

Skin cancer risk in athletes: The dangers of ultraviolet radiation

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The dangers of ultraviolet radiation exposure, which most often comes from the sun, are well-known. Speaking at The Physiological Society's Extreme Environmental Physiology conference next week, W. Larry Kenney, Penn State University, will discuss how broad its effects can be, from premature aging to cancer, and how this can be influenced by different skin tones and the use of sunscreen.

Athletes ranging from hikers, to tennis and runners exceed the recommended ultraviolet exposure limit by up to eight-fold during the summer and autumn months. While regular physical activity is associated with a reduced risk of most cancers, [skin cancer](#) is an exception. For malignant skin cancer, those in the 90th percentile for physical activity have an increased risk of cancer than those in the 10th percentile. Sun protection in these groups is especially important as multiple studies demonstrate an elevated risk of skin cancer for those who regularly participate in outdoor sports or exercise.

The [ultraviolet radiation](#) spectrum is categorized by

wavelength as UV-A (320-400 nm), UV-B (290-320 nm), and UV-C (200-290 nm) and the biological effects vary per type. UV-A constitutes around 95% of ultraviolet radiation that reaches the earth's surface, with the remainder being UV-B. In the skin, UV-A is able to reach the skin's [blood circulation](#) but most of UV-B is absorbed in the outer layers of the skin (called the epidermis and upper dermis) due to its [shorter wavelengths](#).

Skin pigmentation is another factor that affects our response to sun exposure. UV radiation affects the body's ability to create two important substances, vitamin D and folate, which contribute to both a health pregnancy and early childhood development. It helps vitamin D be synthesised, whereas it causes folate to break down.

There is a theory that suggests that early human populations, living in equatorial Africa, evolved skin pigmentation to protect themselves from folate degradation. This theory also says that depigmentation then occurred as humans moved away from the equator to allow for higher levels of vitamin D synthesis.

Commenting on his talk, Professor Kenney said:

"Sun protection in athletes is especially important as multiple studies demonstrate an elevated risk of [skin](#) cancer for those who regularly participate in [outdoor sports](#) or exercise. Surprisingly, fewer than 25% of surveyed athletes reported regular use of sunscreen, so there is clearly more awareness-raising that needs to be done."

Provided by The Physiological Society

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