

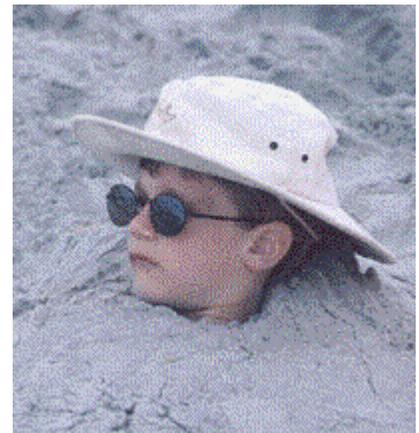
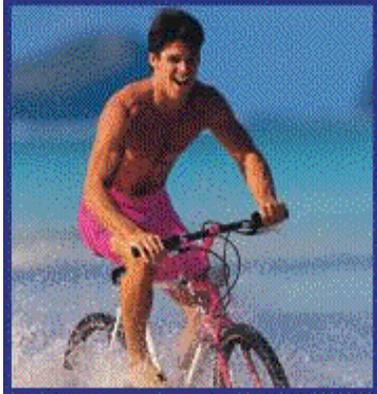
CIVIL AIR PATROL – ARUNDEL COMPOSITE SQUADRON

August 2004

SAFETY

U.V. RADIATION and
SKIN CANCER

A **suntan** may look **good** on you, but it is **not healthy**. It is a sign that your skin has been damaged by **ultraviolet (U.V.) radiation** from the sun. Exposing your skin to U.V. radiation stimulates melanin-producing cells. **Melanin** is a protective brown pigment that makes your

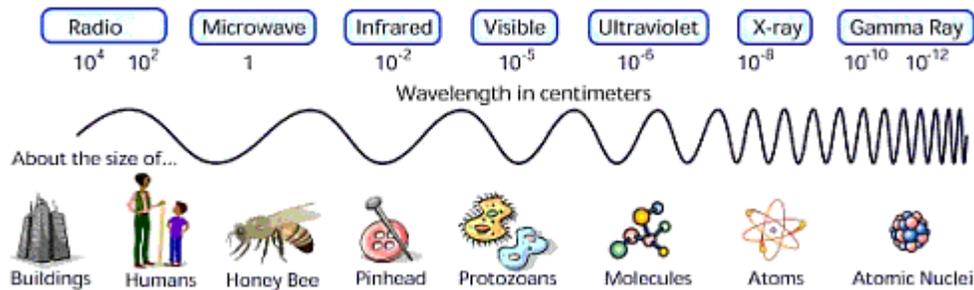


skin tan or brown colored. It is formed to protect the deeper layers of the skin from the harmful effects of the U.V. radiation from the sun.

What is ultraviolet radiation, and why is it so harmful?

The **sun** gives out energy over a broad **spectrum of wavelengths**. U.V. radiation has a shorter wavelength but more radiant energy than visible light. It is this energy that is responsible for sunburns and other adverse health effects on the human body.

Safety Briefs 2004



Scientists classified U.V. radiation into 3 types:

U.V. – A:
(also known as U.V. “Ageing”)

0.32 to 0.40 micron wavelength
Not absorbed by Earth’s ozone layer
Causes premature aging of the skin

U.V. – B:
(also known as U.V. “Burning”)

0.28 to 0.32 micron wavelength
More intense energy than U.V. – A
Partially absorbed by Earth’s ozone layer
Causes sunburns and in severe cases skin cancer

U.V. – C:

