beige or lightly tanned
Burns minimally; always tans well to moderately brown

V. Moderate brown or tanned
Rarely burns; tans profusely to dark

VI. Dark brown or black
Never burns; deeply pigmented

Since most sun lamps and tanning beds emit UVA radiation, doesn't that make them safer than natural sunlight?

No. It's true that most sun lamps and tanning beds emit mainly UVA radiation, and that these so-called "tanning rays" are less likely to cause a sunburn than UVB radiation from sunlight. But, contrary to the claims of some tanning parlors, that doesn't make them safe. UVA rays have a suspected link to melanoma, and like UVB rays, they also may be linked to immune system damage and premature skin aging.

What's the government's position on using sun lamp products found in tanning parlors and in homes?

The Food and Drug Administration (FDA) and the Centers for Disease Control and Prevention (CDC) encourage people to avoid use of tanning beds and sun lamps. You can get a fact sheet on the hazards of indoor tanning from the FDA's Facts on Demand system by calling 1-800-899-0381; the information will be faxed to you on the same day (select 2 and then Division of Device User Programs and Systems Analysis or DDUPSA). You can also go to the FDA Home Page on the World Wide Web at http://www.fda.gov or go to the American Academy of Dermatology (AAD) Home Page on the World Wide Web at http://www.aad.org.

What do medical professionals and the American Academy of Dermatology say about tanning?

The American Medical Association (AMA) and the AAD have warned people for many years about the dangers of tanning. In fact, the AMA and AAD have urged action that would ban the sale and use of tanning equipment for non-medical purposes. Doctors and public health officials have recommended the following steps to minimize the sun's damage to the skin and eyes:

Tips to Avoid Sun Damage

1. Plan your outdoor activities to avoid the sun's strongest rays.
2. As a general rule, avoid the sun between 10 a.m. and 4 p.m.
3. Wear protective covering such as broad-brimmed hats, long pants, and long-sleeved shirts to reduce sun exposure.
4. Wear sunglasses that provide 100% UV ray protection.
5. When outdoors, always wear a broad-spectrum sunscreen with Sun Protection Factor (SPF) 15 or greater, which will block both UVA and UVB, and apply it thirty minutes before sun exposure.

For more information on the levels of ultraviolet radiation reaching your area at noon, you can get the Ultraviolet Index (UVI) from local newspapers, radio, or TV in many cities. The UVI is a number from 0-10. The higher the number, the more intense the exposure. Call the EPA Hotline for more information on the UVI at 1-800-296-1996.

For treatment, if you believe that some damage has already been done:

Seek medical attention from your dermatologist to evaluate if you received skin or eye damage from the sun or if you experienced an allergic reaction to the sun.
See your dermatologist if you develop an unusual mole, a scaly patch or a sore that doesn't heal. You may have developed a pre-cancer or a skin cancer. Your dermatologist can also repair and reverse sun-damaged wrinkles through medical treatments and dermatologic surgery
Conclusion

Tanning – avoid it. Remember, it’s your life and it’s your health.