

TAN.

THE SKIN ABSORBS THE VARIOUS TYPES OF RADIATION.



The most common sources of radiation are the natural ones, that is sun, cosmic rays, and radioactive bodies, but there are also the artificial ones: quartz lamps and mercury steams. The electromagnetic actions are constituted by the Gamma rays, X rays, U.Vs. (ultraviolet), bright rays (visible), infrared ones or I.R., Hertzian waves and are

characterized by a greater or smaller wavelength. The sun is surely the most important natural source of energy and radiations. Great part of the solar radiations are absorbed in the earth ionosphere and the atmosphere: around 7% of this immense energy, ultraviolet radiations, those visible, and a part of infrared reach the earth.

Radiations are absorbed by the skin in different ways, determining different effects. The ionizing, corpuscular, gamma and X rays cross the skin up to reach the deepest tissues (for these characteristics they are used for medical therapies or for x ray examinations). Some rays, such as the Roentgens ones, can determine lesions, erythemas, ulcers, hair fall and other effects.

The U.V. rays are reflected by the skin superficial layer minimally and they penetrate the deepest layers with an intensity of reflection and penetration that increases in relation to the increase of the wavelength and according to the characteristics of a subject and the bodily zones.

The U.V. rays U.V. can be divided into:

U.V. - C wavelength: 100 - 280 nm / held back by the atmosphere without particular effects on the skin

U.V. - B wavelength: 280 - 320 nm / responsible for the solar erythema

U.V. - A wavelength: 320 - 400 nm / responsible for the tan and in a very smaller measure of erythemas

The ultraviolet rays have various actions on the skin: they stimulate the pigmentation function, that is the neo-formation of melanin in the epidermis (tan), they develop a disinfectant action at the level of the skin, they stimulate the synthesis of the D vitamin; among the negative effects, there is the erythema ("the scorching") involving the epidermis' cells and vessels and it



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appears with hyperaemia, break-up of small vessels, blisters, edemas, liquid leakage. Furthermore the U.Vs. accelerate the proliferation of hair and can sometimes determine the appearance of skin tumors.

TAN

POSITIVE EFFECTS

- Stimulation of melanin production
- Synthesis of the D vitamin
- Aesthetical effect

NEGATIVE EFFECTS

- Sunstrokes, erythemas, edemas
- Skin Aging
- Can cause skin tumors, melanomas, etc.

The visible light doesn't determine big damages to the skin, sometimes it can provoke light stroke to the eyes. The infrared rays are little harmful to the skin, for the thermal effects that determine, are often used for therapeutic purpose.

Naturally if the exposure to the sun is gradual, in the right hours, opportunely distanced, the skin can defend itself both from the immediate and chronic damages. If the exposure is excessive or too violent, the skin becomes inelastic, yellowish, opaque and embellished only for brief periods by a temporary tan. The exposure to sun rays can determine phenomena of photo-toxicity, especially in people that use particular medicines and some endogenous effects with an aggravation of pre-existing pathologies due to genetic, immunological, enzymatic and hormonal factors.

To better understand the characteristics of the individuals and their possible answer to the sun exposure, it is possible to distinguish three different typologies of people in terms of photo-sensibility:

TYPE I. People with a normal photo-resistance, with a rapid and uniform pigmentation. Generally the brown and the dark chestnut have these characteristics, they can expose to sun without any special care, in a progressive way and can obtain a fast pigmentation.

TYPE II. People with a slow pigmentation, with an average resistance. They are the blonde or clear chestnut subjects, that have to expose to sun using filtering



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preparations, beginning with few minutes in the less warm hours, above during the first days.

TYPE III. Little resistant people, with an absent or not uniform pigmentation. They are the albinos that have to reduce at the minimum the exposure to sun, and use high doses of sun screens.

There are then extremely photosensitive people because of vascular problems, or elderly and weakened patients. For these subjects an intense skin protection and a special care in the exposure it is recommended because their acclimatization time is rather long.

All these different characteristics, especially the scarce quantity of melanin, underline the importance to assess in advance the single defensive abilities of the skin towards the solar rays with sensitometric tests, that are performed using radiations similar to those solar, but making react them on a limited zone of the skin.

Sun screens. With the application of cosmetic products containing sun screens, the action of the physiological activity (erythemic and melanogenic) of the radiations U.V. - B is modified according to the characteristics of the sun screen.

The index of solar protection "SPF" (Sun Protection Factor) is defined by the relation of the time in which an inflammatory reaction of the skin develops, accompanied by a light edema without sun screen in comparison with the time with sun screen.

Where MED (Minimal Erythemal Dose) represents the beginning of the erythema formation.

Therefore it is convenient to use sun screens especially in the first days of exposure and for photo-sensibility of the II and III type. The screens must be applied uniformly and, in case of long exposures to sun, re-applied every two hours. In case of baths, the screen must be applied again.

Environmental factors. Attention to the environmental factors! The presence of reflecting surfaces (water, snow, etc.) increases the danger of erythemas a lot. The intensity of radiations increases with the altitude and it is much stronger in mountain. Be careful with the wind that can deceive, removing the feeling of heat on the skin.

Some suggestions:

- **TO EXPOSE TO THE SUN GRADUALLY.** The first day is the most risky one: don't rely on sensations, but limit the exposition time.



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- **NOT TO EXPOSE TO SUN IN THE WARM HOURS.** From 11 to 15 the sun rays are more vertical and therefore more dangerous.
- **BE CAREFUL WITH REFLECTING SURFACES** (water, snow,..). The risk of erythemas increases.
- **BE CAREFUL WITH TANNING ON THE MOUNTAIN.** The intensity of the radiations increases with the altitude: the exposure is far more dangerous in mountain than at the sea
- **TO USE SUN SCREENS.** Especially in the first days and if our complexion is clear, use sun screens (apply them every two hours and after the baths of sea)

Conclusion. However one can affirm that to expose to sun carefully, that is to say using suitable sun screens, avoiding too risky hours and exposing for reasonable periods of time, it is not harmful for the skin, but it gives a homogeneous and lasting tan.