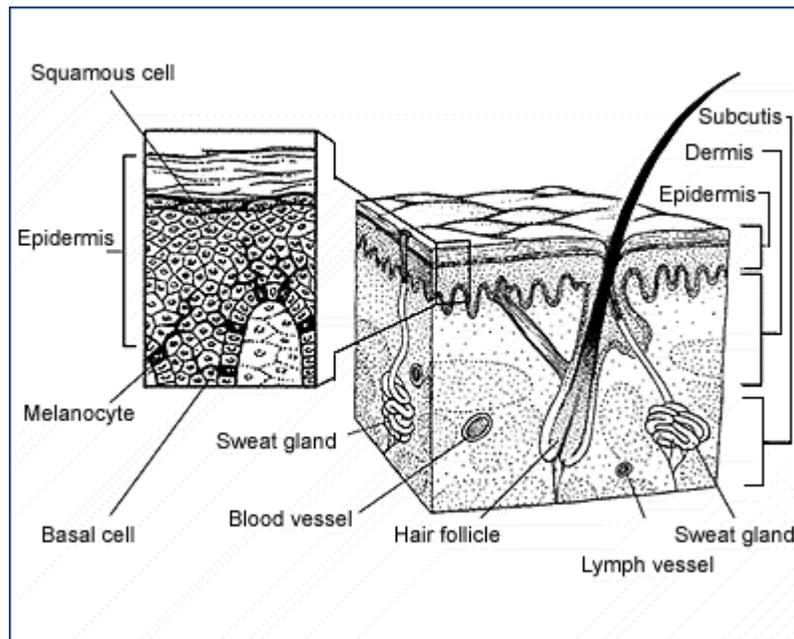
0.20 to 0.28 micron wavelength
This is the most dangerous U.V. radiation
Luckily, it is almost completely absorbed by the Earth’s ozone layer

Before we condemn U.V. radiation, however, let us remember that it also plays a **beneficial** role in our body’s production of **vitamins D and K**. It is also important in the **pollination** of some plants, which reflect U.V. radiation, thereby attracting honeybees and other pollinators toward them. The **sunshine** also makes us **feel good**, especially after a long and dark **winter**, or when we are on the **beach!**



Safety Briefs 2004

In order to understand the damaging effect of U.V. radiation on the human body, we need to know some basic fundamentals about the **human skin**. The skin is the largest organ in our body. It has 3 layers: **epidermis**, dermis, and subcutis.



The epidermis is the top layer. It protects the deeper layers of skin and the organs of the body from the environment. The outermost part of the epidermis is continually shed, and is replaced by newly formed cells. Below this layer are the **squamous cells**. The squamous cells form keratin, which helps the skin protect the rest of the body. The lowest part of the epidermis, the basal layer, is formed by **basal cells**. These cells continually divide to replace the cells that are shed from the top of the epidermis.

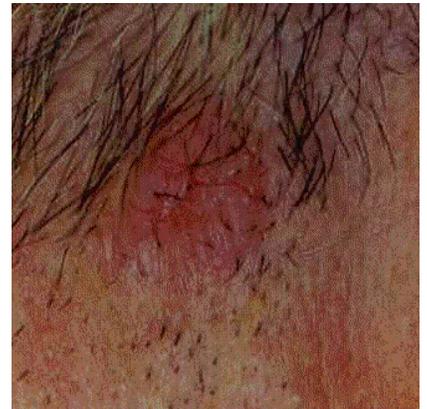
The major problems linked to U.V. exposure are skin cancer (**melanoma** and **non-melanoma**), **cataracts**, and **immune system suppression**. All cells reproduce themselves by dividing. This process keeps the body in good repair. When cell division is not orderly and controlled, abnormal growth occurs. Masses of tissue called tumors build up. **Tumors** may be benign or malignant. Benign tumors do not spread. **A malignant tumor is cancer**. Cancerous tumors can invade and destroy surrounding normal tissues as they grow. They can also break away from the tumor and metastasize (or spread) to other parts of the body, where they can form more cancerous tumors. They can spread either through the **blood** or the **lymphatic vessels**.

Skin cancers are divided into 2 general types: non-melanoma and melanoma. **Melanoma** refers to cancers that develop from the pigment-producing cells of the skin. The **non-melanoma** skin cancers are the most common type. These include **basal cell and squamous cell carcinomas**.

Safety Briefs 2004

Basal cell carcinoma:

- a) Begins in the lowest layer of the epidermis
- b) Accounts for about 75% of all skin cancers
- c) Usually develop in sun-exposed areas of the body, such as the head or neck
- d) Slow growing and usually do not spread to lymph nodes



EARLY DETECTION IS THE KEY FOR SUCCESS !!

