Sunscreen & Skin Cancer

HASPI Medical Anatomy & Physiology 07b

Lab Activity

Name(s): _____

Period: _____ Date: _____

Background

http://www.skincarcinoma.org/wp-content/uploads/2012/01/symptoms-of-skin-cancer.jpg

Skin Cancer

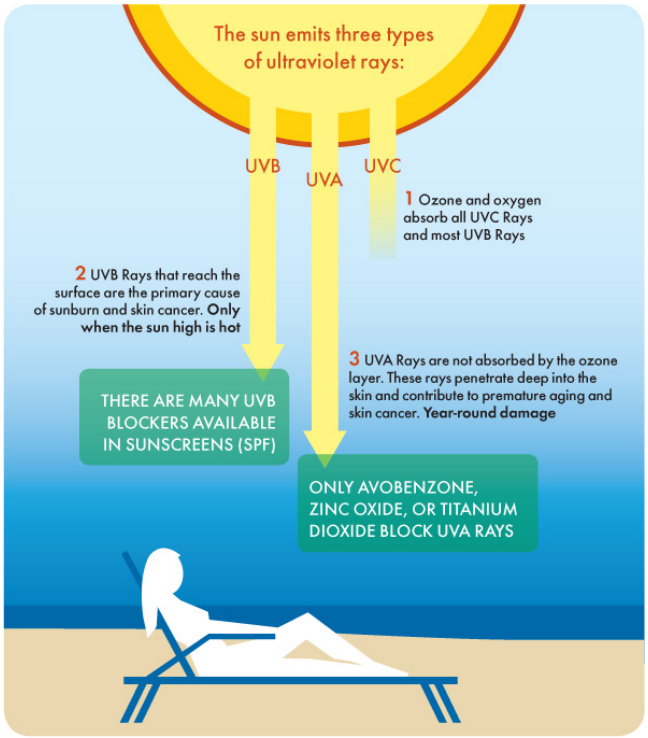
As of 2012, skin cancer is the most common cancer in the U.S. Approximately 2 million people are diagnosed annually with skin cancer. There are more cases of skin cancer diagnosed than lung, colon, breast, and prostate cancer combined. This means that approximately 1 in 5 people will be diagnosed with skin cancer in their lifetime.

The number one risk factor for skin cancer is UV radiation exposure. The most common source of UV radiation is sunlight. In fact, most people have experienced more than 50% of the recommended lifetime UV dose by the time they are 20 years old.

UV radiation exposure can also occur in tanning devices. In fact, a single use of a tanning device increases the chance of developing skin cancer by 20%. According to the American Cancer Society, those who begin indoor tanning before the age of 35 have an 87% increase in their risk of developing melanoma.

Other risk factors beside UV radiation exposure that increase risk of skin cancer include:

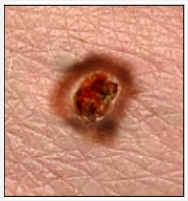
- Fair skin
- One or more severe sunburns
- Living in a sunny environment
- Moles
- Skin lesions
- Family history
- Compromised immune system
- Radiation exposure
- Chemical exposure



http://www.beyondcoastal.com/images/bc/infographics/uv-chart.jpg

Types of Skin Cancer

Skin cancer is most simply abnormal growth of epithelial cells, and is most commonly found in areas of skin with high sun exposure. UV radiation causes mutations in the DNA of skin cells, and when these mutations occur in parts of the DNA that control cell growth, uncontrolled cell growth occurs. There are three main types of skin cancer separated by the type of epithelial cells that they develop. Epithelial cells divide quickly, and many skin cancers can develop quickly depending on their location. Luckily, nearly all forms of skin cancer are easily treatable through surgical excision if detected, diagnosed, and treated early. The following table describes the three most common types of skin cancer.

Skin Cancer Type	Cells Where Develops	Description
Squamous Cell Carcinoma  http://www.veteranstoday.com/wp-content/uploads/2011/06/Squamous-Cell-Carcinoma-VS-Basal-Cell-Carcinoma.jpg	*Squamous cells* primarily make up the cells found in the epidermis.	20% of all skin cancers are squamous cell carcinoma. This cancer is more aggressive than basal cell carcinoma, but easily treated when found early. Squamous cell carcinoma will look like a red, scaly bump or nodule and is most commonly found on the face. It can easily spread to other parts of the body, and is more common in individuals with fair skin.
Basal Cell Carcinoma  http://www.veteranstoday.com/wp-content/uploads/2011/06/Squamous-Cell-Carcinoma-VS-Basal-Cell-Carcinoma.jpg	*Basal cells* lie just below the epidermis and create the basement layer that nourishes the epidermis.	The most common type of skin cancer, making up 75% of all skin cancers, is basal cell carcinoma. This cancer grows very slowly and looks like shiny, waxy bumps or nodules on the skin. It is most commonly found on areas of the body with high sun exposure like the head, arms, legs, and face.
Melanoma  http://uvahealth.com/Plone/ebsco_images/2526.jpg	*Melanocytes* are spread throughout the skin and are responsible for producing the pigment that creates skin color.	Melanoma is the least common type of cancer, but accounts for more than 75% of all deaths caused by skin cancer. This cancer most commonly starts as a mole that becomes cancerous and appears as a large brown spot with irregular borders. Due to the pigment produced by melanocytes, it will often appear as if the mole is growing. Melanoma is most commonly found on the head, neck, or trunk.

