



## **Sun Safety In Science!**

### **I. Sun Stats And The Science Teacher!**

The American Cancer Society statistics indicate that most of the more than 1 million cases of non-melanoma skin cancer diagnosed yearly in the United States are considered “sun-related.” Melanoma, the most serious type of skin cancer, will account for about 60,000 new cases of skin cancer in 2007 and most (about 8,100) of the approximately 11,000 deaths due to skin cancer each year. In addition, more than 1 million Americans will develop nonmelanoma skin cancers this year, and more than 2,800 will die from the disease.

According to a 2006/2007 report by the Australian Institute of Health and Welfare (AIHW) & Australasian Association of Cancer Registries, Australia has the highest rate of skin cancer in the world. Skin cancers account for around 80% of all new cancers diagnosed each year in Australia. Each year Australians are four times more likely to develop a common skin cancer than any other form of cancer. Over 380,000 Australians are treated annually for skin cancer. That equates to over 1,000 people every day. The melanoma incidence rates in Australia and New Zealand are around four times as high as those found in Canada, the United States and the United Kingdom. This is a result of a combination of tropical latitude, fair-skinned population, outdoor lifestyle, and high amount of ambient ultraviolet radiation (UV). In response to this situation, the Australian government has a rigorous offensive against UV exposure, with a focus on school-aged children.

Looking to the future, the U.S. Environmental Protection Agency warns that Americans could suffer 40 million cases of skin cancer and 800,000 cancer deaths in the next 88 years because of depletion of atmospheric ozone.

So what does all of these statistics and concern about skin cancer have to do with the teaching of Science? Here are two ideas to think about:

1. With the resurrection of hands-on science, science teachers and their students seem to be spending more time out in the field. With this comes the increased exposure to UV rays.
2. With the increase in skin cancers forecasted at younger ages, science teachers need to get the word out about sun safety using the “power of the chalk!”

### **II. A Primer: What Are The Common Types Of Skin Cancer?**

The two most common types of skin cancer are basal cell and squamous cell carcinomas. Basal cells are small and round cells found in the base of the outer skin layer. Squamous cells are flat

cells forming the surface of the skin. Both of these are highly curable if caught in early stages. Melanoma, the third most common skin cancer is more dangerous. Melanomas are skin cancers formed from the skin cells that make melanin pigment. The exact role played by ultraviolet light in the genesis of melanoma is controversial and subject to debate. Genetic as well as environmental factors (sun exposure) are involved.

Skin cancer can be found early, and both doctors and patients play important roles in finding skin cancer. The following symptoms may indicate skin cancer and should be shared with your doctor:

- any change on the skin, especially in the size or color of a mole or other darkly pigmented growth or spot, or a new growth;
- scaliness, oozing, bleeding, or change in the appearance of a bump or nodule;
- the spread of pigmentation beyond its border such as dark coloring that spreads past the edge of a mole or mark;
- a change in sensation, itchiness, tenderness, or pain;
- A persistent non-healing skin lesion.

### **III. What Are The Risk Factors?**

The CDC notes certain risk factors more likely to cause skin cancer. They include the following:

- A. Lighter natural skin color.
- B. Family history of skin cancer.
- C. Personal history of skin cancer.
- D. Exposure to the sun through work and play.
- E. A history of sunburns early in life.
- F. Skin that burns, freckles, reddens early or becomes painful in the sun.
- G. Blue or green eyes.
- H. Blond or red hair.
- I. Certain types and a large number of moles.

### **IV. How To Reduce or Prevent Skin Cancer – Using Safer Behaviors!**

The most effective way to reduce or prevent skin cancer is to protect yourself from sun exposure. The CDC recommends five options including:

- A. Seek shade, especially during midday hours (10 am - 4:00 p.m.)
- B. Cover up with clothing to protect skin. There are several companies that offer special sun protective clothing that offers significantly greater protection than “ordinary” clothing.
- C. Use a wide brim hat which will shade the head, ears and neck.
- D. Use sunglasses or shades that wrap around and block 100% of UV-A and UV-B Rays.

- E. Apply sunscreen with a sun protective factor (SPF) of 15 or higher with both UVA and UVB protection.

Note that although the CDC recommends an SPF of 15 or higher, most dermatologists today would now recommend SPF 30 or higher.

#### V. **Skin Cancer Prevention Guidelines For Schools!**

In the 2002 CDC report titled, “Guidelines for School Programs To Prevent Skin Cancer,” seven broad guidelines were included that school programs can use to reduce the risk for skin cancer among students. This included policy, environmental change, education, families, professional development, health services and evaluation. Each guideline includes suggestions regarding key elements, steps for implementation, and realistic expectations for change. The report states the following:

- **Guideline 1: Policy** --- Establish policies that reduce exposure to UV radiation.
- **Guideline 2: Environmental change** --- Provide and maintain physical and social environments that support sun safety and that are consistent with the development of other healthful habits.
- **Guideline 3: Education** --- Provide health education to teach students the knowledge, attitudes, and behavioral skills they need to prevent skin cancer. The education should be age-appropriate and linked to opportunities for practicing sun-safety behaviors.
- **Guideline 4: Family Involvement** --- Involve family members in skin cancer prevention efforts.
- **Guideline 5: Professional development** --- Include skin cancer prevention knowledge and skills in preservice and inservice education for school administrators, teachers, physical education teachers and coaches, school nurses, and others who work with students.
- **Guideline 6: Health services** --- Complement and support skin cancer prevention education and sun-safety environments and policies with school health services.
- **Guideline 7: Evaluation** --- Periodically evaluate whether schools are implementing the guidelines on policies, environmental change, education, families, professional development, and health services.

#### V. **Science Teachers – An Important Role!**

The trend for skin cancer is showing increases worldwide. Schools and especially science teachers need to play a major role in helping to protect students from unnecessary exposure to sunlight and UV radiation. Science teachers can be effective in this area relative to curriculum development, professional development, policies and environmental changes. Their expertise and influence with students make them a critical catalyst in providing essential skin protection

safety and modeling appropriate sun exposure behaviors. A majority of skin cancer can be prevented. Help make the difference in your students' future quality of health and life

RESOURCES:

American Cancer Society – <http://www.cancer.org>

American Academy of Dermatology – <http://www.aad.org>

Australian Institute of Health and Welfare - <http://www.aihw.gov.au/>

Centers For Disease Control and Prevention- <http://www.CDC.gov>

CDC 2002 Report: Guidelines for School Programs To Prevent Skin Cancer  
<http://www.cdc.gov/MMWR/preview/mmwrhtml/rr5104a1.htm>

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