

AESTHETICA



Reveal your inner beauty

**Laser Surgery Center
Cosmetic and Plastic Surgery
Cosmetics and Skin Care**

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About your skin

Sun Sense and Aging

Wrinkles are the *textural* changes in the skin which result from a number of different processes. Wrinkles which are etched deeply into the skin are often the result of life-long sun damage coupled with continued underlying facial musculature movement. They often occur at the outer corners of the eye (the “crow’s feet” area), between the eyebrows, lateral to the corners of the mouth and can occur on the cheeks and elsewhere on the body. In much the same way that a pair of shoes develop stress cracks with time, constant motion placing stresses at the same spots on the skin coupled with loss of skin suppleness creates the wrinkle. In fact, there is no histologic (microscopic) or cellular difference between skin in a wrinkle and that in adjacent areas where there are no wrinkles. More superficial wrinkles which tend to occur more extensively on the face are a result of the loss of some of the structures in the skin which characterize it as youthful. Young skin has a thin *epidermis* (outer layer of skin), fully functioning sweat glands, oil glands and hair follicles, many different types of nerve endings, a thick and elastic *dermis* (the tough, leather-like layer of the skin), a rich blood supply and a plenitude of subcutaneous fat.

Before we discuss the characteristics of aging and aged skin it is important to point out an often confused fact about the skin. **The sun does not cause premature aging of the skin.** I realize that that is quite a statement but, the fact is that both sun damage and aging cause facial wrinkles but do so through entirely different mechanisms. This can be likened to the case of cirrhosis or scarring of the liver from hepatitis or alcohol or end-stage lung disease caused from smoking, inhalation of harmful substances or heat damage. The body has just so many ways of dealing with injury and aging and, no matter the process causing the damage, it is manifested in the same final appearance. For the skin, this manifestation is in the form of wrinkles and also *contour* deformities e.g. jowls, nasolabial folds, eyelid bags, etc. Early sun damage of the skin results in essentially an *inflammatory* process with extra cells in the skin, thickening of the dermis, increased water content of the skin (which can actually decrease the superficial wrinkles) and stimulation of the pigment cells to produce a tan. If this is carried to an extreme, burning occurs which is essentially the same as thermal burning of the skin and results in cellular damage, sloughing of the epithelium (blistering), greatly increased water content, pain and inflammation. Long-term sun damage results in a chronic inflammatory condition, often splotchy pigmentation, extreme thickening of the dermis with direct damage to the elastic layer leading to a tangled mass of elastic tissue which is not functional. This is what causes the loss of elasticity of the skin and the resultant textural and contour changes associated with sun damage. Aging, on the hand, is a process of atrophy. The epidermis and dermis both thin, sweat and oil glands function less well as do the pigment producing cells and the nerve cells. The blood supply decreases leading to slower healing and production of minimal scar tissue with healing.

The subcutaneous fat is largely lost and the water content of the skin decreases greatly. All of these processes are *independent* of sun damage and the rate of skin aging is largely dependent upon the person's genetics. Again, however, the end product is the textural and contour changes noted earlier but through an entirely different process.

Let's talk for a short time about how to prevent sun damage from occurring. The easy answer is to stay out of the sun. Well, that is not only extremely difficult, especially in Hawaii, but also, often, not desired. Most of us would like a slight sun tan. Many of us feel healthier and more energetic in our approach to life when we have a light tan. The vitamin D which skin bacteria produce in the sunlight is an often cited although practically limited reason to have some sun exposure. Many of us live in Hawaii in order to partake of the active outdoor lifestyle which we can do on a year-round basis here. At the same time, the risk of melanoma (the deadly form of skin cancer) and also squamous cell carcinoma (the second most common form of skin cancer) are likely very dependent upon the amount of sunlight that reaches the deep layers of our skin although the development of these cancers is *multifactorial* or dependent upon many inciting factors. We know that the risk of cancer is reduced if we stay out of the sun. This does not mean that our risk of cancer is reduced if we merely have no tan. **There has never been a study which has shown protection from skin cancer through the use of sunscreens.** This includes studies funded by sunscreen manufacturers. Indeed, recent studies conducted at the M.D. Anderson Medical Center in Houston, Texas as well as clinical studies which I performed while at the Mayo Clinic have shown that, by stopping sun burn and allowing people to remain out in the sun for extended periods of time, **the risk of skin cancer may actually increase with the use of present day sunscreens.** This is true with

