

## Effects of Ultraviolet Radiation on the Skin

Go to the following websites to help you answer the questions below:

Skin -

<http://www.cancerindex.org/medterm/medtm5.htm>

Skin and Integumentary System -

<http://www.wisc-online.com/objects/ViewObject.aspx?ID=AP12204>

1. The integumentary system consists of: **the skin, and skin derivatives; (hair, nails, glands and receptors)**
2. The functions of the integumentary system are:
  - a. **Protects the body's internal living tissues and organs**
  - b. **Protects against invasion by infectious organisms**
  - c. **Protects the body from dehydration**
  - d. **Protects the body against abrupt changes in temperature**
  - e. **Helps dispose of waste materials**
  - f. **Acts as a receptor for touch, pressure, pain, heat and cold**
  - g. **Stores water, fat, and vitamin D.**
3. Describe the structure of the epidermis. **The epidermis is the relatively thin, tough, outer layer of the skin. The outermost portion of the epidermis, known as the stratum corneum, then the the basal layer.**
4. Describe the structure of the dermis. **The skin's next layer, is a thick layer of fibrous and elastic tissue (made mostly of collagen, elastin, and fibrillin), the dermis contains nerve endings, sweat glands and oil (sebaceous) glands, hair follicles, and blood vessels.**
5. Describe the structure of the hypodermis. **(The subcutaneous tissue) fat cells**
6. Describe the structure of hair. **Hair grows from follicles that contain the lower shaft and root of the hair.**
7. Where does hair growth occur? **The hair shaft projects through the dermis and epidermis and is kept soft by the sebaceous glands.**
8. Do you think that hair products such as shampoo or gel can effect hair growth?  
**- Personal opinion-**
9. Compare and contrast sweat glands and sebaceous glands.  
**The sweat glands produce sweat in response to heat and stress. Sweat is composed of water, salt, and other chemicals. As sweat evaporates off the skin, it helps cool the body. Specialized sweat glands in the armpits and the genital region (apocrine sweat glands) secrete a thick, oily sweat that produces a characteristic body odor when the sweat is digested by the skin bacteria in those areas.**

The sebaceous glands secrete sebum into hair follicles. Sebum is an oil, that keeps the skin moist and soft and acts as a barrier against foreign substances.

Go to the following website to learn about the effects of ultraviolet radiation on the skin.

<http://www.sunguardman.org/uv-radiation.php>

10. What is a melanocyte? Skin cells

11. How does sunlight affect melanocytes? UV radiation from the sun (or tanning beds) causes the skin cells (melanocytes) in the epidermis to become more active, releasing pigment (melanin), which shows up on your skin as freckles, sunburns or suntans.

12. What is melanoma? Melanoma is a type of skin cancer, which form from melanocyte

13. Explain how sunlight and ultraviolet rays cause melanoma. (Use at least three complete sentences to answer this question.)

14. When is ultraviolet radiation most intense?

- In the middle of the day (Between 10am and 4pm)
- During the summer months
- At higher altitudes
- In regions of the earth closer to the equator

15. Can ultraviolet radiation travel through water? Explain why or why not.

UV Radiation can penetrate through 3 feet of water. UV-A Radiation can reach your skin through glass.

16. Name and describe the three types of skin cancer.

Basal Cell Carcinoma- is the most common type of skin cancer, usually appearing on the face and ears. About 75% of all skin cancers are basal cell. This type of skin cancer is the easiest to treat and cure, as it usually does not spread to other parts of the body. However, if left untreated, basal cell carcinoma can cause considerable disfigurement and can be much more difficult to remove.

Squamous Cell Carcinoma-is the next most common type of skin cancer, appearing on sun-exposed parts of the body. It represents about 20% of all skin cancers. It is more aggressive than basal cell carcinoma and may spread (metastasize) to sites elsewhere in the body. More than 2,000 people die each year from squamous cell carcinoma.

Melanoma –is the most dangerous type of skin cancer, but the least common, representing about 5% of all skin cancer diagnoses. Unfortunately, melanoma is the most rapidly increasing cancer of all. While rates of other types of cancer have

declined in recent years, rates of melanoma are still rising, doubling in the last 30 years. The dangerous thing about melanoma is that it can metastasize to other body organs if not detected and treated early. With early diagnosis and treatment, the cure rate is very high while at later stages, the cure rate drops significantly.

17. Who is at risk for skin cancer? **Everyone**

18. What are four genetic risk factors for skin cancer?

1. Naturally red, blond or light brown hair color
2. Light eye color – blue, gray or green
3. Fair or light skin that burns or freckles easily
4. Many moles on your body (more than 100), irregular moles, or large moles
5. Family history – blood relatives who have had skin cancer

19. What are four behavioral risk factors for skin cancer? (There were only 3 listed on the website)

1. History of sunburns– just two severe sunburns as a child or adolescent doubles your risk of developing melanoma later in life.
2. History of sun exposure without sun protection during outdoor work or play
3. History of using tanning beds

20. How can skin cancer be prevented? Describe 5 ways.

1. Do Not Burn.
2. Avoid sun tanning and tanning beds.
3. Generously Apply Sunscreen
4. Wear Protective Clothing
5. Seek Shade

21. Early diagnosis of skin cancer is very important. Certain changes have been identified that indicate that possible melanoma. The changes are described by a tool known as the ABCDE's of Melanoma. What are the ABCDE's of melanoma?

- A – Asymmetry: one half not exactly like the other
- B – Border: irregular, scalloped, or poorly defined
- C – Color: various colors in the same mole
- D – Diameter: larger than a pencil eraser (6 mm)
- E – Evolving: any change in a mole that is worrisome

22. What is a sunscreen and how does it protect the skin? Include an explanation of SPF in your answer. Sunscreen is a chemical that, to some degree, prevents Ultraviolet Radiation from reaching the skin. SPF stands for sun protection factor

23. Are sunscreens needed on cloudy or rainy days? Explain. Yes, 40% of the sun's UV radiation can penetrate the earth on a cloudy day.

24. How does a sun tan change the skin? Are sun tans safe? UV radiation from the sun (or tanning beds) causes the skin cells (melanocytes) in the epidermis to become more active, releasing pigment. There is no such thing as a healthy tan!