



HEALTH
PHYSICS
SOCIETY

ULTRAVIOLET RADIATION AND PUBLIC HEALTH

POSITION STATEMENT OF THE HEALTH PHYSICS SOCIETY*

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In an average lifetime, one in five persons will be diagnosed with skin cancer. More than one million new basal-cell or squamous-cell skin cancers are diagnosed each year in the United States. In addition, the most serious form of skin cancer, malignant melanoma, will be diagnosed in over 50,000 persons. Annually, approximately 10,000 people die of skin cancer, including over 7,500 from melanoma. Individuals at greatest risk for developing skin cancer have a large number of naevi (moles), sunburn readily, and tan poorly. Reducing exposure to ultraviolet radiation can prevent many of these cancers.

Most human exposure to ultraviolet radiation comes from the sun. The sun's rays contain UVA, UVB, and UVC radiation. UVA and UVB rays can cause skin cancer and are responsible for most of the visible signs of aging, but both types of rays can be protected against by using recommended skin cancer prevention measures. Because the ozone layer does not absorb UVA rays, they enter deeply into the skin to cause aging and possible immune system suppression (DHHS 2002). UVB makes up only 10 percent of the ultraviolet light that reaches the earth's surface, but it is nearly 1,000 times more efficient than UVA in causing a suntan and associated skin damage. The ozone layer absorbs some UVB radiation, but not all. The UVB rays that reach the skin can cause tanning, burns, cataracts, and skin cancer (DHHS 2002). UVC, used in germicidal lamps, causes almost no damage because of its low penetration of the skin.

The atmosphere, especially the ozone layer, filters ultraviolet light and is most effective in early morning and late afternoon. Ultraviolet penetration is greatest between the hours of 10:00 a.m. and 4:00 p.m. UVB intensity increases about 3 percent for every thousand feet in elevation and, like light, is reflected variously from most objects. Sand may reflect

about one-third of the UVB and snow, ice, and water may reflect up to 100 percent. Ironically, water vapor neither absorbs nor reflects very much UVB; consequently, cloudy days offer no protection from UVB. Because children and adolescents usually spend more time in sunlight than adults, they receive over half of their lifetime exposure to UV radiation before adulthood, increasing their likelihood of developing skin cancer (DHHS 2002).

The primary source of artificially produced UVB is tanning booths. In 2000, UV radiation from tanning beds and sunlamps was listed as a carcinogen by the National Institute of Environmental Health Sciences. Some epidemiologic evidence suggests artificial UV radiation causes melanoma. Tanning beds may emit the same type and amount of UV radiation as the summer sun at noon, and sometimes more. Like natural UV radiation, artificial radiation can cause extensive skin damage and is a possible cause of ocular melanoma (DHHS 2002). The Food and Drug Administration (FDA) and the Centers for Disease Control and Prevention (CDC) encourage people to avoid use of tanning beds and sunlamps.

The Health Physics Society advocates that the public be provided adequate information to understand the potential risks from ultraviolet radiation and to make decisions that decrease their risk of skin cancer. A good source of information concerning melanoma, skin cancer, and sun safety is the American Academy of Dermatology Public Resource Center. The Health Physics Society supports and urges public agencies, including schools, to develop skin cancer prevention policies and to take a more active role in educating the public on the risks of exposure to UV and in the methods to reduce risk. To assist the public, health officials, and the media, the Society supports the *Guidelines for School Programs to Prevent Skin Cancer* and offers the following recommendations to reduce the risk of cancer from exposure to ultraviolet radiation.

Protect yourself from the sun and artificially produced UV radiation. To reduce exposure to harmful UVA and UVB radiation, people should practice the following:

- Avoid the use of tanning beds or sunlamps.
- Minimize exposure to the sun between 10 a.m. and 4 p.m., when the sun's rays are strongest. If your shadow is shorter than you are, seek the shade.
- Apply a broad-spectrum sunscreen that protects against UVA and UVB and has a sun protection factor (SPF) of at least 15.
- Reapply sunscreen every two hours, even on cloudy days. Reapply after swimming, perspiring, or drying with a towel.
- Wear sun-protective clothing including a wide-brimmed hat and sunglasses.
- Avoid reflective surfaces.

References

American Academy of Dermatology Public Resource Center. Available at: <http://www.aad.org/public/News/NewsReleases/Press+Release+Archives/Skin+Cancer+and+Sun+Safety/melanoma.htm>. Accessed 7 February 2007.

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* The Health Physics Society is a nonprofit scientific professional organization whose mission is excellence in the science and practice of radiation safety. Since its formation in 1956, the Society has grown to approximately 6,000 scientists, physicians, engineers, lawyers, and other professionals representing academia, industry, government, national laboratories, the Department of Defense, and other organizations. Society activities include encouraging research in radiation science, developing standards, and disseminating radiation safety information. Society members are involved in understanding, evaluating, and controlling the potential risks from radiation relative to the benefits. Official position statements are prepared and adopted in accordance with standard policies and procedures of the Society. The Society may be contacted at 1313 Dolley Madison Blvd., Suite 402, McLean, VA 22101; phone: 703-790-1745; fax: 703-790-2672; email: HPS@BurkInc.com.