sunscreens based on the PABA molecule as well as the more advanced cinnamate formulae which block both UVB and UVA wavelengths of sunlight. There is now some evidence that infrared and UVC wavelengths may also play a role in skin cancer. The depletion of the ozone layer has no effect on the UVA wavelengths thought to mainly stimulate skin cancer, yet, the world-wide development of melanoma is increasing at an alarming rate. There was one study, recently published, which began to show some decrease in melanoma from sunscreen use, however, it was not published in a peer-reviewed journal and I am suspect of the statistics used in the analysis of the data. In short, we do not know what causes skin cancer but we do know that sunlight contributes to its development. It may very well be proven that it is a sunlight induced reduction in the efficiency of the immune system that predisposes individuals to skin cancer. There are some early studies which show that this may be reduced or eliminated by the use of high concentrations of *Vitamin C* applied directly to the skin.

What, then, is my best advice to my patients regarding sun sense? 1) Stay out of the sun between its strongest hours of 10 AM and 3 PM. 2) Examine yourself closely, at least once per year, on your birthday for memory's sake. 3) Wear sun protective, occlusive clothing if you must be out in the sun. Solombra® is an excellent make of this type of clothing and sun wear. 4) Wear reflective type sunscreens such as zinc oxide or titanium dioxide if you are going to be out in the sun for an extended time and 5) **get a tan and do not use sunscreen!** What? A tan? No sunscreen - that's ludicrous! I heard that that is bad for you. In actuality, natural pigment, although it is only the equivalent of an SPF of 5 or so is one

of the broadly absorptive pigments (which I deal with on a daily basis in my laser surgery applications) which has been shown to decrease the risk of skin cancer. Melanoma is largely a disease of Caucasians with over 90% of those affected being white in skin color. Granted that there are likely genetic factors at play as well, but this alone indicates the protective effect of melanin pigment in the development of melanoma. Squamous cell cancer is likely largely caused by repeated sun burns or other repeated trauma to the skin. Basal cell cancer, the most common and least aggressive skin cancer is also mainly a disease of Caucasians but its relationship to the sun is very questionable. By not using sunscreen and getting a "natural tan" without sunscreen, you can only stay out in the sun for a short time. Compare this with those people often seen on the beach who want a tan but slather on sunscreen of, sometime, SPF 15 or higher and lay out for an extended time at the most intense time of sun damage in order to get a tan through the sunscreen which only protects against sun burn but certainly not against skin cancer. This can be likened to buying inexpensive sun glasses which do not screen out ultraviolet rays but merely darken the area around the eye. In response, the pupil opens more, letting in more damaging light and actually *increasing* the risk of cataracts by their use. I believe that a component of the greatly increased rate of melanoma throughout the world is that for the past 10 years or more, people have been listening to their dermatologists and using sunscreen to protect themselves from the harmful effects of the sun. The problem is, they still want a tan and so they stay out for extended time periods to obtain their tan. They are not, however, protected against the cancer-causing effects of the sun. The melanoma rate, consequently, increases. Therefore,

does it not make more sense to minimize sun exposure and, when exposed to the sun, be protected with the one substance that we know protects against skin cancer, namely, natural melanin pigment? The only downfall of this advice is that, if taken to extreme, the damaging effects of the sun's rays will lead to skin textural and contour deformities. Moderation, as with most things in life, is the key to leading as safe an existence with the sun as possible. The textural skin changes can be largely repaired with substances such as Retin-A® and chemical and laser peels. The contour changes, although often helped with these procedures, often require cosmetic/aesthetic surgical correction.

I hope that this short informational brochure answers some of the questions which you have about sun damage and your skin. Please ask either the staff of **AESTHETICA** or Dr. Caputy should you have any other questions about the skin, sun damage and aging effects on the skin.

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