Squamous cell carcinoma:

- a) Develop in the upper level of the epidermis
- b) Account for about 20% of all skin cancers
- c) Usually develop in sun-exposed areas of the body, such as the face, ear, neck, lip, and back of hands
- d) More aggressive than basal cell carcinoma
- e) Faster growing but rarely spreads to other parts of the body



The non-melanoma skin cancers have a cure rate of about 95%, if detected and treated early. Treatment usually involves some type of surgery.

Safety Briefs 2004

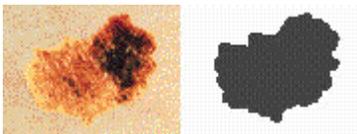
Malignant Melanoma:

Malignant melanoma is the most **serious** form of skin cancer. It is also one of the fastest growing types of cancer in the U.S. Many **dermatologists** believe that there may be a link between childhood sunburns and malignant melanoma later in life. Melanoma begins as an uncontrolled growth of pigment-producing cells in the skin. This growth leads to the formation of dark-pigmented malignant moles or tumors. **Signs of malignant melanoma** may include:

- Change in size** – a mole on the skin may become lumpy or spread outwards over the skin
- Change in shape** – a melanoma is likely to look like a mole with irregular, ragged edge
- Change in color** – a mole may develop a reddish edge. It may also become darker, usually a mixture of brown and black
- Crusting and bleeding** – a slight oozing is a common symptom

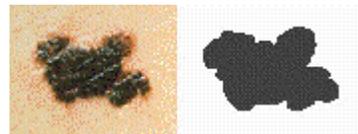
Dermatologists came-up with the “**ABCDs of Melanoma**” to detect danger signs on the skin:

A



Asymmetry – one half unlike the other half

B



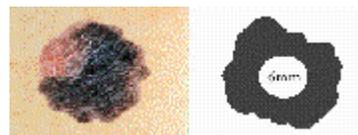
Border – irregular, scalloped or poorly circumscribed border

C



Color – varied from one area to another; shades of tan or brown, black, and sometimes white, red, or blue

D



Diameter – larger diameter than 6mm as a rule (diameter of a pencil eraser)

Can Melanoma Be Cured?

In 2004, approximately 95,900 new cases of skin cancer are expected. Out of these, approximately 7,900 will die from melanoma, and about 2,300 will die from other skin cancers. When detected in its early stages, melanoma is highly curable. For localized melanoma (where it has not spread beyond the outer layers of the skin), the **5-year survival rate is 96%**. The average 5-year survival rate for all individuals with skin cancer is **89%**. The typical treatment involves some type of surgery and/or chemotherapy.

Safety Briefs 2004

***** EARLY DETECTION IS THE KEY FOR SUCCESS !! *****

***** IF LEFT UNTREATED, MELANOMA CAN KILL !! *****

Self-examination can be **very successful** for **identifying melanoma**:

Examine your body as shown in these diagrams:



Front and back in the mirror, then left and right sides with arms raised.



Bend elbows and look carefully at forearms, upper arms and palms.



Backs of your legs and feet, the spaces between your toes and on the sole.



Back of your neck and scalp with a hand mirror. Part your hair for a closer look.



Check back and buttocks with a hand mirror.

Other diseases linked to U.V. radiation are:

Cataracts – eye damage; loss of transparency in the lens of the eye which clouds vision; if left untreated, cataracts can rob people of vision; this disease is curable with modern eye surgery

Immune System Suppression – scientists have found that sunburn can alter the distribution and function of disease-fighting white blood cells in humans for up to 24-hours after exposure to the sun. Repeated exposure to U.V. radiation can cause more long-lasting damage to the body's immune system

SAFETY from U.V. RADIATION

Protecting yourself from overexposure to U.V. radiation is simple if you take a few precautions:

- a) **Wear sunglasses** – wear sunglasses that block 99%-100% of U.V. radiation
- b) **Wear a hat** – a wide brim hat offers good sun protection to your eyes, ears, face, and back of your neck

Safety Briefs 2004

- c) **Sunscreen** – apply sunscreen liberally before you go outside; use sunscreen with a Sun Protection Factor (SPF) of at least 15; reapply every 2-hours when working, playing, or exercising outdoors; use “broad spectrum” and “water resistant” sunscreen

NOTE: SPF 15 means that 15 times more sun exposure is required to produce the same reddening effect (or same sunburn) on the skin as with an unprotected skin.