Sunscreen

Since the number one risk factor for skin cancer is sun exposure, the use of sunscreen is the best prevention. Sunscreen is either made from chemical compounds that are able to absorb UV radiation, reflect UV radiation, or both. In addition, some sunscreens only block UV-B radiation while still allowing UV-A radiation to contact the skin. UV-A radiation will not cause sunburns, but can still increase the risk of skin cancer. Only broad-spectrum sunscreens actually block both UV-A and UV-B radiation.

Sunscreens also have an SPF, or sun protection factor rating, that can range anywhere from 8 - 100+. The SPF rating refers to the amount of time it would take the sun to burn an individual with no sunscreen, compared to the time it would take to burn with the sunscreen. The SPF only refers to the ability of the sunscreen to block UV-B radiation. While there is some variation between SPF, many experts believe that the difference in the amount of protection over SPF 30 is very small, and also no sunscreen is 100% effective.

Boyles, S. and Martin, L.J. 2012. High-SPF Sunscreens: Are They Better? WebMD, www.webmd.com.

American Cancer Society. 2012. Cancer Facts & Figures 2012. The Skin Cancer Foundation, www.skincancer.org.

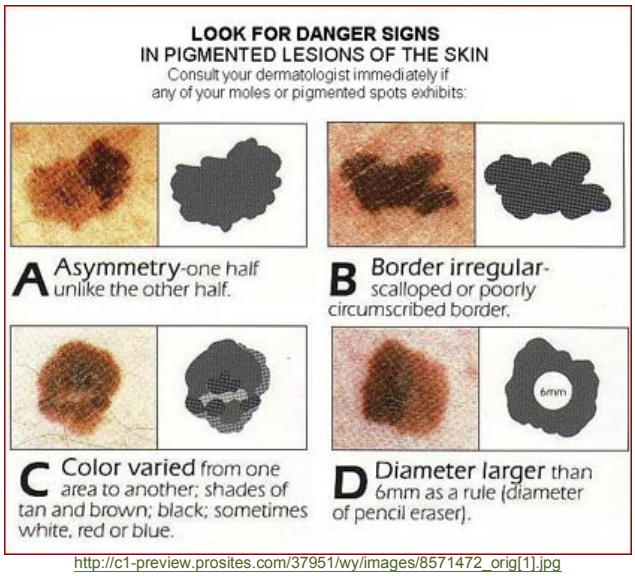
FDA. 2009. Sunburn Protection Factor (SPF). United States Food and Drug Administration.

Patient Analysis

Finding suspicious moles or skin cancer early is the key to treating skin cancer successfully. Examining yourself is usually the first step in detecting skin cancer.

You are a family physician and you have a few patients coming in to have their moles observed. For each patient use the ABCD chart to identify whether the mole is suspicious. Write a summary on the lines provided, answering the following:

1. Is there a possibility the mole is cancerous and why/why not?
2. What is your advice to the patient for this mole? (none, proper sun care, removal, etc.)



http://c1-preview.prosites.com/37951/wy/images/8571472_orig[1].jpg

Patient 1 Information

The patient is a 73-yr.-old Caucasian male with fair skin who has had 3 melanomas removed in the past 2 years. He is a self-confessed beach bum since his youth. The mole is located on his right shoulder and is 7 mm in diameter.

http://www.southflderm.com/images/Melanoma_2.jpg

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Patient 2 Information

The patient is a 69-yr.-old Caucasian female with fair skin. She has recently moved to the U.S. and this is the first time she has had this mole examined. It has been developing since she was in her late teens. It is located on her left cheek and is 23 mm in diameter.

http://healthur.com/wp-content/uploads/2011/03/malignant-melanoma.jpg

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Patient 3 Information

The patient is a 34-yr.-old Hispanic male. He has lived in Brazil for most of his life, and moved to the U.S. last year. He would like the mole looked at since it was previously much smaller, and appears to be increasing in size. It is 3 mm in diameter and is located on the dorsal surface of the foot.

http://www.realpages.com/sites/kulpdermatology/images/5a.jpg

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Review Questions - *on a separate sheet of paper complete the following*

1. How many people are diagnosed with skin cancer in the U.S. annually?
2. How many people will be diagnosed with skin cancer in their lifetime?
3. What is the number one risk factor for skin cancer?
4. By what percentage does use of tanning devices increase the chance of developing skin cancer?
5. List 3 risk factors that you personally may have for skin cancer.
6. What is the difference between UV-A, UV-B, and UV-C radiation?
7. What is squamous cell carcinoma and what does it look like?
8. What is basal cell carcinoma and what does it look like?
9. What is melanoma and what does it look like?
10. Which form of skin cancer is the most common?
11. Which form of skin cancer causes the most deaths?
12. Explain why it is better to use a broad-spectrum sunscreen.
13. What does SPF stand for, and what is the difference between a SPF 15 and a SPF 30 sunscreen?
14. What type of radiation constitutes the basis for setting an SPF rating?