- d) **Lip balm** – in addition to sunscreen, also use lip balm
- e) **Avoid midday sun** as much as possible – the sun’s U.V. rays are the strongest between 10 A.M. and 4 P.M. **When your shadow is shorter than you are tall, the U.V. rays are more intense.**
- f) **Clothing** – tightly-woven, loose-fitting clothes are the best, but any clothing is better than none at all
- g) **Begin early in childhood** – begin using sun protection early because it is estimated that 80% of the lifetime sun exposure occurs before the age of 18. You may feel invincible when you are 16 or 18 years old, but repeated sunburns will catch-up with you later in life!
- h) **Avoid artificial tanning methods** – avoid sunlamps and tanning beds because these are also sources of U.V. radiation
- i) **U.V. Index** – listen to weather reports about the U.V. Index. The U.V. Index provides a daily forecast of the expected risk of overexposure to the sun.

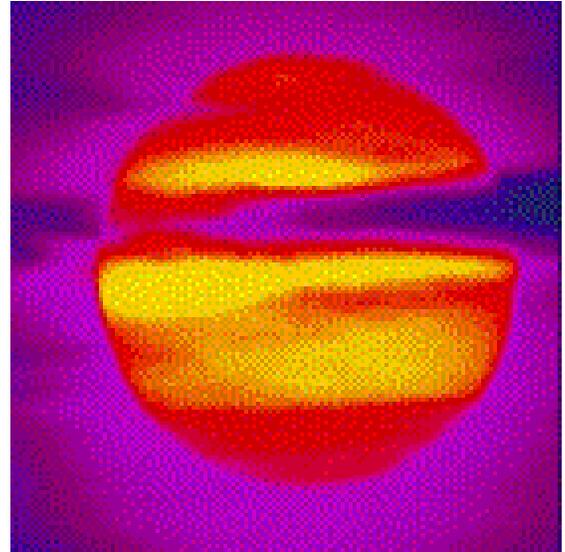
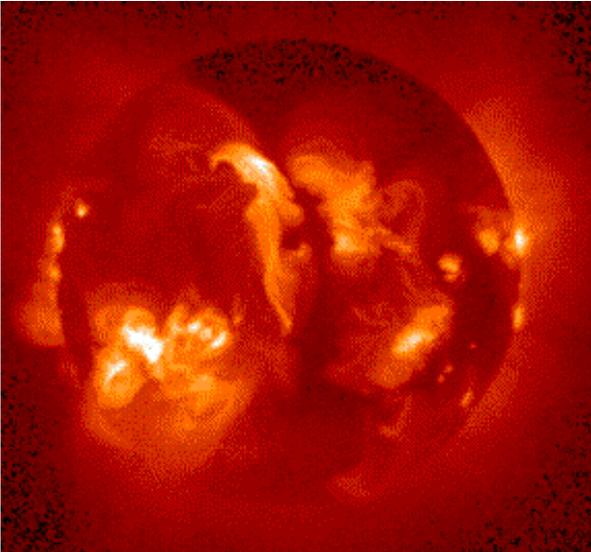
UV Index

Exposure Category	UVI Range
Low	< 2
Moderate	3 to 5
High	6 to 7
Very high	8 to 10
Extreme	11+

Safety Briefs 2004

j) *One Final Safety Tip.....*

BE SUN WISE !!



GET MORE INFORMATION

References:

1. <http://www.cancer.org/>
2. <http://www.pueblo.gsa.gov/>
3. <http://www.skincancerfacts.org.uk/>
4. <http://www.4sarasotas.com/>
5. <http://familydoctor.org/>
6. <http://www.aad.org/>
7. <http://itg1.meteor.wisc.edu/>
8. <http://www.nutramed.com/>
9. <http://www.epa.gov/>
10. <http://www.fda.gov/>
11. <http://imagers.gsfc.nasa.gov>
12. <http://enhs.umn.edu/>
13. Advertisement from the Suntan Shop